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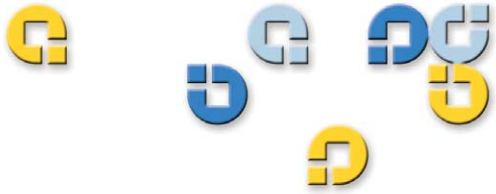

User's Guide User's Guide User's Guide User's Guide User's Guide User's Guide User's Guide

SuperLoader™ 3A Series

SuperLoader 3A

81-81643-03 A01

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Preface

This document serves as an easy-to-use information source to familiarize Quantum customers and systems professionals with the SuperLoader 3A Series autoloader.

Audience

The primary audience for this document consists of end users installing and using an A-Series tape drive configured as part of the SuperLoader 3A Series autoloader.

Purpose

This document provides information on the SuperLoader 3A Series autoloader including:

- Product description
- Operation instructions
- Remote and front-panel administration of the autoloader
- Diagnostics
- Customer Replaceable Unit (CRU) procedures
- System log files and error logs
- Troubleshooting
- Specifications
- Regulatory compliance and statements

Document Organization

This document is organized as follows:

- Chapter 1, Introduction, provides a brief product overview.
- Chapter 2, Operating the Autoloader, provides information about the operator's panel functionality, configuring the autoloader, and viewing status information from the front panel.
- Chapter 3, On-board Remote Management, provides an on-board remote management overview, including configuration, updates, diagnostics, and commands pages.
- Chapter 4, Customer Replaceable Units (CRUs), provides information about replacing a magazine or magazine blank.
- Chapter 5, Troubleshooting, provides troubleshooting information about the autoloader, power-on self test (POST), and running diagnostics from the front panel and remote management pages.
- Appendix A, Specifications, provides specifications for the SuperLoader 3A Series autoloader equipped with an A-Series tape drive.
- Appendix B, Regulatory Statements, lists the applicable regulatory statements for the autoloader.

This document concludes with a glossary and index.

Notational Conventions

This document uses the following conventions:

Note: Notes emphasize important information related to the main topic.

Caution: Cautions indicate potential hazards to equipment and are included to prevent damage to equipment.

Warning: Warnings indicate potential hazards to personal safety and are included to prevent injury.

- Right side of the autoloader — Refers to the right side as you face the component being described.
- Left side of the autoloader — Refers to the left side as you face the component being described.
- Power cycle — Means to turn the autoloader or system on, then turn them off (or off, then on).
- Dimensions in figures — All dimensions are shown with no units specified (Inches understood unless otherwise specified).

Related Documentation

Documents related to the Quantum SuperLoader 3A Series autoloader are shown below:

Document No.	Document Title	Document Description
81-81667	SuperLoader 3A Series Quick Start Guide	This guide contains a sequence of steps recommended for unpacking, installing, and setting up your autoloader.
81-81800	A-Series FTP File Server User's Guide	This guide provides information on how to use the FTP file server.
81-81237	How to Ship the Quantum SuperLoader	This guide provides information on the proper packing for returning the autoloader for repair.

Contacts

Quantum company contacts are listed below.

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Chapter 1

Introduction

Data backup is essential to protect irreplaceable information. Backing up data to magnetic tape is an easy, cost-efficient method used by many small and medium businesses. However, most enterprises have so much data that a single backup tape is not enough; the information has to be spread across numerous tapes. To avoid constantly changing tapes manually, many tape backup systems include Quantum autoloaders.

Quantum autoloaders provide a compact, high capacity, and low cost method for simple, unattended data backup.

The autoloader is compatible with popular operating systems such as Windows, MAC OSX, Linux, and environments that support FTP and Ethernet interfaces.

SuperLoader 3A Series

The Quantum SuperLoader 3A Series autoloader contains an A-Series tape drive and one or two tape magazines holding up to eight cartridges each. Up to sixteen data cartridges can be used with two magazines.

A single cartridge can be inserted directly into an empty tape drive via a password-protected mailslot or into an empty magazine slot.

The Quantum A-Series Tape Drives are an extension to the family of products with video professionals in mind. Using the built-in FTP client in conjunction with a standard Web browser, Material Exchange Format (MXF) files can be stored and retrieved. A Gigabit Ethernet (GigE) interface allows these drives to be quickly connected and accessed on your network.

The A-Series tape drives are ideal for serving a full range of video applications; from hand-carrying video content out to a truck for live production to facility-wide, long-term, secure archive.

The A-Series tape drives offer the following product features:

Table 1 Storage Capacity and Transfer Rates

A-Series Tape Drive	Maximum Storage Capacity	Maximum Native Data Transfer Rate
SDLT 600A	300 GB	36 MB/sec
LTO-3	400 GB	68 MB/sec

Note: There is a limitation on the number of files that can be stored on a media cartridge based on the size of the files and the size of the filenames stored on the table of contents (TOC) region of the tape. For example, the A-Series SDLT 600A tape drive can hold approximately 8,000 files. This limit can be significantly smaller if the filenames are long and/or there are many MXF files.

Media Inventory

When the SuperLoader 3A Series is powered up, it undergoes a media inventory. Each tape cartridge in the autoloader is inserted into the A-Series tape drive and inventoried.

Note: Depending upon the number of cartridges in each magazine and the amount of content or data on each cartridge, the media cartridge inventory may take up to forty minutes.

Ethernet Interfaces

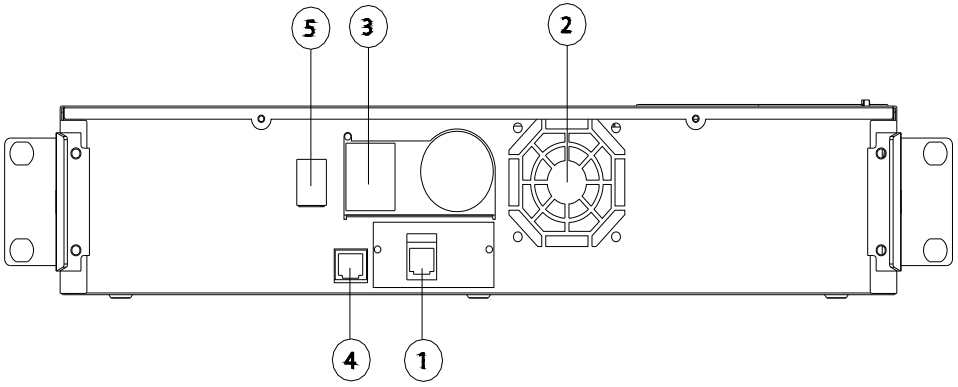
To get the full performance of the SuperLoader 3A Series autoloader, it is advisable to use a GigE network.

The autoloader connects to your host server (see figure 1) via a built-in Gigabit Ethernet (GigE) interface (A-Series tape drive Ethernet port), allowing the host to send data and commands automatically.

You can also connect to the autoloader via a second Ethernet connection (Autoloader remote management Ethernet port) to perform administrative functions and download system updates.

The GigE network port in the autoloader is backward compatible with 100BaseT and 10BaseT networks.

Figure 1 Back Panel Overview



1	A-Series tape drive Ethernet port
2	Fan vent
3	Power connector
4	Autoloader remote management Ethernet port
5	Power switch

Chapter 2

Operating the Autoloader

Many of the operations you perform from the front panel can also be accessed from the On-board Remote Management interface of the autoloader (see chapter 3, On-board Remote Management).

This chapter covers all aspects of operating the autoloader from the front panel.

Note: For information on installing your SuperLoader 3A Series autoloader in a standard 19-inch rack, see the *Quantum SuperLoader 3A Series Quick Start Guide* (81-81667)

Note: For information on accessing and using the Quantum A-Series Tape Drive and FTP File Server, see the *Quantum A-Series FTP File Server User's Guide* (81-81800)

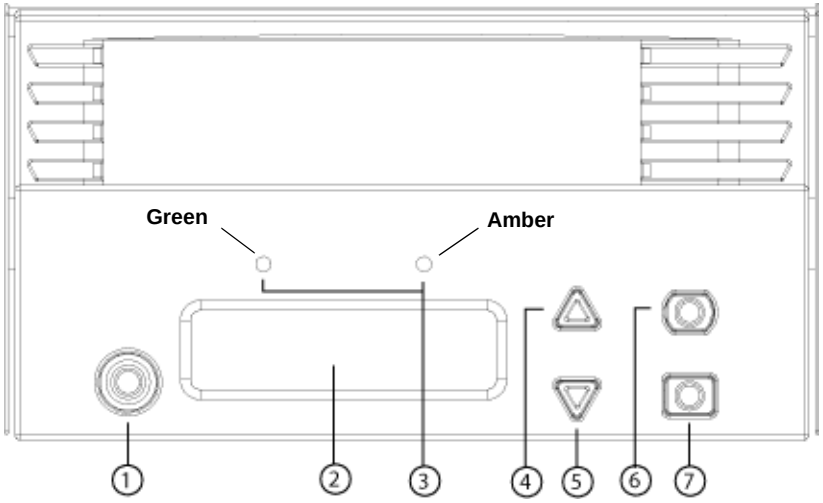
- Using the Front Panel
- Configuring the Autoloader
- Using Cartridges
- Using Magazines and Magazine Blanks
- Viewing Status Information
- Running an Inventory
- Using Data Compression

Using the Front Panel

The front panel consists of two LEDs, four function buttons, and a 2-line by 16-character LCD screen. A scrolling menu on the LCD screen allows you to obtain status information from the autoloader and enter commands.

The front panel provides everything you need to monitor autoloader status and to control all of its functions.

Figure 2 Front Panel



1	Power switch
2	Front panel LCD screen
3	Front panel LEDs
4	Scroll up button
5	Scroll down button
6	Escape
7	Enter

The functionality of the two front panel LEDs is defined in table 2.

Table 2 Front Panel LEDs

Function	Green	Amber
Power off	OFF	OFF
Ready	ON	OFF
Normal activity	Flashing	OFF
Autoloader attention	OFF	Flashing
Autoloader error	OFF	ON

When you first power on the Quantum SuperLoader 3A, it automatically runs a Power-on Self-Test (POST). During the POST, the left (**Green**) LED flashes. After the POST, the left (**Green**) and right (**Amber**) LEDs flash alternately back and forth. Do one of the following:

- If the autoloader powers on successfully, continue configuring the autoloader (see Configuring the Autoloader).

  Note: The front panel requires a six-digit password to change the configuration (see Setting Passwords on page 15). The LCD front panel default password for the Administrator is **000000**. The default password for the Operator is **111111**.

- If the autoloader does not power on successfully, check the following:
  - Power switch is on
  - Power cable is inserted correctly
  - No error code displays on the autoloader LCD
- If you cannot resolve the problem, contact your service representative or go to www.quantum.com.

When you first power on the autoloader, the setting for the Internet Protocol (IP) address is static with the address **192.168.20.128**. If you want to use Dynamic Host Configuration Protocol (DHCP) to change the IP address, see Setting the IP Address on page 9. To determine the IP address when using DHCP, view the Ethernet status information.

All the functionality accessed from the scrolling menu can be password-protected. Two levels of security are built into the menu. The lower-level

security is the operator level and the higher-level security is the administrator level. There is one password for each level.

The administrator password allows access to all the functionality available. The operator password allows access to all the functionality in the **Commands** and **Status** submenus.

Entering Passwords

Many functions on the autoloader may be password-protected to ensure data integrity. To access the menu items necessary to execute these functions, you must first enter your password (see Setting Passwords on page 15). All passwords are six numeric digits long.

When you enter a password, all password-protected functionality is available until you close your browser session. If you do not use the front panel for a period of time, the main screen reappears on the LCD. When the main screen reappears, the autoloader has automatically logged you out. You will have to re-enter your password again to access the menu functionality.

Logging Out

To log out of the autoloader, use the following procedure.

1. From the main menu, scroll to **Commands**, and then press **Enter**.
2. From the **Commands** submenu, scroll to **Log Out**, and then press **Enter**. **Session Complete** displays on the LCD.

> **Note:** You can also press **Escape** to log out. Continue pressing **Escape** as required until the main screen displays.

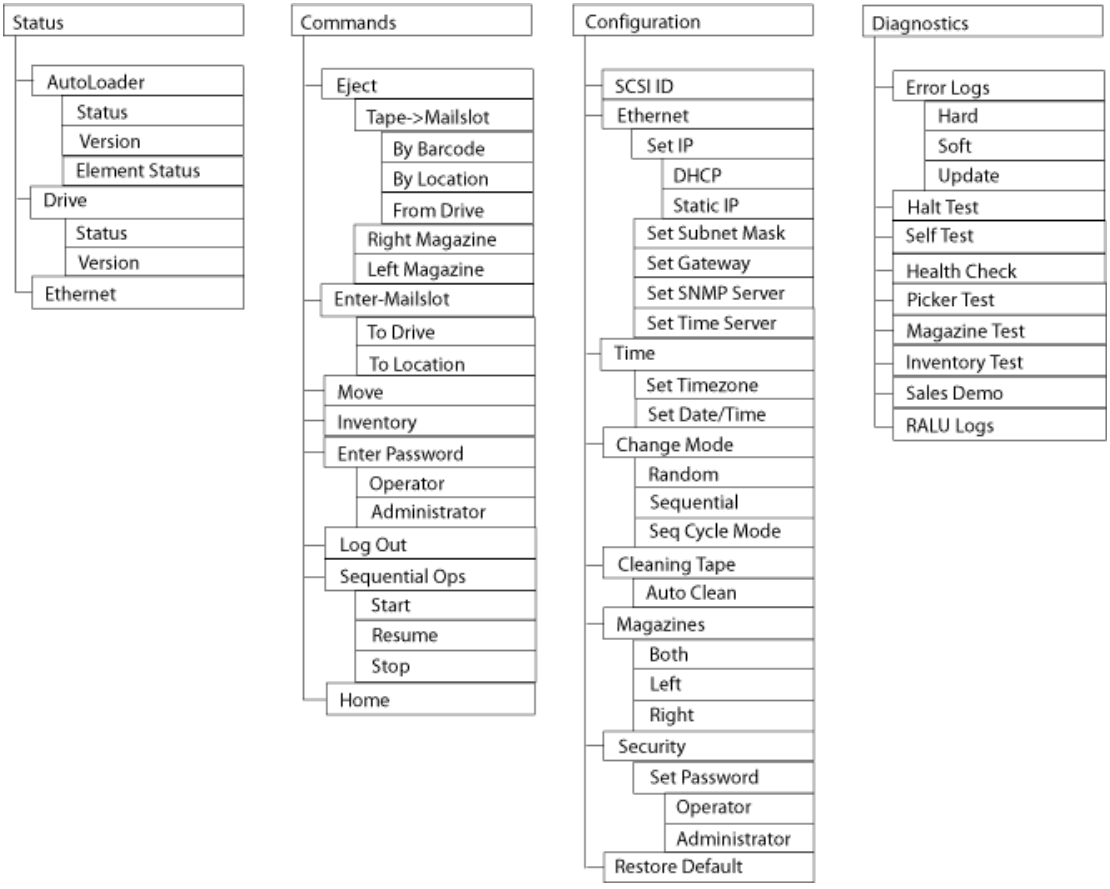
Configuring the Autoloader

To configure the autoloader, start with the main menu on the front panel. If the main menu is not already visible on the LCD, press **Enter**.

When you first power on the autoloader, the default is set with no password protection. However, after you set the security option, all the configuration functionality is password protected. You need an administrator-level password to configure the autoloader.

