

9840 Tape Drive

User's Reference Manual





9840 Tape Drive

User's Reference Manual

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List of Pages

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Pages	Disposition
Cover	
Blank page	
Title page	
Copyright page (ii)	
iii through xxvi	
1-1 through 1-16	
2-1 through 2-8	
3-1 through 3-8	
4-1 through 4-32	
5-1 through 5-14	
6-1 through 6-36	
A-1 through A-8	
B-1 through B-2	
Glossary-1 through Glossary-6	
Index-1 through Index-14	
Reader's Comment Form	
Business Reply Mailer	
Blank Page	
Back Cover	

Summary of Changes

The following table shows the revision history and summary of the changes for this publication.

EC #	Date	Edition	Description
112188	10/98	First	Initial release.
113499	02/99	Second	See this edition for a description of changes.
112275	04/99	Third	See this edition for a description of changes.
112338	09/99	Fourth	See this edition for a description of changes.
112350	11/99	Fifth	See this edition for a description of changes.
111457	03/00	Sixth	See this edition for a description of changes.
111488	05/00	Seventh	See this edition for a description of changes.
111523	08/00	Eighth	Updated menu illustrations. Updated firmware information for VolSafe.
111542	08/00	Ninth	Added a warranty statement for VolSafe.

Contents

List of Pages	iii
Summary of Changes	iv
Contents	v
Figures	xi
Tables	xiii
Preface	xv
Organization	xv
Comments and Suggestions	xvi
Alert Messages	xvi
Conventions	xvii
Additional Information	xviii
StorageTek's External Web Site	xviii
Customer Resource Center	xviii
Channels Site	xviii
Hard-copy Publications	xviii
Customer Support Services	xix
Customer-Initiated Maintenance	xix
Safety	xxi
Fiber Optic Safety	xxi
Laser Product Label	xxii
Notices	xxiii
FCC Compliance Statement	xxiii
Japanese Compliance Statement	xxiv
Taiwan Warning Label Statement	xxiv
Internal Code License Statement	xxv
1: Overview	1-1
9840 Tape Drive	1-1
Configuration Details	1-2
Display and Indicators	1-2

Operator Panel	1-4
Standard Operator Panel	1-4
CSL Operator Panel	1-5
Operator Display	1-6
Cartridge Tapes	1-7
Design	1-7
Models	1-9
Library Drives	1-9
StorageTek Libraries	1-10
L180 Library	1-10
L700 Library	1-10
Cartridge Scratch Loader (CSL)	1-11
Shipment	1-11
Model Numbers	1-11
Rack-mountable CSLs	1-12
Rack-mountable Drives	1-13
Configurations	1-14
Host Environments	1-15
Host Interfaces	1-15
ESCON	1-16
Fibre Channel	1-16
SCSI	1-16
2: Operator Panel Details	2-1
Standard Operator Panel Switches	2-2
IPL Switch	2-2
Menu Switch	2-3
Select Switch	2-3
Unload Switch	2-3
Standard Operator Panel Indicators	2-4
Activity Indicator	2-4
Clean Indicator	2-4
Power Indicator	2-5
Service Indicator	2-5
Operator Display	2-6
CSL Operator Panel Switches	2-7
Autoload Mode Switch	2-7
Start Switch	2-8
CSL Operator Panel Indicators	2-8
Automatic Indicator	2-8
Manual Indicator	2-8
Operator Indicator	2-8
System Indicator	2-8

3: Operator Tasks	3-1
Powering On a Drive	3-1
Power Switch	3-1
Process	3-2
Write-Protecting a Cartridge	3-3
Switch Positions	3-3
Process	3-4
Loading a Drive	3-5
Unloading a Drive	3-5
Cleaning a Drive	3-6
Powering Off a Drive	3-7
Identifying Unrecoverable Tapes	3-8
Reformatting (Reclaiming) a Cartridge Tape	3-8
4: Menus	4-1
Main Menu Summary	4-2
Menu Operations	4-4
Online Menu	4-4
Offline Menu	4-4
Online Main Menus and Submenus	4-5
Offline Menu Operations	4-6
View Fibre Channel Configuration Status	4-7
View SCSI Configuration Status	4-10
View ESCON Configuration Status	4-13
Drive Operations Menu	4-16
Online/Offline Main Menu Tasks	4-22
Online	4-22
Offline	4-23
View Configuration Main Menu Task	4-24
View Configuration Information	4-24
Select a Language	4-25
Select Tape Bar Task	4-25
Reclaim Cartridge Tape	4-25
Firmware Release Main Menu Task	4-27
View Firmware Release Level	4-27
CSL Code Level Main Menu Task	4-28
View CSL Code Level	4-28
Exit Main Menu Tasks	4-29
Exit the Menu System	4-29
Return to Online/Offline Main Menu	4-29
Return to the Menu System	4-30

Tape Bar-Chart Explanation	4-31
Media Information Region	4-31
Displayed Bars	4-31
Segment	4-31
Dots	4-31
Write Bar	4-31
Read Bar	4-31
5: Drive Errors and Messages	5-1
Power and Service Indicator Errors	5-2
Clean Indicator Error	5-3
Operator Panel Messages	5-3
Language Translated Messages	5-7
Specific Error Recovery Procedures	5-8
DumpAgain? Condition	5-8
Save Fails Condition	5-8
UnWr Condition	5-8
Shipping Insert	5-9
Jammed Cartridge	5-12
Fiber-Optic Problems	5-14
6: Cartridge Scratch Loader	6-1
Overview	6-1
Component Locations	6-2
Cartridge Routing	6-3
Rack	6-4
Rack-mount CSL Tray	6-5
Operator Panel	6-6
CSL Switches	6-7
CSL Indicators	6-8
Power On/Off CSL	6-10
Power On	6-11
Power Off	6-11
CSL Cartridge Loading/Unloading	6-12
Cartridge Loading	6-12
Cartridge Unloading	6-13
Modes of Operation	6-14
System Mode	6-14
Mount Message	6-14
Unload Message	6-15
Place CSL in System Mode	6-15
Automatic Mode	6-16

Unload Message 6-16
 Example 6-16
 Place CSL in Automatic Mode 6-16
 Manual Mode 6-17
 Unload 6-17
 Place CSL in Manual Mode 6-17
 Priority Mount Mode 6-18
 CSL in System Mode 6-18
 CSL in Automatic Mode 6-19
 CSL in Manual Mode 6-19
 Cartridge Removal from Feed Channel 6-20
 Error and Recovery 6-21
 Operator Indicator 6-21
 Drive Failure to Load 6-21
 Incorrect Load Process 6-22
 Recovery Process 6-22
 Clearing CSL Errors 6-23
 Fault Symptom Codes 6-24
 Jammed Cartridge 6-26
 Shipping Insert 6-30
 Removal 6-31
 Install and Lock 6-32
 CSL Model Numbers 6-35

A: Product Specifications A-1

Power Requirements A-1
 Environmental Requirements A-2
 Drive and Power Supply A-2
 Cartridge Tapes and Media A-3
 Cartridge Tape Specifications A-4
 Drive Performance A-5
 Host Interfaces and Device Modes A-6
 Library Attachments A-7
 Non-Library Installations A-8

B: Client Programmer Information B-1

Unmarked Firmware-Update Files B-1
 Enterprise ESCON Updates B-1
 Multi-Platform SCSI Updates B-2
 Firmware-File Format B-2
 Data Transfer Limitations B-2

Glossary **Glossary-1**
Index **Index-1**
Reader's Comment Form

Figures

Figure 1-1. 9840 Tape Drive Desktop Configuration	1-1
Figure 1-2. Standard Operator Panel	1-3
Figure 1-3. Standard Operator Panel	1-5
Figure 1-4. CSL Operator Panel	1-6
Figure 1-5. Standard Cartridge Tape	1-8
Figure 1-6. VolSafe Cartridge Tape	1-8
Figure 1-7. 9840 Tape Drive Assembly for a 9310 or 9740 Library	1-9
Figure 1-8. L180 and L700 Libraries	1-10
Figure 1-9. CSL in Tray	1-11
Figure 1-10. Rack-mountable CSL	1-12
Figure 1-11. Rack-mountable Drives	1-13
Figure 2-1. Operator Panels	2-1
Figure 2-2. Standard Operator Panel Switches	2-2
Figure 2-3. Standard Operator Panel Indicators	2-4
Figure 2-4. CSL Operator Panel	2-7
Figure 3-1. L180 or L700 Library 9840 Tape Drive	3-1
Figure 3-2. Operator Display	3-2
Figure 3-3. Cartridges	3-4
Figure 4-1. Operator Panels	4-1
Figure 4-2. Main Menus Available When Drive is Online	4-3
Figure 4-3. Online View CFG? Menus	4-5
Figure 4-4. Offline Configuration Menus	4-6
Figure 4-5. View Fibre Channel Configuration	4-7
Figure 4-6. View SCSI Configuration	4-10
Figure 4-7. View ESCON Configuration	4-13
Figure 4-8. Drive Operations (ESCON)	4-16
Figure 4-9. Tape Write/Read Bar Chart	4-32
Figure 5-1. 9840 Tape Drive	5-1
Figure 5-2. Shipping Insert	5-9
Figure 5-3. 9840 Tape Drive Manual Unload Device (MUD)	5-12
Figure 6-1. CSL	6-1
Figure 6-2. CSL Component Locations	6-2
Figure 6-3. Cartridge Routing	6-3
Figure 6-4. RACK001 for CSL Trays	6-4
Figure 6-5. Rack Mount CSL	6-5
Figure 6-6. CSL Operator Panel	6-6

Figure 6-7. CSL Operator Panel Indicators	6-8
Figure 6-8. SCSI CSL Power	6-10
Figure 6-9. ESCON CSL Power	6-10
Figure 6-10. Cartridge Loading	6-12
Figure 6-11. Cartridge Unloading	6-13
Figure 6-12. CSL Modes of Operation	6-14
Figure 6-13. Priority Mounting a Cartridge	6-18
Figure 6-14. Cartridge Stop Mechanism/First Index Rod	6-19
Figure 6-15. Cartridge Removal	6-20
Figure 6-16. CSL Operator Panel	6-21
Figure 6-17. Ejected Cartridge (Failure to Load)	6-22
Figure 6-18. CSL Rear View	6-23
Figure 6-19. 9840 Tape Drive Manual Unload Device (MUD)	6-26
Figure 6-20. Shipping Insert	6-30
Figure 6-21. MUD Screw in CSL	6-32
Figure 6-22. Rack Enclosure	6-35

Tables

Table 1-1. 9840 Configurations	1-2
Table 1-2. Standard and VolSafe Cartridges	1-7
Table 1-3. CSL Configurations	1-11
Table 1-4. Configurations of the 9840 Tape Drive	1-14
Table 1-5. Products and 9840 Tape Drive Interfaces	1-15
Table 3-1. Write Protect Switch	3-3
Table 4-1. Summary of Main Menus	4-2
Table 4-2. Menu Table - View Fibre Channel Configuration	4-8
Table 4-3. Menu Table—View SCSI Configuration	4-11
Table 4-4. Menu Table - View ESCON Configuration	4-14
Table 4-5. Menu Table—Drive Operations	4-17
Table 5-1. Power and Service Indicators	5-2
Table 5-2. Operator Display Messages	5-3
Table 5-3. Language Translated Messages	5-7
Table 6-1. CSL Component Descriptions	6-2
Table 6-2. Rack Mount CSL Tray Dimensions	6-5
Table 6-3. CSL Operator Panel Switches	6-7
Table 6-4. CSL Operator Panel Indicators	6-8
Table 6-5. CSL FSCs	6-24
Table 6-6. CSL Configurations	6-35
Table A-1. Power Requirements	A-1
Table A-2. Drive and Power Supply Requirements.	A-2
Table A-3. Cartridge Tapes and Media Requirements	A-3
Table A-4. Cartridge Tape Specifications	A-4
Table A-5. Drive Performance.	A-5
Table A-6. Host Interfaces.	A-6
Table A-7. Library Attachments	A-7
Table A-8. Non-Library Drive Installations	A-8

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Preface

This manual contains information about the 9840 Tape Drive. It helps you use the 9840 Tape Drive and respond to operator panel messages or other conditions that occur while operating the 9840 Tape Drive.

Use this information as a reference for on-site operators and users of the 9840 Tape Drive.

■ Organization

This manual contains:

- Chapter 1 “[Overview](#)” describes the 9840 Tape Drive and lists some of its features and capabilities.
- Chapter 2 “[Operator Panel Details](#)” shows the switches, indicators, and message display that comprise the 9840 operator panel.
- Chapter 3 “[Operator Tasks](#)” provides several procedures for operating the 9840 Tape Drive.
- Chapter 4 “[Menus](#)” lists the menus and sub-menus that you use to view configurations and the software release of the 9840 Tape Drive.
- Chapter 5 “[Drive Errors and Messages](#)” lists problems that might occur while using the 9840 Tape Drive and describes recovery actions.
- Chapter 6 “[Cartridge Scratch Loader](#)” provides an overview of the CSL, information on the rack model, operator panel, modes of operation, and error and recovery procedures.
- Appendix A “[Product Specifications](#)” provides requirements and specifications for the 9840 Tape Drive.
- Appendix B “[Client Programmer Information](#)” includes information about applying firmware updates to the 9840 Tape Drive.
- Glossary The [Glossary](#) defines terms used in this manual.
- Index The [Index](#) allows you to locate information in this manual.

■ Comments and Suggestions

A Reader's Comment Form at the back of this publication lets you communicate suggestions or requests for change. StorageTek encourages and appreciates reader feedback.

StorageTek employees with access to Portal may complete an online Reader's Comment Form. Point your browser to:

<http://sts.stortek.com/sts/tis/tisrcf.htm>

■ Alert Messages

Alert messages in this manual signal the reader to special information about a concept, a procedure, or other topics.

Note: Provides additional information that might be of special interest. A note can point out exceptions to rules or procedures. A note usually, but not always, follows the information to which it pertains.

CAUTION:

Informs the user of conditions that might result in damage to hardware, corruption of customer data or application software, or long-term health hazard to people. A caution always precedes the information to which it pertains.

WARNING:

Alerts the user to conditions that might result in injury or death. A warning always precedes the information to which it pertains.

■ Conventions

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

Item	Example	Description
Button	MENU	Physical buttons or switches, onscreen buttons, and softkeys appear in Helvetica font and in all capital letters.
Emphasized text	<i>not or must</i>	Important or emphasized words and phrases appear in italics.
Filenames	dictionary.txt	Filenames appear in Courier font.
Indicators/ LEDs	<i>Open</i>	Indicators and LEDs appear with initial capital letters and in italics.
Keyboard keys	[Y], [Enter] or [Ctrl+Alt+Delete]	Keyboard keys appear within brackets, in Helvetica font, with initial capital letters or as the key appears on the keyboard.
Screen captures or messages	downloading	Screen captures or messages appear in Courier font.
Parameters or input	Device = <i>xx</i>	Names of variables that require values assigned appear in italics.
Pathnames	C:/programs/ StorageTek	Pathnames appear in Courier font.
Positions for switches, jumpers, and circuit breakers	ON	Switch, jumper, and circuit breaker positions appear in default font and all capital letters.
URLs and hypertext links	www.stortek.com/techpubs	Universal Resource Locator (URL) and hypertext links appear in blue text and underlined.

■ Additional Information

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StorageTek's External Web Site

StorageTek's external web site provides marketing, product, event, corporate, and service information. In addition, the external web site serves as an entry point to the Customer Resource Center (CRC) and to the Channel site. The external web site is accessible to anyone with a web browser and an Internet connection.

The URL for the StorageTek external web site is <http://www.storagetek.com>

Customer Resource Center

StorageTek's Customer Resource Center (CRC) is a web site that enables members to resolve technical issues by searching code fixes and technical documentation. CRC membership entitles you to other proactive services, such as HIPER subscriptions, technical tips, answers to frequently asked questions, and online product support contact information. Customers who have a current warranty or a current maintenance service agreement may apply for membership by clicking on the **Request Password** button on the CRC home page.

The URL for the CRC is <http://www.support.storagetek.com>.

Channels Site

StorageTek's Channels site is a web site that provides information about products, services, customer support, upcoming events, training programs, and sales tools to support StorageTek's channel partners. (This site was formerly known as the Partners Page.) Access to this site, beyond the Channels Login page, is restricted. On the Channels Login page, current partners who do not have access can request a login ID and password and prospective partners can apply to become StorageTek resellers.

The URL for the Channels site is <http://channels.storstek.com>.

Hard-copy Publications

Contact a StorageTek sales or marketing representative to order additional paper copies of this publication or to order other StorageTek customer publications in paper format.

■ Customer Support Services

The Call Center for Customer Support Services (CSS) is available 24 hours a day, seven days a week, to customers with StorageTek maintenance contracts and to StorageTek employees. You can find additional information about the CSS on StorageTek's external Web site at:

<http://www.storagetek.com/StorageTek/css>

■ Customer-Initiated Maintenance

Customer-initiated maintenance begins with a telephone call from you to the StorageTek CSS. You receive immediate attention from qualified StorageTek personnel, who record problem information and respond with the appropriate level of support.

To contact the CSS about a problem:

1. Use the telephone to call the StorageTek Customer Support Services at:

☎ 1-800-735-2778 (from within the United States)

☎ 303-673-4056 (from outside the United States)

2. Describe the problem to the call taker. The call taker will ask several questions and will either route your call to or dispatch a customer services engineer (CSE).

If you have the following information when placing a service call, the process will be much easier:

Account name _____

Site location number _____

Contact name _____

Telephone number _____

Equipment model number _____

Device address _____

Device serial number (if known) _____

Urgency of problem _____

Fault Symptom Code (FSC) _____

Problem description _____

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Safety

Operators of the 9840 Tape Drive should follow these safety guidelines:

■ Fiber Optic Safety

WARNING:

Eye hazard. Never look directly into a fiber-optic cable, a fiber-optic connector, or a laser transceiver module. Hazardous conditions might exist from laser power levels that are capable of causing injury to the eye.

Be especially careful when using optical instruments with this equipment. Such instruments might increase the likelihood of eye injury.

The laser transceivers in fiber-optic equipment can pose dangers to personal safety. Ensure that anyone who works with this StorageTek equipment understands these dangers and follows safety procedures. Ensure that the optical ports of every laser transceiver module are terminated with an optical connector, a dust plug, or a cover.

Each fiber-optic interface in this StorageTek Fibre Channel equipment contains a laser transceiver that is a Class 1 Laser Product. Each laser transceiver has an output of less than 70 μW and a wavelength of 850 nm. StorageTek's Class 1 Laser Products comply with EN60825-1(+A-11) and with sections 21 CFR 1040.10 and 1040.11 of the Food and Drug Administration (FDA) regulations.

The following translations are for users in Finland and Sweden who wish to identify laser safety and classification:

CLASS 1 LASER
LUOKAN 1 LASERLAITE
KLASSE 1 LASER APPARAT

■ Laser Product Label

In accordance with safety regulations, a label on each StorageTek Fibre Channel product identifies the laser class of the product and the place and date of the manufacturer. The label appears on top of a Fibre Channel tape drive and near the Fibre Channel connectors on a Fibre Channel tape library. A copy of the label is shown here:

CLASS 1 LASER PRODUCT
LASER KLASSE 1
APPAREIL A LASER DE CLASSE 1
COMPLIES WITH 21 CFR 1040.10 AND 1040.11

Notices

Please read the following compliance and warning statements for this product.

CAUTION:

***Potential equipment damage:* Cables that connect peripherals must be shielded and grounded; refer to cable descriptions in the instruction manuals. Operation of this equipment with cables that are not shielded and not correctly grounded might result in interference to radio and TV reception.**

Changes or modifications to this equipment that are not expressly approved in advance by StorageTek will void the warranty. In addition, changes or modifications to this equipment might cause it to create harmful interference.

■ FCC Compliance Statement

The following compliance statement pertains to Federal Communications Commission Rules 47 CFR 15.105:

Note: This equipment has been tested and found to comply to the limits for Class A digital devices 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 in accordance with the instruction manual, may cause harmful 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 or her own expense.

■ Japanese Compliance Statement

The following compliance statement in Japanese pertains to VCCI EMI regulations:

この装置は、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。 VCCI-A

English translation: This is a Class A product based on the standard of 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.

■ Taiwan Warning Label Statement

The following warning label statement pertains to BSMI regulations in Taiwan, R.O.C.:

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

English translation: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures.

■ Internal Code License Statement

The following is the Internal Code License Agreement from StorageTek:

NOTICE

INTERNAL CODE LICENSE

PLEASE READ THIS NOTICE CAREFULLY BEFORE INSTALLING AND OPERATION THIS EQUIPMENT. THIS NOTICE IS A LEGAL AGREEMENT BETWEEN YOU (EITHER AN INDIVIDUAL OR ENTITY), THE END USER, AND STORAGE TECHNOLOGY CORPORATION (“STORAGETEK”), THE MANUFACTURER OF THE EQUIPMENT. BY OPENING THE PACKAGE AND ACCEPTING AND USING ANY UNIT OF EQUIPMENT DESCRIBED IN THIS DOCUMENT, YOU AGREE TO BECOME BOUND BY THE TERMS OF THIS AGREEMENT. IF YOU DO NOT AGREE WITH THE TERMS OF THIS AGREEMENT, DO **NOT** OPEN THE PACKAGE AND USE THE EQUIPMENT. IF YOU DO NOT HAVE THE AUTHORITY TO BIND YOUR COMPANY, DO **NOT** OPEN THE PACKAGE AND USE THE EQUIPMENT. IF YOU HAVE ANY QUESTIONS, CONTACT THE AUTHORIZED STORAGETEK DISTRIBUTOR OR RESELLER FROM WHOM YOU ACQUIRED THIS EQUIPMENT. IF THE EQUIPMENT WAS OBTAINED BY YOU DIRECTLY FROM STORAGETEK, CONTACT YOUR STORAGETEK REPRESENTATIVE.

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 - b. “Internal Code” is Microcode that (i) is an integral part of Equipment, (ii) is required by such Equipment to perform its data storage and retrieval functions, and (iii) executes below the user interface of such Equipment. Internal code does not include other Microcode or software, including data files, which may reside or execute in or be used by or in connection with such Equipment, including, without limitation, Maintenance Code.
 - c. “Maintenance Code” is defined as Microcode and other software, including data files, which may reside or execute in or be used by or in connection with Equipment, and which detects, records, displays, and/or analyzes malfunctions in the Equipment.
 - d. “Microcode” is defined as a set of instructions (software) that is either imbedded into or is to be loaded into the Equipment and executes below the external user interface of such Equipment. Microcode includes both Internal Code and Maintenance Code, and may be in magnetic or other storage media, integrated circuitry, or other media.
2. The Equipment you have acquired by purchase or lease is manufactured by or for StorageTek and contains Microcode. By accepting and operating this Equipment you acknowledge that StorageTek or its licensor(s) retain(s) ownership of all Microcode, as well as all copies thereof, that may execute in or be used in the operation or servicing of the Equipment and that such Microcode is copyrighted by StorageTek or its licensor(s).
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6. You, the end user, agree to take all appropriate steps to ensure that all of your obligations set forth in this Notice, particularly in paragraphs 4 and 5, are extended to any third party having access to the Equipment.
7. You may transfer possession of the Internal Code to another party only with the transfer of the Equipment on which its use is authorized, and your license to use the Internal Code is discontinued when you are no longer an owner or a rightful possessor of the Equipment. You must give such transferee all copies of the Internal Code for the transferred Equipment that are in your possession, along with a copy of all provisions of this Notice. Any such transfer by you is automatically (without further action on the part of either party) expressly subject to all the terms and conditions of this Notice passing in full to the party to whom such Equipment is transferred, and such transferee accepts the provisions of this license by initial use of the Internal Code. You cannot pass to the transferee of the Equipment any greater rights than granted under this Notice, and shall hold StorageTek harmless from any claim to the contrary by your transferee or its successors or assigns. In addition, the terms and conditions of this Notice apply to any copies of Internal Code now in your possession or use or which you hereafter acquire from either StorageTek or another party.
8. You acknowledge that copies of both Internal Code and Maintenance Code may be installed on the Equipment before shipment or included with the Equipment and other material shipped to you, all for the convenience of StorageTek's service personnel or service providers licensed by StorageTek, and that during the warranty period, if any, associated with the Equipment, and during periods in which the Equipment is covered under a maintenance contract with StorageTek or service providers licensed by StorageTek, both Internal Code and Maintenance Code may reside and be executed in or used in connection with such Equipment, and you agree that no rights to Maintenance Code are conferred upon you by such facts. StorageTek or the licensed service provider may keep Maintenance Code and service tools and manuals on your premises but they are to be used only by StorageTek's customer service personnel or those of service providers licensed by StorageTek. You further agree that upon (i) any termination of such warranty period or maintenance contract period; or (ii) transfer of possession of the Equipment to another party, StorageTek and its authorized service providers shall have the right with respect to the affected Equipment to remove all service tools and manuals and to remove or disable all Maintenance Code and/or replace Microcode which includes both Internal Code and Maintenance Code with Microcode that consists only of Internal Code.

This chapter provides general information about the 9840 Tape Drive:

- “9840 Tape Drive”
- “Operator Panel” on page 1-4
- “Cartridge Tapes” on page 1-7
- “Models” on page 1-9
- “Configurations” on page 1-14
- “Host Environments” on page 1-15
- “Host Interfaces” on page 1-15

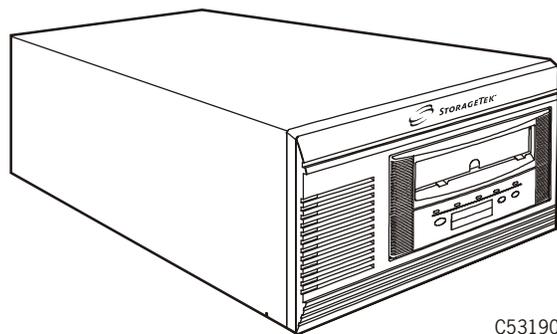
■ 9840 Tape Drive

The StorageTek 9840 Tape Drive is a small, modular, high-performance tape drive designed for the enterprise and multi-platform environments. It operates in a variety of software, hardware, host, and input/output channel environments.

The 9840 is available in desktop, rack-mount, and library-attached configurations. The desktop and rack-mount configurations have the options of manual cartridge tape loading or the automatic cartridge scratch loader (CSL).

Host interfaces for the 9840 include Enterprise Systems Connection (ESCON), Fibre Channel, or small computer system interface (SCSI).

Figure 1-1. 9840 Tape Drive Desktop Configuration



Configuration Details

[Table 1-1](#) shows the details of the 9840 Tape Drive configurations.

Table 1-1. 9840 Configurations

Configuration	Interface	Number of Drives	Figure and Page
Desktop (manual-load)	Fibre Channel or SCSI	1	Figure 1-1 on page 1-1
Desktop (CSL)	ESCON, Fibre Channel, or SCSI	1	
Rack-mount (manual-load) Note 1	ESCON, Fibre Channel, or SCSI	1-12	Figure 1-11 on page 1-13
Rack-mount (CSL)	ESCON , Fibre Channel, or SCSI	1-6	Figure 1-9 on page 1-11
Library-attached	Note 2	Note 3	Figure 1-7 on page 1-9

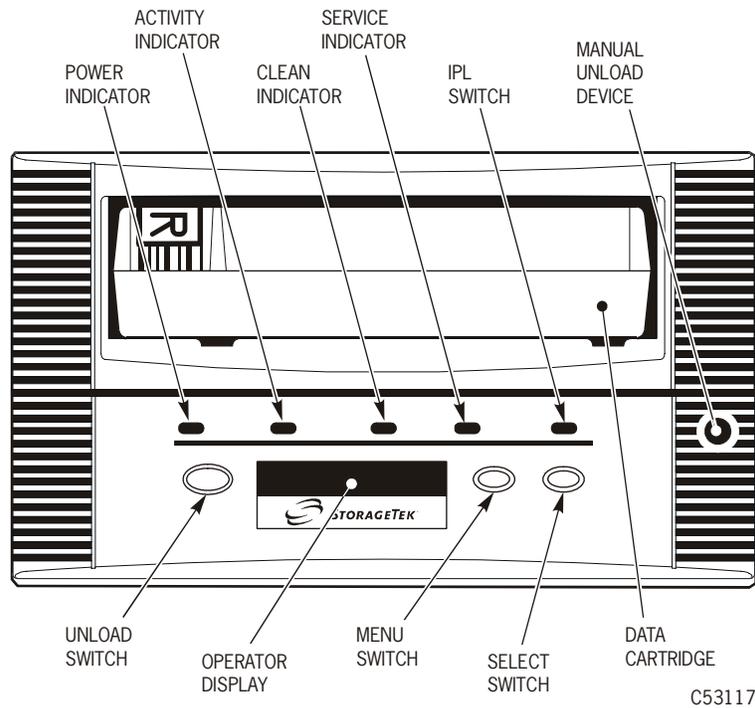
Notes:

1. Manual-load and CSL drives may be intermixed in a single rack. Refer to [Table 1-4 on page 1-14](#) for specific number of CSL and drives installed within each rack.
2. Interfaces vary with each library. Refer to [Table 1-4 on page 1-14](#) for specific interfaces.
3. The number of drives in each library varies. Refer to [Table 1-4 on page 1-14](#) for specific number of drives installed within each library.

Display and Indicators

The 9840 Tape Drive operator panel display and indicators ([Figure 1-2](#)) help you isolate problems and inform you of routine maintenance procedures. You do not need to interrupt library operation for routine maintenance, such as cleaning the drive. Other problems, such as those described in [Chapter 5](#), “[Drive Errors and Messages](#),” may require other actions.

Note: [Figure 1-2](#) illustrates a standard operator panel. [Figure 1-4 on page 1-6](#) illustrates the Cartridge Scratch Loader (CSL) operator panel.

Figure 1-2. Standard Operator Panel

Authorized service personnel must resolve some problems, such as those internal to the 9840 Tape Drive, by replacing the tape drive. [Chapter 5, "Drive Errors and Messages,"](#) provides additional information about contacting StorageTek service.

Note: Refer to [Chapter 6, "Cartridge Scratch Loader,"](#) to resolve CSL specific problems.

■ Operator Panel

The operator panel is the interface between the operator and the 9840 Tape Drive.

Two types of operator panels are available for the 9840 Tape Drive equipment:

- Standard
- CSL

[Figure 1-3](#) shows the standard operator panel, used in the desktop, rack-mount, and library configurations.

[Figure 1-4 on page 1-6](#) shows the CSL operator panel, used in the desktop or rack-mount CSL configurations.

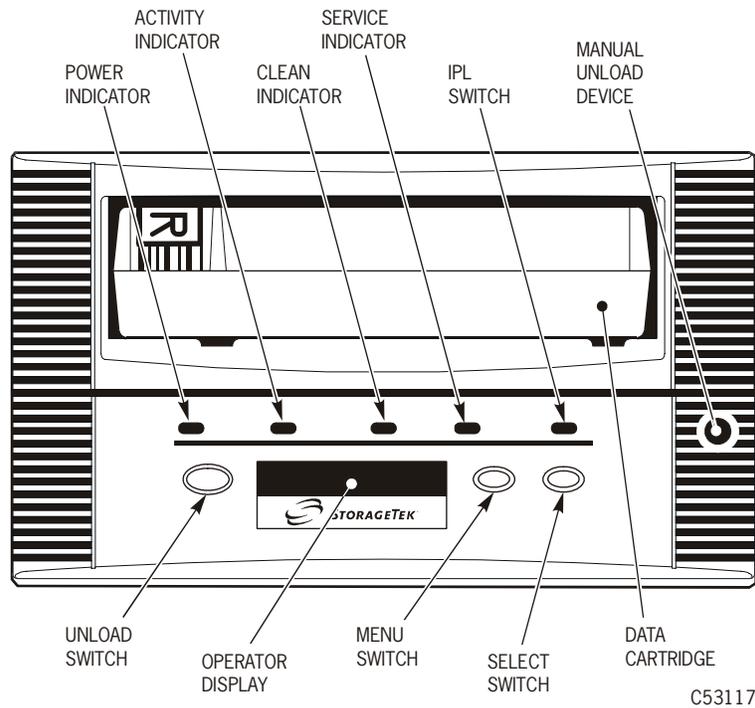
Notes:

- The standard and CSL operator panels use small push-button switches. The term switch or switches is used to identify them throughout this manual.
- The standard 9840 Tape Drive operator panel switches and indicators are replicated on the CSL panel. See [Figure 1-4 on page 1-6](#).