The front panel menu provides the following options:

Figure 3 System Menu Tree



To configure the Quantum SuperLoader 3A Series autoloader, you must verify the setup of the following:

- Magazine(s)
- Ethernet IP address (if you are not using DHCP)
- SNMP server IP address only if SNMP is being used

- Time server IP address (or the time zone, date, and time, if configuring manually)—only if a time server is being used
- Control mode
- Security option

Using the Remote Management Ethernet Port

Ethernet is the method used by the autoloader to access a network. Using the autoloader remote management Ethernet port (see figure 1 on page 3), you can access the On-board Remote Management interface of the autoloader over a network (see chapter 3, On-board Remote Management). To use this Ethernet connection, you must define the following:

- A dynamic or static IP address for the autoloader (required)
- A subnet mask (required)
- An IP gateway (optional)
- A Simple Network Management Protocol (SNMP) server (optional)
- A time server, or set the time and time zone manually (optional)

Setting the IP Address

An IP address is the address of any device attached to a network. Each device must have a unique IP address. IP addresses are written as four sets of numbers separated by periods ranging from 0.0.0.0 up to and including 255.255.255.255.

IP addresses are either permanent or dynamically assigned. A permanent, or static, address remains the same each time the device connects to the network. A dynamic address may change each time the device connects to the network server using Dynamic Host Configuration Protocol (DHCP).

To set a dynamic IP address:

1. From the main menu, scroll to **Configuration**, and then press **Enter**.
2. From the **Configuration** menu, scroll to **Ethernet**, and then press **Enter**.
3. From the **Ethernet** submenu, scroll to **Set IP**, and then press **Enter**.
4. Scroll to **DHCP**, and then press **Enter**. **Please reboot to use DHCP** displays on the LCD screen.

5. Press and hold the power button on the front panel until **System Shutdown wait 60 sec** displays on the LCD. **Power Off** displays on the LCD, then the autoloader shuts off.
6. Press the power button again to power on the autoloader. The IP address is changed.

To set a static IP address:

1. From the main menu, scroll to **Configuration**, and then press **Enter**.
2. From the **Configuration** menu, scroll to **Ethernet**, and then press **Enter**.
3. From the **Ethernet** submenu, scroll to **Set IP**, and then press **Enter**.
4. Scroll to **Static IP**, and then press **Enter**. The cursor automatically displays at the first digit.
5. At each position of the IP address, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

   When you have advanced through all of the digits of the IP address, the autoloader displays **Enter to save**.

   Note: If you make a mistake, press **Escape** to backspace to the digit you want to change.

6. Press **Enter**. The **Configuration** submenu displays and the static IP is now in effect. You do not need to reboot the autoloader.
7. Press **Escape** or **Enter** to return to the Ethernet submenu.

Setting the Subnet Mask

Creating a subnet mask is a method of splitting IP networks into a series of subgroups, or subnets, to improve performance or security.

To set a subnet mask:

1. From the main menu, scroll to **Configuration**, and then press **Enter**.
2. From the **Configuration** menu, scroll to **Ethernet**, and then press **Enter**.
3. From the **Ethernet** submenu, scroll to **Set Subnet Mask**, and then press **Enter**.
4. At each position of the **Subnet Mask** address, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

When you have advanced through all of the digits of the subnet mask address, the autoloader displays **Enter to save**.

> **Note:** If you make a mistake, press **Escape** to backspace to the digit you want to change.

5 Press **Enter**. **New Subnet Mask xxx.xxx.xxx.xxx** displays on the LCD. You do not need to reboot the autoloader.

6 Press **Escape** or **Enter** to return to the Ethernet submenu.

Setting the IP Gateway

To set an IP gateway address:

1 From the main menu, scroll to **Configuration**, and then press **Enter**.

2 From the **Configuration** menu, scroll to **Ethernet**, and then press **Enter**.

3 From the **Ethernet** submenu, scroll to **Set Gateway**, and then press **Enter**. The cursor automatically displays at the first digit.

4 At each position of the gateway address, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

When you have advanced through all of the digits of the gateway address, the autoloader displays **Enter to save**.

> **Note:** If you make a mistake, press **Escape** to backspace to the digit you want to change.

5 Press **Enter**. **New Gateway is xxx.xxx.xxx.xxx** displays on the LCD. You do not need to reboot the autoloader.

6 Press **Escape** or **Enter** to return to the **Ethernet** submenu.

Setting the SNMP Server

An SNMP server monitors a network by processing reporting activity in each network device (hub, router, bridge, and so on). The server uses this information to define what is obtainable from each device and what can be controlled (turned off, on, and so on).

To set an SNMP server address:

1 From the main menu, scroll to **Configuration**, and then press **Enter**.

2 From the **Configuration** menu, scroll to **Ethernet**, and then press **Enter**.

3 From the **Ethernet** submenu, scroll to **Set SNMP Server**, and then press **Enter**. The cursor automatically displays at the first digit.

4 At each position of the SNMP server address, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

When you have advanced through all of the digits of the SNMP server address, the autoloader displays **Enter to save**.

> **Note:** If you make a mistake, press **Escape** to backspace to the digit you want to change.

5 Press **Enter**. **New SNMP Server xxx.xxx.xxx.xxx** displays on the LCD. You do not need to reboot the autoloader.

6 Press **Escape** or **Enter** to return to the **Ethernet** submenu.

Setting the Time

The system time is displayed by On-board Remote Management and it is used internally when logging events and errors. The system time is either regular time or power-on time. Regular time is Month/Date/Year Time, such as **Nov/21/2004 19:28**. Power-on time is Power On Cycles/Power On Hours. For example, **POC: 00121, POH: 00002:07:45** where POC is the number of times the system has booted since it was manufactured, and POH is the number of hours, minutes, and seconds since the last system boot. If regular time is known, it will be used, otherwise power-on time is used.

The SuperLoader 3A Series must be reset after each power up. The time can be reset automatically if a time server is configured.

Setting the Time Server

If you locate a time server that is compatible with Simple Network Time Protocol (SNTP), you can connect the autoloader to a server that will supply the correct date and time. The autoloader uses this information to time stamp information in its memory.

To set a time server address:

1 From the main menu, scroll to **Configuration**, and then press **Enter**.

2 From the **Configuration** menu, scroll to **Ethernet**, and then press **Enter**.

3 From the **Ethernet** submenu, scroll to **Set Time Server**, and then press **Enter**. The cursor automatically displays at the first digit.

4 At each position of the time server address, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

When you have advanced through all of the digits of the time server address, the autoloader displays **Enter to save**.

> **Note:** If you make a mistake, press **Escape** to backspace to the digit you want to change.

5 Press **Enter**. **New Time Server xxx.xxx.xxx.xxx** displays on the LCD. You do not need to reboot the autoloader.

6 Press **Escape** or **Enter** to return to the **Ethernet** submenu.

To set the time zone:

1 From the main menu, scroll to **Configuration**, and then press **Enter**.

2 From the **Configuration** menu, scroll to **Time**, and then press **Enter**.

3 From the **Time** submenu, scroll to **Set Timezone**, and then press **Enter**. The **Time Zone** screen displays, allowing you to set the hours. The cursor automatically displays at the first digit.

4 Scroll to set the number of hours difference between your local time and Greenwich Mean Time (GMT).

5 Scroll to set the number of minutes difference between your local time and GMT, then press **Enter**. The new time zone is set.

6 Press **Escape** or **Enter** as necessary to return to the main menu.

To set the date and time:

1 From the main menu, scroll to **Configuration**, and then press **Enter**.

2 From the **Configuration** menu, scroll to **Time**, and then press **Enter**.

3 From the **Time** submenu, scroll to **Set Date/Time**, and then press **Enter**. The **Date/Time** screen displays, allowing you to set the date and time. The cursor automatically displays at the first digit.

4 The first four digits represent the current year. At each position of the year, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

5. The next two digits represent the current month. At each position of the month, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.
6. The next two digits represent the current day. At each position of the day, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.
7. The next two digits represent the current hour. At each position of the hour, use the up and down arrows to change the value of each digit. Press **Enter**.
8. The last two digits represent the current minute. At each position of the minute, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.
9. Press **Enter** to save.
10. Press **Escape** as necessary to return to the main menu.

Setting the Change Mode

The 3A Series autoloader uses **Random** mode only. The **Sequential** mode is not supported.

In **Random** mode, you (or the backup software) can specify which cartridge you want to use and where you want it to go.

Setting Security

You can add security to the front panel by password-protecting the autoloader's functionality. The security setting only protects the front panel functionality. The default setting is **Off**, meaning that no password is required. However, you can enable the security option so that users must enter a password to access functionality.

Security Option

When you first power on the autoloader, the security option is set to **Off**. Use the following procedure to enable the security option. You must have an administrator-level password to set passwords.

To set the security option:

1. From the main menu, scroll to **Configuration**, and then press **Enter**.
2. From the **Configuration** menu, scroll to **Security**. If a check mark appears after the word, the security option is **On**. If no check mark appears, the security option is **Off**.

3 To change the option, press **Enter**. For example, if the security option was set to **On**, it is now set to **Off**, and no check mark displays.

Setting Passwords

Many operations on the autoloader are password-protected to ensure data integrity. You can set passwords to administrator level and to operator level. Operator-level users have access to the **Commands** and **Status** menus. Administrator-level users have access to all functionality.

To set a password:

1 From the main menu, scroll to **Configuration**, and then press **Enter**.

2 From the **Configuration** menu, scroll to **Set Password**, and then press **Enter**.

3 To set a password to the operator level, scroll to **Operator**. To set a password to the administrator level, scroll to **Administrator**, then press **Enter**. The **Set Password** screen displays.

4 Press **Enter**. If you are not logged in as **Administrator**, press **Enter** again to log in. A text box displays above the first asterisk.

In the text box, scroll to the first character of the password. The cursor automatically appears at the first number of the password.

5 At each position of the password, use the up and down arrows to change the value of each number. Press **Enter** to advance the cursor to the next number.

> **Note:** If you make a mistake, press **Escape** to backspace to the digit you want to change.

6 Press **Enter**. The text box above the asterisk disappears and another text box displays above the next asterisk.

7 Repeat steps 5 and 6 to enter the remaining digits of the password. When you have entered six numbers, the autoloader displays **Submit Password** below the asterisks.

8 Press **Enter** to submit the password. **Password Successfully changed** appears on the LCD.

9 Press **Enter**. The **Operator** and **Administrator** options reappear. You can either enter another password, or press **Escape** or **Enter** as necessary to return to the main menu.

Getting Lost Passwords

If you forget the administrator-level password, you cannot access the autoloader's functionality to enter a new password. In this case, you must call customer support. When you call, have the autoloader connected to the Ethernet and open On-board Remote Management.

> **Note:** You can reset front panel passwords to the factory defaults from On-board Remote Management. However, if the On-board Remote Management passwords are lost, you must contact customer support. If you must contact customer support, be at the host computer with On-board Remote Management on line. From the main screen, click **Configuration**. The enter **Network Password** or **User name** screen displays. The customer support representative will need the number surrounded by asterisks to locate and reset your password. This is your "realm number".

> **Note:** If security is enabled and you try to execute a command without entering a password, the autoloader displays the **Enter Password** screen until you enter a password. Once you enter a password, the autoloader takes you back to the command screen that you were at prior to entering the password.

Using Cartridges

Typically, when you first install the autoloader, you load your cartridges into the magazines and then load the magazines into the autoloader. However, you can insert and eject cartridges individually using the mailslot, or you can eject a magazine, manually load and unload cartridges, then load the magazine back into the autoloader. The

autoloader automatically detects the presence of a cartridge in the magazine slot.

Note: On the front panel menu, whenever you see **Enter** or **Eject**, it means the cartridge enters and leaves the autoloader through the mailslot. Whenever you see **Load** or **Unload**, it means the cartridge is loaded into or unloaded from the tape drive.

If you try to perform an illegal operation, the autoloader refuses to perform the operation. For example, if you try to load a cartridge through the mailslot to the drive, but the drive already contains a cartridge, the mailslot does not unlock. If you try to unload a cartridge from the drive while the autoloader is writing to the tape, the command will not be initiated until the write command is completed.

Warning: If a tape cartridge is holding the mailslot door open on power up, the robot will not move. The system detects that the mailslot door is open but cannot detect the presence of the cartridge. If the mailslot door is open, the bar code scanner laser light may shine out the door and potentially cause physical injury.

Warning: With the mailslot door open, do not insert your hand through the mailslot door. This is to prevent bodily injury from the robot. Precautions are in place to prevent the robotic mechanism functioning in this circumstance.

Warning: If the tape cartridge is holding the mailslot door open during operation, the system keeps track of the tape movement and continues robotic motion. This can occur if the robot ejects the cartridge out through the mailslot door.

Inserting a Single Cartridge

When you want to load a single cartridge into the autoloader, you can use the mailslot. However, if the **Security** option is turned on, you have to enter a valid password to unlock the mailslot before you can load a cartridge. When you insert a cartridge through the mailslot, you can load it into the tape drive or store it in a magazine slot.

To Insert a Cartridge Into the Tape Drive:

1. From the main menu, scroll to **Commands**, and then press **Enter**.
2. From the **Commands** submenu, scroll to **Enter**, and then press **Enter**.
3. From the **Enter** submenu, scroll to **To Drive**, and then press **Enter**. The message **Insert Tape, Push Until Prompted** displays on the LCD.

> **Note:** After **Insert Tape, Push Until Prompted** displays on the LCD, insert the cartridge. After approximately 5 seconds, the system automatically verifies that a cartridge is inserted and continues the process. The message **Tape Loaded** displays when successfully completed.

> **Note:** For the autoloader, push the cartridge in until it stops. The cartridge will be about 3 inches (7.5 cm) inside the mailslot. This may require that you push and have your fingers well within the mailslot opening. After insertion, the end of the cartridge will be visible at the back of the mailslot opening.

4. Once you have inserted the cartridge, press **Enter**.

> **Note:** If the insert cartridge function fails, the cartridge ejects and you will have to repeat steps 3 and 4 again. The message **Missed Tape** appears.

5. Press **Exit** to clear the command and return to the menu.

To Insert a Cartridge Into a Magazine Slot:

1. From the main menu, scroll to **Commands**, and then press **Enter**.
2. From the **Commands** submenu, scroll to **Enter**, and then press **Enter**.

3 From the **Enter** submenu, scroll to **To Location**, and then press **Enter**. The message **Insert Tape, Push Until Prompted** displays on the LCD.

> **Note:** After **Insert Tape, Push Until Prompted** displays on the LCD, insert the cartridge. After approximately 5 seconds, the system automatically verifies that a cartridge is inserted and continues the process. The message **Tape Loaded** displays when successfully completed.

> **Note:** For the autoloader, push the cartridge in until it stops. The cartridge will be about 3 inches (7.5 cm) inside the mailslot. This may require that you push and have your fingers well within the mailslot opening. After insertion, the end of the cartridge will be visible at the back of the mailslot opening.

4 Once you have inserted the cartridge, press **Enter**.

> **Note:** If the insert cartridge function fails, the cartridge ejects and you will have to repeat steps 3 and 4 again. The message **Missed Tape** displays.

5 Press **Exit** to clear the command and return to the menu.

Moving a Single Cartridge

You can easily move a single cartridge from one location to another inside the autoloader.

1 From the main menu, scroll to **Commands**, and then press **Enter**.

2 From the **Commands** submenu, scroll to **Move**, and then press **Enter**.

The **Move** screen appears under **From:**. Scroll to the current location of the cartridge you want to move. Slots that are occupied by a data cartridge are indicated by an asterisk (*****).

3 From **To:**, scroll to the location to which you want to move the cartridge. Slots that are occupied by a data cartridge are indicated by an asterisk (*****). Press **Enter**.

4 Press **Enter**.

If you select an empty location, **No Source Tape** appears on the LCD. Choose a different location.

If you select a location that is already occupied, **Destination Full** appears on the LCD. Choose a different location.

Ejecting a Single Cartridge

When you want to remove a single cartridge from the autoloader, you can specify the cartridge you want by bar code or location, or choose the cartridge currently in the tape drive.

To eject a cartridge by bar code (if you have a bar code reader):

1. From the main menu, scroll to **Commands**, and then press **Enter**.
2. From the **Commands** submenu, scroll to **Eject**, and then press **Enter**.
3. From the **Eject** submenu, scroll to **Tape,** scroll to **Mailslot**, and then press **Enter**.
4. Scroll to **By Barcode**.

   A bar code label displays.
5. Scroll to the label that corresponds to the cartridge you want to eject. Press **Enter**.

To eject a cartridge by location:

1. From the main menu, scroll to **Commands**, and then press **Enter**.
2. From the **Commands** submenu, scroll to **Eject**, and then press **Enter**.
3. From the **Eject** submenu, scroll to **Tape**, scroll to **Mailslot**, and then press **Enter**.
4. Scroll to **By Location**.

   Slots that are occupied by a data cartridge are indicated by an asterisk (*****). The slot that is occupied by a cleaning tape is indicated with an @ sign, if **Auto Clean** is enabled. Scroll to the slot containing the cartridge you want to eject.
5. Press **Enter**.

   The cartridge you want is ejected from the mailslot.

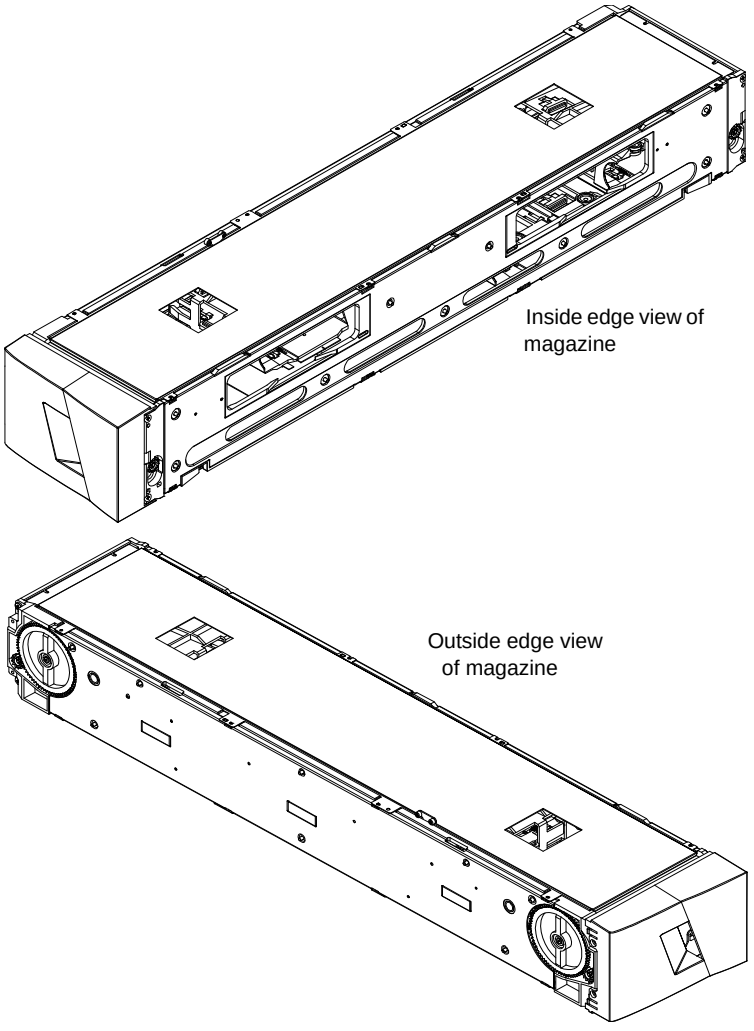
To eject a cartridge from the tape drive:

1. From the main menu, scroll to **Commands**, and then press **Enter**.
2. From the **Commands** submenu, scroll to **Eject**, and then press **Enter**.
3. From the **Eject** submenu, scroll to **Cartridge**, and then press **Enter**.
4. Scroll to **From Drive**, and then press **Enter**.

   The cartridge you want is ejected from the mailslot.

Using Magazines and Magazine Blanks

Figure 4 Left and Right Sides of a Magazine



The autoloader will not run unless both magazine openings are properly closed. One way that you can close the openings is to use two magazines.

If you use only one magazine, then you must fill the other magazine opening with a magazine blank for the unit to become operational.

> **Note:** Magazines, magazine blanks, and magazine handles are not interchangeable between drives types. Please order the appropriate part numbers when replacing these items.

Ejecting a Magazine

When you want to remove several cartridges at once, eject the magazine(s) first.

To eject a magazine:

1. From the main menu, scroll to **Commands**, and then press **Enter**.
2. From the **Commands** submenu, scroll to **Eject**, and then press **Enter**.
3. On the **Eject** submenu, scroll to **Right Magazine** or **Left Magazine**, and then press **Enter**.

   You will hear a distinctive popping sound as the appropriate magazine is ejected from the autoloader. **Left magazine has been ejected** or **Right magazine has been ejected** displays on the LCD.

   > **Note:** To prevent damage to the autoloader or the magazine, use both hands when removing the magazine from the autoloader, supporting the entire length of the magazine.

4. Grasp the magazine by the handle with one hand and slide it out, supporting it underneath with the other hand.

   > **Note:** Once you eject a magazine, you must fully remove it or fully reinstall it before powering off the autoloader. Before returning a magazine to the autoloader, manually turn the wheels on the side of the magazine. If they move freely, the cartridges are properly seated. If the wheels do not turn freely, check the cartridges and remove and replace as needed.

Using the Magazine Load/ Unload Command

When issuing a **Load/Unload** command to the autoloader, the system automatically ejects the right-hand magazine. To remove the left-hand magazine using the **Load/Unload** command, you must:

1. Remove the right magazine.

2 Replace the right magazine with a magazine blank.

3 Issue the **Load/Unload** command again. The system will then eject the left magazine.

4 If you want to have the magazine in the right-hand bay, replace the magazine blank in the right-hand bay with a cartridge magazine.

Installing a Magazine

To install a magazine into the autoloader, use the following procedure.

1 Grasp the magazine by the handle with one hand and support it underneath with the other hand.

2 Slide the magazine into the magazine bay until it clicks.

Make sure that you position the magazine correctly. It should slide into the magazine bay smoothly. If you meet resistance, verify the orientation of the magazine.

The magazine is correctly installed when you feel it click into place and the front is flush with the front panel. **Left Mag Inserted** or **Right Mag Inserted** appears on the LCD. The autoloader automatically proceeds to run an inventory.

Caution: Be careful not to turn the knob on the side of the magazine while the magazine is partially inserted into the autoloader. Doing so may cause damage to the magazine or the autoloader.

Manually Operating the Magazine

The following section describes how to operate a magazine.

There are two knobs located on each end of the magazine. You can move the slots within the magazine by turning these two knobs and aligning a slot with one of the two openings. You can use the openings in the magazine to load and unload cartridges from the eight slots within each magazine.

Note: It is recommended that you fully remove the magazine to load and unload cartridges. If the magazine is not fully removed, do not rotate the magazine.

To load cartridges into a fully ejected magazine:

1. To load cartridges into the magazine, center a slot within one of the openings located on the side of the magazine.
2. Properly orient the cartridge.

> **Note:** There is a keying feature in each slot that only allows you to fully insert the cartridge one way.

3. Fully insert the cartridge into the slot.

When pushing the cartridge into the slot, you will feel a small resistance (detente) until the cartridge is properly latched into the slot. All forward progress stops when the cartridge is fully inserted.

You can remove a cartridge in the same manner as you insert it. Use the knobs to center the desired slot(s) in the openings on the side of the magazine. Using your thumb and index finger, pull out the cartridge. You will feel a small resistance, but continue to pull the cartridge until it comes free.

To unload cartridges from a fully ejected magazine:

1. Pull the ejected magazine until the large upper slot is accessible.
2. Rotate the desired slot into position (centered in the opening). Either load or unload a cartridge to that location. Do not expose more than the large upper opening when manually operating the magazine.

To Identify a Slot:

Each slot has an identification number that is exposed when the slots are in the upper section of the magazine. With the magazine removed from the autoloader, you can see the identification mark on the top side of the magazine through one of two windows on the upper surface of the magazine.

Each magazine has a unique identification number indicating whether it is the right or left magazine. The left magazine will indicate the number 1 and the right magazine will indicate the number 9.

Viewing Status Information

From the scrolling menu on the LCD, you can view the autoloader status, firmware version, element status, tape drive status, tape drive version, and Ethernet information.

Autoloader Status

The autoloader status provides information about: whether a magazine is installed or not, Ethernet connection status, and whether a bar code reader is installed or not.

To view the autoloader status:

1. From the main menu, scroll to **Status**, and then press **Enter**.
2. From the **Status** submenu, scroll to **Autoloader**, and then press **Enter**.
3. From the **Autoloader** submenu, scroll to **Status**, and then press **Enter**. A list of messages similar to the following displays:

Table 3 Autoloader Status

Status	Message	Description
Magazines	L*	The left magazine is present.
	R*	The right magazine is present.
SCSI ID	not used	Not used in the 3A Series autoloader.
Mode	Random	The change mode is set to Random.
	Sequential	Not used in the 3A Series autoloader.
BC Reader	Yes or No	A bar code reader is present.

Firmware Version

To view the current firmware version, use the following procedure:

1. From the main menu, scroll to **Status**, and then press **Enter**.
2. From the **Status** submenu, scroll to **Autoloader**, and then press **Enter**.
3. From the **Autoloader** submenu, scroll to **Version**, and then press **Enter**.

   A list of messages appears on the LCD. The firmware version is listed as **Firmware: VX.XX** where X.XX is the current installed version of the firmware.

Table 4 Firmware Version Fields

Field	Description
Firmware	The number indicates the firmware version.
EDC	The number indicates the **Error Correction Code** that was generated when the firmware was installed. The autoloader uses this number to verify that the firmware and the memory holding the firmware are good.
HW/ME Rev	The numbers indicate the hardware/mechanical versions.

Element Status

The element status reports the status of the magazine slots. The status indicates whether a slot contains a cartridge or not, and which slot is allocated as the cleaning cartridge's slot. To view an element's status:

1. From the main menu, scroll to **Status**, and then press **Enter**.
2. From the **Status** submenu, scroll to **Autoloader**, and then press **Enter**.
3. From the **Autoloader** submenu, scroll to **Element Status**, and then press **Enter**.
4. Press **Enter**.

   You can scroll through each of the slots. Slots that are occupied by a data cartridge are indicated by an asterisk (*****). The empty slot that is assigned to a cleaning cartridge is indicated with an exclamation point (**!**). The slot that is occupied by a cleaning cartridge is indicated with an at sign (@).

5 Scroll to the slot containing the cartridge for which you want to see the label, or the cartridge you want to move, and then press **Enter**.

The **Element Status** screen displays the bar code label for that cartridge. A **Move** command also displays on the screen.

> **Note:** The **Move** command appears only if the security is disabled or if you are logged in as **Administrator** or **Operator**.

If you want to move the cartridge, scroll until the location you want to move to appears under **To:**, and then press **Enter**. If you do not want to move the cartridge, press **Escape**.

Tape Drive Status

To view the tape drive status, use the following procedure.

1 From the main menu, scroll to **Status**, and then press **Enter**.

2 From the **Status** submenu, scroll to **Drive**, and then press **Enter**.

3 From the **Drive** submenu, scroll to **Status**, and then press **Enter**.

A list of messages displays. These messages may include:

Table 5 Drive Status Fields

Field	Description
SCSI ID	Not used in the 3A Series autoloader.
Loader LUN	Not used in the 3A Series autoloader.
Compr	Indicates whether the tape drive compression is enabled or disabled.
Drive Tape	Indicates whether the tape drive is present or not.

Tape Drive Version

To view the tape drive version, use the following procedure.

1. From the main menu, scroll to **Status**, and then press **Enter**.
2. From the **Status** submenu, scroll to **Drive**, and then press **Enter**.
3. From the **Drive** submenu, scroll to **Version**, and then press **Enter**.

   A list of messages appears. These messages may include:

Table 6 Drive Version Fields

Field	Description
Product Type	Indicates the type of drive installed.
Version	Indicates the version number of the drive.

FTP Server Version

The firmware version of the FTP server cannot be viewed from the front panel display. To view the FTP server version or update the FTP server firmware, see Updates Page on page 43.

Ethernet Information

To view the Ethernet information, use the following procedure.

1. From the main menu, scroll to **Status**, and then press **Enter**.
2. From the **Status** submenu, scroll to **Ethernet**, and then press **Enter**.

   A list of messages displays. These messages may include:

Table 7 Ethernet Information Fields

Field	Description
MAC Address	Indicates the unique network identifier associated with the autoloader.
IP Address or DHCP	Indicates the static IP address or currently assigned dynamic IP address.
Network	Indicates whether the autoloader is connected to the network or not and at what speed.

Running an Inventory

The autoloader automatically runs an inventory whenever you power it on or insert a magazine. An inventory checks each magazine slot, the drive, the picker, and the mailslot to determine if a cartridge is present. Each tape cartridge in the autoloader is inserted into the A-Series tape drive and inventoried.

> **Note:** Depending upon the number of cartridges in each magazine and the amount of content or data on each cartridge, the media cartridge inventory may take up to forty minutes.

If so, it also reads the bar code label, if available. If you need to run an inventory in addition to this, you can do so manually.

> **Note:** No bar code labels can be read if there is a tape in the picker.

To perform an inventory manually:

1. From the main menu, scroll to **Commands**, and then press **Enter**.
2. From the **Commands** submenu, scroll to **Inventory**, and then press **Enter**. The autoloader scans the bar codes of all the cartridges present.

Using Data Compression

Compressing the data means that the autoloader can write more data to the same amount of tape. Data compression is drive dependent and cannot be set from the front panel or On-board Remote Management. Your backup application package may also have information on compression. The front panel display indicates whether data compression is **Enabled or Disabled** (see Tape Drive Status on page 28).

Chapter 3

On-board Remote Management

Many of the operations you perform with the On-board Remote Management interface can also be accessed from the front panel of the autoloader (see chapter 2, Operating the Autoloader).

> **Note:** The firmware in the autoloader is used for both standard and A-Series autoloaders. For the A-Series autoloader, SCSI ID, Fibre Channel, and Mode under System Operations on the Configurations Page may be displayed but have no effect on the operation of the unit:

This chapter covers all aspects of operating the autoloader from the On-board Remote Management interface.

- Accessing On-board Remote Management
- Configurations Page
- Updates Page
- Diagnostics Page
- Commands Page

Accessing On-board Remote Management

The SuperLoader 3A Series provides a remote management Ethernet port (see figure 1) that allows you to access the On-board Remote Management interface.

Note: The A-Series tape drive Ethernet port is used for normal operation of the autoloader. You can switch this Ethernet cable to the autoloader remote management Ethernet port or install a user-supplied Ethernet cable to this port and your host network port or router.

This interface includes a Web server that provides a Hypertext Markup Language (HTML)-based graphic user interface (GUI) for ease of use.