Standard Operator Panel

The standard operator panel ([Figure 1-3](#)) has a 10-digit display, four switches, and four indicators.

The standard 9840 Tape Drive ([Figure 1-3](#)) operator panel switches, indicators, and a display are described in [Chapter 2, “Operator Panel Details.”](#)

Figure 1-3. Standard Operator Panel

Note: A qualified service person can configure the 9840 Tape Drive from the operator panel using instructions provided in the *9840 Tape Drive Service Reference Manual* (part number 95740).

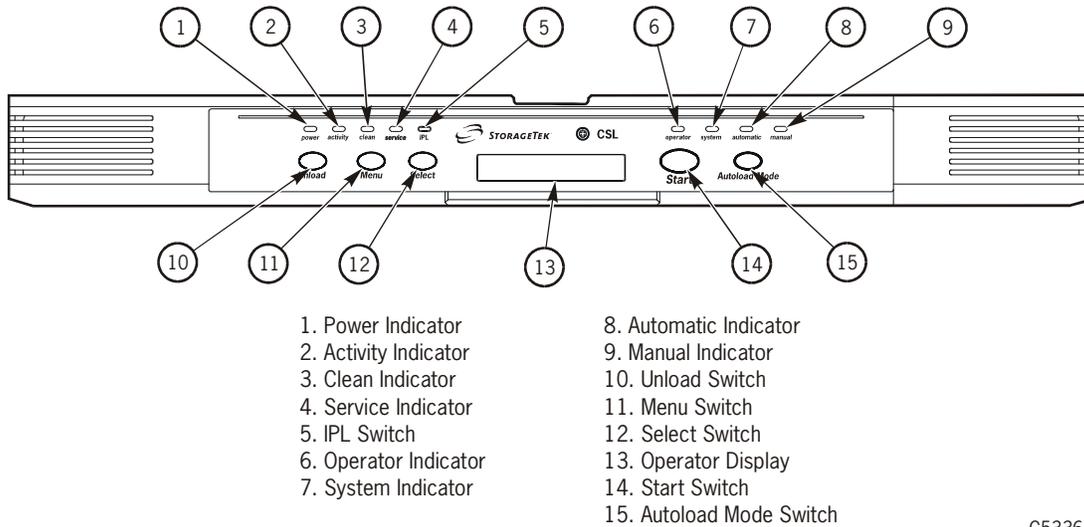
When the 9840 Tape Drive is installed in some libraries, a duplicate operator panel is mounted behind the drive for use by service personnel.

CSL Operator Panel

The CSL operator panel (Figure 1-4) allows a human interface to the subsystem. When the 9840 Tape Drive is installed in a CSL, the front operator panel switches and indicators are replicated on the CSL panel. See Chapter 6, “Cartridge Scratch Loader,” for CSL switch usage and indicator information.

The right half of the operator panel contains the indicators and switches specifically for the CSL. They are:

- *Operator* Indicator (6)
- *System* Indicator (7)
- *Automatic* Indicator (8)
- *Manual* Indicator (9)
- **START** Switch (14)
- **AUTOLOAD MODE** Switch (15)

Figure 1-4. CSL Operator Panel

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Operator Display

This operator display allows you to view the status of the 9840 Tape Drive and CSL. It allows you to view selections such as:

- Drive configuration settings
- Drive firmware release level
- Compression status
- Security
- Interface type and settings
- Tape bar usage
- Language
- VolSafe
- Emulation
- Library addresses (if applicable)
- CSL settings

[Chapter 4, "Menus,"](#) provides specific operations of the standard operator panel. [Chapter 6, "Cartridge Scratch Loader,"](#) provides specific operations of the CSL operator panel.

■ Cartridge Tapes

Three types of 9840 Tape Drive cartridge tapes are available..

- The standard data cartridge tape has *white* labels. The media ID label has a capital “R.” When write-enabled, the standard cartridge tape allows new data to *overwrite* existing data. See [Figure 1-5 on page 1-8](#) and [Table 1-2](#).
- The VolSafe data cartridge tape has *yellow* labels (shaded areas in [Figure 1-6 on page 1-8](#)). The media ID label has a capital “R.” When write-enabled, the VolSafe cartridge tape prevents existing data from being overwritten; it allows new data to be *appended only*. See [Figure 1-6 on page 1-8](#) and [Table 1-2](#).

Note: VolSafe is certified at 9840 firmware level **1.28.106**. There is no warranty for VolSafe in drives with a firmware level lower than **1.28.106**.

Contact your CSE to update your firmware and enable the VolSafe feature.

- The 9840 cleaning cartridge dry-cleans the 9840 tape path with non-magnetic media. The media ID label has a capital “U.”

Design

9840 cartridge tapes have the same dimensions as 18- and 36-track cartridges and thus can coexist with them in libraries. 9840 cartridge tapes have the supply and takeup hubs in the cartridge. This permits midpoint loading and fast access.

See [Appendix A, Product Specifications](#), for more information about cartridge tapes.

[Table 1-2](#) shows compares the standard and VolSafe cartridge tapes.

Table 1-2. Standard and VolSafe Cartridges

Feature	Standard	VolSafe
Manufacturer Label Area	White	Yellow
Customer Label Area	White	White
Access Door	Same	Same
Write Protect Switch	White	Yellow
Finger Grips	Same	Same
Volser Label Area	Same	Same
Media ID (human or barcode identifiable)	White	Yellow

Table 1-2. Standard and VolSafe Cartridges (Continued)

Feature	Standard	VolSafe
Media ID (four machine-identifiable dimples in the plastic case)	All four dimples are the same depth.	The first dimple is deeper than the rest.
Manufacturer Part ID	White	White

Figure 1-5. Standard Cartridge Tape

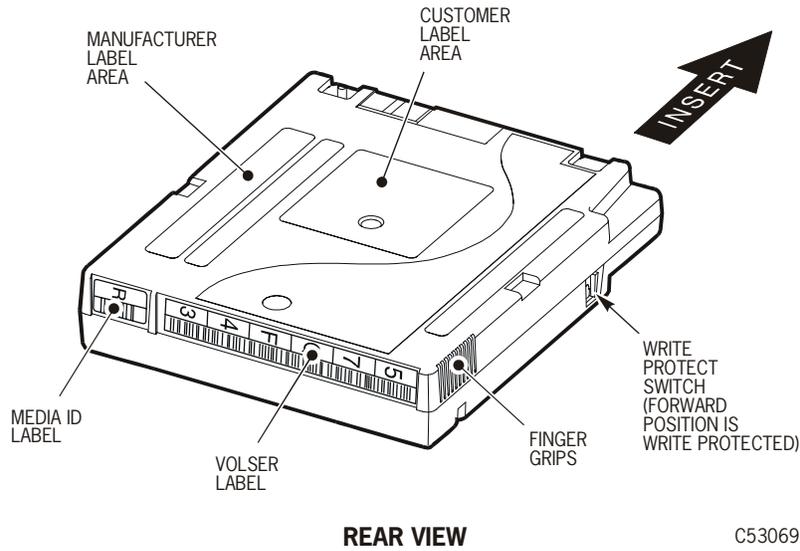
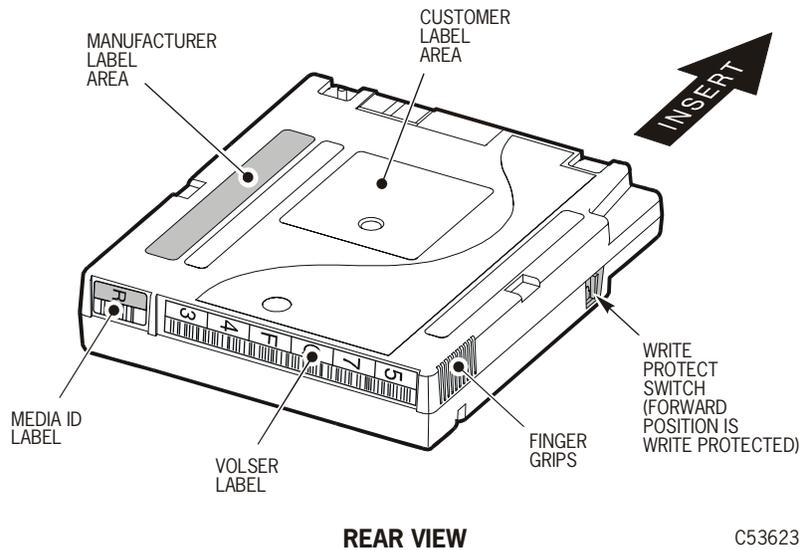


Figure 1-6. VolSafe Cartridge Tape



[Appendix A, “Product Specifications.”](#) provides specifications for 9840 cartridge tapes. For additional information about cartridge tapes and labels, contact the Atlanta Media Service Center at 1-800-905-8502 (voice) or 1-877-888-0609 (fax).

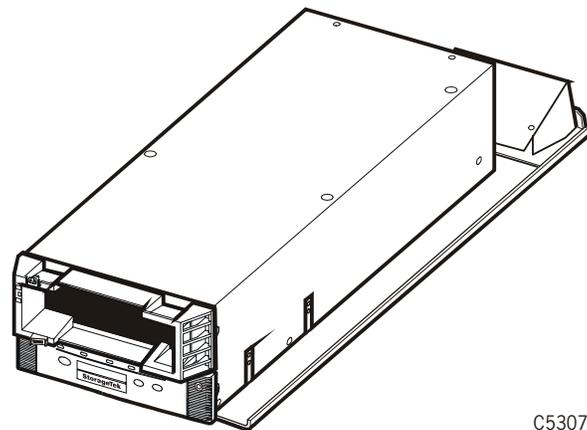
■ Models

This section covers 9840 Tape Drives installed within a library, rack-mountable drives, and rack-mountable CSLs. Library, desktop, and rack-mountable configurations are identified in [Table 1-4 on page 1-14](#).

Library Drives

The 9840 Tape Drive installs in many StorageTek libraries. Refer to [Figure 1-7](#) to see a typical drive configured for a library. The drive is normally attached to a tray allowing easy installation into a library.

Figure 1-7. 9840 Tape Drive Assembly for a 9310 or 9740 Library

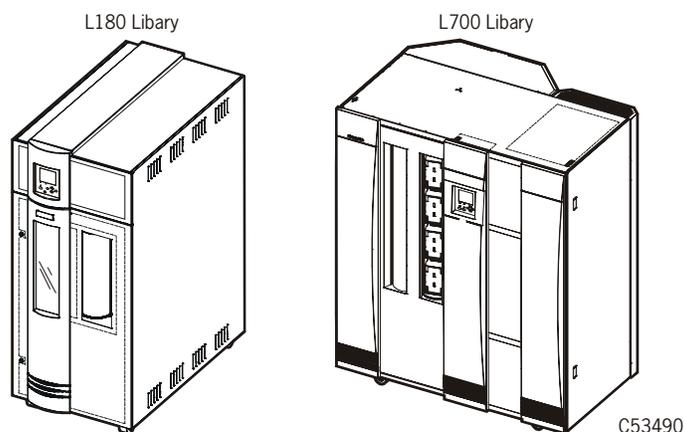


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StorageTek Libraries

Table 1-4 on page 1-14 provides all of the current library configurations. The L180 and L700 libraries (Figure 1-8) are new StorageTek libraries.

Figure 1-8. L180 and L700 Libraries



L180 Library

This library has four major internal components:

- A robot, which mounts and dismounts cartridges
- Storage cells for 84 to 174 data cartridge tapes
- A cartridge access port (CAP) that holds up to 10 cartridge tapes in two magazines
- Drives, which perform read/write operations

Note: Up to six 9840 Tape Drives may be installed in the L180 Library.

L700 Library

This library also has four major internal components:

- A robot, which mounts and dismounts cartridges
- Storage cells for 156 to 678 data cartridge tapes
- A CAP that holds up to 20 cartridges in four magazines with an optional second CAP that holds the same number of cartridges
- Drives, which perform read/write operations

Note: Up to twelve 9840 Tape Drives may be installed in the L700 Library.

Cartridge Scratch Loader (CSL)

The CSL consists of a 9840 Tape Drive, a power supply, and a scratch loader. The CSL is an electromechanical device that can load and unload up to seven cartridge tapes. It also has a feed channel to mount a priority cartridge into the tape drive.

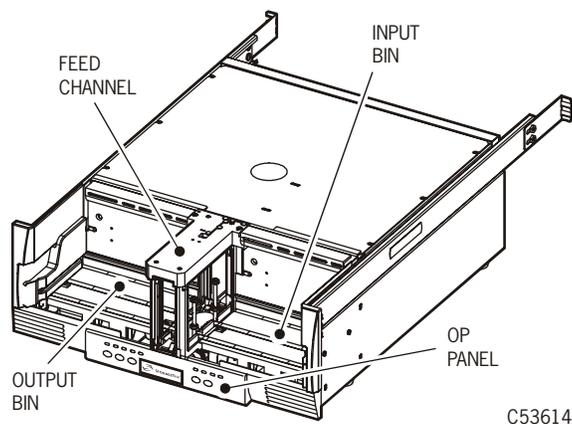
The CSL has three modes of operation. They are:

- Automatic: allows the CSL to operate automatically.
- Manual: allows the CSL to operate manually only.
- System: allows the host to control the CSL.

Shipment

The CSL ships as a 19 inch tray (Figure 1-9) that can be mounted into a rack. One to six CSLs may be installed within the rack enclosure.

Figure 1-9. CSL in Tray



Model Numbers

Refer to [Table 1-3](#) for rack mount model numbers.

Table 1-3. CSL Configurations

CSL Configuration	Model Number
Rack Mount, SCSI	9840S01
Rack Mount, ESCON	9840S02

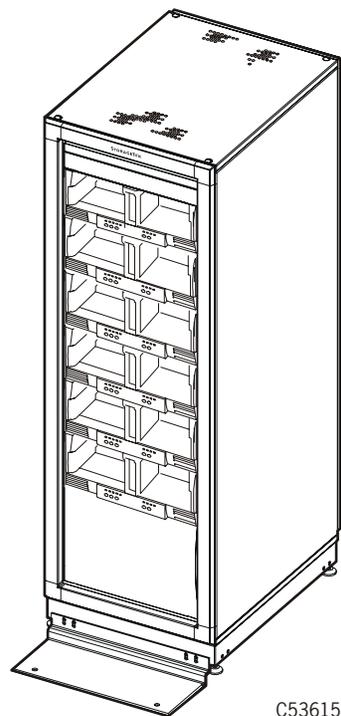
Note: Refer to the System Assurance Guide (SAG) for feature codes.

Rack-mountable CSLs

Refer to [Figure 1-10](#) for the Rack-mountable CSLs. This rack contains 6 CSLs. The rack-mountable CSL ships as a SCSI or ESCON interface. The rack may contain a combination of 9840 Tape Drives and CSLs.

The rack can have up to six CSLs with one per tray, up to 12 manual drives with two per tray, or a combination of CSLs and manual drives to fill the six slots. Different trays may have different interfaces.

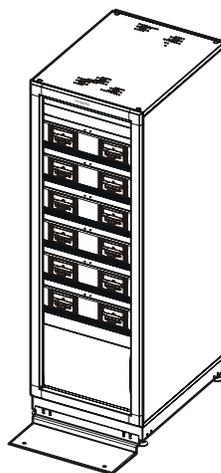
Figure 1-10. Rack-mountable CSL



Rack-mountable Drives

Refer to [Figure 1-11](#) to view the 9840 Tape Drive rack-mountable drives. Fibre Channel, ESCON, and SCSI 9840 Tape Drives may be installed in the rack.

Figure 1-11. Rack-mountable Drives



Stand-Alone
Rack

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The rack ([Figure 1-11](#)) may contain up to twelve 9840 Tape Drives. The 9840 Tape Drive is a field replaceable unit (FRU). It is comprised of:

- A drive, which is 8.255 cm (3.25 in.) high, 14.605 cm (5.75 in.) wide, and 38.10 cm (15 in.) deep.
- A power supply.

Note: The rack can have up to six CSLs with one per tray, up to 12 manual drives with two per tray, or a combination of CSLs and manual drives to fill the six slots. Different trays may have different interfaces.

■ Configurations

Table 1-4. shows the configurations in which the 9840 is available. In each case, the drive and power supply are attached with installation-unique hardware.

Table 1-4. Configurations of the 9840 Tape Drive

Library Type	Description
9310 Library	The StorageTek PowderHorn library. It holds up to 6,000 cartridge tapes and up to 80 drives in up to four 20-drive 9741 cabinets. ESCON, Fibre Channel, and SCSI interfaces are available.
9360 Library	The StorageTek WolfCreek library. It holds up to 1,000 cartridge tapes and up to 20 drives in two 10-drive 9741 cabinets. ESCON, Fibre Channel, and SCSI interfaces are available.
9710 Library	A StorageTek TimberWolf family library, it holds from 224 to 588 cartridge tapes and up to 10 drives. Fibre Channel and SCSI interfaces are available.
9738 Library	A StorageTek TimberWolf family library. It holds 30 cartridge tapes and up to 3 drives. Fibre Channel and SCSI interfaces are available.
9740 Library	A StorageTek TimberWolf family library. It holds 326 or 494 cartridge tapes and up to 10 drives. Up to six 9740 libraries can be interconnected in the Enterprise environment. ESCON, Fibre Channel, and SCSI interfaces are available.
L180 Library	A new StorageTek library. It holds 84 to 174 cartridge tapes and up to 6 drives. Fibre Channel and SCSI interfaces are available.
L700 Library	A new StorageTek library. It holds 156 to 678 cartridge tapes and up to 12 drives. Fibre Channel and SCSI interfaces are available.
Rack-mount (manual-load and CSL)	One manual-load drive, two manual-load drives side-by-side, or one CSL drive, come mounted on a rack-mount tray. StorageTek's equipment rack holds up to six trays. ESCON, Fibre Channel, SCSI interfaces are available.
Desktop (manual-load)	The desktop manual-load configuration consists of a 9840 Tape Drive and a power supply. Fibre Channel and SCSI interfaces are available.
Desktop (CSL)	The Desktop CSL configuration consists of a 9840 Tape Drive, a CSL mechanism, and a power supply. ESCON, Fibre Channel, and SCSI interfaces are available.

■ Host Environments

The 9840 Tape Drive integrates with both Enterprise and multi-platform host environments, depending on the platform and interface options.

- **Enterprise host environment:** An example of this environment include the following components as used in a StorageTek 9310 library:
 - An IBM ES/9000 host
 - An MVS/ESA operating system (version 5.2.2 or higher) with the StorageTek Host Software Component (HSC) library manager software (version 2.1 or higher)
 - Third-party media management software
 - ESCON data interface (to the drives) and RS-232 control interface (to the library)
- **Multi-platform host environment:** The 9840 Tape Drive uses Fibre Channel or a standard SCSI interface to facilitate operation with UNIX, NT, and many other platforms. Certification with new platforms and host-based applications is an ongoing process.

For an up-to-date list of certified platforms and applications, contact either your StorageTek marketing representative or the StorageTek Sales Support Desk at 1-800-275-4785.

■ Host Interfaces

The 9840 Tape Drive uses a Fibre Channel, SCSI, or an ESCON host interface. Each type of interface requires its own factory-installed interface card. Refer to [Table 1-5](#) for products and 9840 Tape Drive interfaces offered by StorageTek.

Table 1-5. Products and 9840 Tape Drive Interfaces

Product	9840 Tape Drive Interface
9310 Library (PowderHorn)	ESCON, Fibre Channel, or SCSI
9710 Library (a TimberWolf model)	Fibre Channel or SCSI
9738 Library (a TimberWolf model)	Fibre Channel or SCSI
9740 Library (a TimberWolf model)	ESCON, Fibre Channel, or SCSI
L180 Library	Fibre Channel or SCSI
L700 Library	Fibre Channel or SCSI
Desktop (manual-mount)	Fibre Channel or SCSI
Desktop (CSL)	ESCON, Fibre Channel, or SCSI
Rack-mount (Manual-mount and CSL)	ESCON, Fibre Channel, or SCSI

ESCON

The ESCON 9840 Tape Drive has one ESCON interface port, which supports 128 logical paths. ESCON subsystem performance and data availability vary according to the installation.

Fibre Channel

The Fibre-Channel (FC) configuration of the 9840 Tape drive has dual fiber-optic ports to allow for point-to-point, arbitrated-loop (including redundant-loop), and fabric topology. The FC interface for the 9840 Tape Drive uses Fibre Channel protocol for SCSI (FCP-2).

The FC configuration of the 9840 Tape Drive connects to other devices with the following equipment:

Bridge	Connects SCSI devices to an FC network
Hub	Connects FC devices to each other in a logical loop
Switch	Connects FC devices to each other in a fabric

SCSI

The SCSI 9840 Tape Drive has one SCSI port. The drive supports all SCSI variants, which the operator sets. The connector accepts a 68-pin SCSI P-cable.

SCSI enables 9840 Tape Drives to connect to the host either directly, in a daisy-chain configuration, or in a combination of direct and daisy-chain configurations. SCSI subsystem performance and data availability vary according to the installation.

Operator Panel Details

2

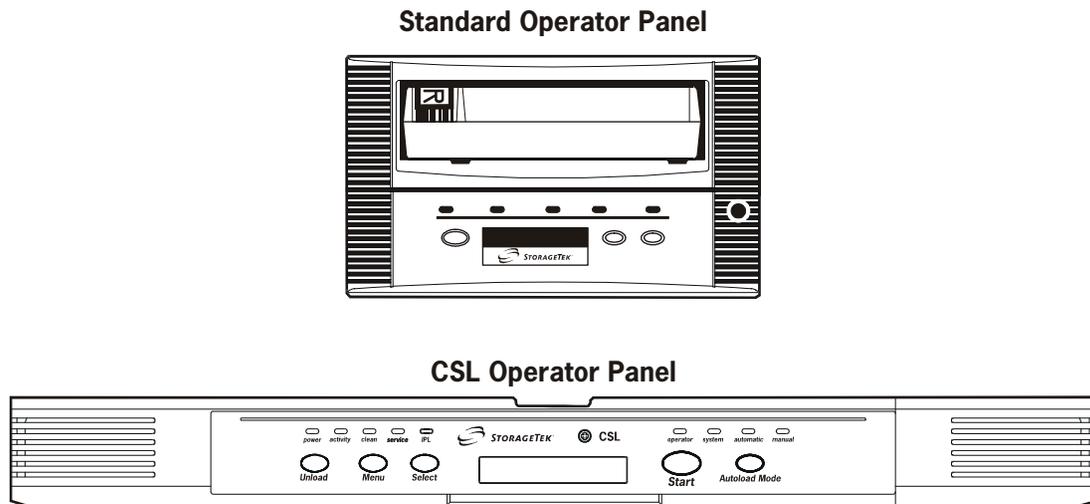
This chapter describes the operator panel switches, indicators, and the operator display for the 9840 Tape Drive. There are two operator panels (Figure 2-1) for the 9840 Tape Drive. They are:

- Standard Operator Panel
- Cartridge Scratch Loader (CSL) Operator Panel

Either operator panel enables you to view the configuration of the 9840 Tape Drive, and notifies you when further support is required.

Note: The 9840 Tape Drive and CSL operator panel use small push-button switches. The term switch or switches is used to identify them throughout this manual.

Figure 2-1. Operator Panels

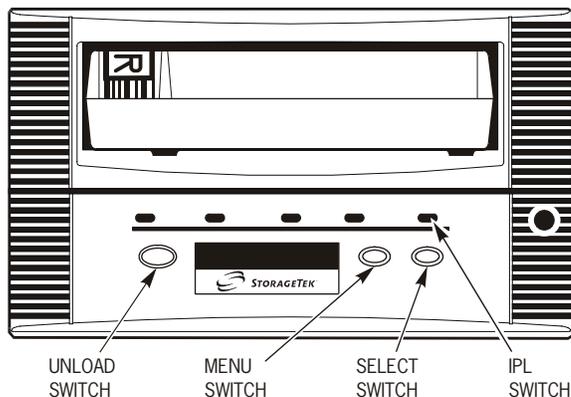


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■ Standard Operator Panel Switches

The 9840 Tape Drive operator panel has four switches (Figure 2-2). This section presents the operator switches in alphabetical order. CSL switches (Figure 2-4 on page 2-7) are discussed later in this chapter.

Figure 2-2. Standard Operator Panel Switches



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IPL Switch

Pressing the IPL switch causes an Initial Program Load (IPL) to occur and resets the 9840 Tape Drive. This process is identical to the program initiation that takes place automatically after the power-on sequencing completes. In addition, the operator panel briefly displays the “IPLPend” (IPL Pending) message when this switch is pressed.

During the IPL process, the 9840 Tape Drive operator panel displays the following messages:

- Load CC** Load common controller code.
Load Servo
Load servo code.
- Load xxxx** Load interface code, where **xxxx** is “ESCN” (ESCON), FIBRE (Fibre Channel), or “SCSI,” which is the type of host interface.
- Start Init** Start Initialization.
- CC Diags** Start the controller diagnostics.
- ASIA Diags** Start additional diagnostics.

xxxx:Dmp y This message alternates with the preceding message if unretrieved dumps in the EEPROM exist. **xxxx** is the fault symptom code of the most recent diagnostic data dump and **y** is the number of uncollected diagnostic data dumps.

Menu Switch

The **Menu** switch is one of the two switches used to manipulate the 9840 Tape Drive menu. Use the **Menu** switch and **Select** switch to access applicable menus. Pressing the **Menu** switch accesses the menu system, the menus, and sub-menus. The menu system enables the operator to perform a limited set of operations on the 9840 Tape Drive.

Pressing the **Menu** switch in normal operation mode causes the Online/Offline menu to appear. For most operator operations, such as viewing the 9840 Tape Drive configuration or its software release level, the 9840 Tape Drive can remain online. For other operations, including those performed by authorized service personnel, the 9840 Tape Drive must be placed offline. See [Chapter 4, “Menus,”](#) for more details.

Select Switch

The **Select** switch is one of the two switches used to manipulate the 9840 Tape Drive menu. Use the **Select** switch and **Menu** switch to access applicable menus. Pressing the **Select** switch while in the main menu selects one of the following choices depending on the structure of the main menu:

- A direct configuration or action choice in the main menu itself
- An underlying sub-menu

See [Chapter 4, “Menus,”](#) for more details.

Unload Switch

Pressing the **Unload** switch rewinds the tape in the cartridge. The cartridge tape then ejects from the drive so you can retrieve it.

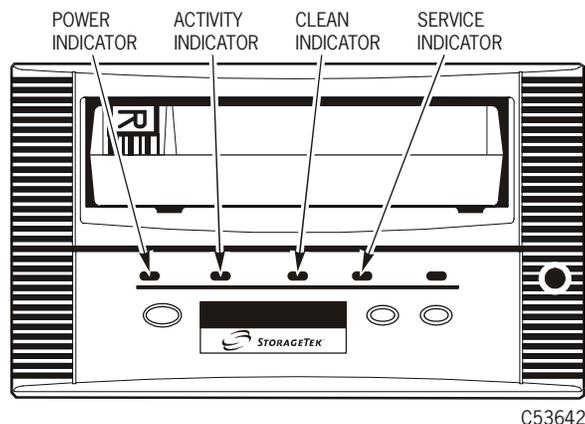
Pressing the **Unload** switch during a write operation causes the 9840 Tape Drive to try to write the remaining data before the cartridge tape unloads. If the operator panel displays the “UnWr **xxxx**” (Unwritten Data) message (where **xxxx** is the fault symptom code), the attempt failed and some data is not written to the tape.

At this point, do not press **Unload** again before you have read the instructions in [Chapter 5, “Drive Errors and Messages,”](#) about recovering from an Unwritten Data condition, see “UnWr Condition” in [Chapter 5, “Drive Errors and Messages.”](#)

■ Standard Operator Panel Indicators

This section describes the standard operator panel indicators (Figure 2-3), which are presented in alphabetical order. CSL indicators (Figure 2-4 on page 2-7) are discussed later in this chapter.

Figure 2-3. Standard Operator Panel Indicators



Notes:

- A combined display of some operator panel indicators may mean that you must perform corrective procedures. For more information, see [Chapter 5, “Drive Errors and Messages.”](#)
- Specific CSL errors and messages are located in [Chapter 6, “Cartridge Scratch Loader.”](#)

Activity Indicator

The green *Activity* indicator signifies the following conditions:

- | | |
|-----------------|--|
| Off | The cartridge tape is not loaded or it has ejected. |
| Flashing | The tape in the cartridge is moving. |
| On | The cartridge tape is loaded and the 9840 Tape Drive is ready. |

Clean Indicator

The amber *Clean* indicator signifies the following conditions:

- | | |
|------------|--|
| On | The 9840 Tape Drive requires cleaning because either intermittent media errors are detected or a specific length of tape has passed over the read/write heads. |
| Off | The 9840 Tape Drive does not require cleaning. |

Power Indicator

The green *Power* indicator signifies the following conditions:

- Off** The power is off.
- Flashing** The 9840 Tape Drive is non-operational. The 9840 Tape Drive may be experiencing one of the following symptoms:
- It is performing a power on or an IPL.
 - It is collecting diagnostic data.
 - It failed a power-on diagnostic.
- See [Table 5-2 in Chapter 5, “Drive Errors and Messages,”](#) for more information about these operator panel messages.
- On** The power on and IPL completed successfully.

Service Indicator

The red *Service* indicator signifies the following conditions:

- Off** An error was not detected.
- Flashing** An error was detected and diagnostic data may have been collected.
- Following a successful IPL and if diagnostic dump data are available, the operator panel alternates the “*” (asterisk) and the “xxxx:Dmp y” message (where xxxx is the fault symptom code of the last diagnostic dump data and y is the number of uncollected diagnostic data dumps in the EEPROM). See [Table 5-2 in Chapter 5, “Drive Errors and Messages,”](#) for more information about these messages.
- The flashing stops, and the messages disappear when you insert any cartridge tape into the 9840 Tape Drive or you press a switch.
- If the 9840 Tape Drive detects the same fault symptom code again, the operator panel displays the “DumpAgain?” message, which requires authorized service personnel to resolve the problem.
- On constant** A hardware error was detected because a 9840 Tape Drive is not functional. If an IPL does not resolve the situation, authorized service personnel may need to replace the 9840 Tape Drive.

■ Operator Display

The standard and CSL operator panel has a single-line 10-digit alphanumeric display that links to the 9840 Tape Drive and to the host. The operator display indicates the following:

- The state of the 9840 Tape Drive
- Fault symptom codes, when applicable
- Menu selections and configuration states when the 9840 Tape Drive is in Menu mode

Depending on host software support, the display also indicates a cartridge tape with a particular volume serial number (VOLSER) needs to be loaded. Other host-generated messages may also appear.

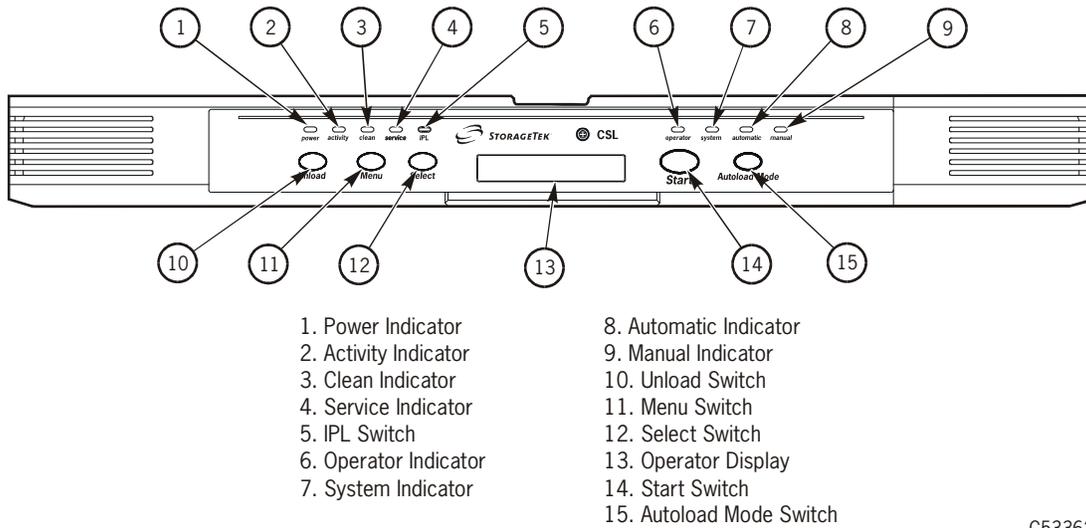
The messages in the 9840 Tape Drive operator display appear constant or flashing. In addition, the 9840 Tape Drive operator display sometimes alternates messages. This manual provides further information in [Chapter 5, “Drive Errors and Messages,”](#) and as specific messages are described throughout this manual.

■ CSL Operator Panel Switches

The CSL operator panel switches (Figure 2-4) are described in this section.

Note: Refer to Figure 2-1 on page 2-1 to see the standard operator panel and explanation of its switches.

Figure 2-4. CSL Operator Panel



C53362

Note: The IPL, Unload, Menu, and Select switches are identical to the switches located on the standard operator panel. They are not covered in this section. Only the CSL **Autoload Mode** and **Start** switches are covered.

Autoload Mode Switch

The **Autoload Mode** switch changes the operation of the CSL to one of three modes: System, Automatic, or Manual.

The CSL powers on in the default mode selected in the drive configuration menu. The default mode is overridden when the switch is used to select a new setting. The CSL remains in the selected mode while the drive is powered on. This does not change the IPL default mode in the drive configuration menu.

System Mode It allows the host to control CSL.

Autoload Mode It allows the CSL to operate automatically.

Manual Mode It allows manual operations only.

Start Switch

The **Start** switch restarts CSL operation after the operator empties a full output bin or replenishes an empty input bin. It is also used to restart CSL operation after clearing a misfed cartridge.

■ CSL Operator Panel Indicators

The CSL operator panel indicators (Figure 2-4) are described in this section. They are described in alphabetical order. Refer to Figure 2-1 on page 2-1 to see the standard operator panel and explanation of its indicators.

Note: The CSL *Power*, *Activity*, *Clean*, and *Service* indicators are identical to the indicators located on the 9840 Tape Drive operator panel. They are not covered in this section. Only the CSL *Automatic*, *Manual*, *Operator*, and *System* indicators are covered here.

Automatic Indicator

The *Automatic* indicator is green. This indicator illuminates identifying that the CSL is in the Automatic mode. This mode allows the CSL to operate automatically.

Manual Indicator

The *Manual* indicator is green. This indicator illuminates identifying that the CSL is in the Manual mode. This mode allows for manual operation only.

Operator Indicator

The *Operator* indicator is red. The indicator flashes when the CSL detects an operator-intervention condition. An operator must inspect the CSL and clear the malfunction.

When the indicator flashes and the operator panel displays *xxxx xxxx*, this indicates a specific tape has been requested from the host.

When the indicator is constantly on, this indicates an error condition. An operator must correct the obvious malfunction and press the **Start** switch to IPL the CSL.

System Indicator

The *System* indicator is green. This indicator illuminates identifying the CSL is in the System mode. This mode allows for full host control of the CSL.

This chapter describes the tasks that you perform with the 9840 Tape Drive:

- “Powering On a Drive” on page 3-1
- “Write-Protecting a Cartridge” on page 3-3
- “Loading a Drive” on page 3-5
- “Unloading a Drive” on page 3-5
- “Cleaning a Drive” on page 3-6
- “Powering Off a Drive” on page 3-7
- “Identifying Unrecoverable Tapes” on page 3-8

Note: This chapter does not include instructions for using the 9840 Tape Drive menus; see [Chapter 4, “Menus,”](#) for more information.

■ Powering On a Drive

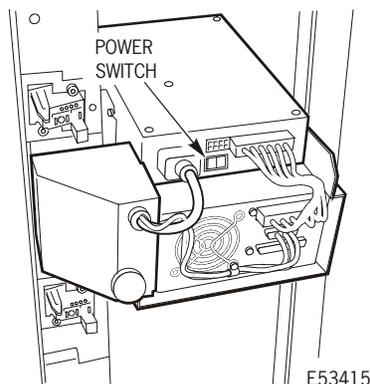
Follow the instructions in this section to power on a 9840 Tape Drive.

Note: Refer to [Chapter 6, “Cartridge Scratch Loader,”](#) to power on a Cartridge Scratch Loader (CSL).

Power Switch

The 9840 Tape Drive might or might not have a power switch when it is installed in a library. [Figure 3-1](#) illustrates a 9840 Tape Drive for an L180 or L700 Library. It does have a power switch on the power supply.

Figure 3-1. L180 or L700 Library 9840 Tape Drive

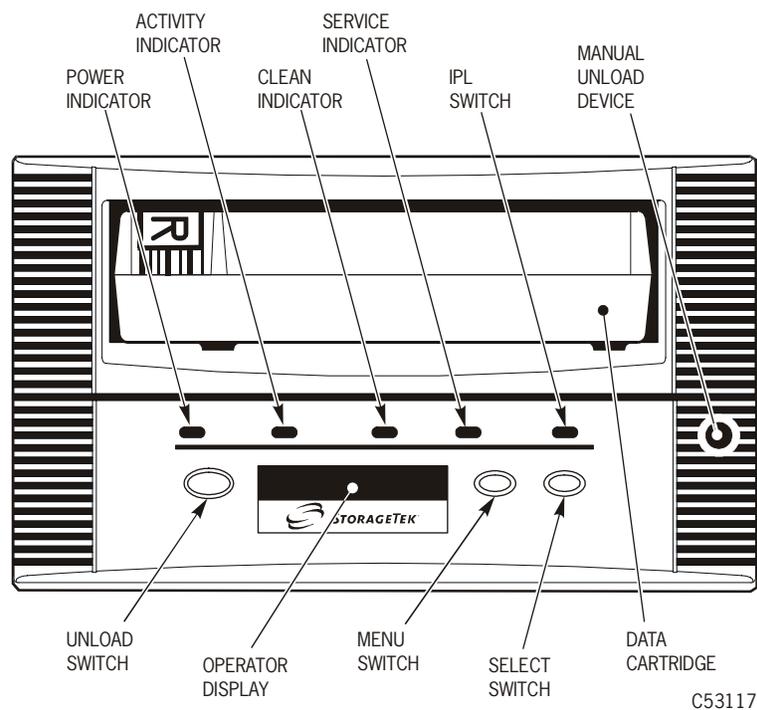


Process

To power on the 9840 Tape Drive with an IPL, follow these steps:

1. Power on the drive:
 - a. If the drive has a power switch in the back (Figure 3-1), ensure that the power cord is plugged in between the drive and the library or rack power strip and turn the switch to ON.
 - b. If the drive does not have a power switch in the back, plug in the drive power cord between the drive and the power strip in the library or rack.
2. Wait until the 9840 Tape Drive completes the IPL procedure. The green power indicator illuminates steadily.

Figure 3-2. Operator Display



3. Observe for the following indications on the operator display (Figure 3-2):
 - The messages “CC DIAGS” and “ASIA DIAGS” indicate that the IPL diagnostics are active. These messages require no action on your part.
 - Drive powers on automatically to Online if drive is operable and no configuration error was encountered.
 - Drive powers on to Offline if a configuration error was encountered and the message “Fix_CfgErr” is displayed; see note.

- “Memory Err” or “Boot Fail” may be displayed if an error occurs early in the IPL sequence. These errors will cause the drive to hang.

Note: If any error is displayed, go to [Chapter 5, “Drive Errors and Messages,”](#) for problem resolution.

■ Write-Protecting a Cartridge

The 9840 Tape Drive uses a standard and VolSafe cartridge ([Figure 3-3 on page 3-4](#)). The VolSafe cartridge can be distinguished from the standard cartridge by its yellow markings. Refer to [Figure 3-3 on page 3-4](#) to locate the yellow markings (shaded areas).

Switch Positions

Refer to [Table 3-1](#) for explanation of the write protect switch positions. The switch ([Figure 3-3 on page 3-4](#)) is located on the right side of the cartridge.

Table 3-1. Write Protect Switch

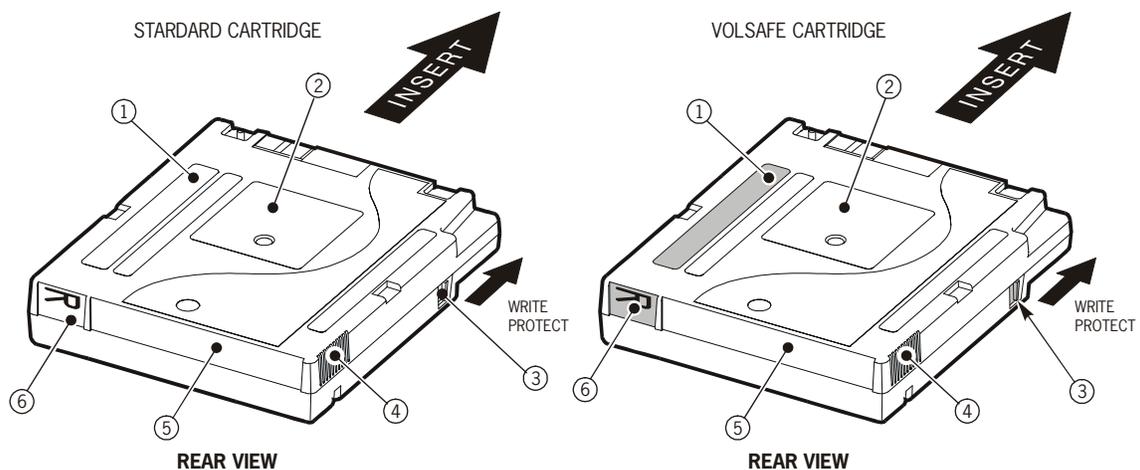
Write Protect Switch	Standard Cartridge	VolSafe Cartridge
Unlocked	Data can be written or overwritten on the cartridge. Data can be read from the cartridge.	Data can be written but not overwritten (appended only) to the data on the cartridge. Data can be read from the cartridge.
Locked	Cartridge is write protected. Data can <i>only</i> be read from the cartridge.	Cartridge is write protected. Data can <i>only</i> be read from the cartridge.

Process

Follow these instructions to write protect a standard or VolSafe cartridge:

1. Hold the cartridge with the customer label side up and rear volser label towards you.
2. Locate the write protect switch on the right side of the cartridge (Figure 3-3).
3. Move the switch to the front of the cartridge (away from you) to the write-protect position.

Figure 3-3. Cartridges



C53605

1. Manufacturer Label Area (yellow on VolSafe Cartridge)
2. Customer Label
3. Write Protect Switch (yellow on VolSafe Cartridge)
4. Finger Grips
5. VOLSER Label Area
6. Media Id (machine identifiable-yellow on VolSafe Cartridge)

■ Loading a Drive

Note: Refer to “CSL Cartridge Loading/Unloading” in Chapter 6, “Cartridge Scratch Loader” to load a CSL.

To load a cartridge tape, follow these steps:

1. Insert the cartridge tape into the 9840 Tape Drive in the direction shown in [Figure 3-3 on page 3-4](#).
2. Wait for the operator panel to display one of the following messages and take the appropriate action, if necessary:
 - A “Ready F” (File Protected) message indicates that a write-protected cartridge tape loaded successfully.
 - A “Ready U” (File Unprotected) message indicates that a write-enabled cartridge tape loaded successfully.
 - A “Ready A” message means that a write-enabled VolSafe cartridge tape loaded successfully in a VolSafe-enabled drive.
 - The “Load xxxx” message indicates that the cartridge tape unsuccessfully loaded, where the xxxx is the fault symptom code. To resolve this condition, follow the instructions in [Table 5-2 in Chapter 5, “Drive Errors and Messages.”](#)

■ Unloading a Drive

Note: Refer to “CSL Cartridge Loading/Unloading” in Chapter 6, “Cartridge Scratch Loader” to unload a CSL.

To unload a cartridge tape, follow these steps:

1. Ensure that the 9840 Tape Drive is not selected from the host (see “Offline” in [Chapter 4, “Menus”](#)).

Note: If the **Unload** switch is pressed during a write operation, the 9840 Tape Drive tries to write the remaining data before the cartridge tape unloads. If the operator panel displays the “UnWr xxxx” (Unwritten Data) message (where xxxx is the fault symptom code), the attempt failed and some data remains unwritten on the tape. For more information about recovering from an Unwritten Data condition, see “UnWr Condition” in [Chapter 5, “Drive Errors and Messages.”](#)

2. Press the **Unload** switch. One of the following conditions will occur:
 - After the tape rewinds, the cartridge tape ejects from the 9840 Tape Drive. Remove the cartridge tape from the 9840 Tape Drive.
 - The cartridge tape fails to eject after the tape rewinds. See “[Jammed Cartridge](#)” in [Chapter 5, “Drive Errors and Messages,”](#) for information.

■ Cleaning a Drive

When the amber-colored *Clean* indicator appears, you must clean the 9840 Tape Drive. The *Clean* indicator signifies that particular tape errors occurred or a specific length of tape passed over the read/write heads. Perform the cleaning procedure with the 9840 Tape Drive offline or online.

Note: Use this procedure to clean the drive in a CSL. To load the cleaning cartridge, follow the load procedures in “[CSL Cartridge Loading/Unloading](#)” in Chapter 6, “[Cartridge Scratch Loader](#).”

You use a dry-cleaning cartridge for this procedure.

Note: Do not clean with the cleaning cartridge unless the *Clean* indicator illuminates. Cleaning more frequently may damage the head.

CAUTION:

Do not wet-clean the 9840 Tape Drive: no chemical cleaning is allowed.

To clean the 9840 Tape Drive, follow these steps:

1. If applicable, unload the cartridge tape from the drive.
2. Insert a cleaning cartridge into the drive.

Note: If the drive immediately ejects the cleaning cartridge and the operator panel displays the “Exp ClCart” message, then the cleaning cartridge is used up. Discard the worn cleaning cartridge and insert a new cleaning cartridge. The cleaning cartridge can only be used for about 100 times before you must discard it.

The green *Activity* indicator flashes to indicate that cleaning is occurring. When the *Clean* indicator turns off, cleaning is complete and the cleaning cartridge ejects.

Note: If the operator panel displays the “Chk xxxx” message, a cleaning cartridge failure occurred (where xxxx is the fault symptom code). Try the procedure again with a different cleaning cartridge. If the problem persists, contact authorized service personnel.

3. Remove the ejected cleaning cartridge from the drive.

■ Powering Off a Drive

To perform a power-off procedure, follow these steps:

Note: Refer to “Power On/Off CSL” in Chapter 6, “Cartridge Scratch Loader” to power off a CSL.

1. Ensure that the 9840 Tape Drive is not selected from the host (see “Offline” in Chapter 4, “Menus”).
2. Unload the cartridge tape from the drive.
3. Remove power from the drive or power supply:
 - a. If the drive or drive tray has a power switch on the back, turn the switch to OFF.
 - b. For library attached drives, turn the power supply switch to OFF (Figure 3-1 on page 3-1).
 - c. If the library drive power supply does not have a power switch, unplug the black-power cord from the power supply. See warning below.

WARNING:

Do not unplug the yellow and black power connector on a library attached drive. The line is hot and you may be shocked if you touch bare wires or pins.

■ Identifying Unrecoverable Tapes

CAUTION:

Do not degauss 9840 Tape Drive tapes. Servo tracks are written on the tape at the factory. When these tracks are mistakenly erased as by degaussing, the cartridge tape must be discarded.

Defective and degaussed tapes fail in all or most operations. Test failing tapes on two different drives. This testing process verifies you have a bad tape.

Note: You may wish to take a good tape and test it on the original drive using the same operation that previously failed. If the operation does not fail with the good tape, the drive is good and the previous tape is defective.

A degaussed tape has no servo tracks and cannot be written on or formatted. You must discard the tape. If you attempt to load a degaussed tape, a Load-(FSC) error message appears on the operator panel.

■ Reformatting (Reclaiming) a Cartridge Tape

Use the Reclaim menu to reformat the tape. If the Reclaim menu accepts and reformats the tape, the tape can be reused.

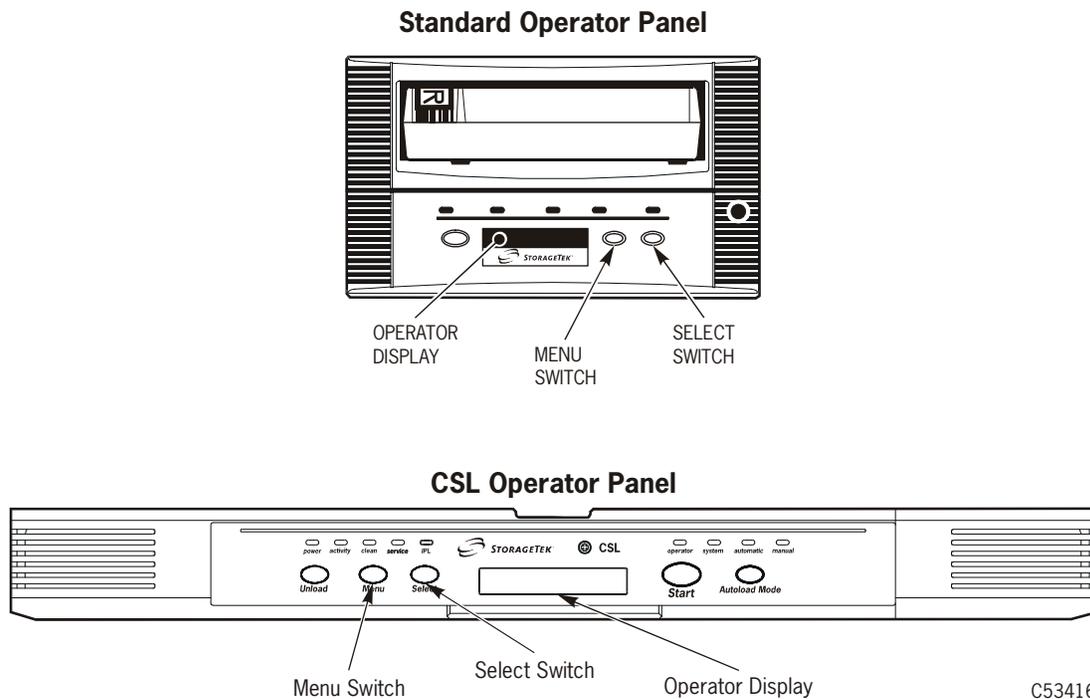
Note: See [Chapter 4, “Menus,”](#) and refer to [Table 4-5 on page 4-17](#) to reformat a tape.

If the Reclaim menu rejects the tape, then the tape is by definition unrecoverable and it must be discarded.

This chapter describes the menu system for the 9840 Tape Drive and how to perform specific operations using the menus and submenus. You must use the **Menu** switch, **Select** switch, and the operator panel (Figure 4-1) to access all menus and submenus.

Note: Refer to Figure 4-1 for the **Menu** switch and **Select** switch used on the standard and cartridge scratch loader (CSL) operator panels.

Figure 4-1. Operator Panels



Press the **Menu** switch to navigate from one main menu item to the next. Press the **Select** switch to enter a submenu and navigate through the options in the submenu.

CAUTION:
Pressing the **Select** switch when the 9840 Tape Drive is offline may alter the drive configuration. Follow the directions in this chapter exactly to avoid configuration problems.

This chapter describes the following topics:

- “Main Menu Summary”
- “Menu Operations” on page 4-4
- “View Fibre Channel Configuration Status” on page 4-7
- “View SCSI Configuration Status” on page 4-10
- “View ESCON Configuration Status” on page 4-13
- “Drive Operations Menu” on page 4-16
- “Online/Offline Main Menu Tasks” on page 4-22
- “View Configuration Main Menu Task” on page 4-24
- “Select a Language” on page 4-25
- “Select Tape Bar Task” on page 4-25
- “Reclaim Cartridge Tape” on page 4-25
- “Firmware Release Main Menu Task” on page 4-27
- “CSL Code Level Main Menu Task” on page 4-28
- “Exit Main Menu Tasks” on page 4-29
- “Tape Bar-Chart Explanation” on page 4-31

Note: This chapter includes only operator procedures. Procedures that require the help of authorized service personnel are not included.

■ Main Menu Summary

Table 4-1 describes the 9840 Tape Drive main menus.

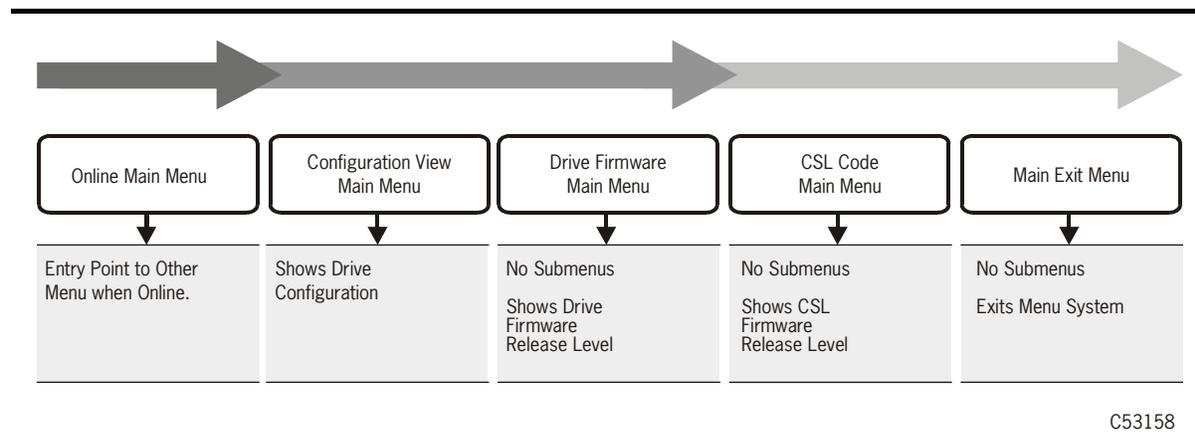
Table 4-1. Summary of Main Menus

Main Menu	Description
Online/Offline	Use this main menu to place the 9840 Tape Drive offline for some procedures and online for other procedures. After the 9840 Tape Drive is set offline or online, use this main menu as the entry point to other main menus.
ESCON Port Enable/Disable	Use this menu to enable or disable the ESCON port if the 9840 Tape Drive uses an ESCON interface. If the 9840 Tape Drive does not use an ESCON interface, this main menu does not display. Menus are different for Fibre Channel, SCSI, and ESCON.
View Configuration	Use this main menu to view the configuration of the 9840 Tape Drive. When the 9840 Tape Drive is online (As in Figure 4-2 on page 4-3), this main menu shows the values of the configuration submenus shown in Figure 4-4 on page 4-6 , for Fibre Channel, SCSI, or ESCON, depending on the host interface.

Table 4-1. Summary of Main Menus (Continued)

Main Menu	Description
Drive	Use this menu to create different types of tapes. When the 9840 Tape Drive is offline, this main menu contains the submenus shown in Figure 4-4 on page 4-6 , depending on the host interface. Any action you specify in the submenu takes place immediately.
Firmware Release	Use this menu to view the current release of the firmware running on the 9840 Tape Drive.
Exit	Use this menu to exit the 9840 Tape Drive menu system.

[Figure 4-2](#) shows an overview of the menu system, including the content of the menus, depending on the state of the 9840 Tape Drive. Main menus are shown across the top of the figure and the appropriate submenus are listed below each main menu.

Figure 4-2. Main Menus Available When Drive is Online

■ Menu Operations

You may view online menus and offline menus. However, operators should only view online menus. Offline menus are for configuration and should only be used by qualified technicians. [Figure 4-3 on page 4-5](#) provides viewing menus online only. [Figure 4-4 on page 4-6](#) provides offline configuration menus.

WARNING:

Changing configurations may disable drive communication to the host. Only qualified technicians should change any configurations.

Online Menu

When the drive is online and the VIEW CFG? submenu is invoked, the current configuration settings are displayed. [Figure 4-3 on page 4-5](#) provides an overview of the information available in this submenu.

Note: The information in this submenu is display only.

Specific information for online menus is also available as follows:

- Fibre Channel Menus in [Figure 4-5 on page 4-7](#)
- SCSI Menus in [Figure 4-6 on page 4-10](#)
- ESCON Menu in [Figure 4-7 on page 4-13](#)

Offline Menu

When the drive is offline, the menus shown in [Figure 4-4 on page 4-6](#) are available.

WARNING:

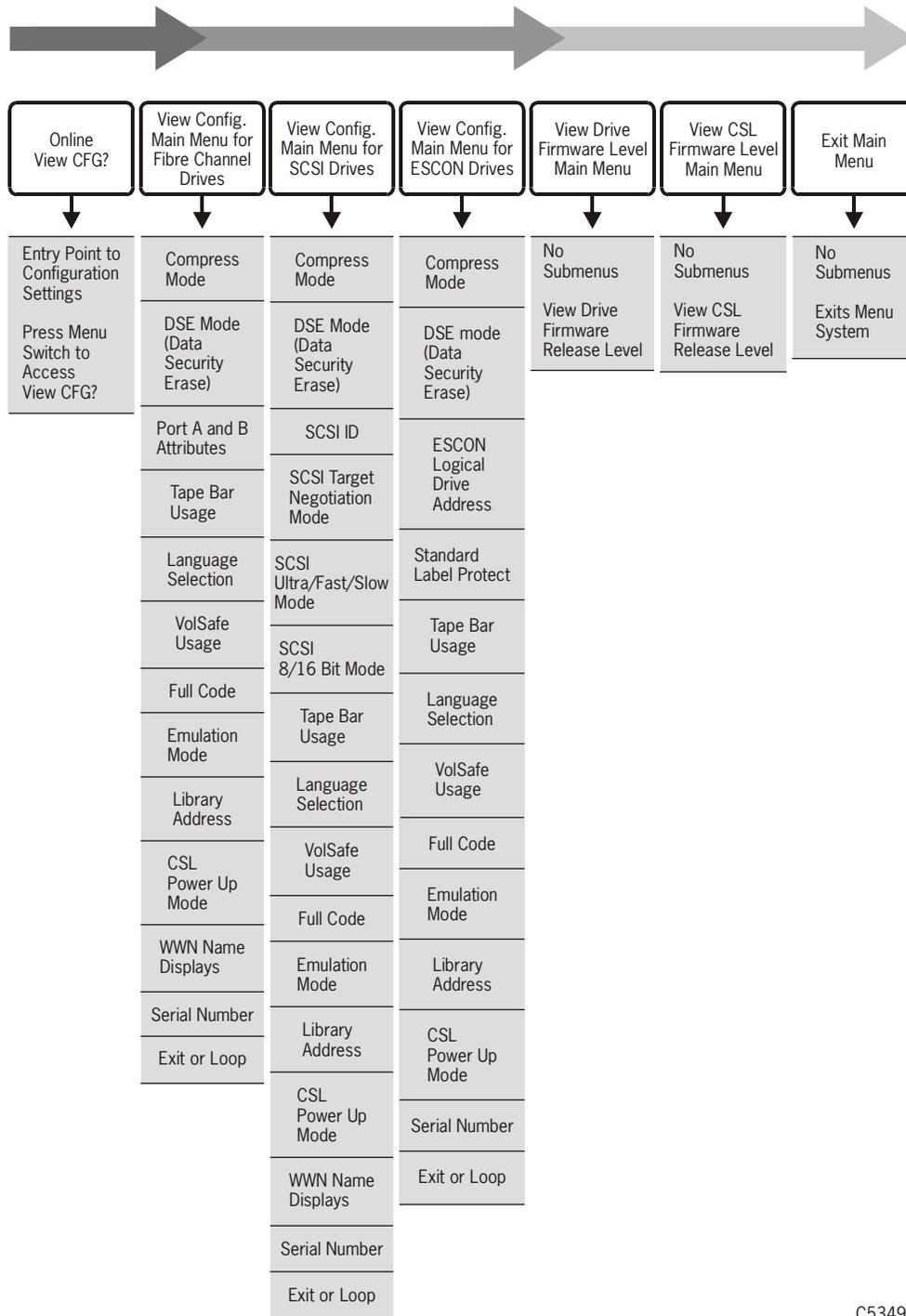
Offline menus are for qualified technicians only. Operators should not access offline menus.

- The CHG CFG? submenu enables you to change configuration options. The options vary depending on the type of channel interface in the drive.
- The DRV MENU? submenu allows you to IPL from tape, create a dump tape, create a code tape, or create a data tape. See the menu tree ([Figure 4-8 on page 4-16](#)) for additional information.

Online Main Menus and Submenus

Figure 4-3 provides online menus. These menus are used by operators and qualified technicians.

Figure 4-3. Online View CFG? Menus

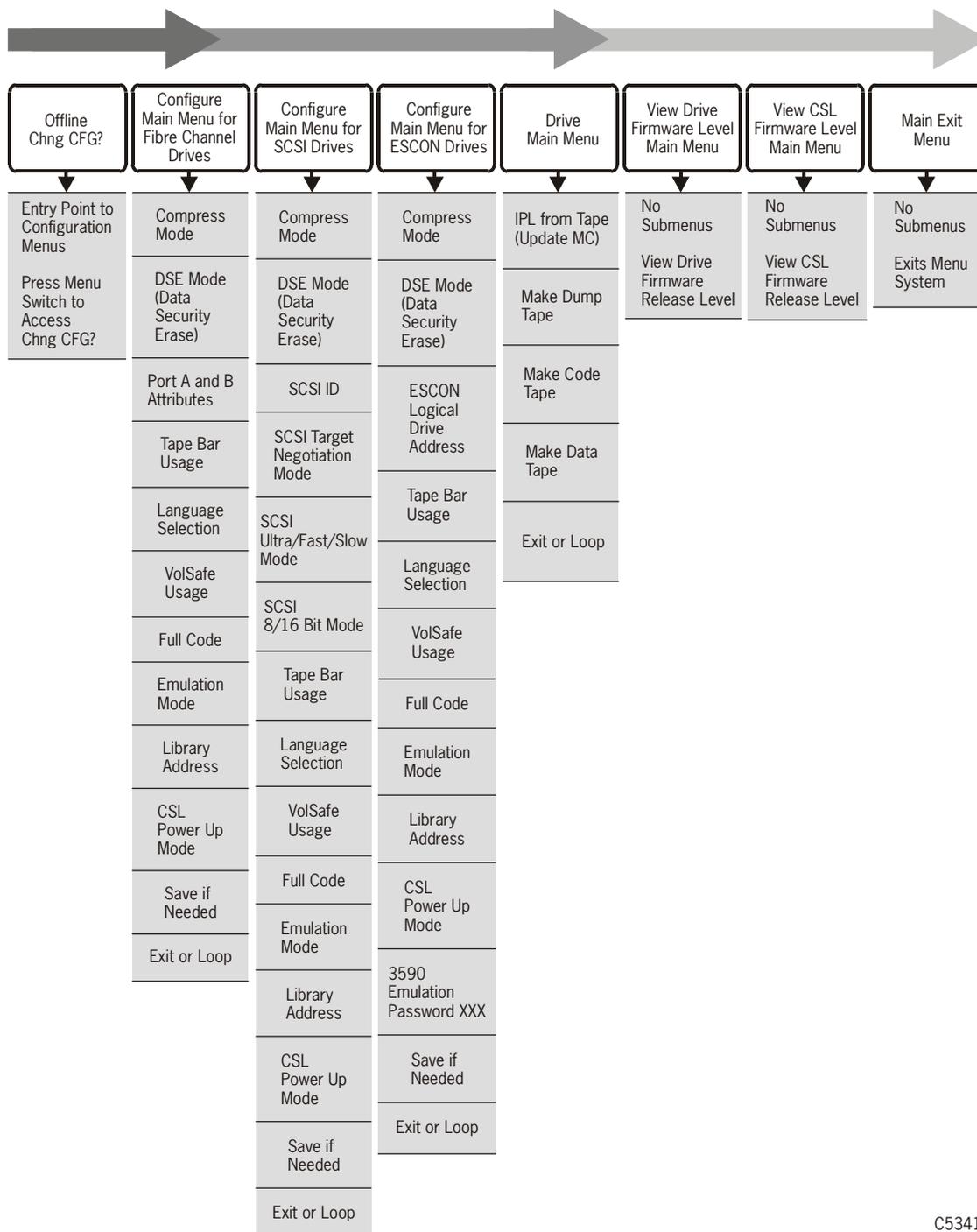


C53493

Offline Menu Operations

Figure 4-4 provides offline configuration menus (for qualified technicians only).