Many of the operations that you perform from the front panel can also be performed remotely using On-board Remote Management. These functions include moving tapes, system operations options, networking options, security options, running diagnostic tests, and performing system updates.

Note: Only use the **Diagnostic** commands when the autoloader is known to be idle and unavailable to host backup/restore applications. Use of the **Diagnostic** commands from On-board Remote Management should not be issued while the autoloader is being used by host applications. The autoloader will recognize when the drive or autoloader is executing host commands and will respond appropriately to prevent application failures. A **Diagnostic** command issued between host application commands may not be recognized resulting in a failed application, such as a failed backup/restore job.

Note: To log out of the system, you must close your browser to end the session.

Opening On-board Remote Management

On-board Remote Management has an HTML interface, which means you use a browser to open it. The following Web browsers are supported:

- For Microsoft Windows—Microsoft Internet Explorer 5.5 or later
- For Microsoft Windows 2003—Microsoft Internet Explorer 6.0 or later (with latest security patches)
- For Redhat® 2.1—Mozilla™ 1.4.2
- Firefox™ 1.0

You need an operator password to access the **Commands** page, and you need an administrator password to access the **Configuration**, **Diagnostics**, and **Updates** pages.

To open On-board Remote Management:

1. From your computer, open your Web browser.
2. In the browser's address field, enter the IP address for your autoloader (see Ethernet Information on page 29 to view the currently assigned static or dynamic IP address from the front panel of the autoloader).

   The **Home** page appears in your browser window.

> **Note:** When using the On-board Remote Management page with Microsoft Internet Explorer, be sure to enable the **Allow META REFRESH** option.
>
> On Internet Explorer version 6.0, this feature is controlled through the **Tools>Internet Options** menu selection under the **Security** tab.

Viewing Status Information

Status information appears on the right-hand side of the **Home** page and every page of On-board Remote Management except for the **Updates** page. The status information is updated every 10 seconds. Changes to the status appear in the status window update, but may take approximately 60 seconds to refresh. You can also click **Refresh Status** to get an immediate update of system status.

The menu headings also appear at the top of every page. To access the functionality under the menu heading, click the specific menu heading. The first time that you connect, On-board Remote Management prompts

you for your username and password, then displays the opening page for that menu.

Default Username and Password

The default username for On-board Remote Management is **guest**. The default password is **guest**.

The username and password are case sensitive and should be entered in all lower case letters. The default username and password are valid if no usernames have been configured.

Time Display

The time displayed is either regular time or power-on time. Regular time is Month/Date/Year time, such as **Nov/21/2004 19:28**. Power-on time is Power On Cycles (POC)/Power On Hours (POH), such as **POC:00121, POH:00002:07:45**.

- POC (5-digit number) is the number of times the system has booted since it was manufactured.
- POH is the number of hours, minutes, and seconds that the system has been on since the current boot occurred.

Feedback on Pages

If there is feedback from the system when you submit a request, the feedback appears beneath the **submit** button. In some cases, you may have to scroll to see the feedback information.

Configurations Page

The **Configurations** page includes a submenu on the left-hand side of the page. You can set the **System Operations**, **Networking**, and **Security** options from this page.

System Operations Options

The options listed under **System Operations** include **SCSI ID** or **Fibre Channel, Mode**, **Compression**, **Barcode Reader, Cleaning Tape**, **Magazines**, and **System Time**.

SCSI ID or Fibre Channel

Not used with the 3A Series autoloader.

Mode

The 3A Series autoloader uses **Random** mode only. The **Sequential** mode is not supported.

In **Random** mode, you (or the backup software) can specify which cartridge you want to use and where you want it to go.

Compression

For the Quantum SuperLoader 3A Series autoloader, data compression is drive dependent. The front panel and On-board Remote Management will display whether or not compression is enabled.

Compressing the data means that the drive can write more data to the same amount of tape.

Note:	Compression cannot be changed from the front panel or On-board Remote Management of the autoloader.

To view the compression setting:

From any page, click the **Configuration** heading. The **Configuration** screen displays. Under the **Compression** heading, the current compression setting is displayed as **Compression Enabled** or **Compression Disabled**.

Barcode Reader

The bar code reader is enclosed within the body of the autoloader. The information from each label is stored in memory and available through SCSI and On-board Remote Management to the computer's operating system or backup application upon request.

The barcode reader can be **Enabled** or **Disabled**.

The **SCSI Barcode Length** entry sets the number of characters of the barcode returned by **SCSI Read Element Data**. Setting the barcode length to zero disables truncation of the barcode and the full barcode is returned in the **SCSI Read Element Data**.

If utilizing the bar code reader, you must apply or slide the bar code labels into the appropriate slot on the front of each cartridge. The labels must conform to ANSI/AIM BC1 -1995 Uniform Symbology Specification Code 39. A set of bar code labels is initially included with the autoloader.

Refer to www.quantum.com for information on obtaining additional bar code labels.

Cleaning Tape

To enable or disable the **Auto Clean** function, you must also designate a full slot for the cleaning tape cartridge. If a slot has not been designated, the box displays **None**.

To designate the cleaning tape slot:

1. Load a cleaning tape into an empty slot using the **Commands** page.
2. Enable or disable **Auto Clean** by selecting the check box.

> **Note:** If **Auto Clean** is disabled, the cleaning tape will automatically be ejected via the mailslot. Cleaning is managed by the backup package you have installed instead.

To set **Auto Clean**:

1. From any page, click the **Configuration** heading. The **Configuration** screen displays.
2. Scroll to **Cleaning Tape**.

   If a check mark appears in the box next to **Auto Clean**, the option is enabled. To disable **Auto Clean**, click the box to remove the check mark. If no check mark appears in the box next to **Auto Clean**, the option is disabled. To enable **Auto Clean**, click the box to enter a check mark.
3. In the **Cleaning Tape Location** field, select the appropriate slot location where you installed the cleaning tape. If **Auto Clean** is disabled, cleaning is managed by the backup package you have installed instead.
4. Click **submit**.

Magazines

This setting is used to report the number of storage elements and the element address to the host. This setting must match the physical configuration in order for correct information to be reported. This setting only affects the information reported to the host. This setting does not affect the access to magazine slots from the front panel or On-board Remote Management. Those interfaces are based on the physical configuration.

When configured for **Both** magazines, the autoloader always reports 16 storage elements to the host. This allows the removal and reinstallation of magazines without affecting what is reported to the host. When configured for **Left** or **Right**, the autoloader will always report eight storage elements to the host.

The element addresses vary depending on which magazine is configured. If **Left** or **Right** is selected, and both magazines are physically installed, the front panel and On-board Remote Management allow the user access to the other magazine, but the host will not have access.

To set the **Magazines** option:

1. From any page, click the **Configuration** heading. The **Configuration** screen displays.
2. Scroll to **Magazines**. The **Magazines** options display.

A check mark appears after the currently enabled mode.

3 Do one of the following:

- To leave the **Magazines** mode unchanged, press **Esc**.
- To change the **Magazines** configuration, scroll to the setting you want for the autoloader, selecting the appropriate check box, and then click **submit**. These settings include **Both**, **Right**, and **Left**.

  The message **This will require a power cycle and ISV configuration change. Enter To Continue** is displayed.
- To continue with the change, press **submit**. The message **Please power cycle the tape autoloader and reconfigure the ISV app.** displays.

System Time

The system time is displayed by On-board Remote Management and is used internally for logging events and errors (see Setting the Time on page 12).

The system time must be reset each time the autoloader powers up. The time is reset automatically if a time server is configured (see Using the Remote Management Ethernet Port on page 9). Otherwise, the time must be set manually from the front panel or through On-board Remote Management. The time zone setting is not lost when powered off.

> **Note:** Whether connected to a time server or not, the autoloader automatically corrects for daylight savings time if the time was set using On-board Remote Management. If the time was set from the front panel of the autoloader, you must correct for daylight savings time manually.

To set the system time:

1 Using the first drop-down list next to **Time Zone**, select the number of hours difference between your local time and Greenwich Mean Time (GMT).

> **Note:** For example, if you live in Colorado, the time difference is –6 hours in the summer and –7 hours in the winter.

2 Below the **Time Zone** field, select the current **Month** drop-down list.

3 In the **Day** field, type the current day of the month.

4 In the **Year** field, type the current year.

5 In the **Hour** text box, type the current hour in 24-hour format.

6 In the **Minute** text box, type the current minute.

7 Click **submit** to save the information.

Setting Network Options

When you originally installed the autoloader, you set the Ethernet configurations through the front LCD panel. However, you can modify them through On-board Remote Management. The options include **Current Network Parameters**, **Set IP**, and **Set Network Configuration**. To change the Ethernet configurations:

To view the **Current Network Parameters**:

1 From any page, click the **Configuration** heading. The **Configuration** screen displays.

2 From the **Configuration** menu, click **Networking**.

The **Current Network Parameters** area displays the current IP address, MAC address, and the speed setting for the Ethernet connection.

In the **Set IP** section, if a check mark appears in the box next to **DHCP**, the dynamic IP address option is enabled. This means that with every reset of the system, the IP address may change depending on the network administrator's settings.

To **Set IP** address:

1 Clear the check box to remove the check mark from the **DHCP** field, if applicable.

2 In the IP address fields, type the static IP address using the **<Tab>** key to move from box to box.

3 If no check mark appears in the box next to **DHCP**, the static IP address option is enabled. To change a static IP address, type in the new address in the IP address fields using the **<Tab>** key to move from box to box.

4 To change the IP address from a static address to a dynamic address, click the box next to **DHCP**.

To **Set Network Configuration**:

1. To change the values of the subnet mask, gateway, Simple Network Management Protocol (SNMP) server, or the time server, type in the new address, using the **<Tab>** key to move from box to box.
2. Click **submit**.

Setting Security Options

When you enable the security option, users must enter a password to access the autoloader's front panel functionality. A password allows either administrator-level access or operator-level access (see Setting Security on page 14).

To set **Security**:

1. From any page, click the **Configuration** heading. The **Configuration** screen displays.
2. On the left-hand side of the screen, click **Security**. The **System Security** section of the screen displays.
3. To enable front panel security, select the check box next to **Front Panel Security Enabled**.
4. If the check box is blank, the security option for the front LCD panel is not enabled.
5. Click **submit**.

To **Reset Front Panel Password**:

1. From any page, click the **Configuration** heading. The **Configuration** screen displays.
2. On the left-hand side of the screen, click **Security**.
3. Select the check box next to **Reset Front Panel Password**. A check mark appears.
4. Click **submit**.

To set **User Administration**:

1. From any page, click the **Configuration** heading. The **Configuration** screen displays.
2. On the left-hand side of the screen, click **Security**.
3. From the drop-down list next to **Select User Type**, select **Operator 1**, **Operator 2**, **Administrator 1** or **Administrator 2**.

4 In the **Username** field, enter a user name.

5 In the **Password** field, enter the new password.

6 In the **Verify Password** field, re-enter the same new password.

7 Click **submit**.

> **Note:** To view the list of currently defined users, click **submit** with **Select User Type**.

To set the **Client Authorization Control**:

1 From any page, click the **Configuration** heading. The **Configuration** screen displays.

2 On the left-hand side of the screen, click **Security**.

Scroll to **Client Authorization Control**. In this section is a list of the IP addresses that are authorized to perform functions using On-board Remote Management for this specific unit. There are two sets of IP address boxes. You can individually enable/disable and configure each set.

- If enabled, each set can be used to specify either a range of IP addresses or a pair of specific IP addresses that are allowed to administer this unit. A set can also be used to specify a single IP address if the desired IP address is entered into both the "a" and "b" portions of the set. When a set is used to specify a range of IP addresses, the "b" portion of each address set must be greater than or equal to the "a" portion of that address set.
- If neither set is enabled, any IP client can administer the unit. If a single set is enabled, only clients that pass the test specified by that set are allowed administrator access. If both sets are enabled, any client that passes either of the two filter tests can administer the unit.

The Web server always allows any client to view the status information of the unit, regardless of the authorized client list or the overlap control policy.

3 Use the drop-down box to select **Enable** or **Disabled**.

4 Type the IP addresses in the appropriate boxes.

5 Click **submit** to save.

Client Overlap Control is a management policy on controlling how the Web server handles overlapping control requests from multiple clients on the authorized client list. The options include **No Locking**, **Full Locking**, and **Time-Based Locking**.

- **No Locking** allows multiple clients to have unrestricted access to control the system as long as they are on the authorized client list.
- **Full Locking** permits only one authorized client to issue control requests at a time. This client must release the lock by clicking the **Home** option in the upper frame of the page to permit other authorized clients to have control access.
- **Time-Based Locking** is similar to **Full Locking** in that only one authorized client can have control access at once, but the lock is automatically released after the specified number of seconds of inactivity have elapsed.

After selecting the appropriate policy by clicking the check box, click **submit** to save the changes.

1. From any page, click the **Configurations** heading. The **Configurations** screen displays.
2. On the left-hand side of the screen, click **Security**.
3. Select a security option from the **Client Overlap Control** options:
   - **No locking** allows multiple users to access the system and issue requests.
   - **Full Locking** allows only one user to access the system and issue requests.
   - **Time-based Locking** allows only one user to access the system and issue requests with the lock expiring after a designated amount of inactivity (in seconds).
   - **Home** is used to release a full or time-based lock and permit another user to access the system.

   Note: Locking is only available to users on the authorized client list.

4. Click **submit**.

Note: To log out of the system, you must close your browser to end the session.

> **Note:** By entering an improper range of IP addresses, a user could possibly lock out all IP clients from administering the autoloader. If this occurs, you can restore the default values by running **Restore Default** from the front panel **Configuration Menu**.

Updates Page

You can browse to find system updates (autoloader and tape drive firmware) and then upload the updates. To get system updates:

1. From any page, click the **Updates** heading. The **Firmware Update** screen displays.
2. Click **Browse** to navigate to the host system for the update file. The file should end in an **.img** extension.
3. Click **Upload**.
4. Click **OK** in response to the confirmation box. The autoloader automatically uploads the new code and processes it to the system.

> **Note:** A Microsoft issue can keep a user from updating drive or loader firmware over the On-board Remote Management interface. This can occur under Windows Server 2003 with Service Pack 1 (SP1), or if a user has installed Microsoft Security Update MS05-019. This problem will appear with a 6F Communication Error message on the front panel with the warning light on. On-board Remote Management will continue to report the autoloader status as **Initialization**.
>
> Microsoft has described a workaround for this problem in their product with Technical Support Article 898060 (http://support.microsoft.com/default.aspx?scid=898060). If this problem occurs, the autoloader should be restarted to avoid further communication errors.

FTP Server Updates

Updates to the FTP file server are done through the FTP client using the A-Series tape drive Ethernet port.

To determine the current version of FTP client firmware or to update the firmware:

1. Open a browser and enter the A-Series tape drive IP address (default is **10.10.10.10**).

   The FTP client screen displays

2. From the **Admin** menu, click **Login** and enter **admin** for the password.
3. Click **Update Server Firmware**.

   The current firmware version displays.

4. To update the firmware version, click **Browse** and select the file.
5. Click **Update** to start the process.

   When the update completes, a prompt to reboot for changes to take effect displays.

6. Click **Reboot**.

> **Note:** The reboot process may take as long as five to seven minutes. After reboot completes, a media cartridge inventory is initiated. Depending upon the number of cartridges in each magazine and the amount of content or data on each cartridge, the media cartridge inventory may take up to 40 minutes.

Diagnostics Page

From the **Diagnostics** page, you can run various tests on the autoloader. You can also view error and history logs, test progress, identify the physical unit in a rack, or reset the system.