Figure 4-4. Offline Configuration Menus



C53411

Table 4-2. Menu Table - View Fibre Channel Configuration

Options	Notes	Procedure
Online/Offline Main Menu		
Online	Defaults to online.	1. If applicable, press Menu to access.
Offline	For viewing the configuration, the drive must be online.	2. If Online does not display, press Select to toggle to online.
View Configuration Main Menu		
View CFG? (View Configuration?)	To bypass this menu and view only the firmware release level, press Menu twice; otherwise, follow the instructions.	<ol style="list-style-type: none"> 1. If applicable, press Menu once to display the menu. 2. Press Select to access. The compression status displays. 3. Press Select or Menu repeatedly to view the rest of the configuration status: Data Security Erase (DSE) Drive Attributes (Port A/B) Drive Address Tape Bar Language ESCON Emulation Mode Library Address CSL Mode World Wide Name (WWN) Serial Number (S/N) 4. Press Menu or Select to go to the Exit menu. 5. Press Menu to repeat viewing or Select to go to next firmware release level menu.
Firmware Level View Menu		
None	Display shows Rx.yy.zzzc, where <i>x</i> = major revision number, <i>yy</i> = minor revision number, <i>zzz</i> = integration number, <i>c</i> = channel type (s -SCSI, e -ESCON, f -Fibre)	<ol style="list-style-type: none"> 1. If applicable, press Menu once to display the firmware level. 2. Press Menu again to go to the Exit menu.

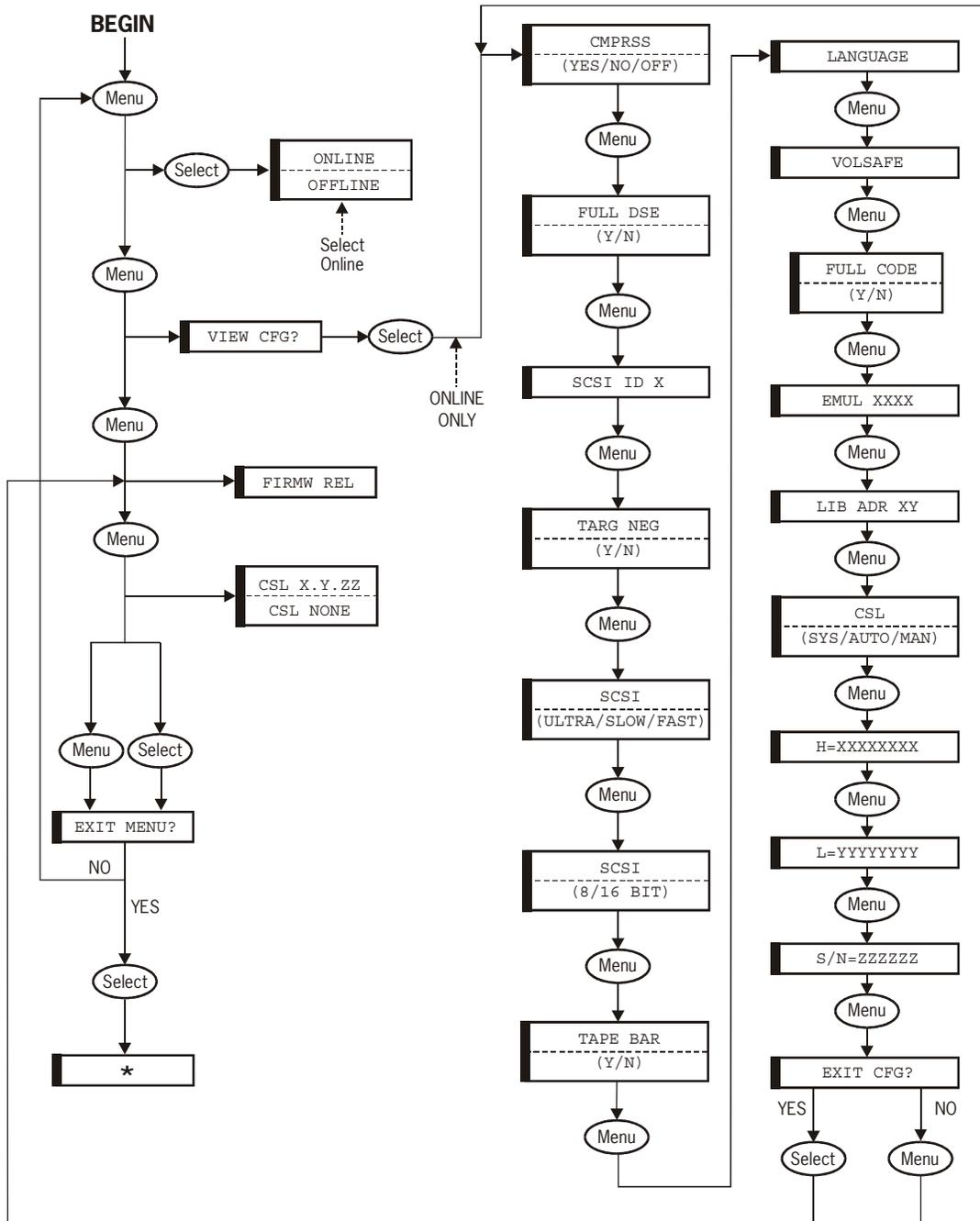
Table 4-2. Menu Table - View Fibre Channel Configuration (Continued)

Options	Notes	Procedure
Main Exit Menu		
Exit Menu?	This menu gives you the opportunity to repeat the operation.	<ol style="list-style-type: none">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.

View SCSI Configuration Status

Figure 4-6 provides a flowchart for viewing a SCSI configuration.

Figure 4-6. View SCSI Configuration



C53629

Table 4-3 provides the SCSI menus and displays used to view the drive when it is online.

Table 4-3. Menu Table—View SCSI Configuration

Options	Notes	Procedure
Online/Offline Main Menu		
Online	Defaults to online.	1. If applicable, press Menu to access.
Offline	For viewing the configuration, the drive must be online.	2. If Online does not display, press Select to toggle to online.
View Configuration Main Menu		
View CFG? (View Configuration?)	To bypass this menu and view only the firmware release level, press Menu twice; otherwise, follow these instructions.	<ol style="list-style-type: none"> If applicable, press Menu once to display the menu. Press Select to access. The compression status displays. 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 Tape Bar Language SCSI Emulation Mode Library Address CSL Mode World Wide Name (WWN) Serial Number (S/N) Press Menu or Select to go to the Exit menu. Press Menu to repeat viewing or Select to go to next firmware release level menu.

Table 4-3. Menu Table—View SCSI Configuration (Continued)

Options	Notes	Procedure
Firmware Level View Menu		
None	Display shows Rx.yy.zzzc, where: <i>x</i> = major revision number, <i>yy</i> = minor revision number, <i>zzz</i> = the integration number, <i>c</i> = channel type (s -SCSI, e -ESCON, f -Fibre)	<ol style="list-style-type: none"> 1. If applicable, press Menu once to display the firmware level. 2. Press Menu again to go to the Exit menu.
Main Exit Menu		
Exit Menu?	This menu gives you the opportunity to repeat the operation.	<ol style="list-style-type: none"> 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.

View ESCON Configuration Status

Figure 4-7 provides a flowchart for viewing a ESCON configuration. Table 4-4 on page 4-14 provides the ESCON menus and displays used to view the drive when it is online.

Figure 4-7. View ESCON Configuration

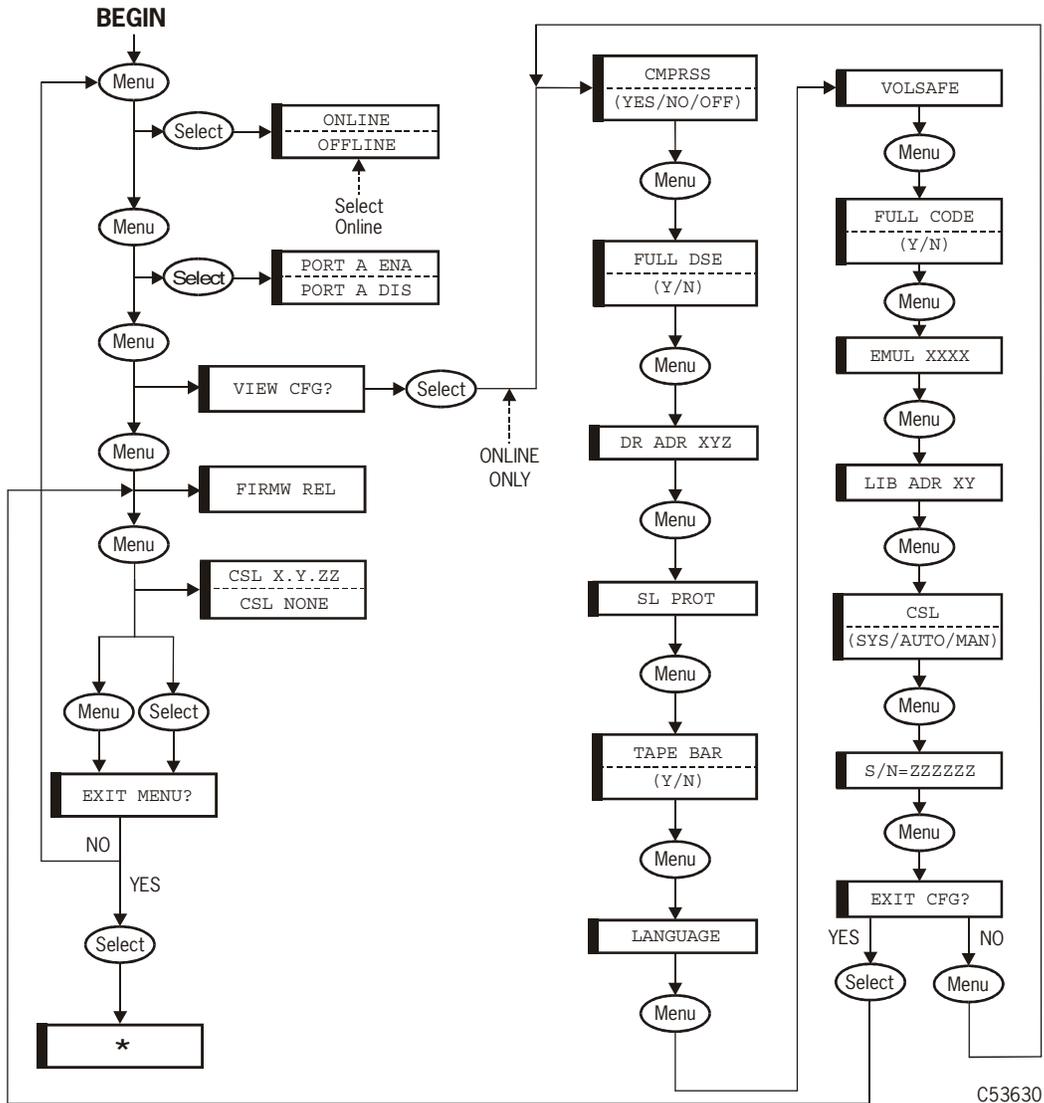


Table 4-4. Menu Table - View ESCON Configuration

Options	Notes	Procedure
Online/Offline Main Menu		
Online	Defaults to online.	1. If applicable, press Menu to access.
Offline	For viewing the configuration, the drive must be online.	2. If Online does not display, press Select to toggle to online.
View Configuration Main Menu		
View CFG? (View Configuration?)	To bypass this menu and view only the firmware release level, press Menu twice; otherwise, follow the instructions.	<ol style="list-style-type: none"> 1. If applicable, press Menu once to display the menu. 2. Press Select to access. The compression status displays. 3. Press Select or Menu repeatedly to view the rest of the configuration status: Data Security Erase (DSE) SCSI ID Drive Address Standard Label Protect Tape Bar Language ESCON 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 next firmware release level menu.
Firmware Level View Menu		
None	Display shows Rx.yy.zzzc , where <i>x</i> = major revision number, <i>yy</i> = minor revision number, <i>zzz</i> = integration number, <i>c</i> = channel type (s -SCSI, e -ESCON, f -Fibre)	<ol style="list-style-type: none"> 1. If applicable, press Menu once to display the firmware level. 2. Press Menu again to go to the Exit menu.

Table 4-4. Menu Table - View ESCON Configuration (Continued)

Options	Notes	Procedure
Main Exit Menu		
Exit Menu?	This menu gives you the opportunity to repeat the operation.	<ol style="list-style-type: none">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.

Table 4-5 provides the drive menus and displays to:

- Enter the Drive submenus
- Initial program load (IPL) drive from new firmware tape
- Make dump tape
- Make code tape (for qualified technicians only)
- Make data tape
- Build media information region (MIR)

Table 4-5. Menu Table—Drive Operations

Options	Notes	Procedure
Online/Offline Main Menu		
Online	Defaults to Online.	1. If applicable, press Menu to access.
Offline	OffLn Pend, OnLn Pend, and TIPS Pend (ESCON only) may display while waiting for a system response or diagnostics completion.	2. To go online and exit operations: <ol style="list-style-type: none"> 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 do special operations: <ol style="list-style-type: none"> a. Press Select to toggle to offline. b. Press Menu several times to reach the Drive main menu.
Drive Main Menu		
Drv Menu? (Drive Menu?)	This is the entry point to the Drive submenus.	1. If applicable, press Menu to access. 2. Press Select to enter the Drive submenus or press Menu to bypass the Drive menus.

Table 4-5. Menu Table—Drive Operations (Continued)

Options	Notes	Procedure
Code Update Submenu In Drive Main Menu		
IPL From Tp (Initial Program Load Drive from New Firmware Tape)	This selection updates the firmware in the drive from the firmware tape inserted in the drive.	<ol style="list-style-type: none"> 1. Press Menu to bypass. If not bypassing, follow the remaining steps: 2. Press Select to activate. <p>If a tape is present in the drive, it ejects.</p> <ol style="list-style-type: none"> 3. When Ld IPL TP displays, insert the write-protected firmware tape with the desired code. <p>When done, the drive automatically ejects tape, IPLs, and comes online.</p>
Displays: CodUpFailsx (Code Update Fail Number <i>x</i>)—see Table 5-2 on page 5-3 for help		
Dump Tape Submenu in Drive Main Menu		
MakeDumpTp (Make Dump Tape)	This selection formats a dump tape. It does not collect diagnostic data. Tapes used to obtain dump data must first be formatted this way to accept dump data.	<ol style="list-style-type: none"> 1. If applicable, press Menu once to access or twice to bypass. If not bypassing, follow the remaining steps: 2. Press Select to activate. <p>If a tape is present in the drive, it ejects.</p> <ol style="list-style-type: none"> 3. When Ld Dump Tp displays, insert a write-enabled tape. <p>Old data on the tape is erased.</p> <ol style="list-style-type: none"> 4. When the tape ejects, insert another or press Menu to exit to the next submenu.
Displays: DmpCrFailx (Dump Create Fail Number <i>x</i>)—see Table 5-2 on page 5-3 for help		

Table 4-5. Menu Table—Drive Operations (Continued)

Options	Notes	Procedure
Create Code Update Submenu in Drive Main Menu		
<p>MakeCodeTp (Make Code Tape)</p> <p>Displays: CodCrFailx (Code Create Fail Number <i>x</i>)—see Table 5-2 on page 5-3 for help</p>	<p>This selection copies the firmware from the drive to the tape. This tape may be used to update other drives using the Code Update submenu.</p>	<p>Note: This procedure is for a qualified technician only. Operators do not use the function.</p>
Reclaim Tape Submenu in Drive Main Menu		
<p>MakeDataTp (Make Data Tape)</p> <p>Displays: DatCrFailx (Data Create Fail Number <i>x</i>)—see Table 5-2 on page 5-3 for help</p>	<p>This selection reformats tapes so they can be reused as normal data tapes. This is referred to as “reclaiming.”</p>	<ol style="list-style-type: none"> 1. If applicable, press Menu once to access or twice to bypass. If not bypassing, follow the remaining steps: 2. Press Select to activate. If a tape is present in the drive, it ejects. 3. When Ld Data Tp displays, insert write-enabled tape. Old data on the tape is erased. 4. When tape ejects, insert another, or press Menu to go to the Drive Exit Submenu.

Table 4-5. Menu Table—Drive Operations (Continued)

Options	Notes	Procedure
Build Media Information Region (MIR)		
Build MIR (Build media information region)	<p>The 9840 Tape Drive uses information recorded on each tape to access and manage that tape while mounted on the drive.</p> <p>This information is recorded at the beginning of the tape in an area known as the Media Information Region (MIR).</p>	<ol style="list-style-type: none"> 1. If applicable, press Menu once to access or twice to bypass. If not bypassing, follow the remaining steps: <p style="margin-left: 20px;">Note: Ensure the drive is unloaded.</p> 2. Press Select to activate. 3. When <code>Ld Cust Tp</code> displays, insert tape requiring MIR. <p style="margin-left: 20px;">Note: If using a Cartridge Scratch Loader (CSL) to build the MIR on a tape, after inserting the tape into the feed channel, press the Start switch to load the tape.</p> <p style="margin-left: 20px;">Rebuild MIR flashes on the operator panel when the MIR is rebuilding.</p> 4. When the MIR is rebuilt the tape ejects, insert another, or press Menu to go to the Drive Exit Submenu.
Drive Exit Submenu in Drive Main Menu		
Exit Drv ? (Exit Drive?)	This submenu allows you to repeat the Drive menu or exit.	<ol style="list-style-type: none"> 1. If applicable, press Menu to access. 2. To return to Code Update submenu (the beginning of the Drive main menu), press Menu. 3. To exit menu system: <ol style="list-style-type: none"> a. Press Select. b. Press Menu repeatedly until <code>Exit Menu?</code> displays.

Table 4-5. Menu Table—Drive Operations (Continued)

Options	Notes	Procedure
Main Exit Main Menu		
Exit Menu?	This menu gives you the opportunity to return the drive online and stay in or exit the menu system.	<ol style="list-style-type: none"> 1. If applicable, press Menu to access. 2. To return to the Online/Offline main menu to return the drive to Online and exit: <ol style="list-style-type: none"> a. Press Menu. b. Return to the Online/Offline menu at the beginning of this table. 3. To exit the menu system without returning drive to online, press Select.

■ Online/Offline Main Menu Tasks

Use the Online/Offline main menu to change the state of the 9840 Tape Drive from online to offline and offline to online. When the 9840 Tape Drive is in a particular state, you can perform further operations using the menu system.

Online

To change the state of the 9840 Tape Drive to online, follow these steps:

1. Press the **Menu** switch.

The operator panel displays the “Online” or “Offline” message, which indicates the present state of the 9840 Tape Drive.

2. Do one of the following:

- If the operator panel displays the “Online” message, go to step 5.
- If the operator panel displays the “Offline” message, continue with step 3.

3. Press the **Select** switch once to place the 9840 Tape Drive online.

The operator panel displays some of the following messages:

- The “TIPS Pend” message indicates that the ESCON tape independent protocol is pending.
- The “IPLPend” message indicates that the IPL is starting.
- The “CC Diags” message indicates that the controller diagnostics are running.
- The “ASIA Diags” message indicates that the additional diagnostics are running.
- The “Onl Pend” message indicates that the online state is pending due to the completion of diagnostics.
- The “Online” message indicates that the transition completed successfully.

4. Bring the drive back online to the host. Enterprise and client-server (Fibre Channel/SCSI) operations are discussed here.
 - a. Enterprise, vary the drive online for all host paths to the drive by keying in one of the following commands:

```
MVS V <address> online
```

```
VM Vary on, <address>
```
 - b. Fibre Channel and SCSI: The drive is ready for I/O after it is put online.

5. Press the **Menu** switch until the operator panel displays the “Exit Menu?” message.
6. Press the **Select** switch to exit.

The 9840 Tape Drive is online and available.

Offline

To change the state of the 9840 Tape Drive to offline, follow these steps:

1. Cease all I/O from the host. Enterprise and client-server (Fibre Channel/SCSI) operations are discussed here.
 - a. Enterprise: vary the drive offline for all host paths to the drive by keying in one of the following commands:

```
MVS V <address> offline
```

```
VM Vary off, <address>
```

- b. Fibre Channel and SCSI: Ensure the operator ceases all I/O from the host.
2. Press the **Menu** switch.

The operator panel displays the “Online” or “Offline” message, which indicates the present state of the 9840 Tape Drive.

3. Do one of the following:
 - If the operator panel displays the “Offline” message, go to step 5.
 - If the operator panel displays the “Online” message, continue with step 4.
4. Press the **Select** switch once to place the 9840 Tape Drive offline.

The operator panel displays some of the following messages:

- The “TIPS Pend” message indicates that the ESCON tape independent protocol is pending.
 - The “IPLPend” message indicates that the IPL is starting.
 - The “Offl Pend” message indicates that the offline state is pending because it is waiting for a system response.
 - The “Offline” message indicates that the transition completed successfully.
5. When the operator panel displays the “Offline” message, press the Menu switch to proceed to other menus.

■ View Configuration Main Menu Task

Use the View Configuration main menu to view configuration information. You can view this menu while the 9840 Tape Drive is online. Authorized service personnel perform other procedures with the View Configuration main menu when the 9840 Tape Drive is offline.

CAUTION:

Do not navigate through the View Configuration main menu when the 9840 Tape Drive is offline because doing so might alter the drive configuration.

Follow the directions in this section exactly to avoid configuration problems.

View Configuration Information

View the configuration settings of the 9840 Tape Drive by looking at the submenus of the View Configuration main menu while the 9840 Tape Drive is online. Follow these steps:

1. Press the **Menu** switch once to enter the menu system.
The operator panel displays the “Online” or “Offline” message.
2. Do one of the following:
 - If the 9840 Tape Drive is already online, go to step 4.
 - If the 9840 Tape Drive is offline, continue with step 3.
3. Press the **Select** switch once to change the state of the 9840 Tape Drive to online.
The operator panel displays the “Online” message.
4. Press the **Menu** switch until the operator panel displays the “View Cfg?” message.
5. Press the **Select** switch to enter the View Configuration main menu.
The operator panel displays the value for the Compress mode submenu.
6. Press the **Menu** or the **Select** switch repeatedly to view the other drive configurations. Do so until you reach the Configuration Exit menu.
The operator panel displays the “Exit Config” message.
7. At the Configuration Exit submenu, do one of the following:
 - Press the **Menu** switch to view the configuration values again.
 - Press the **Select** switch to exit the View Configuration main menu; then press the **Select** switch until you exit the menu system.

■ Select a Language

Language selection is a configuration task. Qualified technicians use this selection to change the displayed language. The selections are: English, Espanol, Francais, Italiano, Deutcher.

CAUTION:

Language selection should only be changed by a qualified technician. Operators should request assistance if the language selection must be changed.

Note: Refer to [Table 5-3 on page 5-7](#) for 9840 Tape Drive translated messages.

■ Select Tape Bar Task

The tape bar selection is a configuration task. Qualified technicians set this selection during initial configuration of the drive. Refer to [“Tape Bar-Chart Explanation” on page 4-31](#) for a detailed explanation of the tape bar.

■ Reclaim Cartridge Tape

Use the Drive main menu to reclaim (or reformat) a cartridge tape. You can view this menu while the 9840 Tape Drive is offline. Authorized service personnel perform other procedures with the Drive main menu when the 9840 Tape Drive is offline.

CAUTION:

Do not navigate through the Drive main menu when the 9840 Tape Drive is offline because doing so might alter the drive configuration. Before performing this procedure, view the drive configuration and make a note of the configuration parameters.

Do not degauss 9840 Tape Drive cartridges. Servo tracks are written on the tape at the factory. When these tracks are mistakenly erased, the cartridge tape must be discarded. They cannot be recovered with this procedure.

When a cartridge tape has been formatted for special uses, such as a firmware update, it can be reformatted as a data tape and return it to usual usage. This process is referred to as “reclaiming a cartridge tape.”

To reclaim a cartridge tape, follow these steps:

1. Place the 9840 Tape Drive offline (see [“Offline” on page 4-23](#)).
2. Press the **Menu** switch until the operator panel displays the “Drv Menu?” message.
3. Press the **Select** switch to enter the Drive main menu.

4. Press the **Menu** switch until the operator panel displays the “MakeDataTp” message.
5. Press the **Select** switch to initiate the reclaim process.
If a cartridge tape is already in the 9840 Tape Drive, it ejects. The operator panel displays the “LdDataTp” message.
6. Place a cartridge tape that is not write-protected into the 9840 Tape Drive.
The reclaim process starts automatically, and it erases and reformats the tape. After the reclaim process completes, the cartridge tape ejects.
Note: If the operator panel displays the “DatCrFail1” message, see [Chapter 5, “Drive Errors and Messages,”](#) for corrective action.
7. Remove the ejected cartridge tape from the 9840 Tape Drive.
8. To reclaim another cartridge tape, repeat steps 6 and 7.
9. When you are finished reclaiming cartridge tapes, press the **Select** switch until the operator panel displays the “Exit Drv?” message.
10. Press the **Menu** switch until the operator panel displays the “Exit Menu?” message.
11. Press the **Menu** switch to repeat the operation or **Select** to exit the operation
12. Press the **Menu** switch to go to main exit menu
13. Place the 9840 Tape Drive online (see [“Online” on page 4-22](#)).

■ Firmware Release Main Menu Task

Use the Firmware Release main menu to view the level of the firmware used by the 9840 Tape Drive.

View Firmware Release Level

View the firmware release level to determine if the firmware in the 9840 Tape Drive requires an update.

To view the firmware release level, follow these steps:

1. Place the 9840 Tape Drive online (see “[Online](#)” on page 4-22).
2. Press the **Menu** switch to reach the Firmware Release main menu.

The operator panel displays the level of the firmware release used by the 9840 Tape Drive. The format is $Rx.yy.zzzc$, where x is the major revision number, yy is the minor revision number, zzz is the integration number, and c is the channel type (“ s ” is SCSI, “ e ” is ESCON, “ f ” is Fibre Channel).

3. Press the **Menu** switch until the operator panel displays the “Exit Menu?” message.
4. Press the **Menu** switch to return to the Online/Offline menu.

The operator panel displays the “Online” message.

5. Press the **Menu** switch to exit the menu system.

■ CSL Code Level Main Menu Task

Use the Cartridge Scratch Loader (CSL) Code Level Main Menu to view the firmware level used by the CSL.

View CSL Code Level

To view the CSL code level, follow these steps:

1. Place the 9840 Tape Drive online (see [“Online” on page 4-22](#)).
2. Press the **Menu** switch to reach the CSL code level main menu.

The operator panel displays the level of code used by the CSL. The format is *CSL x.y.zz*, where *x* is the major revision number, *y* is the minor revision number, and *zz* is the integration number.

Note: If no CSL is attached, the display shows *CSL NONE*.

3. Press the **Menu** switch until the operator panel displays the “Exit Menu?” message.
4. Press the **Menu** switch to return to the Online/Offline menu.

The operator panel displays the “Online” message.

5. Press the **Menu** switch to exit the menu system.

■ Exit Main Menu Tasks

The Exit main menu offers three choices:

- Exit the menu system
- Return to the Online/Offline main menu
- Return to the menu system

Exit the Menu System

At the Main Exit menu (the operator panel displays the “Exit Menu?” message), press the **Select** switch to exit the menu system.

After exiting, observe the operator display, which provides some 9840 Tape Drive status information messages:

- A “Ready F” message means the drive is online and loaded with a write-protected cartridge tape.
- A “Ready U” message means the drive is online and loaded with a write-enabled cartridge tape.
- A “Ready A” message means the drive is online, VolSafe is enabled, and the drive is loaded with a write-enabled VolSafe cartridge tape.
- An * (asterisk) indicates that the 9840 Tape Drive is online, but a cartridge tape is not loaded.
- An “Offline” message alternating with the “*” (asterisk) message indicates that the 9840 Tape Drive is offline

Return to Online/Offline Main Menu

To return to the menu system to place the 9840 Tape Drive online after you reach the Exit main menu (the operator panel displays the “Exit Menu?” message), follow these steps:

1. Press the **Menu** switch.
The operator panel displays the “Offline” message.
2. Press the **Select** switch to place the 9840 Tape Drive online.
The operator panel displays the “Online” message.
3. Press the **Menu** switch until the operator panel displays the “Exit Menu?” message.
4. Press the **Select** switch to exit the menu system.

Return to the Menu System

To return to the menu system from the Exit main menu (the operator panel displays the “Exit Menu?” message) to perform another operation, follow these steps:

1. Press the **Menu** switch at the Exit main menu.

The operator panel displays the “Offline” or “Online” message.

2. If necessary, press the **Select** switch to place the 9840 Tape Drive online or offline.

The operator panel displays the “Online” or “Offline” message.

3. Press the **Menu** switch to reach the main menu you want to enter.
4. Work in the main menu using the instructions in this chapter.

■ Tape Bar-Chart Explanation

The tape bar-chart ([Figure 4-9 on page 4-32](#)) 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 drive is in Ready (idle) mode. The bar display alternates with the Write, Read, or Ready display, depending on the present mode of the drive.

Media Information Region

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.

Displayed Bars

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

Segment

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. Please see next page.

Dots

The three rows of dots in the middle of the display represent the read bar and the two outer rows of dots 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 4-9](#).

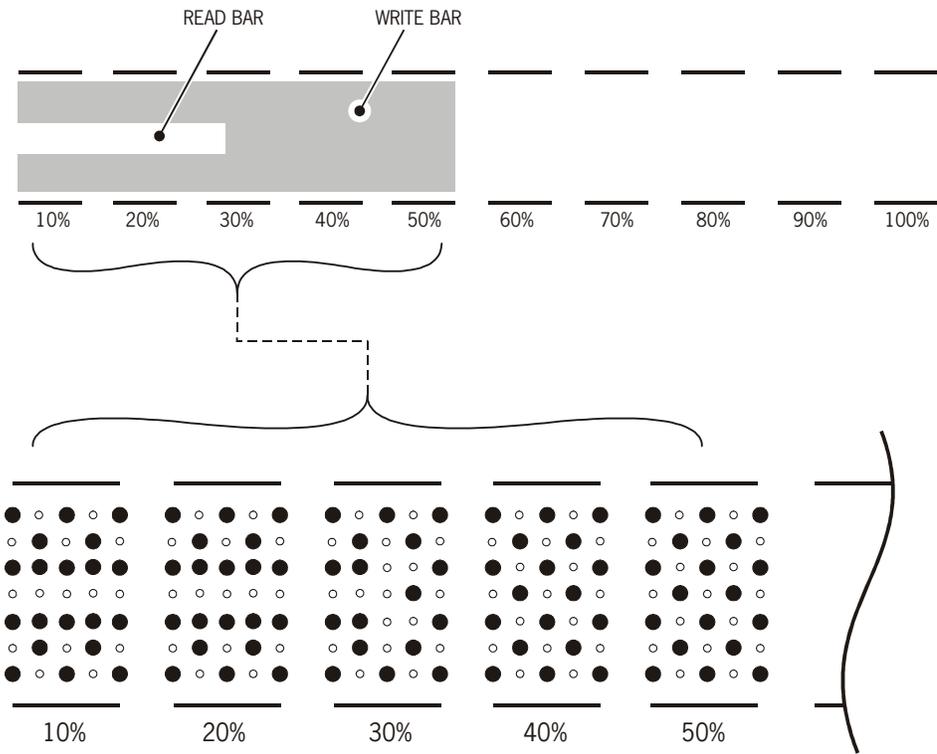
Write Bar

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

Read Bar

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.

Figure 4-9. Tape Write/Read Bar Chart



C53412

Drive Errors and Messages

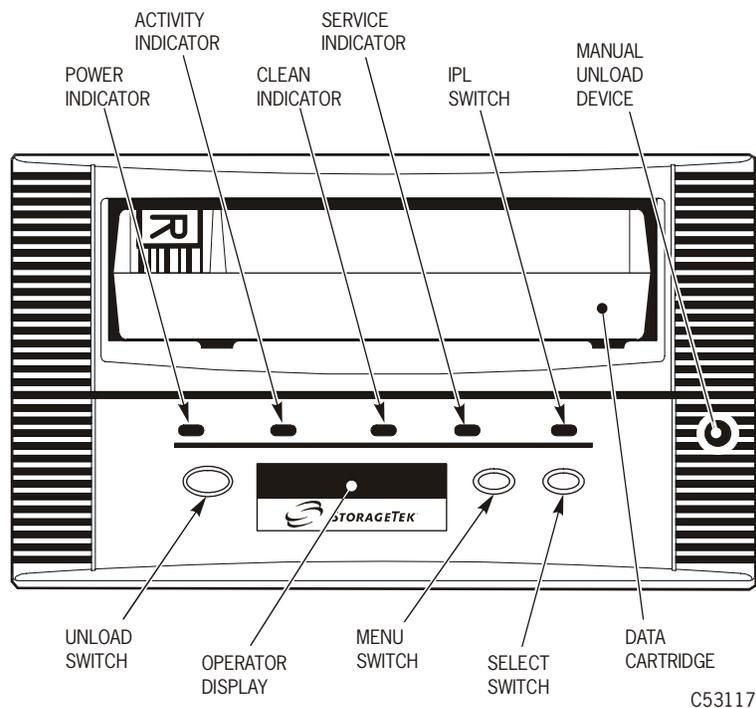
5

This chapter describes error indications that may occur with the 9840 Tape Drive (Figure 5-1) and the procedures to resolve the problem. It includes:

- “Power and Service Indicator Errors” on page 5-2
- “Clean Indicator Error” on page 5-3
- “Operator Panel Messages” on page 5-3
- “Language Translated Messages” on page 5-7
- “Specific Error Recovery Procedures” on page 5-8
- “Shipping Insert” on page 5-9
- “Jammed Cartridge” on page 5-12
- “Fiber-Optic Problems” on page 5-14

Note: If you use the procedures in this chapter to recover from a problem and you cannot resolve it yourself, contact authorized service personnel.

Figure 5-1. 9840 Tape Drive



Refer to [Chapter 6, “Cartridge Scratch Loader,”](#) for CSL error information.

■ Power and Service Indicator Errors

Table 5-1 summarizes the combination of the *Power* and the *Service* indicators (“9840 Tape Drive” on page 5-1), the meaning, and the recommended corrective action.

Note: Table 5-1 does not summarize all conditions that can occur. If an uncorrectable malfunction occurs, contact authorized service personnel.

Table 5-1. Power and Service Indicators

<i>Power Indicator</i>	<i>Service Indicator</i>	Meaning	Action
On	Off	Normal operation is occurring.	No user action is necessary.
On or flashing	Flashing after dump collection	A 9840 Tape Drive error is detected.	Perform an IPL. If the problem persists, contact authorized service personnel.
Flashing while action takes place	Flashing or off	A 9840 Tape Drive error occurred. Power-on and IPL sequences occur automatically.	No user action is necessary. If repeated power-on and IPL sequences do not make the drive operational, contact authorized service personnel.
Continuous flashing	Flashing or off	The 9840 Tape Drive failed the power on procedure; it cannot exit the IPL mode.	Retry the power on and IPL procedure. If the problem persists, contact authorized service personnel.
On	On	A 9840 Tape Drive failure occurred.	Perform an IPL. If the problem persists, contact authorized service personnel.

■ Clean Indicator Error

When the amber-colored *Clean* indicator is on, you must clean the 9840 Tape Drive. The *Clean* indicator signifies that particular tape errors occurred or a specific length of tape passed through the tape path.

For information about cleaning the 9840 Tape Drive, see “[Cleaning a Drive](#)” in [Chapter 3, “Operator Tasks.”](#)

■ Operator Panel Messages

The operator display on the 9840 Tape Drive operator panel displays the names of menus, sub-menus, and choices. It also displays status and error messages

Table 5-2. Operator Display Messages

Display	Probable Cause	Recommended Action
* (asterisk)	A steady asterisk indicates that drive is online but a cartridge is not loaded.	Operator discretion
ASIA Diags	Diagnostics are running during a normal IPL.	No user action is necessary.
Bank n Bad	During boot, a section of memory was found bad.	Perform an IPL. If the problem persists, contact authorized service personnel.
Boot Fail	The IPL failed.	Perform an IPL. If the problem persists, contact authorized service personnel.
BT Monitor	A sequence of switches took you to an Engineering area.	IPL to clear.
CC Diags	Diagnostics are running during a normal IPL.	No user action is necessary.
Chk (FSC)	An operational failure occurred; the 9840 Tape Drive automatically performs an IPL.	Wait for the IPL to complete and retry the operation. If the problem persists, contact authorized service personnel.
Cleaning (*Cleaning*)	Cleaning tape was inserted and drive is now in process of cleaning.	No user action is necessary.
<i>cnhdnsn</i>	Hardware revision level supported by the firmware in this drive.	This message occurs when firmware level is insufficient to control the hardware level in the drive: call for service.

Table 5-2. Operator Display Messages (Continued)

Display	Probable Cause	Recommended Action
CodCrFail1	The 9840 Tape Drive cannot write code onto the tape. The 9840 Tape Drive cannot position the tape.	Ensure that the tape is write-enabled. Try another cartridge tape.
CodCrFail2	The 9840 Tape Drive cannot read code from the tape.	Retry the operation. Try another cartridge tape. If the problem persists, contact authorized service personnel.
CodeUpDate	The firmware in the drive is being updated from the host: operator panel switches are locked.	No user action is necessary.
CodUpFail1	The 9840 Tape Drive cannot read the tape. The 9840 Tape Drive cannot position the tape. The 9840 Tape Drive cannot read an image on the tape.	Try another cartridge tape.
CodUpFail2	The EEPROM failed.	Contact authorized service personnel.
CodUpFail3	The 9840 Tape Drive cannot read code from the tape.	Retry the operation. Try another cartridge tape. If the problem persists, contact authorized service personnel.
CodUpFail4	The tape is not a code update tape.	Try another cartridge tape. If the problem persists, contact authorized service personnel.
DatCrFail1	The 9840 Tape Drive cannot create (reformat) the data tape.	Ensure that the tape is write-enabled. Try to reformat the data tape using another 9840 Tape Drive. If the problem persists, contact authorized service personnel.
DmpCrFail1	The 9840 Tape Drive cannot create (reformat) the diagnostic dump tape.	Ensure that the tape is write-enabled. Contact authorized service personnel.
DmpCrFail2	The 9840 Tape Drive cannot read the format of the tape.	Retry the operation. Try another cartridge tape. If the problem persists, contact authorized service personnel.
DumpToHost	Dump or event log is being transferred to host: operator panel switches are locked.	No user action is necessary.

Table 5-2. Operator Display Messages (Continued)

Display	Probable Cause	Recommended Action
DmpWrFail1	The 9840 Tape Drive cannot write diagnostic data onto the tape. The 9840 Tape Drive cannot position the tape.	Contact authorized service personnel.
DmpWrFail2	There is no diagnostic dump data to process.	Contact authorized service personnel.
DumpAgain?	The 9840 Tape Drive detected the same Chk (FSC) within a minute.	See “ DumpAgain? Condition ” on page 5-8.
Exp ClCart	The cleaning cartridge is spent.	Replace the cleaning cartridge.
FFFF:Dmp Y	Alternates with and “*” (asterisk) after completion of IPL, where <i>FFFF</i> =the FSC of last dump data collected and <i>Y</i> =number of uncollected dumps in EEPROM.	Optionally move dump/s to the host or tape. See various dump instructions in this chapter.
Fix CfgErr	The checksum does not match after an IPL.	Contact authorized service personnel.
Init (FSC)	An initialization error occurred.	Contact authorized service personnel.
IPL Pend	After the IPL switch is pressed, the IPL is pending.	Wait until the IPL automatically completes.
Load CC	The common controller code is loading.	No user action is necessary.
Load ESCON	Normal display during IPL.	No user action is necessary.
Loading	Cartridge tape is being loaded.	No user action is necessary.
Load (FSC)	The load or unload operation failed.	If another tape also fails load, IPL drive. If the problem persists, contact authorized service personnel. If another tape works, tape is suspect.
Load FIBRE	Normal display during IPL.	No user action is necessary.
Load SCSI	Normal display during IPL.	No user action is necessary.
Locating	Drive is doing a high speed seek.	No user action is necessary.
Memory Err	The IPL failed.	Perform an IPL. If the problem persists, contact authorized service personnel.
NTReady F	The write-protected tape is in the process of a manual unload.	No user action is necessary.
NTReady U	The non-write-protected tape is in the process of a manual unload.	No user action is necessary.

Table 5-2. Operator Display Messages (Continued)

Display	Probable Cause	Recommended Action
Offline	Alternating with the "*" message, this message indicates that the 9840 Tape Drive is offline.	No user action is necessary.
Online	The 9840 Tape Drive is operational.	No user action is necessary.
Power Fail	The power supply has failed.	Contact authorized service personnel.
Ready A	The drive is VolSafe-enabled and loaded with a write-enabled VolSafe cartridge tape.	No user action is necessary.
Ready F	The loaded cartridge tape is write-protected.	No user action is necessary.
Reading	The drive is in read mode.	No user action is necessary.
Ready U	The loaded cartridge tape is not write-protected.	No user action is necessary.
Rewinding	The drive is rewinding.	No user action is necessary.
Save Fails	The new configuration cannot be saved because the read-access memory (RAM) may be defective.	See "Save Fails Condition" on page 5-8.
SavingDump	Displayed while saving dump to EEPROM.	Normal display. Wait for dump to complete.
Start Init	Initialization started.	No user action is necessary.
Trapped	Boot is trapped in a closed loop.	Perform an IPL. If the problem persists, contact authorized service personnel.
Unloading	Cartridge tape is being unloaded.	No user action is necessary
UnWr (FSC)	The Unload switch was pressed during a write operation.	See "UnWr Condition" on page 5-8.
Write Prot	Drive attempted to write to a write-protected tape.	Change switch on cartridge tape to write-enable.
Writing	The drive is in write mode.	No user action is necessary.

■ Language Translated Messages

Table 5-3 provides 9840 Tape Drive messages that have been translated from English to Spanish, French, Italian, and German. This table will be updated as new information is acquired.

Table 5-3. Language Translated Messages

English	Spanish	French	Italian	German
Cleaning	*Limpia*	Nettoyage	*Pulir*	Reinigen
Erasing	*Borrando*	Effacement	*Cancellare*	*Loeschnng*
Locating	Situando	Recherche	Ricerca	Suchen
Loading	Cargando	Chargement	Carico	Laden
NT Ready F	Noprep P	Npret PTG	No PRT P	N Bereit N
NT Ready U	Noprep N	Npret NPTG	No PRT N	N Bereit G
Ready F	Prepda P	Pret PTG	Pronto P	Bereit G
Ready U	Prepda N	Pret NPTG	Pronto N	Bereit N
Rewinding	Rebobina	Rebobinage	Riavvolg	Spult-R
Unloading	Descarga	Dechargemt	Scaricam	Entladung

■ Specific Error Recovery Procedures

This section describes recovery actions for the following:

- “DumpAgain? Condition”
- “Save Fails Condition”
- “UnWr Condition”

If your error condition is not listed, contact authorized service personnel for assistance.

DumpAgain? Condition

If the 9840 Tape Drive detects the same fault symptom code within a minute, the *Service* light flashes and the “DumpAgain?” message alternates with a “Chk xxxx” message, where *xxxx* is the fault symptom code. The 9840 Tape Drive is not operational and requires manual intervention.

1. Press the **IPL** switch to perform an IPL on the 9840 Tape Drive.
2. Do one of the following:
 - If the IPL successfully completes, continue with normal operation.
 - If the IPL fails as indicated by any displayed message, contact authorized service personnel.

Save Fails Condition

If the operator panel displays the “Save Fails” message while you are saving a new configuration, it means that the random-access memory (RAM) in the drive failed. Contact authorized service personnel to replace the drive.

Note: You should not encounter this condition as authorized service personnel generally enter all configuration information using the operator panel.

UnWr Condition

If the operator panel displays the “UnWr” (Unwritten Data) message after you press the **Unload** switch, it indicates that you pressed the switch during a write operation. This signifies that the 9840 Tape Drive tried to write some remaining data before it unloaded the cartridge tape, but the attempt failed. Some data remains unwritten.

At this point, you have two choices:

- If you do not want to save the unwritten data, press the **Unload** switch again to unload the cartridge tape immediately. **Data loss occurs.**
- If you want to save the unwritten data, issue one of the following command sequences before pressing the **Unload** switch:

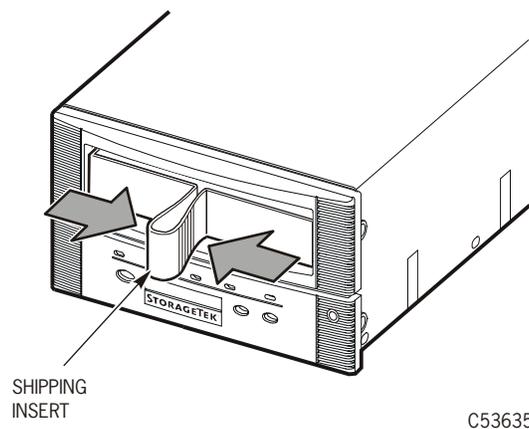
- In the VM/MVS environment: **ESCON Swap**
- In the SCSI environment: **Recover Buffer Data**

■ Shipping Insert

Note: Refer to [Chapter 6, “Cartridge Scratch Loader,”](#) to install and lock a shipping insert into a CSL.

Follow these instructions to properly install and lock the shipping insert ([Figure 5-2](#)) into a drive. Before you can lock the shipping insert into the drive, you *must* use the manual unload device (MUD) screw (step 2) to raise the reel motors and to lower the cleaning brush within the drive.

Figure 5-2. Shipping Insert

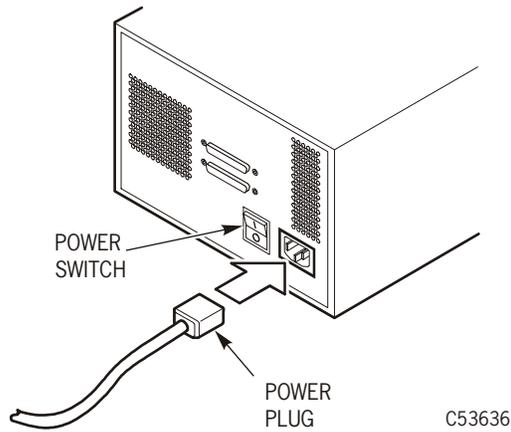


CAUTION:
If the shipping insert is not locked into the tape drive, the drive head will become damaged in shipment.

Notes:

- Only use the MUD mechanism to reset the drive for shipping or to remove jammed cartridges.
- The MUD screw must be turned to the left or counter-clockwise (CCW) to reset the drive to its shipping position and to install and lock the shipping insert into the drive.
- The MUD screw must be turned to the right or clockwise (CW) to remove jammed cartridges.

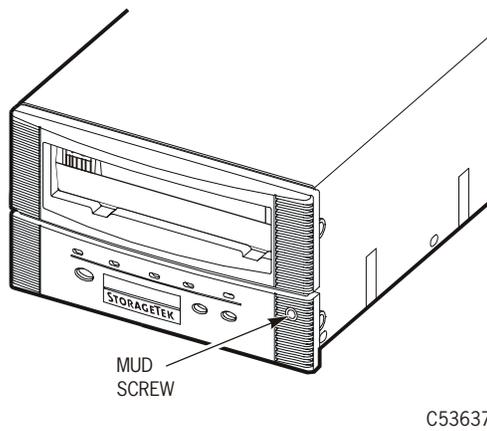
1. Power off the drive if power is applied.



Note: This drive uses a SCSI interface to the host.

2. Locate the manual unload device (MUD) screw on right-front area of the drive.

1. MUD screw



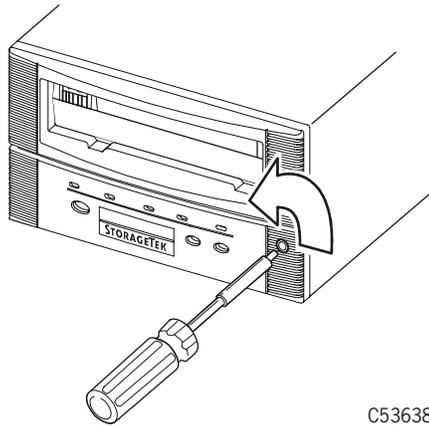
3. Obtain a common screwdriver and insert it into the MUD slot.
 4. Press against the spring-loaded MUD screw until it stops.
-

WARNING:

Do not turn the screwdriver to the right or clockwise (CW) when preparing the drive for a shipping insert.

5. Slowly turn the screwdriver to the left or counter-clockwise (CCW) to raise the reel motors up and to lower the cleaning brush.

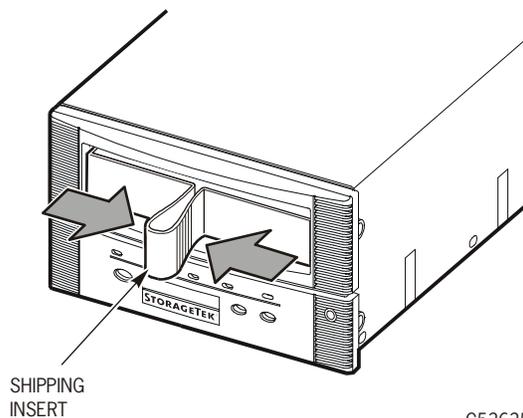
Note: When the MUD screw will not turn any further CCW, the reel motors are up and the cleaning brush is lowered.



C53638

6. Remove the screwdriver.
7. Insert and lock the shipping insert in the 9840 Tape Drive.

Note: Gently pull on the shipping insert to verify it is locked within the carriage.



C53635

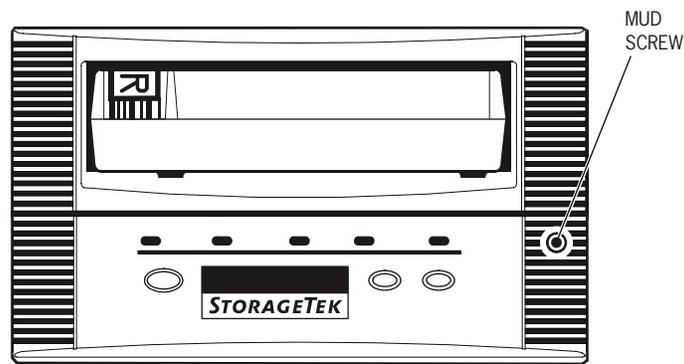
■ Jammed Cartridge

Note: Refer to [Chapter 6, “Cartridge Scratch Loader,”](#) to remove a jammed cartridge from a CSL.

A jammed cartridge in a 9840 Tape Drive is not a common malfunction. However, you must know how to remove jammed cartridges when the malfunction occurs. Follow the procedures in this section to remove a jammed cartridge.

See [Figure 5-3](#) for the 9840 Tape Drive MUD screw location. The MUD screw is located on the right-front side of the drive.

Figure 5-3. 9840 Tape Drive Manual Unload Device (MUD)



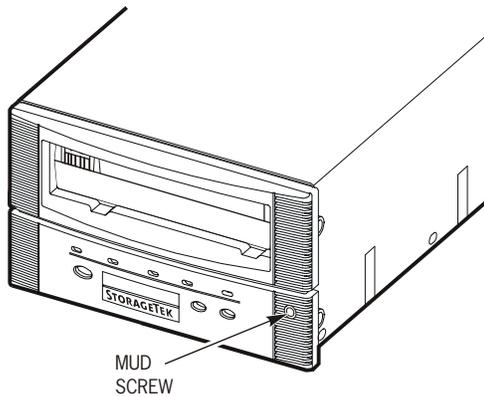
C53632

Notes:

- Only use the MUD mechanism to remove jammed cartridges or to reset the drive for shipping.
- The MUD screw must be turned to the right or clockwise (CW) to remove jammed cartridges.
- The MUD screw must be turned to the left or counter-clockwise (CCW) to reset the drive to its shipping position and to install and lock the shipping insert into the drive.

1. Locate the MUD screw on the drive.

Note: The 9840 Tape Drive MUD screw is located on the right-front side of the drive.



C53633

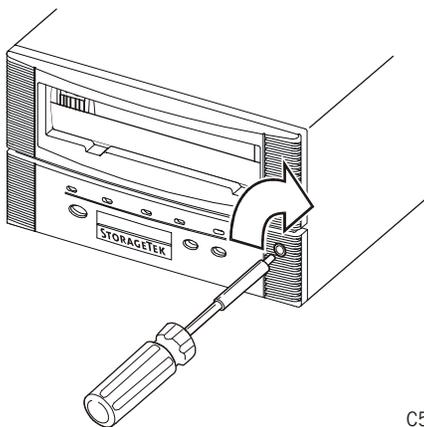
2. Obtain a common screwdriver and insert it into the MUD slot.
3. Press against the spring-loaded MUD screw until it stops.

WARNING:

Do not turn the screwdriver to the left or counter-clockwise (CCW) when removing a jammed cartridge.

4. Slowly turn the screwdriver clockwise (CW) to remove the jammed cartridge.

Note: When the MUD screw will not turn any further CW, the reel motors are lowered and the cartridge can be removed.



C53634

5. Remove the screwdriver.
6. Remove the cartridge from the 9840 Tape Drive.

Note: If cartridges continue to jam, the drive is defective and must be replaced.

■ Fiber-Optic Problems

Note: Contact authorized service personnel to perform any fiber-optic cleaning.

The 9840 ESCON and Fibre Channel Tape Drives use many fiber-optic components, including connectors, adapters, plugs, and transmitter/receiver subassemblies.

If you encounter unexplained problems that occur in the interface, some of the fiber-optic components that are part of the interface might require cleaning.

Cartridge Scratch Loader

6

This chapter covers the Cartridge Scratch Loader (CSL). It contains:

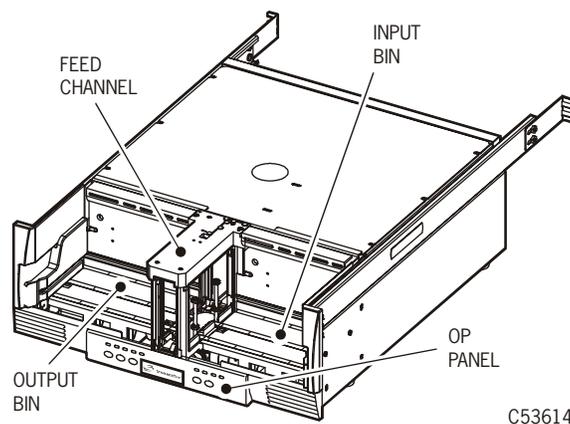
- “Overview”
- “Rack” on page 6-4
- “Rack-mount CSL Tray” on page 6-5
- “Operator Panel” on page 6-6
- “Power On/Off CSL” on page 6-10
- “CSL Cartridge Loading/Unloading” on page 6-12
- “Modes of Operation” on page 6-14
- “Error and Recovery” on page 6-21
- “Jammed Cartridge” on page 6-26
- “Shipping Insert” on page 6-30
- “CSL Model Numbers” on page 6-35

■ Overview

The CSL (Figure 6-1) consists of a 9840 Tape Drive, a power supply, and a CSL mechanism. The CSL is an electromechanical device that can load and unload up to seven cartridge tapes. It also has a priority feed slot (open area of feed channel) to mount a priority cartridge into the tape drive.

Note: Priority cartridges can be mounted in any mode of operation.

Figure 6-1. CSL



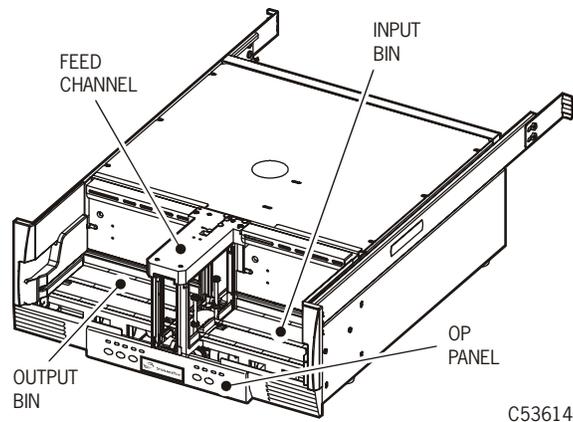
Component Locations

Refer to [Table 6-1](#) for CSL component descriptions and to [Figure 6-2](#) for locations of the CSL components. Operators should become familiar with the CSL components listed below.

Table 6-1. CSL Component Descriptions

Component	Purpose
Operator Panel	Operates the 9840 Tape Drive and CSL
Output Bin	Houses ejected cartridges from the feed channel
Feed Channel	Inputs/outputs cartridges to/from 9840 Tape Drive and also used for priority mounts
Input Bin	Loads cartridges into the feed channel

Figure 6-2. CSL Component Locations



The CSL ships as a 19 inch tray that can be mounted into a rack. One to six CSLs may be installed within the rack enclosure.

[Figure 6-4 on page 6-4](#) illustrates the rack mount CSL. The rack mount CSL is offered as a SCSI and ESCON interface.

Cartridge Routing

Cartridges are loaded into the CSL (Figure 6-3 on page 6-3) vertically with the Media Id label (R) facing out towards the operator (reels to the right). Load cartridges into the input bin (right side of the CSL).

Note: Never load cartridges flat or with the cartridge reels to the left.

Figure 6-3. Cartridge Routing

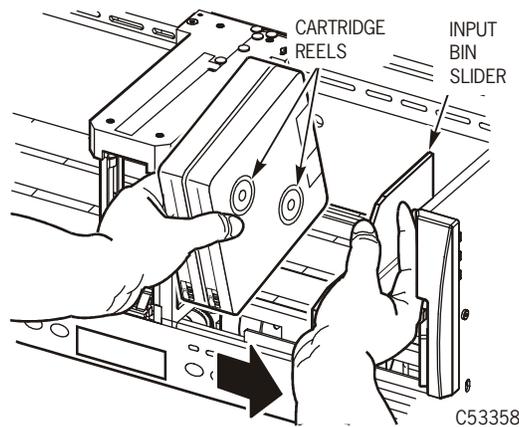


Figure 6-2 on page 6-2 provides all components of the CSL. The output bin is located on the left side of the CSL. The feed channel is in the middle of the CSL. Cartridges are shifted from the right to the left, from the input bin into the feed channel and from the feed channel into the output bin.

Note: The CSL is unable to prevent or detect miss-oriented cartridges. Ensure cartridges are always loaded correctly (Figure 6-3).

Cartridges are loaded into the drive as they are manually loaded by the operator. If the drive detects an incorrectly positioned cartridge, it forces a CSL failure condition or requests an unload operation from the CSL.

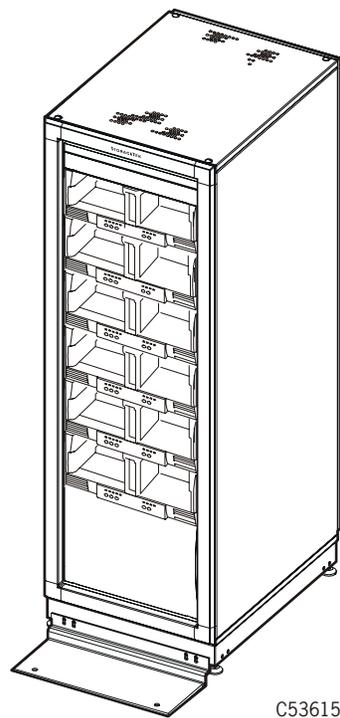
■ Rack

The StorageTek RACK001 may be used to install the rack mount CSL trays. Refer to [Figure 6-4](#) for the StorageTek RACK001. This rack contains 6 CSLs. The rack may contain a combination of 9840 Tape Drives and CSLs.

Note: A customer may wish to use other racks to install the rack mount CSL trays. This is permissible.

The rack can have up to six CSLs with one per tray, up to 12 manual drives with two per tray, or a combination of CSLs and manual drives to fill the six slots. Different trays may have different interfaces.

Figure 6-4. RACK001 for CSL Trays



The rack and CSLs ship in separate containers. The CSLs must be installed within the rack by a qualified individual.

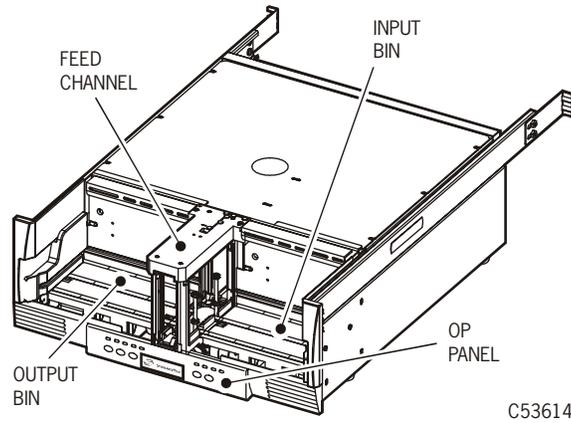
■ Rack-mount CSL Tray

Refer to [Figure 6-5](#) for the rack mount CSL. The rack mount CSL ships as a SCSI or ESCON interface.

Note: The slide rails are installed on the CSL in [Figure 6-5](#).

This rack unit has the feed channel, input bin, output bin, and operator panel identified. The rack unit has a power switch on the rear to control all enclosed electronics.

Figure 6-5. Rack Mount CSL



[Table 6-2](#) provides the rack mount CSL tray dimensions.

Table 6-2. Rack Mount CSL Tray Dimensions

Dimension	Client Server	Enterprise
Width	ANSI/EIA 19-inch rack	ANSI/EIA 19-inch rack
Depth	30 in.	30 in.
Height	7.625 in.	7.625 in.
Weight	39 lb	39 lb

Operator Panel

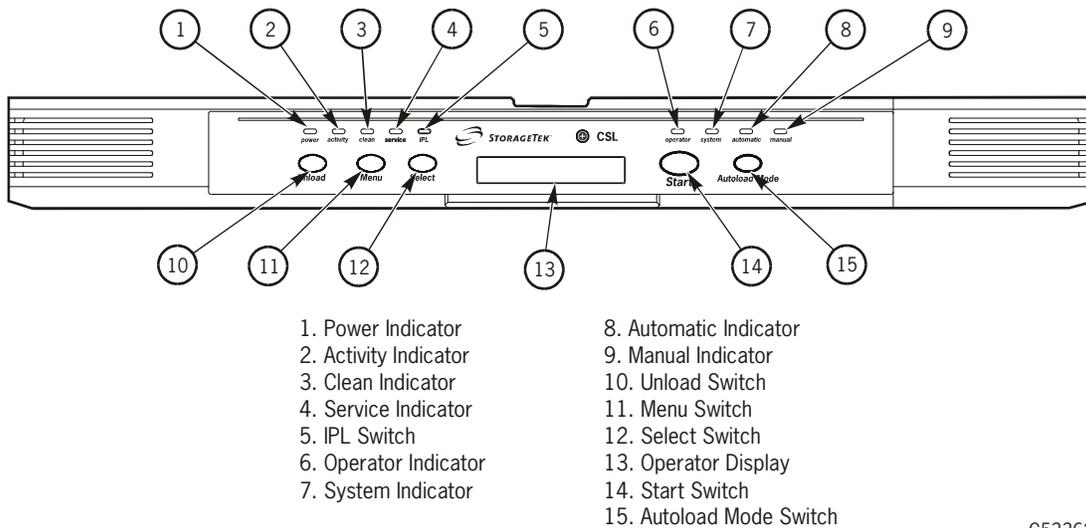
Note: The 9840 Tape Drive and CSL operator panel use small push-button switches. The term switch or switches is used to identify them throughout this manual.

The operator panel (Figure 6-6) allows a human interface to the subsystem. The left half of the operator panel contains the indicators and switches specifically for the 9840 Tape Drive.

The right half of the operator panel contains the indicators and switches specifically for the CSL. They are:

- *Operator* Indicator (6)
- *System* Indicator (7)
- *Automatic* Indicator (8)
- *Manual* Indicator (9)
- **Start** Switch (14)
- **Autoload Mode** Switch (15)

Figure 6-6. CSL Operator Panel



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Note: The IPL switch (5) only IPLs the drive. Use the **Power** switch on the back of the CSL to IPL the CSL.

Note: Only the CSL indicators and switches are discussed in this section. Refer to “Operator Panel” on page 1-4 for an explanation of the 9840 Tape Drive indicators and switches.

CSL Switches

Refer to [Table 6-3](#) for CSL operator panel switch descriptions.

Note: Refer to “[Operator Panel](#)” on [page 1-4](#) for explanation of the 9840 Tape Drive switches.