Running Diagnostic Tests

The diagnostic tests available on the autoloader include:

- Loader–Self Test
- Loader–Health Check
- Loader–Picker Test
- Loader–Magazine Test
- Loader–Inventory Test
- Sales Demo
- RALU Logs

Viewing Error or History Logs

To view error or history logs:

1. From any page, click the **Diagnostics** heading. The **Diagnostics** screen displays.
2. Under **View Error and History Logs**, click **View Logs**. You can also save the logs to a file by clicking **Save Logs**. If you save the logs to a file, you must select a destination folder within 60 seconds.

> **Note:** **View Logs** allows you to view a summary of the hardware, software and update logs for the autoloader.
>
> **Save Logs** saves detailed log information to a file for the autoloader. On some browsers, after saving logs, it may be necessary to click on **Home** to continue using the On-board Remote Management function.

Diagnostics

To view the various diagnostic options:

1. From any page, click the **Diagnostics** heading. The **Diagnostics** screen displays.
2. In the **Diagnostics** section, select the diagnostic test that you want to run from the **Test** drop-down menu.
3. Specify a loop count, if desired.
4. Click **Start Test**.
5. While the test is running, you can view the status of the test. From **View Diagnostic Test Progress**, click **View Status**.

   A separate screen indicates which test is running and the current status of the diagnostic test.
6. To refresh the status information, click **View Diagnostic Test Progress**, and then click **View Status** again.

Sales Demo

Within the **Diagnostics** menu, the **Sales Demo** selection allows for a random access, load/unload (RALU) sequence.

Identification

You can use the **Identification** feature of the autoloader by requesting the LCD backlight to flash for a specified number of seconds. This can be helpful in identifying the location of the autoloader in an equipment room.

1. From any page, click the **Diagnostics** heading. The **Diagnostics** screen displays.
2. Under **Identification**, enter the number of seconds in the **Time (secs)** field.
3. Click **Identify**. The LCD backlight flashes on the autoloader for the specified number of seconds.

Performing a System Reset

You will use **System Reset** when making mode changes, magazine changes, and IP address changes. A system reset will take at least three minutes if there is a tape in the drive, or approximately 30 seconds otherwise. To perform a system reset:

1. From any page, click the **Diagnostics** heading. The **Diagnostics** screen displays.
2. Under the **System Reset** section, click **System Reset**.

Commands Page

You can move tapes, run a system inventory, or reset the picker to its home position from the **Commands** page. When you click **Commands**, the page displays.

Moving Tapes

From a remote location, you can request that a tape be moved from one position to another. To move a tape:

1. From any page, click the **Commands** heading. The **Commands** screen displays.
2. From the **Moving Tapes** section of the page, click the drop-down menu under **From:** and select the current location of the tape that you want to move.

   Note: You can also click the slot on the graphic of the autoloader magazine to select and move a cartridge.

3. From the drop-down menu under **To:**, select the location to which you want to move the tape, and then click **submit**.

Inventory

The autoloader automatically runs an inventory whenever you power it on or insert a magazine. If you need to run an inventory in addition to this, you can use On-board Remote Management to do it remotely. To run an inventory:

1. From any page, click the **Commands** heading. The **Commands** screen displays.
2. From the **Commands** page, click **Inventory**. The autoloader starts an inventory immediately.

Set to Home

If the autoloader is not able to successfully execute a **Moving Tapes** or an **Inventory** command, try executing a **Set to Home** command, and then retry the move or inventory command again.

The **Set to Home** command resets the autoloader as a means to help the autoloader recover from an unexpected internal condition. To set to **Home**:

1. From any page, click the **Commands** heading. The **Commands** screen displays.
2. From the **Commands** page, click **Set to Home**. This executes a reset command to the autoloader.

Chapter 4

Customer Replaceable Units (CRUs)

The SuperLoader 3A Series is not intended for customer servicing. Customer Replaceable Units (CRUs) are limited to replacing magazines or magazine blanks.

Magazines are not interchangeable between the VS/SDLT drive types and LTO drive types used by the SuperLoader 3A Series.

Warning: If you choose to service the unit, the power cable must be removed from the unit and the electrical outlet before removing the cover. Failure to do so may cause severe bodily injury or damage to the equipment.

Replacing a Magazine or Magazine Blank

To replace a cartridge magazine or magazine blank, you need to remove the current magazine or blank, and then install the new magazine or blank. If you currently have a magazine blank and wish to change it to a cartridge magazine, you must remove the blank first, and then insert a cartridge magazine. This allows for up to a maximum of 16 cartridges in the autoloader, plus one cartridge in the drive.

Note: Handles are either right or left. They are not interchangeable between the left and right sides of the autoloader.

Removing a Magazine

In most cases, you will remove a magazine by using the **Eject** command on the front panel menu. If you need to remove the magazine when the autoloader is powered off, you must remove it manually. Please contact Customer Support for more information.

Removing a Magazine Using the Front Panel

1. On the menu, scroll to **Commands**.
2. Press **Enter**.
3. On the Commands submenu, scroll to **Eject**, and then press **Enter**.
4. On the Eject submenu, scroll to **Right Magazine** or **Left Magazine**, depending on which magazine you want to eject, and then press **Enter**.

   The magazine pops forward so that the front of the magazine is no longer flush with the front panel.
5. With one hand, grasp the magazine by the handle and slide it forward to remove. Place your other hand under the magazine to support it and prevent it from falling.

Removing a Blank

Your autoloader comes equipped with either two magazines, or one magazine and one magazine blank. The autoloader will not function without both magazine bays equipped with either a magazine or a magazine blank.

To remove a magazine blank:

1. Pull the magazine blank straight out.
2. Replace with another magazine blank or a cartridge magazine.

Installing a Magazine

To install a cartridge magazine:

1. Grasp the magazine by the handle with one hand and support it underneath with the other hand.

2 Slide the magazine into the magazine bay. Make sure you position the magazine correctly; it should slide smoothly.

> **Caution:** Insert the magazine slowly to avoid damaging internal components or the autoloader.

3 The magazine is correctly installed when you feel it click into place and the front is flush with the front panel.

Installing a Blank

To install a magazine blank:

1 Grasp the magazine blank by the handle with one hand and guide the blank into the magazine bay.

2 Slide the magazine blank into the magazine bay until it stops.

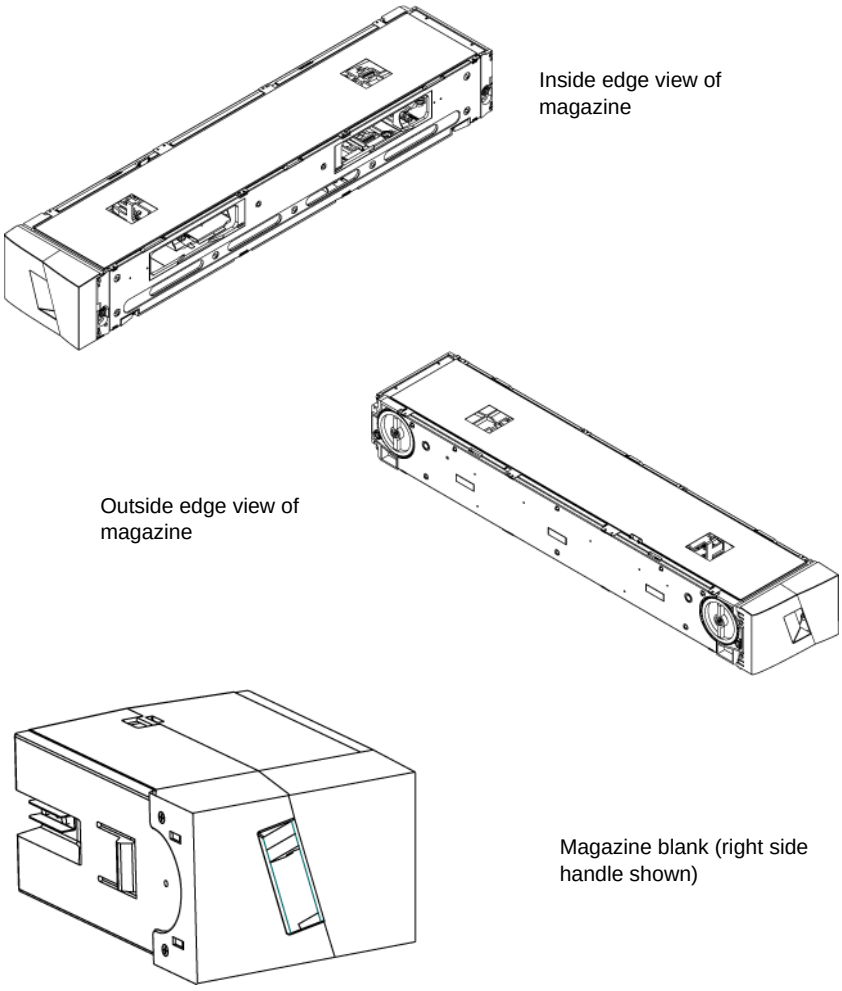
> **Note:** The magazine blank is correctly installed when you feel it click into place and the front of the blank is flush with the front panel of the autoloader.

Changing the Orientation

A magazine or magazine blank can be configured to fit in the right or left magazine bay. The handle must be removed and the appropriate handle attached to match the orientation of the magazine or blank.

To remove and attach a magazine handle, you will need a #1 Phillips screwdriver.

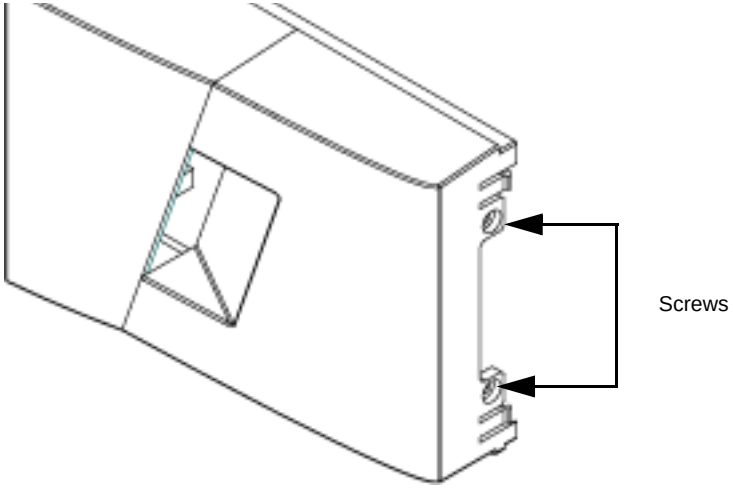
Figure 5 Magazine and Blank



Changing the Orientation of a Magazine

1 Remove the two screws that attach the handle to the front of the magazine.

Figure 6 Removing the Screws from the Handle



2 Unsnap the handle carefully, being careful not to break the hinge.

3 Rotate the magazine 180 degrees so that what was the front of the magazine is now the back.

4 Attach the appropriate left or right handle to the front of the rotated magazine.

5 Snap the handle back onto the front of the magazine.

6 Install the two screws to attach the handle securely to the magazine.

Changing the Orientation of a Magazine Blank

1 Remove the two screws that attach the handle to the front of the magazine blank.

2 Unsnap the handle carefully, being careful not to break the hinge.

3 Rotate the magazine blank 180 degrees so that what was the front of the magazine is now the back.

4 Add the appropriate right or left handle to the front of the rotated magazine blank.

5 Snap the handle back on the front of the magazine blank.

6 Install the two screws to attach the handle securely to the magazine blank.

Chapter 5

Troubleshooting

This chapter provides troubleshooting information that might be helpful with problems encountered during autoloader operation.

For troubleshooting information when working with FTP file transfers using the built-in FTP client and server, see the *Quantum A-Series FTP File Server User's Guide* (81-81800-0x).

- Autoloader Troubleshooting
- Power-on Self Test (POST)
- Diagnostic Tests from the Front Panel
- On-board Remote Management Diagnostic Tests
- Returning the Autoloader for Service

Before Contacting Customer Support

Errors that you may experience with your autoloader can range from severe hardware damage to simple connection problems. Before you return your autoloader, you may be able to fix the problem yourself by following some basic troubleshooting procedures.

Other than drive cleaning, there is no recommended routine maintenance for the Quantum SuperLoader 3A Series autoloader.

The front LCD provides some troubleshooting capabilities, but is limited. On-board Remote Management provides more detailed information about the present state of the autoloader and past performance, and is more helpful for troubleshooting errors.

General troubleshooting information is shown in table 8 and describes the probable cause and suggested action for problems that you may encounter.

For more detailed troubleshooting information, see Autoloader Troubleshooting.

.

Warning: The SuperLoader 3A Series is not intended for customer servicing. If you do service the unit yourself, the power cable must be removed from the unit and the electrical outlet before removing the cover. Failure to do so may cause severe bodily injury or damage to the equipment.

Table 8 Probable Cause and Possible Solutions

Problem	Suggested Action
The front panel does not display information.	The connection to the LCD has failed. • Use On-board Remote Management to troubleshoot error.
The user starts a code update from the front panel without inserting a tape.	• Power cycle the unit.
The autoloader does not respond from the front panel. Bug checks display immediately after loading a new version of firmware.	The firmware is corrupted. • Reload the firmware.
The autoloader is operating slowly.	The autoloader is incorrectly configured for the operating system • Go to www.quantum.com for compatibility requirements.

Problem	Suggested Action
The autoloader does not turn on.	The power cable or source is malfunctioning. The autoloader is incorrectly configured. • Check all outlets and power cables for proper connection. • Contact customer support.
The front panel and light indicators do not turn on.	• Verify that the autoloader is plugged in. • Verify that the power switch on the back is turned on. • Verify that the drive carrier assembly is locked into the autoloader chassis with the four screws supplied. • Contact customer support.
The front panel does not display information, but light indicators above the front panel are turned on.	• Connect to the autoloader using On-board Remote Management via the autoloader remote management Ethernet port (see figure 1 on page 3). Then issue a **System Reset** from the **Diagnostics** page. • Verify that the drive carrier assembly is locked into the autoloader chassis with the four screws supplied. • On the front panel, press and hold the power switch for 15 seconds, then turn the rear power switch off. Wait 60 seconds and turn the rear power switch back on. • Contact customer support.

Problem	Suggested Action
The autoloader does not communicate with the host system via the Ethernet.	• Verify that the A-Series tape drive Ethernet cable (see figure 1 on page 3) is connected to the correct hub. • Verify the Ethernet configuration settings via the front panel LCD. If the DHCP server is available, Ethernet status should indicate DHCP (see Ethernet Information on page 29, otherwise, you must set a unique IP address and a subnet mask. • Power off the autoloader by turning off the system from the front panel LCD and turning it back on. • Contact customer support.
The application software reports a failure locating a piece of media or fails to move a piece of media as requested.	• Use the On-board Remote Management tool and verify that the media is in the expected location internal to the autoloader. • Using On-board Remote Management diagnostic tool, execute the **Loader–Health Check** command. • Issue a **System Reset** either by using On-board Remote Management **Diagnostics** page **System Reset**, or by turning the power off from the front panel. • Contact customer support.
The application software reports an error while reading or writing a piece of media.	• Try a different piece of media. • Issue a **System Reset** either by using On-board Remote Management **Diagnostics** page **System Reset**, or cycle the power from the front panel. • Contact customer support.
Other failures occur.	• Issue a **System Reset** either by using On-board Remote Management **Diagnostics** page **System Reset**, or cycle the power from the front panel. • Contact customer support.