Table 6-3. CSL Operator Panel Switches

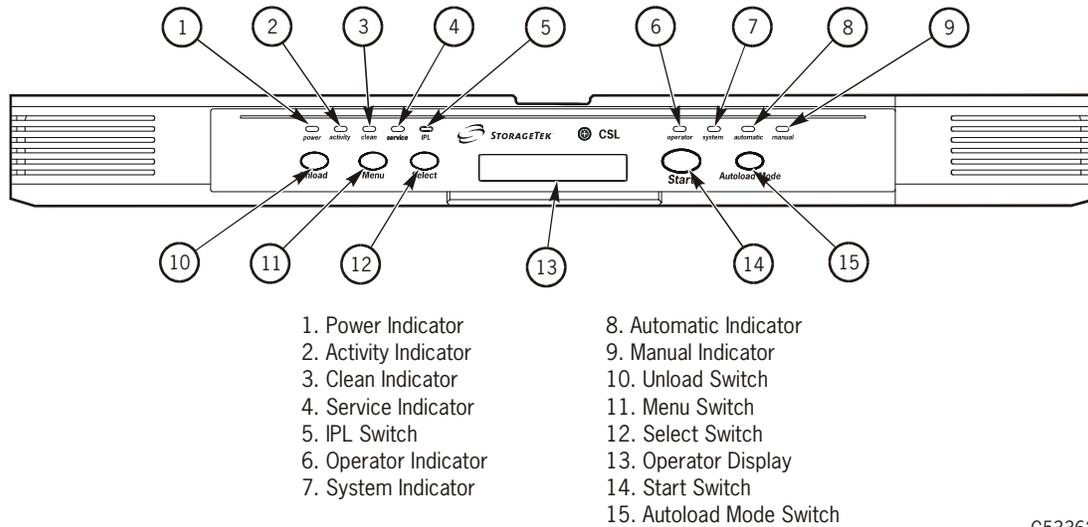
Switch	Description
Start Switch (CSL only)	<p>Pressing this switch restarts CSL operation after the operator empties a full output bin or replenishes an empty input bin.</p> <p>Also used to restart CSL operation after clearing a misfed cartridge.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. Remove the cartridge before pressing the Start switch. 2. Press the Start switch twice when there is a load failure or solid <i>Operator</i> light (red) on the CSL. Pressing the switch twice reinitializes the CSL.
Autoload Mode Switch (CSL only)	<p>Pressing this switch changes the operation of the CSL to one of three modes: System, Automatic, or Manual.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. Select the mode of operation by using the Autoload Mode switch. 2. Press the Start switch to set the mode of operation. <p>The CSL powers on in the default mode selected in the drive configuration menu. The default mode is overridden when the switch is used to select a new setting. The CSL remains in the selected mode while the drive is powered on. This does not change the IPL default mode in the drive configuration menu.</p> <ul style="list-style-type: none"> • System allows host to control CSL. • Auto allows CSL to operate automatically. • Manual allows manual operations only.

CSL Indicators

The CSL operator panel indicators (Figure 6-7) are described in Table 6-4.

Note: Refer to “Operator Panel” on page 1-4 for explanation of the 9840 Tape Drive indicators.

Figure 6-7. CSL Operator Panel Indicators



C53362

Note: The IPL switch (5) only IPLs the drive. Use the **Power** switch on the back of the CSL to IPL the CSL.

Table 6-4. CSL Operator Panel Indicators

Indicator	Figure 6-7 Number	Description	Explanation
<i>Operator</i> (red) (CSL only)	6	When flashing:	The CSL detected an operator-intervention condition. Do the following as required: <ul style="list-style-type: none"> • See if input bin empty • Verify if a mode change is in progress • Remove cartridge(s) from output bin • Load cartridge(s)
		When flashing and xxxx xxxx is displayed:	It asks for the specific tape indicated in the display
		When constantly on:	It indicates an error condition. To correct, fix jam (remove cartridge in feed channel) and press Start switch. Refer to “Jammed Cartridge” on page 6-26.

Table 6-4. CSL Operator Panel Indicators (Continued)

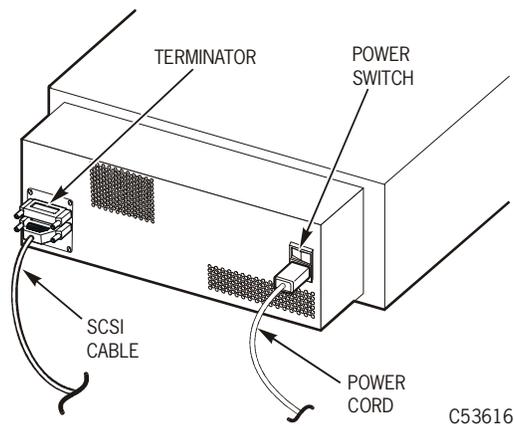
Indicator	Figure 6-7 Number	Description	Explanation
<i>System</i> (green) (CSL only)	7	Indicates CSL is in System mode:	allows host to control CSL.
<i>Automatic</i> (green) (CSL only)	8	Indicates CSL is in Auto mode:	allows CSL to operate automatically.
<i>Manual</i> (green) (CSL only)	9	Indicates CSL is in Manual mode:	allows manual operations only.

■ Power On/Off CSL

This section provides a process to power on/off the CSL. [Figure 6-8](#) provides locations of the Power switch, power cord, terminator, and cable for a CSL SCSI interface.

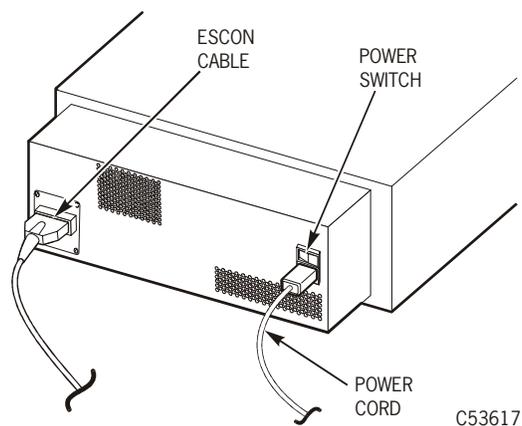
Note: The CSL Power switch and power cord are located on the rear of the CSL.

Figure 6-8. SCSI CSL Power



[Figure 6-9](#) provides locations of the Power switch, power cord, and cable for a CSL ESCON interface.

Figure 6-9. ESCON CSL Power



Power On

1. Ensure the power cord is attached to the receptacle on the rear of the CSL.

Note: The power cord and applicable interface cable (ESCON or SCSI) should have been attached during initial installation.

2. If the power cord is not attached to the CSL, do the following:
 - a. Attach the female end of the power cord to the CSL receptacle.
 - b. Attach the male end of the power cord to a power outlet.
3. Press the **POWER** switch on the rear of the CSL to ON (1).

4. Verify that the CSL powers on.

Note: A steady asterisk on the operator panel indicates a successful IPL completion, the drive is online, but not loaded with a cartridge.

Power Off

1. Press the **Unload** switch to eject the cartridge from the CSL.
2. Ask the operator to ensure that the drive has no I/O from the host.

Note: In the enterprise environment, have the operator vary the drive offline.

3. Use the operator panel to place the CSL offline.

Note: Refer to [Chapter 4, "Menus."](#) for instructions to place the CSL offline.

4. Press the **POWER** switch on the rear of the CSL to OFF (0). This will power off the CSL.
5. Verify that the CSL powers off.

Note: All indicators are off and the operator panel is blank.

■ CSL Cartridge Loading/Unloading

This section contains procedures to load and unload cartridges within the CSL.

Cartridge Loading

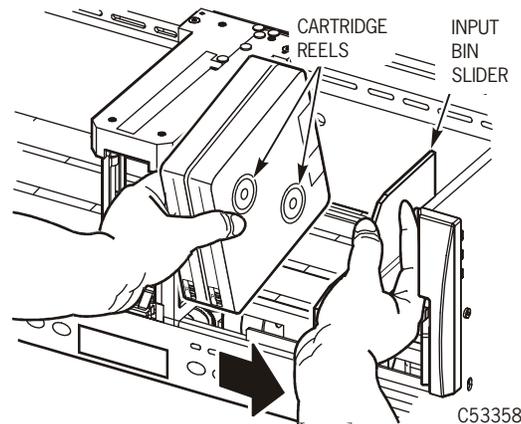
Note: Engineering recommends no drive activity during cartridge loading. This ensures that no drive errors are induced.

To correctly load a cartridge into the input bin, follow these instructions and refer to [Figure 6-10](#).

Notes:

- Load cartridges into the CSL vertically with the Media Id label (R) right side up and facing out towards the operator (reels to the right).
- Never load cartridges with the cartridge reels to the left.
- Never load cartridges flat within the CSL. This causes an instant CSL failure.

Figure 6-10. Cartridge Loading



1. Move the CSL spring-loaded slider to the right and hold it in this position while loading cartridges.
2. Load cartridges into the CSL vertically with the Media Id label (R) facing out towards the operator (reels to the right).
3. Verify that the customer label (if used) is on the left side of the cartridge (toward the feed channel).
4. Tilt the cartridge back slightly.
5. Insert the bottom-back edge of the cartridge into the CSL input bin.

6. Slide the front edge of the cartridge into the CSL.
7. Slowly release the CSL spring-loaded slider and ensure it touches the loaded cartridges.
8. Check that all loaded cartridges are seated correctly.

Note: Ensure cartridges are aligned vertically and horizontally within the input bin and the spring-loaded slider is firmly against the cartridges.

Cartridge Unloading

Cartridges are ejected from the feed channel into the output bin (Figure 6-11). One to seven cartridges may be ejected into the CSL output bin.

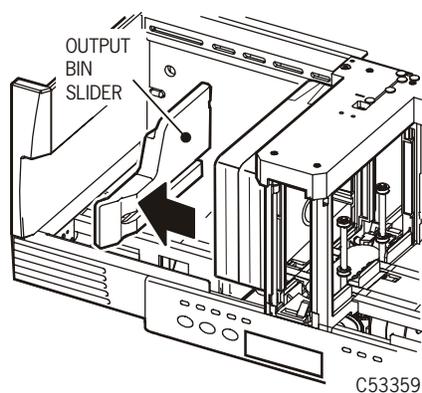
Note: When unloading cartridges from the CSL output bin, ensure the spring-loaded slider does not slam into the feed channel.

To correctly unload a cartridge from the output bin, follow these instructions and refer to Figure 6-11:

1. Move the CSL spring-loaded slider to the left and hold it in this position while unloading cartridges.
2. Grasp the cartridge(s) and tilt the cartridge back slightly.
3. Remove the cartridge(s).
4. Slowly allow the CSL spring-loaded slider to touch the feed channel.

Note: Allowing the output or input bin slider to slam into the feed channel may cause drive errors.

Figure 6-11. Cartridge Unloading

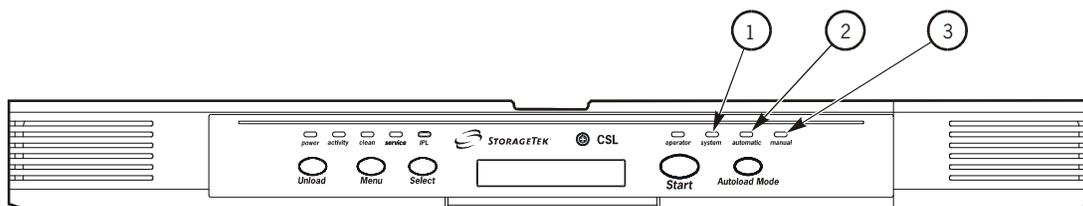


■ Modes of Operation

The CSL has three distinct modes of operation (Figure 6-12). They are:

- System Mode
- Automatic Mode
- Manual Mode

Figure 6-12. CSL Modes of Operation



1. System Indicator
2. Automatic Indicator
3. Manual Indicator

C53361

When power is applied to the CSL, illumination of one of the mode LEDs indicates the CSL is receiving power and is ready for operation. The *Operator* indicator may also light indicating a required manual intervention.

System Mode

The system mode allows the host (enterprise only) to control the CSL. The CSL stays in the system mode until changed from the operator panel or until the drive sends a mode change command. The drive changes the mode of operation at IPL to the mode set in the configuration on the operator panel.

Note: If the input bin is empty while the CSL is in *System* mode, the input bin must be replenished, and the **Start** switch must be pressed to restart the CSL operation.

If a Load Display command has been sent to the CSL from the host, a cartridge will be loaded.

If a Load Display command has *not* been sent to the CSL from the host, a cartridge will not load until a Load Display command is received from the host to mount a cartridge.

Mount Message

When the CSL receives a mount message from the host, one of the following occurs:

- If the drive is empty and the feed channel contains a cartridge which hasn't been previously loaded, the cartridge loads into the drive.
- If the drive and the feed channel are empty, but at least one cartridge is available in the input bin, then the cartridge loads into the drive.
- If the drive, the feed channel, and the input bin are all empty, the *Operator* indicator blinks until a cartridge is loaded and the **Start** switch is pressed.

Note: This is for ESCON attached drives only. SCSI attached drives will issue an error to the host.

- If the drive is full, then a mount pre-queues for execution during the next unload.

Note: This is for ESCON attached drives only.

Refer to [“Priority Mount Mode” on page 6-18](#) to physically mount a priority cartridge directly into the CSL.

Unload Message

When the CSL receives an unload message, the cartridge in the drive moves to the feed channel. The CSL sequences as follows:

- If the output bin is not full, the cartridge is placed into the output bin.
- If the output bin is full, the cartridge remains in the feed channel, and the *Operator* indicator blinks until the cartridge is removed and the **Start** switch is pressed.

Note: Refer to [“Cartridge Removal from Feed Channel” on page 6-20](#) to remove a priority mounted cartridge from the feed channel.

- If a mount has been pre-queued then, if possible, the next cartridge is mounted with only one cartridge shift operation.

Place CSL in System Mode

1. Press the **Autoload Mode** switch until the *System* indicator illuminates.
2. Press the **Start** switch to set the System mode.
3. Load up to seven cartridges in the input bin.
4. Press the **Start** switch.

Note: The CSL does not respond to the **Start** switch if a cartridge is not in the input bin of the loader.

5. Unload the output bin when necessary.

Automatic Mode

The automatic mode allows the CSL to operate without operator intervention. Cartridges automatically load from the input bin into the drive. Cartridges are loaded in the order they were inserted and unloaded into the output bin when the operating system is finished with the tape.

Note: If the input bin is empty while the CSL is in *Automatic* mode, the input bin must be replenished, and the **Start** switch must be pressed to restart the CSL operation.

Refer to “[Priority Mount Mode](#)” on page 6-18 to physically mount a priority cartridge directly into the CSL.

Unload Message

Upon receiving an unload message from the host, the CSL acts identically to the unload in the system mode with a subsequent pre-queued mount of the next cartridge into the drive automatically if possible. The CSL sequences as follows:

- If the output bin is not full, the cartridge is placed into the output bin.
- If the output bin is full, the cartridge remains in the feed channel, and the *Operator* indicator blinks until the cartridge is removed from the output bin and the **Start** switch is pressed.

Note: Refer to “[Cartridge Removal from Feed Channel](#)” on page 6-20 to remove a priority mounted cartridge from the feed channel.

- If a mount has been pre-queued then, if possible, the next cartridge is mounted with only one cartridge shift operation.

Example

A job requires a specific order of cartridges to execute.

1. Load the cartridge tapes into the input bin in the order they will be used.
2. Press the **Start** switch.

Note: The CSL automatically inserts cartridges into the feed channel in the order they were inserted in the input bin and ejects them into the output bin when the operating system has finished with each tape.

Place CSL in Automatic Mode

1. Press the **Autoload Mode** switch until the green *Automatic* indicator illuminates.
2. Press the **Start** switch to set the Automatic mode.
3. Load up to seven cartridges in the input bin in the required sequence (left to right, in the order they will be used).

4. Press the **Start** switch.
5. Unload the output bin when the job is complete or as necessary.

Manual Mode

In manual mode, the operator has complete control over CSL and drive operation. While the CSL is in manual mode:

- You may wait for a cartridge mount request and then mount a cartridge.
- You may receive requests for multiple cartridge mounts and load the requested volumes into the input tray.
- You may remove individual cartridges as they are ejected from the feed channel or wait until the output bin is full before removing them.

Note: In Manual mode, however, you must press the **Start** switch *each time* to load a cartridge into the drive.

Refer to [“Priority Mount Mode” on page 6-18](#) to physically mount a priority cartridge directly into the CSL.

Unload

Upon receiving an unload command from the drive, the CSL acts identically to the unload in the system mode.

After the unload is successfully completed the CSL pauses until the **Start** switch is pressed. Pressing the **Start** switch loads the next available cartridge. The CSL sequences as follows:

- If the output bin is not full, the cartridge is placed into the output bin.
- If the output bin is full, the cartridge remains in the feed channel, and the *Operator* indicator blinks until the cartridge is removed from the output bin and the **Start** switch is pressed.

Note: Refer to [“Cartridge Removal from Feed Channel” on page 6-20](#) to remove a priority mounted cartridge from the feed channel.

- If a mount has been pre-queued then, if possible, the next cartridge is mounted with only one cartridge shift operation.

Place CSL in Manual Mode

1. Press the **Autoload Mode** switch until the green *Manual* indicator illuminates.
2. Press the **Start** switch to set the Manual mode.
3. When a mount message appears on the operator panel or system console, place the requested volumes in the input bin.
4. Press the **Start** switch.

5. Unload the output bin when necessary.

Priority Mount Mode

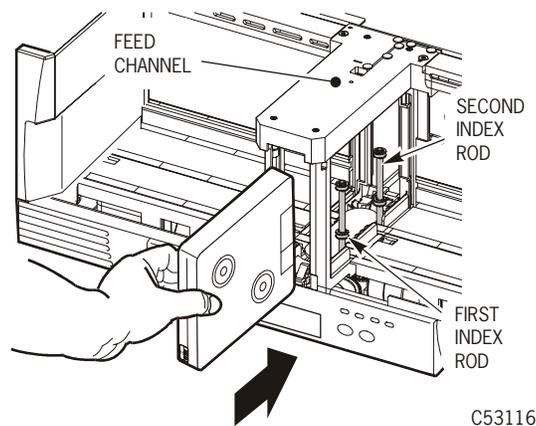
The CSL is a sequential scratch loader. An operator can physically mount a priority cartridge directly into the unit. The host may issue a `Load Display` command with required volser. This command may be issued during any CSL mode of operation informing the operator to place the cartridge into the feed channel (Figure 6-13).

Note: The output bin holds only seven cartridges. If you are going to load a priority cartridge into the feed channel, ensure the output bin is unloaded or has space for the priority mounted cartridge.

To mount a priority cartridge, review:

- “CSL in System Mode” on page 6-18
- “CSL in Automatic Mode” on page 6-19
- “CSL in Manual Mode” on page 6-19

Figure 6-13. Priority Mounting a Cartridge



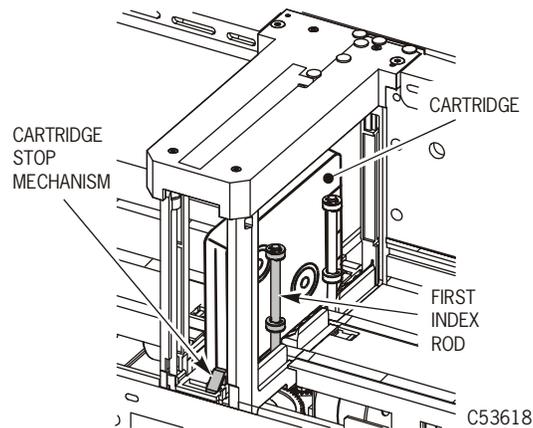
CSL in System Mode

When the CSL is in the system mode and the drive is not loaded, follow these procedures to load a priority cartridge:

1. Verify that the drive is currently unloaded and the index rods are on the right (Figure 6-13).
2. Insert the priority cartridge into the CSL feed channel (Figure 6-13):

- a. Insert the cartridge past the cartridge stop mechanism. See [Figure 6-14](#).

Figure 6-14. Cartridge Stop Mechanism/First Index Rod



- b. Do not insert the cartridge past the first index rod ([Figure 6-14](#)).

Note: If the cartridge is *not* inserted into the CSL feed channel properly ([Figure 6-14](#)), the CSL *cannot* insert the cartridge into the drive slot.

3. Check to ensure the *Operator* light is flashing.
4. Press the **Start** switch to feed the cartridge into the drive and to clear the flashing *Operator* light.

CSL in Automatic Mode

The automatic mode is used for sequential mounting of cartridges from the input bin into the drive. When the CSL is in the automatic mode and the drive is not loaded, follow these procedures to load a priority cartridge:

1. If there are no cartridges in the input bin, the *Operator* light flashes to signal you to insert a priority (single) cartridge into the feed channel. Press the **Start** switch to resume CSL operation.
2. If the input bin is not empty, the mode must be changed to manual mode to mount the priority cartridge. This prevents the next cartridge from being automatically loaded.

Note: Refer to [Figure 6-14 on page 6-19](#) to correctly load a cartridge into the feed channel.

CSL in Manual Mode

This mode is used for sequential mounting of cartridges from the input bin into the drive. The operator controls each mount by pressing the **Start** switch before each mount. When the CSL is in the manual mode and the drive is not loaded, follow these procedures to load a priority cartridge:

1. If there are no cartridges in the input bin, the *Operator* light flashes signaling you to put a cartridge into the feed channel.
2. Press the **Start** switch to resume CSL operation.

Note: Refer to [Figure 6-14 on page 6-19](#) to correctly load a cartridge into the feed channel.

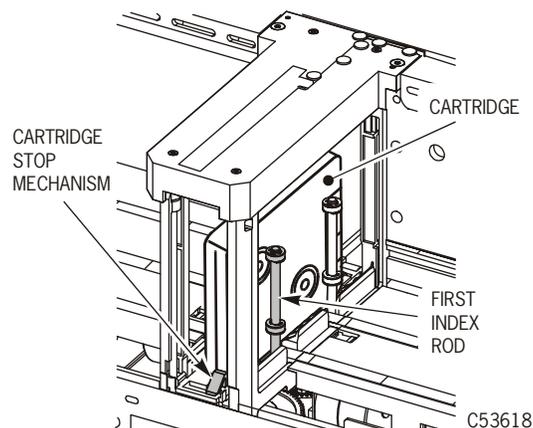
Cartridge Removal from Feed Channel

If the output bin is full (seven cartridges), and you load an eighth cartridge into the feed channel for a priority mount, the cartridge *cannot* eject into the output bin. The cartridge ejects into the feed channel. You must physically remove the cartridge from the feed channel.

Follow these instructions to remove the eighth cartridge from the feed channel:

1. Remove all cartridges from the input and output bins.
2. Push the cartridge stop mechanism down.
3. Grasp the cartridge and remove it from the feed channel.

Figure 6-15. Cartridge Removal



■ Error and Recovery

Note: Refer to [Chapter 5, “Drive Errors and Messages,”](#) for specific drive errors.

Errors may be encountered anytime during operation of the CSL. Errors, recovery, and FSCs are discussed in this chapter.

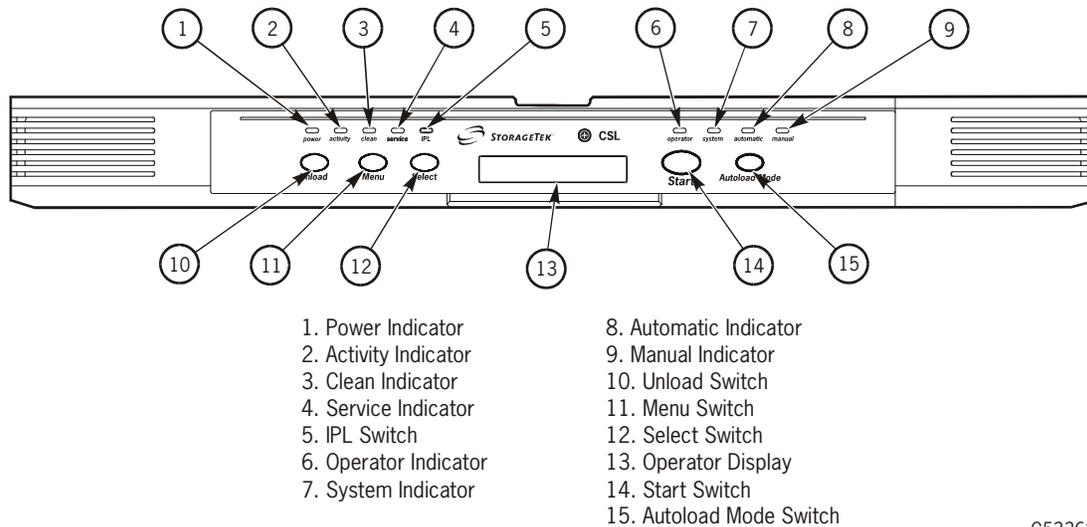
Note: The 4EXX FSCs are for the CSL only.

Operator Indicator

When the *Operator* indicator (call out 6) is flashing ([Figure 6-16](#)), the CSL detected an operator-intervention condition. Refer to [Table 6-4 on page 6-8](#) for a description of the *Operator* indicator.

When the *Operator* indicator is on constantly, the CSL has detected an error condition (usually a jammed cartridge or an incorrectly loaded cartridge).

Figure 6-16. CSL Operator Panel



C53362

Drive Failure to Load

Cartridges may be loaded into the CSL incorrectly (priority mount or from the input bin). Sometimes, cartridges are loaded with the cartridge reels to the left ([Figure 6-17 on page 6-22](#)). When this is done, the CSL attempts to load the cartridge into the drive. This type of a load causes an instant CSL failure.

CAUTION:

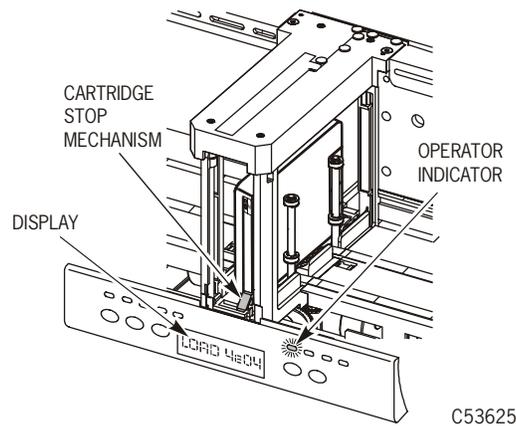
Never load cartridges with the cartridges reels to the left. Only load cartridges with the cartridges reels to the right.

Incorrect Load Process

This is the process of events when cartridges are loaded incorrectly into the CSL. The cartridge reels are facing to the left (Figure 6-17). You cannot see them in Figure 6-17.

1. The CSL attempts to load the cartridge into the drive.
2. The CSL loads the cartridge approximately three-quarters of the way into the drive.
3. The drive senses the cartridge is loaded incorrectly.
4. The CSL moves the cartridge out of the drive and to the cartridge stop mechanism (Figure 6-17).

Figure 6-17. Ejected Cartridge (Failure to Load)



5. Fault Symptom Code (FSC) LOAD 4E04 displays on the operator panel and the *Operator* indicator is on constantly.

Recovery Process

1. Remove the incorrectly loaded cartridge:
 - a. Press down on the cartridge stop mechanism (Figure 6-17).
 - b. Grasp the cartridge and pull it from the feed channel.
2. Clear the CSL error.
 - a. Press the **Start** switch (Figure 6-16 on page 6-21) to clear the solid *Operator* indicator.
 - b. After the **Start** switch is pressed, the *Operator* indicator blinks and the operator display still shows LOAD 4E04 until a successful load or you press the **Unload** switch (Figure 6-16 on page 6-21) to clear the display.

3. Ensure all remaining cartridges to be loaded are placed within the input bin correctly (cartridge reels to the right).
4. The CSL is now ready for normal operations.

Clearing CSL Errors

Refer to the following process to clear CSL errors. Follow the directions explicitly.

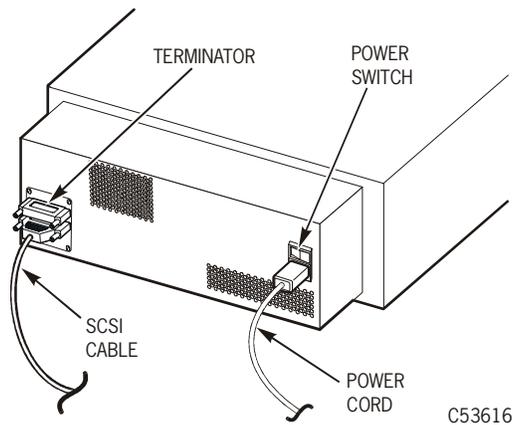
Note: Any time the *Operator* indicator is flashing or on solid, clear the obvious error.

1. After correcting the error, press the **Start** switch (Figure 6-16 on page 6-21, call out 14) to clear the *Operator* indicator.
2. If pressing the **Start** switch did not clear the *Operator* indicator, press the **Start** switch twice.

Note: Press the **Start** switch twice when there is a load failure or solid *Operator* indicator (red) on the CSL. Pressing the switch twice reinitializes the CSL.

3. If pressing the **Start** switch twice did not clear the *Operator* indicator, power cycle the CSL to bring it back online. Refer to “Power On/Off CSL” on page 6-10 to correctly power cycle the CSL. Figure 6-18 shows the location of the power switch.

Figure 6-18. CSL Rear View



Note: This CSL uses a SCSI interface to the host.

Fault Symptom Codes

Perform the following sequence of checks if a CSL error occurs.

1. Check the CSL *Operator* indicator to see if it is flashing (operator summoned) or on solid (failure). Clear the obvious error.
2. If the CSL does not indicate any problems, check the FSC list (Table 6-5).
3. Check sense data at the host for any FSC in addition to the information provided in Table 6-5.

Note: Some malfunctions are caused by communications errors between the CSL and the drive, and also by internal software. If the malfunctions continue, force a dump of the drive for engineering evaluation.

Table 6-5 provides the 4EXX FSCs, suspected malfunction, and possible fix.

Table 6-5. CSL FSCs

FSC	Malfunction	Fix
4E04	Cartridge installed incorrectly (180 degrees out, cartridge reels to left).	Insert cartridge correctly. Install cartridge with reels to the right.
4E05	SCSI load command rejected due to no CSL being attached to the drive.	Replace the CSL.
4E0C	SCSI load command cannot be performed. The CSL is not in the System mode.	Select the System mode.
4E0D	SCSI load command cannot be performed. There is no cartridge in the input bin or feed channel.	Load cartridge.
<p>Note: The 4E0D FSC may occur after a cleaning cartridge has been unloaded.</p>		
4E11	ESCON load command is rejected due to no CSL being attached to the drive.	Replace the CSL.
4E2D	SCSI load command failed due to the CSL no longer in the System mode. The mode was changed during the load.	Return CSL to System Mode.

Table 6-5. CSL FSCs

FSC	Malfunction	Fix
4E31	SCSI load command failed due to the CSL no longer in the System mode. The mode was changed during the load. This error occurs immediately after a cleaning or dump cartridge has just been unloaded.	Return CSL to System Mode.
4E34	SCSI load command failed due to no cartridge being available to load. This error only occurs immediately after a cleaning or dump cartridge has just been unloaded and the CSL is in the Automatic mode.	Load a cartridge.

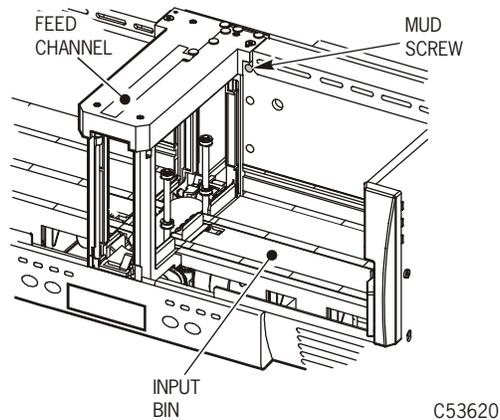
■ Jammed Cartridge

A jammed cartridge in a CSL is not a common malfunction. A jammed cartridge unloads from the drive and remains on the feed roller (Figure 6-19). It does *not* eject fully into the feed channel.

You must know how to remove jammed cartridges when the malfunction occurs. Follow the procedures in this section to remove a jammed cartridge.

See Figure 6-19 for the CSL manual unload device (MUD) screw location. The MUD screw is located to the right of the feed channel.

Figure 6-19. 9840 Tape Drive Manual Unload Device (MUD)

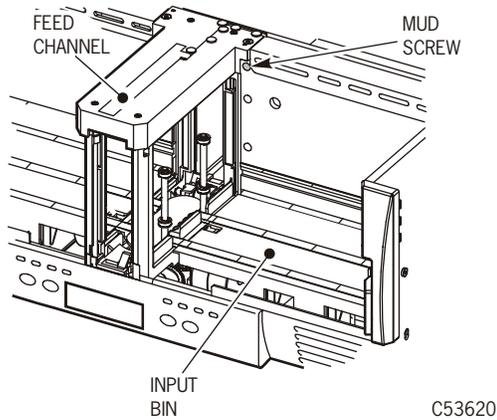


Notes:

1. Only use the MUD mechanism to remove jammed cartridges (cartridges still in the 9840 Tape Drive) or to reset the drive for shipping (cartridges not on the feed roller).
2. The MUD screw must be turned to the right or clockwise (CW) to remove jammed cartridges.
3. The MUD screw must be turned to the left or counter-clockwise (CCW) to reset the drive to its shipping position and to install and lock the shipping insert into the drive.

1. Power off the CSL if power is applied (“Power On/Off CSL” on page 6-10).
2. Remove all cartridges from the input and output bins.
3. Locate the MUD screw within the CSL input bin (upper-left area).

Note: The CSL MUD screw is located to the right of the feed channel.

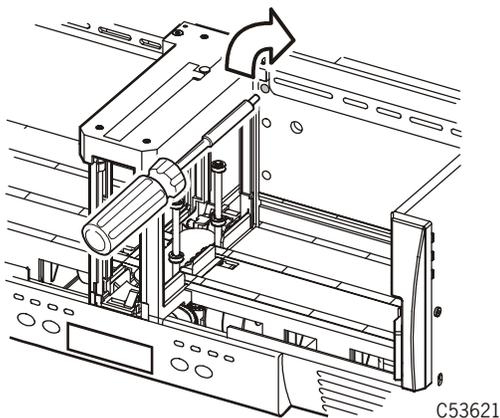


4. Obtain a long-common 1/8 in. screwdriver and insert it into the MUD slot.
5. Press against the spring-loaded MUD screw until it stops.

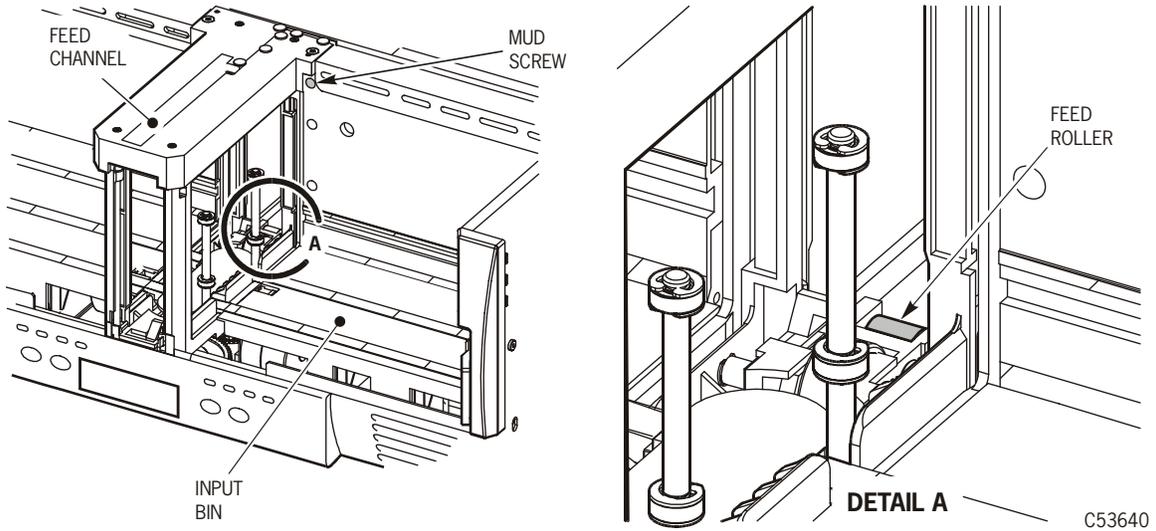
WARNING:

Do not turn the screwdriver to the left or counter-clockwise (CCW) when removing a jammed cartridge.

6. Slowly turn the screwdriver to the right or clockwise (CW) to remove the jammed cartridge (may take approximately ten turns).
 - a. Turn the MUD screw until it will not turn any further. This action lowers the reel motors within the drive.



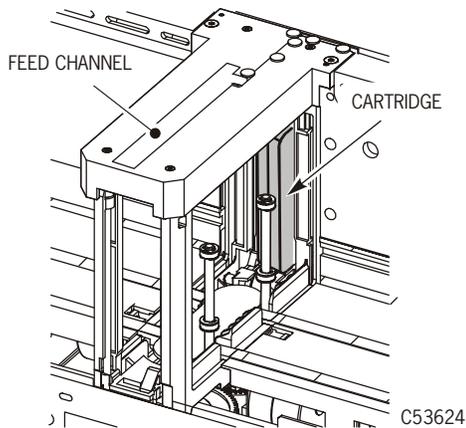
- b. Turn the MUD screw to the right (CW) until the cartridge rests on the feed roller.



7. Remove the screwdriver.
8. Remove the cartridge from the 9840 Tape Drive.

Note: The cartridge *will not* eject completely out of the CSL. It will *only* eject out of the drive and stop deep inside the feed channel on the feed roller.

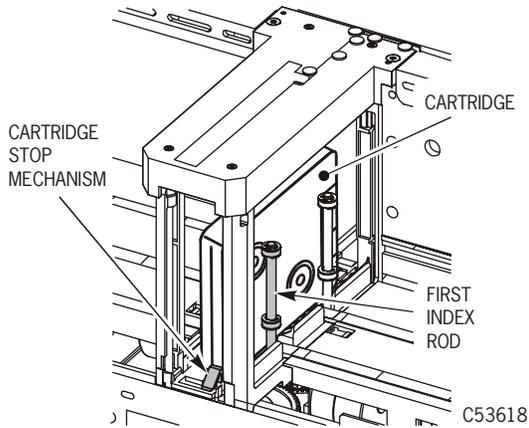
- a. Use both hands and reach between the input bin and output bin sliders.
- b. Grasp the cartridge with your fingers.
- c. Slowly work the cartridge out of the drive through the feed channel.



9. Work the cartridge through the feed channel to the cartridge stop mechanism.
 - a. Push down on the cartridge stop mechanism.

Note: This allows the cartridge to be removed from the front of the feed channel.

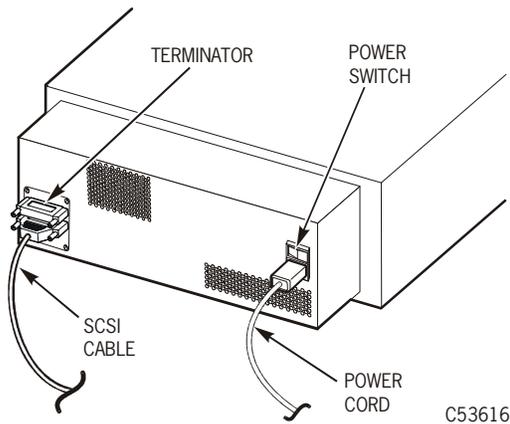
 - b. Grasp the cartridge and remove it from the feed channel.



10. Power on the CSL.
11. Refer to [“Power On/Off CSL” on page 6-10](#) for the power on procedures.

Note: Refer to the figure below for location of the power switch.

If cartridges continue to jam, the CSL is defective and must be replaced.



■ Shipping Insert

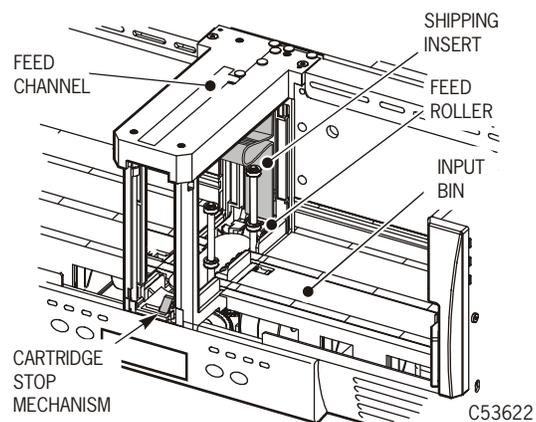
This section contains instructions to remove, install, and lock a shipping insert into the CSL. The shipping insert must always be inserted and locked into the CSL. Read caution below.

CAUTION:

If the shipping insert is not locked into the tape drive, the drive head will become damaged in shipment.

When you receive a new CSL, you must remove the shipping insert. [Figure 6-20](#) provides the location of the shipping insert within the CSL feed channel.

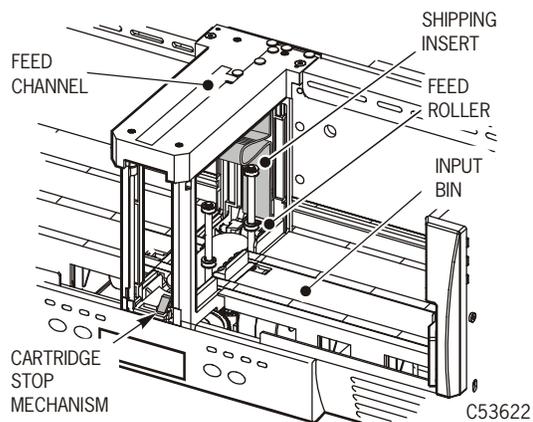
Figure 6-20. Shipping Insert



Removal

Follow these instructions to remove the shipping insert from the CSL.

1. Locate the shipping insert within the feed channel.
2. Push the input bin slider to right of the input bin and hold it in place.
3. Reach through the input bin and squeeze the shipping insert handle together.
Note: Squeezing the handle unlocks the shipping insert from the drive.
4. Slide the shipping insert out through the feed channel to the cartridge stop mechanism.
5. Push down on the cartridge stop mechanism and remove the shipping insert.



6. Store the shipping insert.

Install and Lock

Follow these instructions to properly install and lock the shipping insert into a CSL. Before you can lock the shipping insert into the CSL, you *must* use the manual unload device (MUD) screw (Figure 6-21) to raise the reel motors and to lower the cleaning brush within the drive.

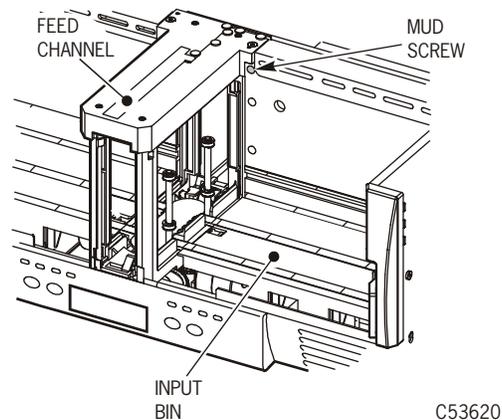
CAUTION:

If the shipping insert is not locked into the tape drive, the drive head will become damaged in shipment.

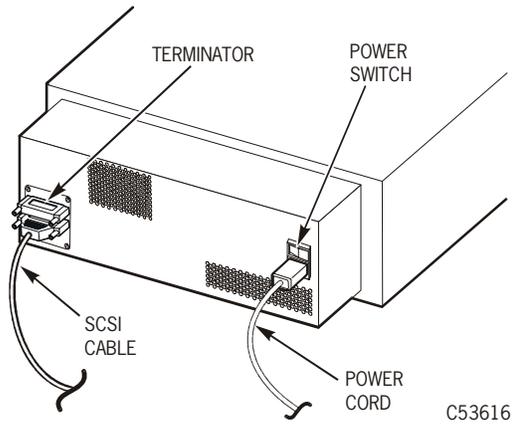
Notes:

1. Only use the MUD mechanism to reset the drive for shipping.
2. The MUD screw must be turned to the left or counter-clockwise (CCW) to reset the drive to its shipping position and to install and lock the shipping insert into the drive.

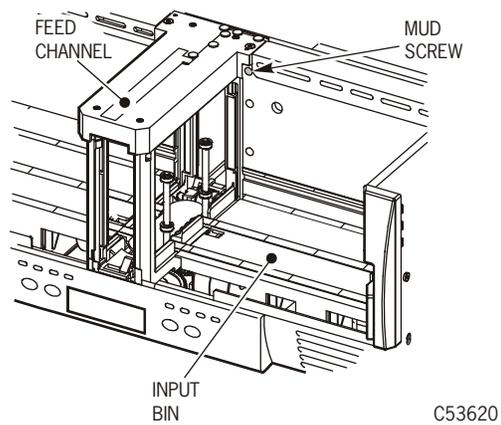
Figure 6-21. MUD Screw in CSL



1. Power off the CSL if power is applied.



2. Locate the manual unload device (MUD) screw to the right side of the feed channel.
3. Obtain a long-common 1/8 in. screwdriver and insert it into the MUD slot.
4. Press against the spring-loaded MUD screw until it stops.

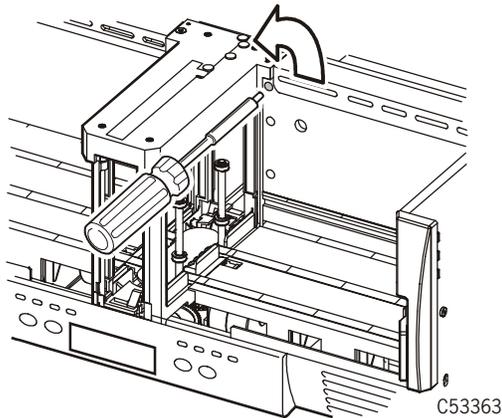


WARNING:

Do not turn the screwdriver to the right or clockwise (CW) when preparing the drive for a shipping insert.

5. Slowly turn the screwdriver to the left or counter-clockwise (CCW) to raise the reel motors and to lower the cleaning brush.

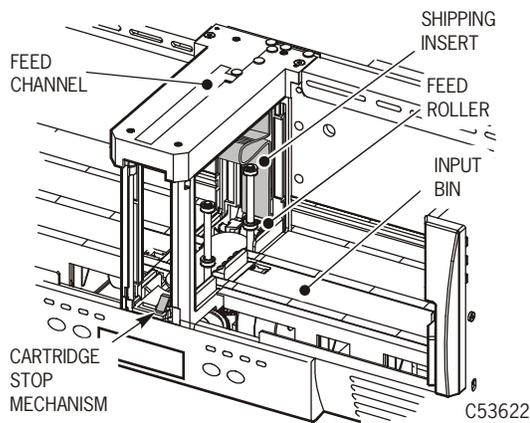
Note: When the MUD screw will not turn any further, the reel motors are raised and the cleaning brush is lowered.



6. Remove the screwdriver.
7. Insert and lock the shipping insert in the 9840 Tape Drive.

Note: Some force must be used to insert the shipping insert past the feed roller.

8. Gently pull the shipping insert outward to verify it is locked within the carriage.



9. Send the defective CSL to StorageTek.

■ CSL Model Numbers

The CSL is offered within a rack enclosure (Figure 6-22). Refer to Table 6-6 for the rack mount model numbers.

Figure 6-22. Rack Enclosure

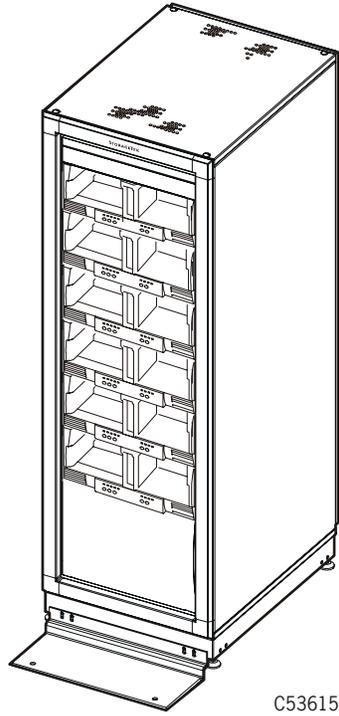


Table 6-6. CSL Configurations

CSL Configuration	Model Number
Rack Mount, SCSI	9840S01
Rack Mount, ESCON	9840S02

Note: Refer to the System Assurance Guide (SAG) for feature codes.

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Product Specifications

A

This appendix lists the following product specifications for the 9840 Tape Drive:

- “Power Requirements” on page A-1
- “Environmental Requirements” on page A-2
- “Cartridge Tape Specifications” on page A-4
- “Drive Performance” on page A-5
- “Host Interfaces and Device Modes” on page A-6

■ Power Requirements

The specifications shown in [Table A-1](#) reflect power requirements for each 9840 Tape Drive installed as a desktop and rack-mount drive tray.

Table A-1. Power Requirements

Characteristics	Value
Input voltage	100 to 240 VAC
Input frequency	50 to 60 Hz
Power consumption	90 W
Internal voltages	+3.3, \pm 5.0, and +24.0 VDC
Inrush current	14.813 A for 2 ms at 110 VAC, 60 Hz 24.680 A for 2 ms at 220 VAC, 50 Hz

■ Environmental Requirements

This section describes environmental requirements, including the drive, power supply, cartridge tapes, and media for the 9840 Tape Drive.

Drive and Power Supply

Table A-2 shows the environmental requirements for the drive and the power supply for the 9840 Tape Drive.

Table A-2. Drive and Power Supply Requirements

Temperature	
Operating	15.0° to 32.0°C (59° to 90°F)
Storage	10.0° to 40.0°C (50° to 104°F)
Shipping	-40° to 60°C (-40° to 140°F)
Relative Humidity Non-Condensing	
Operating	20% to 80%
Storage	10% to 95%
Shipping	10% to 95%
Wet Bulb Maximum	
Operating	26°C (79°F)
Storage	26°C (79°F)
Shipping	26°C (79°F)
Altitude	
Operating	Up to 3.05 km (up to 10,000 ft)
Storage	Up to 3.05 km (up to 10,000 ft)
Shipping	Up to 15.24 km (up to 50,000 ft)
Operating Heat Output/Air Flow Requirements	
Drive and power supply	61.7 kCal (241.3 Btu/hr)

Cartridge Tapes and Media

Table A-3 shows the environmental requirements for cartridge tapes and media for the 9840 Tape Drive.

Table A-3. Cartridge Tapes and Media Requirements

Temperature	
Operating (see note)	15° to 32°C (59° to 90°F)
Storage (up to four weeks)	5° to 32°C (41° to 90°F)
Storage (archive)	18° to 26°C (65° to 79°F)
Shipping	-23° to 49°C (-10° to 120°F)
Relative Humidity, Non-Condensing	
Operating (see note)	20% to 80%
Storage (up to four weeks)	5% to 80%
Storage (archive)	40% to 60%
Shipping	5% to 80%
Wet Bulb Maximum	
Operating (see note)	26°C (79°F)
Storage (up to four weeks)	26°C (79°F)
Storage (archive)	26°C (79°F)
Shipping	26°C (79°F)
Note: Allow a cartridge to acclimatize within the operating environment for at least 24 hours.	

■ Cartridge Tape Specifications

Table A-4 shows the specifications for the cartridge tapes to be inserted into the 9840 Tape Drive.

CAUTION:

Do not degauss 9840 Tape Drive cartridges. Servo tracks are written on the tape at the factory. When these tracks are mistakenly erased, the cartridge tape must be discarded.

Table A-4. Cartridge Tape Specifications

Characteristics	Values
Type STK1R data cartridge, StorageTek PN 310319401	271 m (889 ft) physical length 251 m (823 ft) recordable length 9 μ m tape thickness
Type STK1U cleaning cartridge, StorageTek PN 310324601	Good for about 100 cleanings. Estimated usage: 1 cleaning per drive every two days.
Dimensions	125 x 109 x 25.8 mm (4.92 x 4.29 x 1.00 in.)
Data Compression	LZ-1 Enhanced, 3:1 Ratio
Note: Individual results may vary depending on the characteristics of the data and other variables.	
Capacity	20 GB uncompressed
Archival Life	15 to 30 years
Media Durability	
Short length	80,000 write/read passes minimum
Long length	6,500 write/read passes minimum
Load/Unloads	10,000 minimum
Uncorrected bit error rate, including those caused by media defects	1 in 10^{18} bytes
Permanent Errors	Zero
Weight	0.26 kg (9.17 oz)

■ Drive Performance

Table A-5 shows performance characteristics of the 9840 Tape Drive.

Table A-5. Drive Performance

Characteristics	Values
Maximum block size	256 kB
Data rate, head-to-tape	Greater than 10 MB/s (see note)
Data rate of host interface	<p>Fibre Channel: burst transmission speed of 100 MB/s (256 kB)</p> <p>SCSI: 40 MB/s burst synchronous/ ULTRA-1, differential, wide/fast, negotiable down to SCSI-1 narrow differential (see note)</p> <p>ESCON: burst transmission speed of 18 MB/s (see note)</p>
Maximum rewind time: from end of any wrap to logical beginning of tape (BOT)	Approximately 16 s maximum for a 271 m (889 ft) cartridge tape
Reposition time	No penalty
Tape load and initialize to ready	4 s
Unload time	5 s excluding rewind
Access time (does not include library timing)	8 s for first search 11 s average for subsequent search
Data buffer size	8 MB
Read/write speed	79 ips (2m/s)
Search/rewind speed	315 ips (greater than 8 m/s)
Note: Individual results may vary depending on the characteristics of the data and other variables.	

■ Host Interfaces and Device Modes

Table A-6 shows the host interfaces supported by the 9840 Tape Drive. Table A-6 also shows the device modes supported by each interface type.

Table A-6. Host Interfaces

Interface Type	Interface Characteristics
Fibre Channel	Transmission speed of 100 MB/s (burst) Interface options: <ul style="list-style-type: none">• Bridge: Connects SCSI devices to an FC network• Hub: Connects FC devices in a logical loop• Switch: Connects FC devices in a fabric
SCSI	Synchronous, differential (burst): <ul style="list-style-type: none">• Narrow/slow at 5 MB/s• Narrow/fast at 10 MB/s• Narrow/ultra at 20 MB/s• Wide/slow at 10 MB/s• Wide/fast at 20 MB/s• Wide/ultra at 40 MB/s
ESCON	Transmission speed of 18 MB/s

■ Library Attachments

Table A-7 lists the libraries in which the 9840 Tape Drive can be installed. The table also lists the cartridge capacity of each library.

Table A-7. Library Attachments

Library Type	Description
9310	The StorageTek PowderHorn library. It holds up to 6,000 cartridges and up to 80 drives in up to four 20-drive 9741 cabinets. Several 9310 libraries can be interconnected. ESCON, Fibre Channel, and SCSI interfaces are available.
9360	The StorageTek WolfCreek library. It holds up to 1,000 cartridges and up to 20 drives in up to two 10-drive 9741 cabinets. Several 9360 libraries can be interconnected. ESCON, Fibre Channel, and SCSI interfaces are available.
9710	A StorageTek TimberWolf family library. It holds from 224 to 588 cartridges and up to 10 drives. Fibre Channel and SCSI interfaces are available.
9738	A StorageTek TimberWolf family library. It holds 30 cartridges and up to 3 drives. Fibre Channel and SCSI interfaces are available.
9740	A StorageTek TimberWolf family library. It holds 326 or 494 cartridges and up to 10 drives in one 10-drive 9741 cabinet. Up to six 9740 libraries can be interconnected in the Enterprise environment. ESCON, Fibre Channel, and SCSI interfaces are available.
L180	A new StorageTek library. It holds 84 to 174 cartridges and up to 6 drives. Fibre Channel and SCSI interfaces are available.
L700	A new StorageTek library. It holds 156 to 678 cartridges and up to 12 drives. Fibre Channel and SCSI interfaces are available.

■ Non-Library Installations

Table A-8 describes the non-library 9840 Tape Drive installations.

Table A-8. Non-Library Drive Installations

Installation Type	Description
Desktop, manual-load	This installation consists of a 9840 Tape Drive and a power supply. The desktop has the smallest footprint of any version of the 9840. Fibre Channel and SCSI interfaces are available for the 9840.
Desktop, CSL	This installation consists of a 9840 Tape Drive, a CSL mechanism, and a power supply. ESCON, Fibre Channel, and SCSI interfaces are available for the 9840.
Rack-mount, manual-load	This installation consists of a rack-mount tray with either one drive or two drives side-by-side. The StorageTek rack holds up to six trays. ESCON, Fibre Channel, and SCSI interfaces are available for the 9840.
Rack-mount, CSL	This installation consists of a rack-mount tray with one 9840 Tape Drive, a CSL mechanism, and a power supply. The StorageTek rack holds up to six trays. ESCON, Fibre Channel, and SCSI interfaces are available for the 9840.

This appendix is intended for the client programmer who is responsible for updating firmware for the 9840 Tape Drive. It describes the file format and handling of unmarked 9840 Tape Drive firmware update tapes and firmware update files (such as those that are downloaded, are on disk, or are placed on the Internet).

This appendix includes the following topics:

- [“Unmarked Firmware-Update Files” on page B-1](#)
- [“Enterprise ESCON Updates” on page B-1](#)
- [“Multi-Platform SCSI Updates” on page B-2](#)
- [“Firmware-File Format” on page B-2](#)
- [“Data Transfer Limitations” on page B-2](#)

■ Unmarked Firmware-Update Files

Unmarked firmware-update tapes are tapes on which the 9840 Tape Drive firmware is written in normal data format. The drive cannot automatically identify these tapes as firmware-update tapes, but they can be used by the host to update the firmware in the drives.

You can download firmware-update files to the host from a source site using a program, such as the File Transfer Protocol (FTP). The host then uses these files to update the 9840 Tape Drive firmware.

■ Enterprise ESCON Updates

The StorageTek MPST/TIPS program reads the tape and updates the firmware. The MPST/TIPS program can also use a firmware file as source data.

■ Multi-Platform SCSI Updates

The host reads the tape. The firmware then loads into the 9840 Tape Drive using the SCSI Write Buffer commands, provided that the vendor has implemented the correct utilities for using this command.

You can also use SCSI Write Buffer commands to load downloaded firmware files into the 9840 Tape Drive.

■ Firmware-File Format

The firmware file is formatted as follows:

- 80-byte ASCII header (tape only).
- Tape mark (tape only).
- 8,192-byte records on tape (the last record may be less than 8,192 bytes). The same firmware file on other media equals the byte count of all these records.
- Tape mark (tape only).

■ Data Transfer Limitations

The host transfers firmware update records to the 9840 Tape Drive at a minimum of 8,192 bytes per record. The record sizes can be between 8,192 bytes and 262,144 bytes (8 kB to 256 kB), except for the last record, which may be less than 8 kB.

Glossary

This glossary defines abbreviations and new or special terms used in this publication.

Some of the definitions are taken from the *IBM Dictionary of Computing*. The letters in the parentheses that follow some definitions indicate the source of the definition:

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

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

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

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

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

A

access time The time interval between the instant at which a call for data is initialized and the instant at which the delivery of data is completed. (T)

adapter Hardware used to join different optical fiber connector types. (IBM)

Also, any hardware used to join different connector types.

address A character or group of characters that identifies a register, a particular part of

storage, or some other data source or destination. (A)

Advanced Interactive Executive (AIX)

IBM's implementation of the UNIX (trademark of AT&T Bell Laboratories) operating system. The RISC System/6000 system, among others, runs the AIX operating system. (IBM)

AIX See Advanced Interactive Executive.

alphanumeric Pertaining to data that consist of letters, digits, and usually other characters, such as punctuation marks. (T)(A)

applications software Software that is specific to the solution of an application problem. (T)

automatic checking test See checksum.

B

backup Pertaining to a procedure, technique, or hardware used to recover lost or destroyed data or to keep a system operating. (T)

beginning-of-tape The location on a tape where written data begins.

bin A place in which a cartridge resides in a library. A bin can be an input bin or an output bin.

block A collection of contiguous records recorded as a unit. Interblock gaps separate blocks, and each block can contain one or more records.

buffer A routine or storage that compensates for a difference in the rate of data flow, or the time of occurrence of events when transferring data from one device to another.

burst In data communication, a sequence of signals counted as one unit in accordance with a specific criterion or measure. (A)

C

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

In the 9840 Tape Drive System, the cartridge has both the supply and take-up reels. Cartridges in other tape subsystems may have only a single supply reel with the take-up mechanism residing in the drive itself.

channel A functional unit, controlled by the processor (or host), that handles the transfer of data between processor storage and local peripheral equipment. (IBM)

check A detection of an error condition or test for correct condition.

checksum In error detection, a function of all bits in a block. If the written and calculated sums do not agree, an error is indicated. (IBM)

Chk Check.

cleaning cartridge A cartridge tape containing special material used to clean the 9840 Tape Drive System.

code Instructions written for a computer. (IBM)

compress To save storage space by eliminating gaps, empty fields, redundancy, or unnecessary data to shorten the length of records or files. (IBM)

condition One of a set of specified values that a data item can assume. (IBM)

conditioning time The amount of time to prepare a tape for use in the 9840 Tape Drive System.

configuration The manner in which the hardware and software of an information

processing system is organized and interconnected. (T)

configuration error An error that results from incorrect configuration values.

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

CSL Cartridge Scratch Loader.

D

data error rate The number of errors that occur per a measurable amount of data on a tape.

data rate The speed of a data transfer process, usually expressed in bits per second or bytes per second. (IBM)

data tape A cartridge tape formatted for use as a regular data tape for the system in which it is used.

diagnostic Pertaining to the detection and isolation of errors in programs and faults in equipment. (IBM)

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

dump To copy the contents of all or part of virtual storage for the purpose of collecting error information. (IBM)

In the 9840 Tape Drive System, to copy the contents of the drive EEPROM to a cartridge tape or host file.

dump-formatted cartridge A cartridge on which the tape has been specially formatted to store diagnostic dump data.

E

emulation The use of programming techniques and special machine features to permit a computing system to execute programs written for another system. (IBM)

enterprise A representation of the goals, organizational structure, business processes, and information resources and requirements of an enterprise. (IBM)

Enterprise Systems Connection

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

environmental requirement Any of the physical conditions required for the protection and proper operation of a functional unit; the requirement is usually specified as a nominal value and a tolerance range. For a device, there may be more than one set of environmental requirements; for example, one set for transport, another for storage, and another for operation. (T) (A)

error A discrepancy between a computed, observed, or measured value or condition and the true, specified, or theoretically correct value or condition. (I) (A)

ESCON See Enterprise Systems Connection.

ESCON channel A channel having an Enterprise Systems Connection channel-to-control-unit I/O interface that uses optical cables as a transmission medium.

F

fault symptom code (FSC) A hexadecimal code generated by the drive for controller microcode in response to a detected subsystem error.

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

fiber optics The branch of optical technology concerned with the transmission

of radiant power through fibers made of transparent materials such as glass, fused silica, and plastic. (E)

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

file-protect To prevent the destruction or overwriting of data stored on cartridge tape. See also write-protect switch.

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

fixed Synonym for resident.

format In programming languages, a language construct that specifies the representation, in character form, of data objects in a file. (I)

frame A hardware device in which drives are installed.

FRU See field replaceable unit.

FSC See fault symptom code.

H

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

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

host interface An interface between a network and host computer. (T)

HP/UX A form of UNIX designed to run on Hewlett Packard and other workstations.

I

indicator A device that gives a visual or other indication of the existence of a defined state. (T)

initialization The operations required for setting a device to a starting state, before the use of a data medium, or before implementation of a process. (T)

Initial Program Load (IPL) The initialization procedure that causes an operating system to commence operation.

input/output (I/O) Pertaining to a device, process, or channel involved in data input, data output, or both. (IBM)

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

interface card See input/output.

I/O See input/output.

IPL See Initial Program Load.

IRIX An operating system that runs on Silicon Graphics and other workstations.

L

library installation The process of installing the 9840 Tape Drive System in a library environment.

loader The device that physically loads cartridges for use.

link In an ESCON environment, the physical connection and transmission medium used between an optical transmitter and an optical receiver. A link consists of two conductors, one used for sending and the other for receiving, providing a duplex communication path.

link address In an ESCON environment, an address assigned at initialization that identifies a channel or control unit and allows it to send and receive transmission frames and perform I/O operations.

logical device address A number used to represent a terminal or terminal component within a workstation. (IBM)

M

magnetic tape A tape with a magnetizable layer on which data can be stored. (T)

manual operation Processing of data in a system by direct manual techniques. (IBM)

MB Megabytes, or 1,048,576 bytes.

media defects Physical impurities or other problems that cause the medium to function improperly.

medium A physical material in or on which data may be represented. (IBM)

menu A list of options displayed to the user by a data processing system, from which the user can select an action to be initiated. (T)

microcode A code, representing the instructions of an instruction set, that is implemented in a part of storage that is not program-addressable. See also firmware. (IBM)

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

Multiple Virtual Storage/Enterprise Systems Architecture (MVS/ESA) An extended version of IBM's MVS.

MVS See Multiple Virtual Storage.

MVS/ESA See Multiple Virtual Storage/Enterprise Systems Architecture.

N

Netware An operating system used with Compaq and other workstations.

Nearline A registered trademark of StorageTek. This term is used in association with StorageTek's Automated Cartridge System.