Autoloader Troubleshooting

Whenever any system or application actions occur, the autoloader generates logs recording the action. You can use some of these logs to troubleshoot errors. Errors are problems that occur while operating the autoloader and prevent the autoloader from completing a specific action

When an error occurs, one of the following can happen:

- No error message displays, but the autoloader fails to complete the requested action.
- The screen displays the error message and the **Hard Log** records non-recoverable errors.

> **Note:** To troubleshoot hard errors, you may need to power cycle, repair, or replace the unit

Autoloader Logs

While there are other types of logs, only use the **Hard Log** to troubleshoot errors. This log helps determine the type of error, time of occurrence, and parts of the autoloader affected.

The autoloader generates the following logs, all with the same basic format:

Soft Logs

The **Soft Log** records the autoloader's history during different conditions. It is similar to the **Hard Log** but may have been overwritten by a recovery action.

Update Logs

The **Update Log** records firmware changes and upgrades in the autoloader. It also records information when hardware is updated or changed.

Shadow Logs

(Engineering use only)

Boot Logs

The **Boot Log** keeps track of the boot status in terms of number of hours the unit has been powered on, the number of times the autoloader has been rebooted, and the reason for the reboot.

Hard Logs

The **Hard Log** is used for troubleshooting purposes and is described in Retrieving the Hard Log. Entries in the **Hard Log** represent errors that were not recovered during normal retry operations.

The following table indicates the ways in which you can retrieve each log type.

Table 9 Log Retrieval Methods

Log Type	http	Front Panel
Soft	Yes	Yes
Update	Yes	Yes
Shadow	Yes	No
Boot	Yes	No
Hard	Yes	Yes

Each log records information such as time of the event, error codes, and context information. The key fields are the time stamp (in order to correlate the event with a possible application interruption), and the error type for which the event was logged.

Retrieving the Hard Log

Partial information from the **Hard Log** can be retrieved from the front panel. The front panel displays only the most important information.

You can retrieve complete **Hard Log** information through On-board Remote Management.

Whenever the autoloader generates a **Hard Log**, On-board Remote Management automatically displays the log information. For front panel retrieval, you must request the information.

By interpreting the information in this log, you can determine how to troubleshoot errors.

To retrieve Hard log information from the front panel:

1. From the front panel LCD, scroll to **Diagnostics**, and then press **Enter**. The **Diagnostics** submenu displays.
2. From the **Diagnostics** submenu, scroll to **Error Logs**, and then press **Enter**. The **Error Log** submenu displays.
3. From the **Error Logs** submenu, scroll to **Hard**, and then press **Enter**. The log information displays.

To retrieve Hard log information from On-board Remote Management:

1. From any screen, click the **Diagnostics** heading. The **Diagnostics** screen displays.
2. Click **View Logs**.
3. If you want to save logs to your hard drive, click **Save Logs**. If you save a log to a file, you must select a destination folder within 60 seconds.

Hard Log Example

The first line of the **Hard Log** shows the number of entries, queue size, and defines the queue wrap and erase parameters.

The first line of each **Hard Log** event contains the information you are looking for. The highest number entry, shown at the bottom of the queue, contains the most recent event.

You are interested primarily in the time stamp and error fields. Context information followed by the 12 double-words are for engineering use only and cannot be interpreted without firmware source code.

```
****  Hard Log ****
Block 1, 004/016 entries @  64 bytes each, wrap @ 004, erase @ 008
0000: 2001-Jun-27, 17:24:06.001, Error: 002f0222, Context: 4802/00000000
      65460621:00610004:ffffffff:ffffffff
      ff741e03:0075ff63:0566063f:007f0000
      ffffffff:ffffffff:ffffffff:ffffffff
0001: 2001-Jun-27, 17:24:08.036, Error: c02f0223, Context: 4802/00000000
      00000000:00000000:00000000:00000000
      00000000:00000000:00000000:00000000
      00000000:00000000:00000000:00000000
0002: 2001-Jun-27, 17:38:19.777, Error: 002f0222, Context: 4802/00000000
      65460621:00610004:ffffffff:ffffffff
      ff741e03:0075ff63:0566063f:007f0000
      ffffffff:ffffffff:ffffffff:ffffffff
0003: 2001-Jun-27, 17:38:21.812, Error: c02f0223, Context: 4802/00000000
      00000000:00000000:00000000:00000000
      00000000:00000000:00000000:00000000
      00000000:00000000:00000000:00000000
```

Time Stamp

The time the event occurred. This field helps correlate the event with a possible application interruption.

If the unit is unable to acquire the correct time/date from the SNTP time server or the front panel, the time stamp contains values indicating the power cycle number and the time an entry was written relative to that power cycle, listed as Power On Hours (POH).

> **Note:** The unit has no internal real-time clock and requires you to set the time of day from the front panel or the network interface (SNTP).

Error

The error fields are defined as follows:

Bits 31, 30	Bits 29-28	Bits 27-24	Bits 23-20	Bits 19-16	Bits 15-12	Bits 11-8	Bits 7-4	Bits 3-0
Recovery Action	Task ID		Error Type		Context Information			

Recovery Action

Recovery Action defines what the autoloader will do based on the event that occurred.

- If the value is 0, the autoloader continues operations. These events are typically soft recoverable events or events that are just recording an action for when the development team is working on enhancements.
- If the value is nonzero, the autoloader must reboot in order to recover from the event. The reboot happens automatically.

Task ID

Task ID defines what firmware task was being performed at the time of the event.

Task ID	Description
00	System Timer
01	Loader Manager
02	Picker
03	Magazine Left
04	Magazine Right
05	Magazine Up Left
06	Magazine Up Right
07	Drive Manager

Task ID	Description
08	Bar Code Reader
09	Front Panel
0A	IP
0B	Diagnostic
0C	Error
0D	Code Update
0E	ADI
0F	Drive Manager Timer
11	HTTP
12	SNTP
20	Idle
3E	Watch Dog Timer
3F	Un-handle Interrupt

Error Type

Error Type defines the type of error and the action to which the event is related. This field helps identify what caused the event to occur.

Table 10 Error Code Listing and Suggested Actions

Error	Description	Suggested Actions
00–25	General Software flags	• Check for a **Hard Error** log. If an error displays in the **Hard Error** log, power cycle the autoloader and run the **Loader—Health Check** test. • Check www.quantum.com for firmware updates. • If all previous steps fail, contact customer support.

Error	Description	Suggested Actions
26	Message Send ID error	• Power cycle the autoloader. • If the previous step fails, contact customer support.
27	Message Bad	• Check the SCSI bus cables and terminators. • Check the host adapter. • If all previous steps fail, contact customer support.
28	Message parameter Bad	• Check the host device driver. • Check the host application. • Check the SCSI bus cables and terminators. • Check the host adapter. • Power cycle the autoloader. Repeat checks after power cycle. • If all previous steps fail, contact customer support.
29	Invalid Element	• Check the host device driver. • Check the host application. • Power cycle the autoloader. Repeat checks after power cycle. • If all previous steps fail, contact customer support.
2A	Invalid Element Status	• Check the host device driver. • Check the host application. • Power cycle the autoloader. Repeat checks after power cycle. • If all previous steps fail, contact customer support.
2B–2F	Firmware tables and stacks invalid	• Check for a **Hard Error** log. If an error displays in the **Hard Error** log, power cycle the autoloader and run the **Loader—Health Check** test. • Check www.quantum.com for firmware updates.

Error	Description	Suggested Actions
30	POST Failure	• Verify that the magazines are fully seated. • Power cycle. • If all previous steps fail, contact customer support.
31–38	System Monitoring type events	• Check for a **Hard Error** log. If an error displays in the **Hard Error** log, power cycle the autoloader and run the **Loader—Health Check** test. • Check www.quantum.com for firmware updates. • If all previous steps fail, contact customer support.
3A	Drive Error	• Check the **Drive Log Sense** for drive errors. If the drive is still logging errors, contact customer support. • If the drive is logging tray a different piece of media. • If the drive fails with two different pieces of media, contact customer support.
3B	Drive Hardware Err	
3C	Drive Needs Cleaning	
3D	Drive Error	• Check the **Drive Log Sense** for drive errors. If the drive is still logging errors, contact customer support. • If the drive is logging tray a different piece of media. • If the drive fails with two different pieces of media, contact customer support.
3E	Load Error	• Verify that the cartridge does not have labels or other matter anywhere on the cartridge except where labels are expected to be placed. • Try to load a different piece of media. • If multiple pieces of media fail, contact customer support.

Error	Description	Suggested Actions
3F	Unload Error	• Verify that the cartridge does not have labels or other matter anywhere on the cartridge except where labels are expected to be placed. • Try to load a different piece of media. • If multiple pieces of media fail, contact customer support.
49	Offline	• No action required.
4A	Door Locked	• No action required.
4B	Open Front	• Install the magazine or magazine blank. • Replace the magazine or magazine blank (try a second one if possible). • If all previous steps fail, contact customer support.
4C	Over Temp	• Verify that the temperature of the autoloader inlet air is within specifications. • Clear debris from any opening of the autoloader, both in front and in the back. • Verify that both fans are working. If fans are bad, contact customer support.
60–69	Internal communications events	• Power cycle. • If the previous step fails, contact customer support.
A0–A4	Picker Servo Errors	• Run the **Loader–Health Check** test. • If repeated events display in the **Hard Error** log, power cycle the autoloader. Repeat test after power cycle. • If all previous steps fail, contact customer support.

Error	Description	Suggested Actions
A5	Source Element Empty	• Verify that the expected source really does have a cartridge. • Run the **Loader–Health Check** test. • If the source is a magazine, replace the cartridge in that slow with a different cartridge and try again. If error continues, replace the magazine. • If source is the tape drive, verify the tape drive has a cartridge and it was ejected. • Power cycle the autoloader. • If the error continues, contact customer support.
A6	Source Magazine Missing	• Verify that the magazine is installed correctly into the autoloader. • Remove and reinsert the magazine again. • Try a second magazine, if possible. • Power cycle the autoloader. • If the error continues, contact customer support.
A7	Mailslot full	• Verify that the magazine is installed correctly in the autoloader. • Remove and reinsert the magazine again. • Try a second magazine, if possible. • Power cycle the autoloader. • If all previous steps fail, contact customer support.

Error	Description	Suggested Actions
A8	Destination Element Full	• Verify the expected destination really does not have a cartridge. • Run the **Loader—Health Check** test. • If destination is a magazine, install and remove a cartridge from the selected slot and try again. If error continues, replace the magazine. • If destination is the tape drive, verify the tape drive does not have a cartridge. • Power cycle the autoloader. • If error continues, contact customer support. • If the cartridge is in the mailslot opening, remove it. • Verify that the mailslot is fully closed. • Verify that there is no debris in the mailslot opening.
A9	Picker Full	• Look in the front of the autoloader and confirm that the picker is full. • Run the **Loader—Health Check** test. • If all previous steps fail, contact customer support.
AA	Picker Cartridge Sensor Error	• Look in the front of the autoloader and confirm the picker is full. • Run the **Loader—Health Check** test. • If all previous steps fail, contact customer support.
AB	Drive Path Sensor Error	• Run the **Loader—Health Check** test. • Power cycle the autoloader. • If all previous steps fail, contact customer support.
AC	Mail Slot Door Sensor Error	• Insert a cartridge into the autoloader via the mailslot. • Power cycle the autoloader. • If all previous steps fail, contact customer support.

Error	Description	Suggested Actions
AD	Mail Slot Solenoid Error	• Insert a cartridge into the autoloader via the mailslot. • Power cycle the autoloader. • If all previous steps fail, contact customer support.
AE	Unknown Servo Error	• Run the **Loader—Health Check** test. • If the previous step fails, contact customer support.
AF	Error Log Information Event	• No action required.
B0–BF	Error Events related to the picker not rotating or translating properly	• Run the **Loader—Health Check** test. • Power cycle the autoloader. • If all previous steps fail, contact customer support.
C0	Unknown Motor Error	• Run the **Loader—Health Check** test. • Power cycle the autoloader. • If all previous steps fail, contact customer support.
D0	Magazine Solenoid Bad	• Check the **Task ID** in the **Hard Error** log to determine if the problem is the right or the left magazine. • Remove and reinsert the magazine. Verify that the magazine slides freely, and clicks and locks into place. • Power cycle the autoloader. • Try a different magazine. • If all previous steps fail, contact customer support.
D1	Magazine Present Sensor Bad	• Check the **Task ID** in the **Hard Error** log to determine if the problem is the right or the left magazine. • Remove and reinsert the magazine. • Power cycle the autoloader. • Make sure that the sensor is not blocked by debris. • If all previous steps fail, contact customer support.

Error	Description	Suggested Actions
D2–D4	Position Sensor Bad	• Check the **Task ID** in the **Hard Error** log to determine if the problem is the right or the left magazine. • Remove and reinsert the magazine. • Try a different magazine, if possible. • Power cycle the autoloader. • If all previous steps fail, contact customer support.
D5–DE	Cartridge flags located on the magazine may be bad or the sensor to detect the flags may have a problem.	• Check the **Task ID** in the **Hard Error** log to determine if the problem is the right or the left magazine. • Remove and reinsert the magazine. • Try a different magazine, if possible. • Make sure that the sensor is not blocked by debris. • Power cycle the autoloader. • If all previous steps fail, contact customer support
DF	Jammed Cartridge	• Check the **Task ID** in the **Hard Error** log to determine if the problem is the right or the left magazine. • Power cycle the autoloader. • If all previous steps fail, contact customer support

Power-on Self Test (POST)

This section describes the POST and its various tests and also explains how to perform diagnostic tests from the front panel and from the On-board Remote Management interface.

The Power-on Self Test (POST) and diagnostic tests are helpful tools for testing the autoloader's functionality and for troubleshooting errors.

With the results from the POST and diagnostic tests, you can determine how well the autoloader is working and locate any problems

Every time you turn on the autoloader, the POST checks all of the autoloader's basic components. If you experience problems with the autoloader, the POST is a good method to determine if any major parts are malfunctioning.

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Note: Use of the **Diagnostic Commands** from the On-board Remote Management interface should not be issued while the autoloader is being used by host applications. Only use the **Diagnostics Commands** when the autoloader is known to be idle and unavailable to host backup/restore applications.

The autoloader recognizes when the drive or autoloader is executing host commands and will respond appropriately to prevent application failures. A diagnostic command issued between host application commands may not be recognized appropriately, resulting in a failed application.

Table 11 POST Descriptions

POST	Test Description
MICROP	Tests the microprocessor's general-purpose registers
IRAM	Tests the microprocessor's internal RAM
Addr Lines	Bit walks the SRAM address lines
SRAM	Tests the 512k SRAM

POST	Test Description
Code Chksum	Verifies the Flash image checksum
EERom	Checks the EERom area and verifies the checksums
PLL Clock	Tests that the microprocessor's PLL is synchronized correctly
LCD	Verifies that the LCD is present and working correctly
Ethernet	Configures and verifies communication with the Ethernet chip
Barcode	Verifies that the bar code reader is present and performs a hardware handshake
Temperature Sense	Pass/Fails the MDM and configures the AHIM temperature sensors
MDM	Verifies that the MDM is present and checks the sensors
Fan	Verifies that the fan is operating correctly

Performing a POST

If you experience errors while operating your autoloader, you may need to reboot the autoloader to perform a POST.

To reboot the SuperLoader 3A Series:

1. Hold down the power button until the **System Shutdown Please Wait...** message displays.
2. Release the power button. The autoloader turns off.
3. Press the power button again to turn the autoloader on. POST runs automatically.