O

offline Neither controlled by nor communicating with a computer. (IBM)

online Pertaining to the operation of a functional unit when under the direct control of the computer. (T)

open systems A system whose characteristics comply with standards made available throughout the industry and that therefore can be connected to other systems complying with the same standards. (T)

In the 9840 Tape Drive System, a drive that has a SCSI or fibre-optic interface.

operating system Software that controls program execution.

operator control panel A functional unit that contains switches used to control all or part of a computer and possibly the indicators giving information about its functioning. (T)

P

performance One of two major factors, together with facility, on which the total productivity of a system depends. Performance is largely determined by a combination of throughput, response time, and availability. (IBM)

port A specific communications end point within a host. A port is identified by a port number. (IBM)

protocol A set of semantic and syntactic rules that determines the behavior of functional units in achieving communication. (I).

R

RAM See random access memory.

random access memory (RAM) A storage device in which data can be written and read. (IBM).

read/write head The data sensing and recording unit of a diskette magazine drive or tape drive. (IBM)

reclaim In the 9840 Tape Drive System, the process of reformatting a tape as a data tape.

release A distribution of a new product or new function and fixes for an existing product. (IBM)

resident Pertaining to computer programs or data while they remain on a particular storage device. (T)

restore To return a backup copy to the active storage location for use. (IBM)

rewind To move tape from the take-up hub to the supply hub. (IBM)

S

SCSI See Small Computer System Interface.

small computer system interface (SCSI) An input and output bus that provides a standard interface between the devices.

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

Solaris An operating system that runs on SUN Microsystems and other workstations.

state The condition of a device, such as online or offline.

sub-menu A menu related to and reached from a main menu. (IBM)

switch A device or programming technique for making a selection; for example, a toggle, a conditional jump. (A)

T

tape See magnetic tape.

tape drive A device for moving magnetic tape and controlling its movement. (T) It is also called a tape transport.

target A SCSI device performing an I/O operation requested by the initiator.

transmitter/receiver subassembly (TRS)
In an ESCON environment, the electronic component that contains an optical transmitter and an optical receiver. (IBM)

transport An electro-mechanical device capable of threading tape from a cartridge, moving the tape across a read/write head, and writing data onto or reading data from the tape.

TRS See transmitter/receiver subassembly.

V

vary offline To change the status of a device from online to offline. When a device

is offline, no data set may be opened on that device. (IBM)

vary online To restore a device to a state where it is available for use by the system. (IBM)

VOLSER See volume serial number.

volume serial number A six-character alphanumeric label used to identify a volume.

W

Windows NT Microsoft's operating system that is used on a variety of computers and workstations.

write operation An output operation that sends a processed record to an output device or output file. (IBM)

write protection Restriction of writing into a data set, file or storage area of a user or program not authorized to do so. (IBM)

Index

Symbols

* (asterisk) message, 4-29

Numerics

9310 library, 1-14

9360 library, 1-14

9710 library, 1-14

9738 library, 1-14

9740 library, 1-14

9840

cartridge, 1-4

configuration

library and non-library, 1-14

view ESCON menu, 4-13

view fibre channel menu, 4-7

view SCSI menu, 4-10

CSL

power off, 6-11

power on, 6-11

specifications, A-8

data buffer size, A-5

desktop, 1-14, A-8

indicators, 2-4

activity, 2-4

clean, 2-4

location, 6-8

power, 2-4

service, 2-5

jammed cartridges

CSL, 6-26

drive, 5-12

menus

configuration menu, 4-3

ESCON, 4-13

fibre channel, 4-7

main menu, 4-2

navigating menus, 4-1

offline, 4-6

online, 4-5

SCSI, 4-10

MUD

screw, 5-12, 6-26

usage, 5-12, 6-26

Offline, 4-23

Online, 4-22

operator panel, 1-4

CSL, 1-5

description, 1-4

display, 2-6

standard, 1-4

performance, A-5

returning to the menus, 4-30

stand-alone rack, A-8

stuck cartridge removal, 5-12, 6-26

switches, 2-2

IPL, 2-2

menu, 2-3

select, 2-3

unload, 2-3

tape drive

cartridges, 1-4

components, 1-13

configuring by service personnel, 1-5

in L180, 3-1

in L700, 3-1

maintaining, 1-2

time

access, A-5

load, A-5

unload, A-5

viewing

configuration information, 4-24

drive operations, 4-16

ESCON configurations, 4-13

fibre channel configurations, 4-7

SCSI configurations, 4-10

software release level, 4-27

A

access time, A-5

activity indicator, 2-4, 3-6

alternating messages, 2-6

ASIA

DIAGS, 3-2

Diags, 5-3

Diags message, 2-2, 4-22

asterisk, 4-29, 5-3

attachments for library, A-7
 autoload mode switch, 1-5, 2-7, 6-6, 6-7
 automatic
 indicator, 1-5, 2-8, 6-6, 6-9
 mode, 6-16, 6-19

B

Bank n Bad, 5-3
 Bar-Chart, 4-31
 bin
 input, 6-2
 output, 6-2
 Boot Fail, 5-3
 BT Monitor, 5-3
 buffer size, A-5
 build MIR, 4-20

C

cartridge
 9840, 1-4
 cleaning, 3-6
 failure to load, 6-21
 jammed, 5-12, 6-26
 loading, 3-5
 manual unload device, 5-12, 6-26
 procedures, 6-12
 reading mode, 5-6
 reclaiming, 4-25
 rewinding, 5-6
 routing, 6-3
 scratch loader (CSL)
 code, 4-28
 main menu, 4-28
 specifications, A-4
 standard, 1-7
 stop mechanism, 6-19
 tape
 removal from CSL, 6-26
 removal from drive, 5-12
 unloading, 3-5, 6-13
 VolSafe, 1-7
 worn cleaning, 3-6
 write protect, 3-3
 caution
 shielded cables, xxiii
 CC Diags, 2-2, 4-22, 5-3
 CD DIAGS, 3-2
 channel (feed), 6-2

channel transfer rate
 ESCON, A-5
 fibre channel, A-5
 SCSI, A-5
 Channels web site, xviii
 chart (tape bar), 4-31
 check malfunction
 Chk (FSC), 5-3
 Chk (FSC) message, 3-6, 5-8
 CIM. *See* Customer Initiated Maintenance
 cleaning
 cartridge, 3-6
 indicator, 2-4, 3-6
 message, 5-3
 clear
 CSL malfunction, 6-21
 operator indicator error, 6-23
 client programmer information, B-1
 cnhndnsn, 5-3
 CodCrFail1, 5-3, 5-4
 CodCrFail2, 5-4
 code FSCs, 6-21
 CodeUpDate, 5-4
 CodUpFail1, 5-4
 CodUpFail2, 5-4
 CodUpFail3, 5-4
 CodUpFail4, 5-4
 commands
 ESCON swap, 5-9
 recover buffer data, 5-9
 vary
 offline, 4-23
 online, 4-22
 compliance statements
 code, xxv
 FCC, xxiii
 Japanese, xxiv
 Taiwan, xxiv
 components
 9840
 drive, 1-13
 power supply, 1-13
 specifications, 1-13
 CSL, 6-2
 ESCON, 5-14
 fiber optic, 5-14
 fibre channel, 5-14
 operator panel for 9840, 1-4

- configuration
 - 9840
 - desktop, 1-14
 - drives, 1-14
 - stand-alone rack, 1-14
 - tape drive system, 1-5
 - desktop, 1-14
 - drive menu
 - code update, 4-18
 - create code update, 4-19
 - dump tape, 4-18
 - main display, 4-17
 - reclaim a tape, 4-19
 - Fix CfgErr error, 3-2, 5-5
 - L180 Library, 1-14
 - L700 Library, 1-14
 - library
 - 9310, 1-14
 - 9360, 1-14
 - 9710, 1-14
 - 9738, 1-14
 - 9740, 1-14
 - L180, 1-14
 - L700, 1-14
 - menus, 4-3
 - stand-alone rack, 1-14
 - status
 - ESCON, 4-13
 - fibre channel, 4-7
 - SCSI, 4-10
 - viewing information, 4-24
- configuring
 - fibre channel, 4-8
- contacting StorageTek, xix
- controls for operator
 - CSL operator panel, 2-7
 - IPL switch, 2-2
 - menu switch, 2-3
 - select switch, 2-3
 - standard operator panel, 2-2
 - unload switch, 2-3
- conventions (explanation), xvii
- CSL
 - capacity, A-8
 - cartridge
 - procedures, 6-12
 - routing, 6-3
 - stop mechanism, 6-19
 - unloading, 6-13
 - components, 6-2
 - drive, 1-11
 - fault symptom codes (FSCs), 6-21
 - feed channel, 6-2
 - FRUs, 1-11
 - FSCs, 6-24
 - host interfaces, 6-2
 - indicators
 - automatic, 2-8, 6-9
 - location, 6-8
 - manual, 2-8, 6-9
 - operator, 6-8
 - operator panel, 2-8
 - system, 6-9
 - input bin, 6-2
 - interface, A-8
 - interfaces
 - ESCON, 6-2
 - SCSI, 6-2
 - malfunction
 - 4eXX FSCs, 6-21
 - clear error, 6-21
 - model numbers, 1-11, 6-35
 - modes
 - automatic, 6-16, 6-19
 - explanation, 6-14
 - manual, 6-17
 - priority, 6-18
 - system, 6-14, 6-18
 - operator
 - indicator, 2-8, 6-21
 - panel, 1-5, 6-2, 6-6
 - output bin, 6-2
 - overview, 1-11
 - power
 - cord, 6-11
 - explanation, 6-10
 - on CSL, 6-11
 - supply, 1-11
 - rack
 - components, 6-5
 - dimensions, 6-5
 - enclosure, 1-12, 6-4
 - removing shipping insert, 6-31
 - sequence checks, 6-24
 - switches
 - autoload mode, 2-7

- description, 2-7
- start, 2-8
- CSS. *See* Customer Support Services
- Customer Initiated Maintenance (CIM), xix
- Customer Resource Center (CRC), xviii
- Customer Support Services, xix

D

data

- make tape, 4-26
- reclaim process, 4-26
- transfer rate
 - ESCON, A-5
 - fibre channel, A-5
 - limitations, B-2
 - SCSI, A-5

DatCrFail1, 5-4

degauss 9840 tapes, 3-8

description

- NTReady, 5-5
- NTReady U, 5-5
- Offline, 5-6
- Online, 5-6
- operator panel, 1-4

desktop

- 9840, 1-14, A-8
- capacity, A-8
- installations, A-8
- interface, A-8

device

- mode
 - ESCON, A-6
 - fibre channel, A-6
 - SCSI, A-6
- MUD screw, 5-12, 6-26

dimensions

- cartridge, A-4
- rack for CSL, 6-5

displayed bars, 4-31

dots on tape, 4-31

drive

- installations
 - library, A-7
 - non-library, A-8
- main menu, 4-25
- offline, 3-2
- online, 3-2
- operations menu, 4-16

- power off, 3-7, 6-11

- power on, 3-1, 6-11

Drv Menu? message, 4-25

dry cleaning, 3-6

dump messages

- Dmp y, 2-3, 2-5
- DmpCrFail1, 5-4
- DmpCrFail2, 5-4
- DmpWrFail1, 5-5
- DmpWrFail2, 5-5
- DumpAgain?, 2-5, 5-5, 5-8
- DumpToHost, 5-4

E

enclosure rack, 1-12, 6-4

enterprise

- ESCON updates, B-1
- host, 1-15

environmental requirements, A-2

- drive and power supply, A-2
- tape cartridges and media, A-3

environments

- host, 1-15
- MVS/VM, 5-9
- SCSI, 5-9

error indications

- Bank n Bad, 5-3
- Boot Fail, 5-3
- Chk (FSC), 5-3
- CodCrFail2, 5-4
- CodeUpDate, 5-4
- CodUpFail1, 5-4
- CodUpFail2, 5-4
- CodUpFail3, 5-4
- CodUpFail4, 5-4
- CSL, 6-24
- DatCrFail1, 5-4
- DmpCrFail1, 5-4
- DmpCrFail2, 5-4
- DmpWrFail2, 5-5
- DumpAgain?, 5-5
- Exp ClCart, 5-5
- Fix CfgErr, 5-5
- Init (FSC), 5-5
- IPL Pend, 5-5
- Load (FSC), 5-5
- Memory Err, 5-5
- operator display, 5-3

- operator indicator, 6-23
- ESCON
 - data rate, A-5
 - default, 4-14
 - description, 1-16
 - interface
 - attachments, 1-15
 - CSL, 6-2
 - host channel, 6-2
 - logical paths, 6-2
 - menu, 4-13
 - problems, 5-14
 - speed, 6-2
 - Swap command, 5-9
 - tape independent protocol, 4-22, 4-23
 - updates, B-1
 - view
 - firmware, 4-14
 - menu tree, 4-13
 - View CFG? display, 4-14
- example of menu
 - 9840, 4-4
 - drive operations, 4-16
 - ESCON, 4-13
 - fibres channel, 4-7
 - offline, 4-6
 - online, 4-5
 - SCSI, 4-10
- Exit
 - Config, 4-24
 - Config message, 4-24
 - Drv?, 4-26
 - Drv? message, 4-26
 - Menu, 4-30
 - menu message, 4-30
 - messages, 4-29
- exit displays
 - Exit Menu?
 - drive operations, 4-21
 - ESCON, 4-15
 - fibres channel, 4-9
 - SCSI, 4-12
- Exp ClCart
 - error indication, 5-5
 - message, 3-6
- explanation
 - conventions, xvii
 - FSCs, 6-21

F

- failure
 - CSL (FSCs), 6-24
 - power supply, 5-6
 - to load, 6-21
- fault
 - indicators
 - CSL, 6-21
 - drive, 5-2
 - symptom code (FSC), 2-3, 6-24
- feed channel, 6-2
- FFFF, Dmp Y, 5-5
- fiber optic
 - components, 5-14
 - problems
 - ESCON, 5-14
 - fibres channel, 5-14
- fibres channel
 - configuration, 1-16
 - data rate, A-5
 - default, 4-8
 - description, Glossary-3
 - drive offline, 4-23
 - drive online, 4-22
 - library drives, 1-14
 - menu
 - table, 4-8
 - view, 4-7
 - non-library drives, 1-14
 - view
 - firmware, 4-8
 - menu tree, 4-7
 - View CFG? display, 4-8
- file
 - protected message, 3-5, 4-29
 - unprotected message, 3-5, 4-29
- firmware
 - ESCON, 4-14
 - fibres channel, 4-8
 - file format, B-2
 - SCSI, 4-11
 - unmarked, B-1
 - update files, B-1
- fix config error
 - Fix CfgErr display, 3-2
 - Fix CfgErr error, 5-5
- flashing messages, 2-6
- flow of cartridges, 6-3

- FRUs
 - CSL, 1-11
 - desktop, 1-11
 - rack, 1-11
- FSC
 - CSL, 6-24
 - description (Fault Symptom Code), 2-3
 - Dmp y message, 2-3, 2-5
 - indicators, 6-21
 - last dump data, 5-5
- function
 - indicator
 - clean, 5-3
 - CSL, 6-8
 - drive, 2-4
 - power, 5-2
 - service, 5-2
- G**
- gain access
 - drive menu, 4-1
 - ESCON port, 4-1
 - main menu, 4-1
 - to different menus, 4-1
 - view configuration menu, 4-1
- gather information on
 - ESCON, 1-15
 - fibre channel, 1-15
 - SCSI, 1-15
- H**
- handle errors
 - CSL, 6-23
 - drive, 5-2
- hard-copy publications from StorageTek, xviii
- hosts
 - environments, 1-15
 - ESCON interface, 1-15, 1-16
 - interface performance, A-6
 - multi-platform, 1-15
 - SCSI interface, 1-15, 1-16
 - supported device modes, A-6
- I**
- incorrect load process, 6-22
- indicators
 - activity, 2-4, 3-6
 - clean, 2-4, 3-6
- CSL
 - automatic, 1-5, 6-6, 6-9
 - location, 6-8
 - manual, 1-5, 6-6, 6-9
 - operator, 1-5, 6-6, 6-8
 - system, 1-5, 6-6, 6-9
- error, 5-3
- location
 - CSL, 6-8
 - standard op panel, 2-4
- operator, 6-21
- power, 2-5
- service, 2-5
- information
 - displayed bars, 4-31
 - MIR, 4-31
 - programmer, B-1
 - read bar on tape, 4-31
 - tape
 - bar task, 4-25
 - dots usage, 4-31
 - write/read bar chart, 4-32
- trademarks, 2
- write
 - bar on tape, 4-31
 - protected tape, 5-6
 - to a cartridge, 5-6
- information (build MIR), 4-20
- Init (FSC), 5-5
- Initial Program Load, 2-2, 3-1
- input bin, 6-2
- inserting a cartridge, 3-5
- install/lock shipping insert, 6-32
- installation of racks, A-8
- interfaces
 - ESCON, 1-16
 - fibre channel, 1-16
 - host, 1-16, A-6
 - SCSI, 1-16
- IPL
 - description, 2-2
 - Pend message, 2-2, 4-22, 4-23, 5-5
 - power on, 3-1
 - switch, 2-2
- J**
- jacks (connector)
 - CSL power, 6-10

- drive power, 5-10
- jammed cartridge
 - clear CSL operator indicator, 6-21
 - CSL, 6-26
 - CSL recovery, 6-21
 - drive, 5-12

K

- keeping saved data, 5-8
- key
 - indicators
 - activity, 2-4
 - clean, 2-4
 - power, 2-4
 - service, 2-5
 - switches
 - IPL, 2-1
 - menu, 2-3
 - select, 2-3
 - unload, 2-3

L

- L180 library, 1-14, A-7
- L700 library, 1-14, A-7
- label, laser product, xxii
- language
 - selection
 - explanation, 4-25
 - view ESCON status, 4-13
 - view fibre channel status, 4-7
 - view SCSI status, 4-10
 - translated messages
 - English, 5-7
 - French, 5-7
 - German, 5-7
 - Italian, 5-7
 - Spanish, 5-7
- laser product label, xxii
- last dump data- FSC, 5-5
- LdDataTp message, 4-26
- LEDs
 - CSL indicators, 6-8
 - standard indicators, 2-4
- library
 - 9310, 1-14
 - 9360, 1-14
 - 9710, 1-14
 - 9738, 1-14

- 9740, 1-14
 - attachments, A-7
 - drives, 1-9
 - host interfaces, 1-15
 - L180, 1-14
 - L700, 1-14
 - list of configurations, 1-14
 - software attachments, 1-15
- limitations on transferring data, B-2
- lists
 - menus, 4-3
 - sub menus, 4-3
- load
 - 9840 cartridge, 3-5
 - cartridges incorrectly, 6-21
 - FSCs, 6-21
 - messages, 2-2, 3-5, 5-5
 - time, A-5
- loader (CSL)
 - code, 4-28
 - main menu, 4-28
- locating message, 5-5
- location of MUD screw, 1-5

M

- main menus
 - Drive, 4-25
 - exit menu, 4-29
 - Online/Offline, 2-3, 4-22, 4-29
 - Software Release, 4-27
 - summary, 4-2
 - View Configuration, 4-24
- maintaining the 9840 Tape Drive System, 1-2
- make
 - code tape, 4-19
 - data tape, 4-19
 - dump tape, 4-18
- MakeDataTp, 4-26
- malfunctions
 - Chk (FSC), 3-6, 5-8
 - clear error, 6-21
 - CSL, 6-24
 - failure to load, 6-21
 - fiber optic, 5-14
 - fibre channel, 5-14
 - FSCs, 6-21
 - list of errors, 5-3
 - sequence checks, 6-24

- use CSL start switch, 6-23
 - manual
 - indicator, 1-5, 2-8, 6-6, 6-9
 - mode, 6-17
 - unload device (MUD)
 - location, 5-12, 6-26
 - remove jammed cartridge, 5-12, 6-26
 - maximum channel block, A-5
 - mechanism (cartridge stop), 6-19
 - media information region (MIR), 4-31
 - Memory Err, 3-3, 5-5
 - menu
 - drive operations, 4-16
 - ESCON, 4-13
 - examples, 4-4
 - fibre channel, 4-7
 - list of, 4-2
 - main, 4-2
 - returning, 4-30
 - SCSI, 4-10
 - switch, 2-3
 - messages
 - (FSC) Dmp y, 2-3, 2-5
 - * (asterisk), 4-29
 - alternating, 2-6
 - ASIA Diags, 2-2, 4-22
 - asterisk (*), 4-29
 - CC Diags, 2-2, 4-22
 - Chk (FSC), 3-6, 5-8
 - cleaning, 5-3
 - Drv Menu ?, 4-25
 - DumpAgain?, 2-5, 5-8
 - English, 5-7
 - Exit Config, 4-24
 - Exit Drive, 4-26
 - Exit Menu?, 4-30
 - Exp ClCart, 3-6
 - File Protected, 3-5, 4-29
 - File Unprotected, 3-5, 4-29
 - flashing, 2-6
 - French, 5-7
 - German, 5-7
 - indicated by operator display, 5-3
 - IPLPend, 2-2, 4-22, 4-23
 - Italian, 5-7
 - language translated, 5-7
 - LdDataTp, 4-26
 - Load (FSC), 2-2, 3-5
 - locating, 5-5
 - Offl Pend, 4-23
 - Offline, 4-23, 4-29
 - Onl Pend, 4-22
 - Online, 4-22
 - protected file, 4-29
 - Ready A, 3-5, 4-29, 5-6
 - Ready F, 3-5, 4-29, 5-6
 - Ready U, 3-5, 4-29, 5-6
 - Save Fails, 5-8
 - solid, 2-6
 - Spanish, 5-7
 - Start Init, 2-2
 - TIPS Pend, 4-22, 4-23
 - unprotected file, 4-29
 - UnWr (FSC), 2-3, 3-5, 5-8
 - View Cfg ?, 4-24
 - MIR, 4-20
 - mode
 - autoload switch, 1-5, 6-6, 6-7
 - of operation
 - automatic, 6-16, 6-19
 - manual, 6-17
 - priority, 6-18
 - system, 6-14, 6-18
 - model numbers, 1-11, 6-35
 - MUD
 - location of screw
 - CSL, 6-26
 - drive, 5-12
 - procedure to use, 5-12, 6-26
 - removing jammed cartridge, 5-12, 6-26
 - warning, 5-12, 6-26
 - multi-platform
 - host environment, 1-15
 - SCSI updates, B-2
 - MVS
 - online, 4-22
 - vary commands, 4-22, 4-23
- ## N
- navigating, 4-3, 4-6
 - new cleaning tape required, 3-6
 - non-library drive installations, A-8
 - NTReady F, 5-5
 - NTReady U, 5-5
 - numbers (CSL model), 1-11, 6-35

O

Offline

- description, 5-6
- message and "*", 4-29
- message indication, 4-23
- Offl Pend message, 4-23
- state of the drive, 4-23
- vary, 4-23

Online

- description, 5-6
- message, 4-22
- state of the drive, 4-22
- vary, 4-22

Online/Offline

- main menu, 2-3
- returning system online, 4-29
- state of drive, 4-22

operations menu (drive), 4-16

operator controls

- Menu switch, 2-3
- Select switch, 2-3
- Unload switch, 2-3

operator panel

- 9840, 1-4
- components, 6-2
- description, 1-4, 1-5, 6-6
- diagnostic messages, 3-2
- display
 - appearance, 2-6
 - FFFF, Dmp Y, 5-5
 - messages, 5-3
- indicators, 6-8, 6-21
- operator indicator, 1-5, 6-6, 6-8
- summary of operations, 1-4

organization of information in this manual, xv

output bin, 6-2

overview

- CSL, 1-11

P

panel (operator), 6-2

performance

- 9840 Tape Drive System, A-5
- ESCON, A-6
- Fibre Channel, A-6
- SCSI, A-6

place drive

offline, 4-22

online, 4-22

power

- explanation, 6-10
- failure, 5-6
- indicator, 2-5
- off
 - CSL, 6-11
 - drive, 3-7
- on
 - CSL, 6-11
 - CSL switch location, 6-10
 - drive, 3-1
 - drive switch location, 3-1

requirements, A-1

switch, 6-11

priority mode, 6-18

problems

- DumpAgain? condition, 5-8
- ESCON, 5-14
- fiber-optic, 5-14
- fibres channel, 5-14
- Save Fails condition, 5-8
- UnWr condition, 5-8

procedures

cartridge

- explanation, 6-12
- loading a CSL, 6-12
- loading a drive, 3-5
- unloading a CSL, 6-13
- cleaning the 9840 tape drive, 3-6
- IPL, 3-1
- loading a CSL cartridge, 6-12
- loading a drive cartridge, 3-5
- power off, 3-7
- power on, 3-1
- unloading a CSL cartridge, 6-13
- unloading a drive cartridge, 3-5

process

- build MIR, 4-20
- code update, 4-18
- incorrect load, 6-22
- make code tape, 4-19
- make data tape, 4-19
- make dump tape, 4-18

product

- 9840 interfaces, 1-15
- libraries, 1-15

programmer information, B-1
protected message for tape, 3-5, 4-29
protocol, ESCON tape
 independent, 4-22, 4-23

Q

quick menu
 drive operations, 4-16
 ESCON, 4-13
 fibre channel, 4-7
 SCSI, 4-10

quit menu
 drive operations, 4-21
 ESCON, 4-15
 fibre channel, 4-9
 SCSI, 4-12

R

rack
 enclosure, 1-12, 6-4
 for CSL, 6-5
 installations, A-8
 stand-alone, A-8
read bar, 4-31
reading mode, 5-6
Ready A message, 3-5, 4-29, 5-6
Ready F message, 3-5, 4-29, 5-6
Ready U message, 3-5, 4-29, 5-6
reclaiming a cartridge
 menu, 3-8
 procedure, 4-25
Recover Buffer Data command, 5-9
recovery
 DumpAgain? message, 5-8
 process (bad CSL load), 6-22
 Save Fails message, 5-8
 UnWr (FSC) message, 5-8
release level (viewing), 4-27
remove
 cartridges, 3-5, 6-13
 jammed cartridge, 5-12, 6-26
requirements
 environmental, A-2
 power, A-1
returning
 9840 online, 4-29
 to the menu system, 4-30
 to the Online/Offline menu system, 4-29

rewinding tape, 5-6
routing cartridges, 6-3

S

safety
 fiber optics, xxi
 laser product label, xxii
Save Fails message, 5-6, 5-8
SavingDump, 5-6
scratch loader
 code, 4-28
 main menu, 4-28
screw (MUD), 5-12, 6-26
SCSI
 data rate, A-5
 default
 online, 4-11
 description, 1-16
 drive
 offline, 4-23
 online, 4-22
 environment, 5-9
 Exit Menu?, 4-12
 interface, 1-15, 6-2
 menu, 4-10
 speed, 6-2
 Ultra-1, A-5
 updates, B-2
 view
 firmware, 4-11
 menu tree, 4-10
 View CFG? display, 4-11
 width, 6-2
segment, 4-31
select
 9840 switch, 2-3
 language, 4-25
 tape bar, 4-25
sequence checks
 clearing malfunctions, 6-24
 FSCs, 6-24
 process, 6-24
service indicator, 2-5
shipping insert
 important information, 5-9, 6-32
 install/lock, 5-10, 6-32
 lock in drive, 5-11, 6-34
 MUD screw, 6-32

- removal from CSL, 6-31
 - using MUD screw, 5-11, 6-34
 - warning if not used, 6-30
 - size
 - of buffer, A-5
 - rack, 6-5
 - software
 - firmware file, B-2
 - release main menu, 4-27
 - update firmware, B-1
 - viewing release level, 4-27
 - solid messages, 2-6
 - specifications
 - cartridge, A-4
 - drive performance, A-5
 - environmental requirements, A-2
 - interfaces, A-6
 - library, A-7
 - non-library drive installs, A-8
 - power requirements, A-1
 - tape cartridges and media, A-3
 - Stand-Alone Rack, 1-13
 - standard cartridge, 1-7
 - Start Init message, 2-2, 5-6
 - start switch, 1-5, 2-8, 6-6, 6-7, 6-23
 - status (view)
 - ESCON menu, 4-13
 - fibre channel menu, 4-7
 - SCSI menu, 4-10
 - stop mechanism, 6-19
 - StorageTek
 - Channels site, xviii
 - Customer Resource Center (CRC), xviii
 - hard-copy publications, xviii
 - web site, xviii
 - StorageTek libraries
 - 9310, 1-14, 1-15, A-7
 - 9360, 1-14, A-7
 - 9710, 1-14, A-7
 - 9738, 1-14, A-7
 - 9740, 1-14, A-7
 - L180, 1-14, A-7
 - L700, 1-14, A-7
 - summary menu, 4-2
 - switches
 - CSL autoload mode, 1-5, 2-7, 6-6, 6-7
 - CSL Start, 2-8
 - CSL start, 1-5, 6-6, 6-7, 6-23
 - IPL, 2-2
 - Menu, 2-3
 - operator panel, 1-4
 - Select, 2-3
 - Unload, 3-5
 - system
 - indicator, 1-5, 2-8, 6-6, 6-9
 - mode, 6-14, 6-18
- ## T
- table
 - drive operations menu, 4-17
 - ESCON menu, 4-14
 - fibre channel menu, 4-8
 - SCSI menu, 4-11
 - Taiwan warning statement, xxiv
 - tape
 - 9840, 1-4
 - bar
 - chart, 4-31
 - task information, 4-25
 - cartridge
 - cleaning, 3-6
 - procedures, 6-12
 - code load, 4-28
 - displayed bars, 4-31
 - dots explanation, 4-31
 - drive
 - in L180, 3-1
 - in L700, 3-1
 - file
 - protected, 3-5, 4-29
 - unprotected, 3-5
 - jammed cartridge, 5-12, 6-26
 - loading
 - CSL, 6-12
 - drive, 3-5
 - main menu, 4-28
 - making a data tape, 4-26
 - MIR, 4-31
 - read
 - bar information, 4-31
 - mode, 5-6
 - reclaiming, 4-25
 - removing stuck cartridge, 5-12, 6-26
 - rewinding, 5-6
 - unloading
 - 9840 drive, 3-5

- CSL, 6-13
- write bar, 4-31
- telephone number, CSS, xix
- time
 - access, A-5
 - load, A-5
 - unload, A-5
- TIPS PEND message, 4-22, 4-23
- trademarks, 2
- transfer
 - limitations, B-2
 - rate
 - ESCON, A-5
 - fibre channel, A-5
 - SCSI, A-5
- translated messages, 5-7
 - English, 5-7
 - French, 5-7
 - German, 5-7
 - Italian, 5-7
 - Spanish, 5-7
- trapped explanation, 5-6
- typographical conventions, xvii

U

- Ultra-1 SCSI, A-5
- unload
 - cartridges, 6-13
 - message, 5-6
 - switch, 2-3
 - time, A-5
- unmarked firmware, B-1
- unprotected message for tape, 3-5
- UnWr (FSC) message, 2-3, 3-5, 5-6, 5-8
- update
 - firmware files, B-1
 - SCSI in multi-platform, B-2
 - tapes (firmware), B-1
- use
 - configuration menu, 4-6
 - drive menu, 4-3, 4-17
 - ESCON menu, 4-14
 - fibre channel menu, 4-8
 - SCSI menu, 4-11

V

- vary drive
 - offline, 4-23

- online, 4-22
- view
 - Cfg? message, 4-24
 - configuration information, 4-24
 - configuration main menu, 4-24
 - firmware
 - ESCON, 4-14
 - fibre channel, 4-8
 - SCSI, 4-11
 - offline main menu
 - drive, 4-6
 - entry point, 4-6
 - ESCON drives, 4-6
 - exit, 4-6
 - fibre channel drives, 4-6
 - firmware, 4-6
 - SCSI drives, 4-6
 - online main menu
 - drive, 4-5
 - entry point, 4-5
 - ESCON drives, 4-5
 - exit, 4-5
 - fibre channel drives, 4-5
 - firmware, 4-5
 - SCSI drives, 4-5
 - release level, 4-27
- View CFG?
 - ESCON, 4-14
 - fibre channel, 4-8
 - SCSI, 4-11
- VM
 - vary commands, 4-22, 4-23
 - vary off, 4-23
 - vary on, 4-22
- VM/MVS environment, 5-9
- VolSafe cartridge, 1-7
- VOLSER label, 2-6

W

- warning
 - eye hazard from laser, xxi
- weight
 - cartridge, A-4
 - rack, 6-5
- WolfCreek library, 1-14
- worn cleaning cartridge, 3-6
- write
 - bar explanation, 4-31

protect cartridge
 standard, 3-3
 VolSafe, 3-3

protect switch enabled, 5-6
tape write/read bar chart, 4-32
to a cartridge, 5-6

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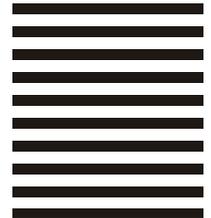


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