Interpreting the POST Results

While the POST is running, a progress indicator showing the name of the test displays on the front panel. If the autoloader is working properly, the message **System Ready** and the current configuration display after the POST completes successfully.

If the autoloader is not working properly, error messages display on the front panel (see Autoloader Troubleshooting on page 58).

Diagnostic Tests from the Front Panel

Diagnostic tests allow you to calibrate parts of the autoloader, check the condition of parts, or test the autoloader's functionality. From the front panel, you can perform all of the diagnostic tests. Because certain tests require you to manually insert a cartridge, you can perform only some of the diagnostic tests using On-board Remote Management (see On-board Remote Management Diagnostic Tests).

> **Note:** On-board Remote Management allows you to request all diagnostic tests, but any tests that require a cartridge to be inserted will time-out unless someone manually inserts the cartridge at the appropriate time.

Setting the Security

When you enable the security function, the diagnostic tests are password protected to ensure data integrity. To access any of the diagnostic tests, you must first enter an **Administrator** password. If you do not enter the password, you will be prompted to enter the password when you attempt to perform a diagnostic test.

To enter an **Administrator** password:

1. From any menu, click the **Commands** heading. The **Commands** screen displays.
2. On the **Command** submenu, scroll to **Enter Password**, and then press **Enter**.
3. On the **Enter Password** submenu, scroll to **Administrator**, and then press **Enter**.

   The **Login** screen displays with a row of asterisks. A text box displays above the first asterisk.
4. In the text box, scroll to the first number of the password, and then press **Enter**. The text box above the asterisk disappears and another text box displays above the next asterisk.
5. Repeat step 4 to enter the remaining numbers of your password.

> **Note:** Press **Escape** to backspace to a previous text box, if necessary.

When you have finished entering your password, **Submit Password** displays on the LCD below the asterisks.

6 Press **Enter** to submit your password. The display returns to the **Enter Password** submenu.

Stopping a Diagnostic Test

At times you may need to stop a diagnostic test while it is in progress. Certain diagnostic tests even require you to stop them or they run continuously. To stop a diagnostic test while it is running, use the **Halt Test** function. When you select **Halt Test,** any picker or magazine functions complete, and then the diagnostic test is stopped.

To perform a **Halt Test** from the front panel:

1 While the diagnostic test you wish to stop is running, press **Escape.** The **Diagnostics** submenu displays.

2 On the submenu, scroll to **Halt Test**, and then press **Enter. User Abort** displays.

3 Press **Enter** to return to the **Diagnostics** submenu. Refer to On-board Remote Management for any test results.

To perform a **Halt Test** from On-board Remote Management:

1 Select **Halt Test** from the **Diagnostics** drop-down menu, and click **Stop Test**.

2 Select **View Status** to see the results of the command. **Test Stopped** displays along with any test results.

Front Panel Diagnostic Tests

You can perform the following diagnostic tests using the front panel:

- Halt Test
- Loader—Self Test
- Loader—Health Check
- Loader—Picker Test
- Loader—Magazine Test
- Loader—Inventory Test
- Sales Demo (performs a Random Access Load/Unload sequence)
- RALU Logs (displays the results from the previously run Sales Demo)

To perform any of the front panel diagnostic tests:

1. From the main menu, scroll to **Diagnostics** and press **Enter**.
2. Scroll to the test that you want to run and press **Enter**.

   If you are already logged in as **Administrator**, the test begins executing immediately. The message **Running Test** displays while the test is running.

   The **Loader—Health Check** test displays an ongoing progress indicator while executing. When the test completes, either the message **Test Successful** displays or the message **Test Failed** and an error code displays. Proceed to step 4.
3. If you are not logged in, you will be asked to enter the **Administrator** password. Do the following:

   a. From the front panel, enter the **Administrator** password by using the **Up** and **Down** scroll arrows to select each digit, and then press **Enter** to move to the next digit. To move to the previous digit, press **Escape**. When you have entered the entire six digit password, you will be asked to press **Enter** one more time to submit the password. If the password is incorrect, you will be asked to re-enter it using the same procedure. Otherwise, you will be returned to the **Diagnostics** menu. Press **Enter** to run the desired test.

      Running Test displays while the test is in progress. To stop the test prematurely, see Stopping a Diagnostic Test.

   b. The **Loader—Health Check** test displays an ongoing progress indicator while executing. When the test completes, either the message **Test Successful** displays or the message **Test Failed** and an error code display.
4. If the test is successful, press **Enter** to return to the **Diagnostics** test menu. For detailed results of a test, use On-board Remote Management to retrieve the diagnostic test status (see Diagnostics Using On-board Remote Management).

On-board Remote Management Diagnostic Tests

You can perform the following diagnostic tests from On-board Remote Management:

- Halt Test
- Loader—Self Test
- Loader—Health Check
- Loader—Picker Test
- Loader—Magazine Test
- Loader—Inventory Test

Note: On-board Remote Management allows you to request all diagnostic tests, but any tests that require a cartridge to be inserted will time-out unless someone manually inserts the cartridge at the appropriate time.

Diagnostics Using On-board Remote Management

Many tests can be run using On-board Remote Management. To perform On-board Remote Management diagnostic tests:

1. Open a web browser and connect to the autoloader. The On-board Remote Management main menu displays.
2. Click the **Diagnostics** heading. A login window displays.
3. Type an **Administrator** user name and a password, and then click **Enter**. The **Diagnostics** submenu displays.
4. Select the test you wish to perform from the Diagnostics drop-down menu, and then click **Start Test**.

   The selected diagnostic test runs. While the test is running, you can view the status of the test. To view the status from the **View Diagnostic Test Progress**, click **View Status**.

Returning the Autoloader for Service

If you need to return the autoloader to the factory for service, first verify which customer replaceable unit (CRU) that you need to return and return only that CRU, not the entire autoloader.

Once you determine the CRU to replace, contact customer support to obtain return authorization (RA) and shipping information. When you have the RA number, use the following procedure.

Preparing the Autoloader for Shipment

If you must return the complete autoloader for service, use these steps to prepare the autoloader for shipment.

1. Remove all cartridges from the unit.
2. Power off the autoloader via the front panel.
3. Remove the power and Ethernet cables from the autoloader.

> **Note:** Do not ship these items if you are returning the autoloader to the factory.

Removing the Autoloader from a Rack

To remove the autoloader from a rack:

1. Loosen the four screws that connect the two support brackets to the two autoloader brackets.
2. Loosen the four screws on the front of the autoloader that attach the two front tabs (support brackets) to the front rails. Do not remove the screws completely at this time.
3. Remove the four screws at the back of the autoloader that connect the support brackets (two screws per bracket) to the autoloader brackets.
4. While supporting the front of the autoloader, remove the four front screws.

> **Caution:** Injury may occur if the unit is not supported when you remove the front screws. The screws are holding up the front of the unit.

5 Using two people, or an appropriately rated mechanical lift, remove the autoloader from the rack by sliding the autoloader out and supporting it from the bottom. The person handling the back of the unit must depress the locking tab on the support bracket while sliding the unit forward.

6 Loosen the four screws and remove the autoloader brackets from the back of the autoloader.

7 Place the autoloader into the original packaging box. If you no longer have the original packaging, contact your service representative to purchase the packaging kit.

Packing the Autoloader

Use the original packing material to pack the autoloader: the shipping container, two foam insert packing pieces, the accessory kit box (or the filler tube if your autoloader did not come with an accessory kit box), and the antistatic bag. You will also need packing tape.

1 Place the antistatic bag over the autoloader.

2 Place one of the foam endcaps onto one side of the autoloader. Place the second foam insert onto the other side of the autoloader and make sure the pieces fit snugly onto the autoloader.

> **Note:** One end of the foam insert has a curved piece. This end of the foam insert is designed to fit the front of the autoloader.

3 Place the autoloader down into the shipping box and push the back of the autoloader towards the back end of the box.

4 Insert the empty accessory kit box (or filler tube) into the shipping box at the front end of the autoloader in the space between the autoloader foam inserts and the shipping container.

5 Place any necessary paperwork on top of the autoloader inside the box.

6 Close and seal the box.

7 Place the shipping label on the box.

8 Ship the box.

Appendix A

Specifications

This appendix provides specifications for the SuperLoader 3A Series autoloader equipped with an A-Series tape drive.

- SuperLoader 3A Series Autoloader
- A-Series SDLT 600A Tape Drive
- A-Series LTO-3 Tape Drive

SuperLoader 3A Series Autoloader

Physical Specifications

Rack Mount	
Height	8.9 cm (3.5 in.)
Width	45 cm (17.7 in.)
Length	75.46 cm (29.71 in.)
Package Weight (without media)	22.7 kg (50 lb.)
Footprint	0.32 square meters (3.4 square feet)

Performance Specifications

Drive Type	1 Quantum A-Series tape drive
MCBF	400,000 cycles
Typical cycle time	< 40 seconds. One cycle consists of moving a cartridge from the tape drive to a magazine slot, selecting another magazine slot, and then moving the cartridge back to the tape drive. It does not include the time that the tape drive takes to unload or load/calibrate.

Environmental Specifications

Temperature Range (Dry Bulb)	
Operating	+10º to +35ºC
Nonoperating	- 40ºC to +65ºC
Temperature Variation	
Operating	10ºC per hour
Nonoperating	20ºC per hour
Humidity	
Operating	20% to 80% noncondensing
Nonoperating	10% to 90% noncondensing
Gradient	10% per hour without condensation
Wet Bulb	
Operating	26ºC max
Nonoperating	29ºC max
Altitude	
Operating	-153 m to 3048 m
Nonoperating	-153 m to 12192 m

Power Specifications

Line voltage	**60 Hz system**: 90–265 VAC; **50 Hz system**: 90–265 VAC
Maximum power	160W
Line frequency	47–63 Hz
AC Input current	**60 Hz system**: 4.0 A (RMS) for 115 VAC **50 Hz system**: 2.0 A (RMS) for 230 VAC

Vibration Specifications

Operating	
Swept Sine Vibration	5–500 Hz, 0.25 G, 0.254 mm (0.01 in.) to smooth crossover, 1 8ve/min, (X, Y, Z) axes
Random Vibration	0.25 Grms, 5–500 Hz (X, Y, Z) axes
Non-Operating	
Swept Sine Vibration	5–500 Hz, 0.75 G, 0.52 mm (0.02 in.) to smooth crossover, 1 8ve/min, (X, Y, Z) axes
Random Vibration	1.06 Grms, 5–500 Hz (X, Y, Z) axes

Shock Specifications

Operating	3 G, 5 ms half-sine, 3 pulses (+/-) per axis, X, Y, Z
Non-Operating	20 G, 8 ms half-sine, 3 shocks (+/-) per axis, X, Y, Z

A-Series SDLT 600A Tape Drive

Drive Specifications

Description	Quantum SDLT 600A
Read/write transfer rate: maximum sustained (SDLT II media)	Noncompressed mode: 129.6 GB/hr Compressed (2:1 typical): 259.2 GB/hr
Burst transfer rate	160 MB/s
Average access time	79 seconds (from BOT)
Loading time to BOT (for previously written tape)	40 seconds (maximum)
Unloading time from BOT	20 seconds (maximum)
Interface type	Gigabit Ethernet (GigE)

Media Capacity

Media Type	Capacity
SDLT II storage capacity	4.7 TB (noncompressed) with 16 cartridges 9.4 TB (2:1 typical compression) with 16 cartridges

Media Specifications

Characteristic	SDLT II
SDLT II formatted capacity	300 GB (noncompressed) 600 GB (2:1 typical compression)
Basic description	Advanced metal particle
Tape length	630 m (2,066 ft.)
Cartridge dimensions	105.6 x 105.3 x 25.4 mm (4.16 x 4.15 x 1.0 in)
Read compatibility	SDLT I, SDLT II
Shelf life	> 30 years with < 10% loss in demagnetization @ 20°C 40% RH (noncondensing)
Cartridge life	1,000,000 passes (any point on the tape passing the recording head in either direction)
SDLT Cleaning cartridge life	15 uses

A-Series LTO-3 Tape Drive

Drive Specifications

Description	Quantum LTO-3 A-Series
Read/write transfer rate: maximum sustained (LTO Ultrium 3 media)	Noncompressed mode: 68 MB/s Compressed (2:1 typical): 136 MB/s
Burst transfer rate	160 MB/s (maximum, native)
Average access time	58 seconds (from BOT)
Loading time to BOT (for previously written tape)	75 seconds (maximum)
Unloading time from BOT	30 seconds (maximum)
Interface type	Gigabit Ethernet (GigE)

Media Capacity

Media Type	Capacity
LTO Ultrium 3 storage capacity	6.4 TB with 16 cartridges 12.8 TB (2:1 typical compression) with 16 cartridges

Media Specifications

Characteristic	LTO Ultrium 3
LTO Ultrium 3 formatted capacity	400 GB (noncompressed) 800 GB (2:1 typical compression)
Basic description	Pre-formatted (servo written) metal particle
Tape length	680 m (2230.9 ft.)
Cartridge dimensions	102 x 105.4 x 21.5 mm (4 x 4.15 x .85 in)
Read and Write compatibility	LTO Ultrium 3 only
Shelf life	> 30 years with < 10% loss in demagnetization @ 20°C 40% RH (noncondensing)
Cartridge life	1,000,000 passes (any point on the tape passing the recording head in either direction)
LTO Universal Cleaning cartridge life	20 uses

Appendix B

Regulatory Statements

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Taiwan Statement

警告使用者:

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

Japan Notice

この装置は，情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は，家庭環境で使用することを目的としていますが，この装置がラジオやテレビジョン受信機に近接して使用されると，受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Canadian Notice (Avis Canadien)

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme Canadian Notice (Avis Canadien)

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

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

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) and its amendment (93/68/EECD) issued by the Commission of the European Community.

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

- EN55022 (CISPR 22) - Electromagnetic Interference
- EN50082-1 (IEC801-2, IEC801-3, IEC801-4) - Electromagnetic Immunity
- EN60950 (IEC950) - Product Safety

Product Safety Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

Use a wrist strap connected by a ground cable to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 mega-ohm 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.

Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.

Use conductive field service tools.

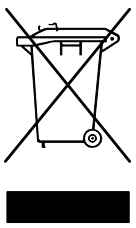
Environmental Compliance

Quantum is committed to providing quality products in an environmentally sound manner and to comply with all applicable environmental laws, rules and regulations.

This product was designed, manufactured and made available with consideration to worldwide laws, rules and regulations applicable to the product and the electronics industry including the European Union Directives 2002/95/EC & 2002/96/EC (RoHS and WEEE).

For further information on Quantum's Environmental Compliance and Global Citizenship, please consult the following Web site at http://qcare.quantum.com.

Disposal of Electrical and Electronic Equipment



This symbol on the product or on its packaging indicates that this product should not be disposed of with your other waste. Instead, it should be handed over to a designated collection point for the recycling of electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please visit the Quantum Web site at http://qcare.quantum.com or contact your local government authority, your household waste disposal service or the business from which you purchased the product.

Glossary

A

access Read, write, or update information on a storage medium, such as tape.

access time The interval between the time a request for data is made by the system and the time the data is available from the drive.

API Application Programming Interface.

applet Java applets are small Java programs that get downloaded to the client computer and then run from a web browser when a web page that uses Java is loaded.

archiving The removal of data from the computer system on to secondary storage media that is safely stored away.

autoloader A robot that includes one tape drive and one or more magazines of tape cartridges. Autoloaders are used for unattended data backup.

A/V A/V or Audio/Video is a generic term used to describe products and services associated with audio and video.

B

backup A copy of a file, directory, or volume on a separate storage device from the original, for the purpose of retrieval in case the original is accidentally erased, damaged, or destroyed.

backward compatibility The ability of a current drive product to read tapes written on earlier model drives.

bad data block A block that cannot reliably hold data because of a media flaw or damaged format markings.

BIOS Basic Input/Output System. A set of routines that work closely with the hardware to support the transfer of information between various elements of the system, such as memory, disks, and peripheral devices.

BOM or BOT Beginning of Media or Beginning of Tape. The physical beginning of the media.

BSMI Bureau of Standards, Metrology, and Inspection (Taiwan).

buckling mechanism The buckling mechanism engages the media leaders on cartridge load and disengages them on cartridge unload.

buffer An area of RAM reserved for temporary storage of data that is waiting to be sent to a device. The data is usually on its way to or from the tape drive or some other peripheral device.

C

cache Specialized RAM used as a buffer between a fast CPU or I/O channel and storage which has a relatively slow access time (for example, cartridge or diskette), to avoid slowing down the former.

CE Council of Europe.

CFR Code of Federal Regulations (United States).

CSA Canadian Standards Association, also known as CSA International.

compressed capacity Capacity after data has been processed to reduce storage space while maintaining data integrity using either software or hardware.

D

data compression A process that reduces the amount of storage space required to hold a particular block of data. Data transfer speed and total tape capacity are affected by the data compression achieved. In accordance with industry practice, a typical compression ratio is 2:1 of data storage. Actual compression ratios achieved are dependent on the redundancy of data files being recorded.

dB A Decibel is a logarithmic unit of sound intensity; 10 times the logarithm of the ratio of the sound intensity to some reference intensity.

DCM The Data Control Module provides the path and guides for all media motion inside the tape drive and to write data to and read data from the media.

device driver A low-level (usually kernel-mode) operating system component that enables a PC to communicate with peripheral devices such as printers, CD-ROMs, and tape drives. Each kind of device requires a different driver.

DHCP Dynamic Host Configuration Protocol. Software that automatically assigns IP addresses to client stations logging onto a TCP/IP network.

DLT Digital Linear Tape.

DLT*ice* Quantum's firmware compliance management function of DLTSage, which provides secure archival functionality to the SDLT 600A tape drive and DLTtape II cartridges.

DLTSage Quantum's suite of preventive maintenance diagnostic software tools that enables users to more simply manage tape storage environments.

domain A group of computers, programs, and devices on a network administered as a unit with common procedures and rules for use by a specific group of users. A user logs on to the domain to gain access to the resources.

E

ECC Error Correction Code, also known as Error Checking and Correction. The incorporation of extra parity bits in transmitted data in order to detect errors that can be corrected by the controller.

EDC Error Detection Code. DLT tape drives include a 16-bit EDC with every 4 KB of user data. The EDC helps the drive detect and recover any errors that may occur.

EEC European Economic Community.

EEPROM Electronically-Erasable Programmable Read Only Memory. An integrated circuit memory chip that can store programs and data in a non-volatile state. These devices, which are used to store firmware in DLT tape drives, can be erased and reprogrammed with new data.

EIM The Electronic Interface Module provides the main control function for the system and the interface from the system to the host computer, library, or autoloader.

EMAM Enhanced Media Auxiliary Memory - The memory on a cartridge associated with the file system table of contents.

EMC Electromagnetic Compatibility.

EMI Electromagnetic Interference. Electrical interference caused by electromagnetic radiation.

EN EN standards are voluntary technical standards of the European Union and European Economic Area.

encoding The protocol by which particular data patterns are changed prior to being written on the tape surface as a pattern of On and Off or 1 and 0 signals.

erase The removal of data from a piece of media.

error A message that occurs when there is a loss of ability to interpret recorded data. Usually due to magnetic issues or defects in or on the media.

Error Correction Code See ECC.

Error Detection Code See EDC.

ESD An Electrostatic Discharge is a sudden flow of electric current through a material that is normally an insulator.

Ethernet a local-area network (LAN) protocol using high-speed communications.

EU European Union.

F

FCC Federal Communications Commission. A United States agency responsible for enforcing communications related regulations stating how much radiation computers and other electronic equipment are allowed to emit.

firmware Permanent or semi-permanent instructions and data programmed directly into the circuitry of programmable read-only memory or electronically-erasable programmable read-only memory chips. Used for controlling the operation of the computer or tape drive. Distinct from software, which is stored in random access memory and can be altered with ease.

format A magnetic track pattern that specifies the locations of the tracks and sectors. This information must exist on a tape before it can store any user data. Formatting erases any previously stored data.

formatted capacity The amount of room left to store data on a tape after writing the sector headers, boundary definitions, and timing information during a format operation.

FTP File Transfer Protocol. A protocol used to transfer files over a TCP/IP network.

full height Dimensions of a drive that meet standard height requirements, usually 3.25 inches (82.55 mm) for a tape or disk drive product.

G

GB Gigabyte. A unit of measurement equal to 1 million kilobytes.

GHz Gigahertz. A measurement of frequency that equals one thousand million Hz, or one thousand MHz. Speeds for computer microprocessors, buses, and interfaces are often measured in GHz.

GS German Safety.

H

half height Standard drive size equivalent to half the vertical space of a 5.25 inch (133.35 mm) drive.

hard error A data error that persists when the tape is reread, usually caused by defects in the physical surface.

Hierarchical Storage Management (HSM) A method of storing massive amounts of data in tape libraries that allows for easy and rapid recall of the material. Due to the lowering cost of disk drives, HSM has yet to reach its full potential.

HiFN An ASIC (Application Specific Integrated Circuit) for the SDLT that handles data compression.

HIM The Host Interface Module implements the interface between the host system and the tape drive.

HRE Hard Read Error.

HTTP HyperText Transfer Protocol - The protocol for moving hypertext files across the Internet. Requires an HTTP client program on one end, and an HTTP server program on the other end. HTTP is the most used protocol on the Internet.

HWE Hard Write Error.

Hz Hertz. A unit of frequency measurement that equals 1 cycle per second. Computers and electronic devices are often measured in

kilohertz (kHz), megahertz (MHz), gigahertz (GHz), or terahertz (THz).

I

IEC The International Electrotechnical Commission is a standards organization that prepares and publishes international standards for all electrical, electronic, and related technologies.

IEEE Institute of Electrical and Electronics Engineers

image backup A backup option that takes a "snapshot" of an entire system by writing a volume image to tape sector-by-sector, rather than file-by-file. This method of backup is very fast and allows companies to backup critical information in a limited backup window.

IP Internet Protocol. A communications protocol which contains a network address and routes a message to a different network.

ISO The International Organization for Standardization is an international non-governmental standard-setting body made up of representatives from national standards bodies.

ISV Independent Software Vendor.

K

KB Kilobyte. A unit of measure consisting of 1,024 bytes.

kHz Kilohertz. A measurement of frequency that equals 1000 Hz.

L

LAN Local Area Network. A computer network covering a relatively small area. A LAN usually is confined to a building or a few nearby buildings. A LAN can be connected to another LAN over any distance through telephone lines and radio waves to form a wide area network (WAN).

LCD Liquid Crystal Display. The technology used by portable computer and flat-panel displays. The Operator Control Panel on the front of the SuperLoader is an LCD screen.

LED Light Emitting Diode.

Lempel-Ziv Algorithm A data compression technique used in all DLT tape drives. Named after Abraham Lempel and Jacob Ziv.

LGMR Laser Guided Magnetic Recording.

M

MAM Medium Auxiliary Memory (MAM) is an SDLT 600A tape drive feature that provides information on the status and prior use history of a Super DLTtape cartridge.

MB Megabyte. A unit of measurement equal to 1 million or 10^6 bytes.

media The material or device used to store information in a storage subsystem, such as a tape or disk drive. DLTtape media is a high-grade metal particle (MP) formulation that takes advantage of the latest advances in binder chemistry. By combining both solid and liquid lubricants in the tape binder system, tape and head wear are reduced while repelling airborne particles that could affect read/write head performance. In addition, by using a uniform particle shape, a dense binding system, a smooth coating surface, and a specially selected base file, Quantum DLTtape half-inch cartridge tapes take advantage of shorter wavelength recording schemes to ensure read compatibility with future generations of DLT drives.

MCBF Mean Cycles Between Failures. This is average cycle count between possible failures. A cycle is the movement of a cartridge from the tape drive to a magazine slot and the selection of another cartridge and moving that cartridge back to the drive.

MHz MegaHertz. A measurement of frequency in millions of cycles per second.

microsecond (μs) One millionth of a second (.000001 sec.).

millisecond (ms) One thousandth of a second (.001 sec.).

MTTR Mean Time to Repair. The average time it takes to repair a drive that has failed for some reason. This only takes into consideration the changing of the major subassemblies such as the printed circuit board or sealed housing. Component-level repair is not included in this number as this type of repair cannot be performed in the field.

MTBF Mean Time Between Failures. Reliability rating indicating the expected failure rate of a product in power on hours (POH).

MXF Material eXchange Format, is a file format designed to improve data and metadata exchange. The targeted objective is the inter operability between content creation mainframes, work stations and peripherals.

This wrapper file format was designed to make use of current and forthcoming data formats. It also permits conveyance of

metadata following standardized schemes. This metadata is used first to describe the structure of the file and its play out *structural metadata* but also to let the user specify its own metadata annotating the content of the file *descriptive metadata*.

This format is also designed to ensure the interchange of data in a streaming environment such as data tape storage or networked communications.

N

native capacity The capacity of a given media product in its basic recording format (without the use of data compression).

native mode Refers to the uncompressed storage capacity of a media subsystem. (See "native capacity".)

O

OEM Original Equipment Manufacturer.

operational pattern This term is used to designate the complexity of an MXF file. It describes the possibilities for building the *material packages*.

overwrite To write data on top of existing data thus erasing the original data.

P

parity A method of generating redundant information that can be used to detect errors in stored or transmitted data.

peak transfer rate The maximum speed with which information moves inside a tape drive or between drive and host. Usually measured in megabytes per second.

performance A measure of the speed of the drive during normal operation. Factors affecting performance are seek times, transfer rate, and command overhead.

peripheral A device added to a system as a complement to the basic central processing unit (CPU), such as a disk drive, tape drive, or printer.

POH Power-on Hours. The unit of measurement for mean time between failure (MTBF), expressed as the number of hours that the drive is powered on. See MTBF.

POST Power-on Self Test. Diagnostic programs, loaded automatically by the BIOS, that perform basic tests on the major system components, such as memory, cartridge and magazine

information. If no problems are detected during POST, the system continues the start-up process.

R

RAM Random Access Memory. an integrated circuit memory chip that allows information to be stored and retrieved by a microprocessor or controller. The information can be stored or accessed in any order, and all storage locations are equally accessible.

random access The ability to directly locate any piece of data without having to read everything in memory or on disk.

read after write A mode of operation that has the computer read back each data block immediately after it is written on the tape, checking that the data read back is the same as recorded.

read/write head The mechanism by which data is recorded onto magnetic media in a tape drive system. See read after write.

Reed-Solomon error correction An error correction technique based on research done by Irving reed and Gustave Solomon at MIT's lincoln Laboratory in the 1960s. First used to check the accuracy of data received from the Voyager spacecraft.

restore To replace data on the hard drive with data obtained from another media device.

RoHS Restrictions on Hazardous Substances is an EU directive that restricts, and in some cases bans, the use of certain compounds in the manufacture of electronic equipment. RoHS mandates that new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, poly-brominated biphenyls (PBB), or poly-brominated diphenyl ethers (PBDE).

ROM Read Only Memory. Integrated circuit chip containing programs and data that can be accessed and read but cannot be modified.

S

SAN Storage Area Network.

scalability Refers to the capability provided by the DLT tape drive family to read tapes from previous generations of drives. Allows users to upgrade to a faster, higher capacity DLT drive, yet still be able to read tape recorded on an older system. The term also refers to the ability of DLT tape library systems to be upgraded with a higher performance DLT drive and thus provide more

capacity and performance in the same footprint. See backward compatibility.

SDLT Super Digital Linear Tape.

seek The movement of a read/write head to a specific data track.

self-cleaning head Found in all DLT tape drives. Tiny ridges on either side of the DLT drive read/write head continuously wipe the tape clean as it passes over the head. This is why there is no periodic cleaning prescribed for DLT tape drives.

server A powerful computer system with a large capacity tape or hard disk drive that serves the information access and communication needs of multiple users.

shelf life The length of time that media can be stored without losing its magnetic strength. For Super DLTtape II media, this period is 30 years or more.

shock rating A rating, expressed in Gs which stands for multiples of gravity, of how much shock a tape drive can sustain without damage. Operating and non-operating shock levels are usually specified separately.

SITE This command is used for site-specific commands. Compliant to FTP norm.

SMTP Simple Mail Transfer Protocol. An e-mail protocol on the Internet that defines the message format and the message transfer agent.

SNMP Simple Network Management Protocol. A protocol that monitors and controls a network.

SNTP Simple Network Time Protocol. SNTP is based on NTP, the Network Time Protocol, an industry standard way for computers to synchronize their time to an external reference standard. NTP and SNTP are fully interoperable. Each consists of a client, for example the SuperLoader, which obtains the current time (in UTC) from either an SNTP server or an NTP one. SNTP and NTP are in wide use on the Internet. NTP is specified by RFC1305. SNTP is specified by RFC2030.

soft error A faulty data reading that does not recur if the same data is reread from the disk or corrected by ECC. Usually caused by power fluctuations or noise spikes.

SRAM Static RAM. A memory chip that requires power to hold its content.

sustained transfer rate The data transfer rate of a tape drive in native mode.

tar A UNIX operating system command that stands for "create tape archives" and/or extract files.

TCP/IP Transmission Control Protocol/Internet Protocol. A communications protocol which ensures that the total amount of bytes sent is received correctly, and also provides the routing information.

timecode Timecode information can be recorded within an MXF file. Given that an MXF file can have several outputs (MXF terminology: *material package*), each of them can be set to a different timecode.

transfer rate The rate at which the drive sends and receives data from the controller. Usually measured in megabytes per second. The SDLT 600A drive has a native transfer rate of 35 MB/s.

U

UL Underwriters Laboratories is a testing laboratory, which develops standards for consumer products, chiefly dealing with product safety.

unformatted capacity The total number of usable byes on the media, including the space that will be required later to record location, boundary definitions, and timing information. (See also native capacity.)

URL Uniform Resource Locator - The address of a site on the Internet.

V

VCCI Voluntary Control Council for Interference by Information Technology Equipment (Japan).

virtual file A kind of edit list used only for the partial restore of .mxf files. Storing a file means creating a copy of a file from your local disk and transferring it to tape. Retrieving a file is the reverse operation. A transfer can be a store or a retrieve.

volume The quantity of information written on a piece of media. Typically measured in megabytes or gigabytes.

W

Web server A computer that stores Web documents and makes them available to other computers via a web browser. A server may be dedicated, meaning its sole purpose is to be a Web server, or non-

dedicated, meaning it can be used for basic computing in addition to acting as a server.

WEEE Waste Electronic and Electrical Equipment is an EU directive that mandates that producers of electronic goods assume the responsibility of recycling WEEE and create sustainable development programs to design more easily reusable and recyclable products.

WORM Write Once, Read Many. An optical disk technology that allows the drive to store and read back data but prevents the drive from erasing information once it has been written.

write protected Files or media that cannot be changed. Use write protection when you want to protect data from being changed or destroyed. To write protect most tape cartridges, slide the write-protect tab to the "locked" position.

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