Seagate

Viper 200®

LTO Ultrium Tape Drive

Installation Manual

VIPER

ULTRIUM LTO 1

Manufacturing Part Number: 100248193

Publication T003, Rev. C4 September 04, 2002

Viper 200

LTO Ultrium Tape Drive

Installation Manual

Contents

FCC notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

If necessary, you should consult the dealer or an experienced radio/television technician for additional suggestions. You may find the booklet, *How to Identify and Resolve Radio-TV Interference Problems,* prepared by the Federal Communications Commission, helpful. This booklet (Stock No. 004-000-00345-4) is available from the U.S. Government Printing Office, Washington, DC 20402.

Warning.	Changes or modifications made to this equipment, which have not been expressly approved by Seagate, may cause radio and television interference problems that could void the user's authority to operate the equipment.

Further, this equipment complies with the limits for a Class B digital apparatus in accordance with Canadian Radio Interference Regulations ICES-003.

Cet appareil numérique de la classe B est conforme a la norme NMB-003 du Canada.

The external device drive described in this manual requires shielded interface cables to comply with FCC emission limits.

Additional Warnings:

- To prevent fire or electrical shock hazard, do not expose the unit to rain or moisture.
- To avoid electrical shock, do not open the cabinet.
- Refer servicing to qualified personnel.

Introduction

This installation manual summarizes the installation and operation of the Seagate® Viper 200® Ultrium tape drive. The Viper 200 is a high-performance eight-channel Ultrium tape drive that uses ½-inch Ultrium tape cartridges with a native capacity of up to 100 Gbytes (200 Gbytes assuming 2:1 data compression). It supports Read While Write (RWW) and provides intelligent hardware data compression as well as cartridge soft load. It comes with an ULTRA 2 WIDE SCSI LVD (LVD), an Ultra Wide SCSI HVD (HVD) or a Fibre Channel LC Optical (FC) interface and a library RS-422 serial interface.

The Viper 200 design is well suited for mid-range to high-end servers, mainframe systems, and tape library automation systems.

The internal Viper 200 is designed to fit in a 5¼-inch full-height drive bay. The external drive is a standalone unit with built-in power supply. The following Viper 200 models are covered in this manual:

Model number	Form factor	Interface
STU42001LW	5.25-inch Internal drive	LVD
STU42001WD	5.25-inch Internal drive	HVD
STU42001FC	5.25-inch Internal drive	FC
STU62001LW	External drive	LVD
STU62001WD	External drive	HVD

Note: LVD drives should be installed only in an SCSI LVD environment, HVD drives should be only be used in a SCSI HVD environment, and FC drives should only be installed in an Fibre Channel environment.

Unpacking and Inspection

Although drives are inspected and carefully packaged at the factory, damage may occur during shipping. Follow these steps for unpacking the drive.

1. Visually inspect the shipping containers and notify your carrier immediately of any damage.
2. Place shipping containers on a flat, clean, stable surface; then carefully remove and verify the contents against the packing list. If parts are missing or the equipment is damaged, notify your Seagate representative.
3. Save the containers and packing materials in case you ever have to reship the drive.

Installing an internal HVD or LVD Viper 200

This section describes the steps necessary to install an internal Viper 200 drive with an Ultra 2 Wide SCSI LVD or Ultra Wide SCSI HVD interface. For instructions on installing a Fibre Channel drive, see page 15. For instructions on installing an external HVD or LVD drive, see page 23.

Before you begin

The following guidelines and cautions apply to handling and installing internal tape drives. Keep them in mind as you install the drive.

- Determine if the drive is an FC, HVD or an LVD model. Install an HVD drive only in an HVD environment, and an LVD model only in an LVD environment. Do not mix HVD and LVD devices. Look at the label above the drive's connector to determine if the drive is an FC, HVD or an LVD model:

LVD label:

HVD label:

FC label:

Caution.	Plugging an HVD drive into an LVD bus or vice versa will make the entire bus non-functional and may permanently damage the drive or other SCSI devices on the bus.

- Because the Viper 200 drive can transmit data at up to 80 Mbytes/second, it is recommended that a maximum of two Vipers be connected to one SCSI host adapter.
- Internal drives contain some exposed components that are sensitive to static electricity. To reduce the possibility of damage from static discharge, the drives are shipped in a protective antistatic bag. Do not remove the drive from the antistatic bag until you are ready to install it.
- Before you remove the drive from the antistatic bag, touch a metal or grounded surface to discharge any static electricity buildup from your body.

- Always lay the drive either on top of the antistatic bag or place it inside of the bag to reduce the chance of damage from static discharge.

Configuring an internal HVD or LVD drive

Before you install the tape drive in your computer, you may need to configure the drive's SCSI ID and other drive features. Jumpers located on the back of the drive (near the left edge of the drive) are used to configure the SCSI ID and to enable termination power.

Default settings

The default drive settings for the Viper 200 are listed below:

- **SCSI ID:** 6
- **Termination Power:** disabled.

If these default settings are appropriate for your needs, skip ahead to "Mounting an internal HVD or LVD drive" on page 10.

Jumper settings

Configuration jumpers on the back of the drive control the drive's SCSI ID and SCSI terminator power. The jumpers can also be used for remote SCSI address selection. Figure 1 on the following page shows the locations of the jumper blocks for the internal Viper 200.

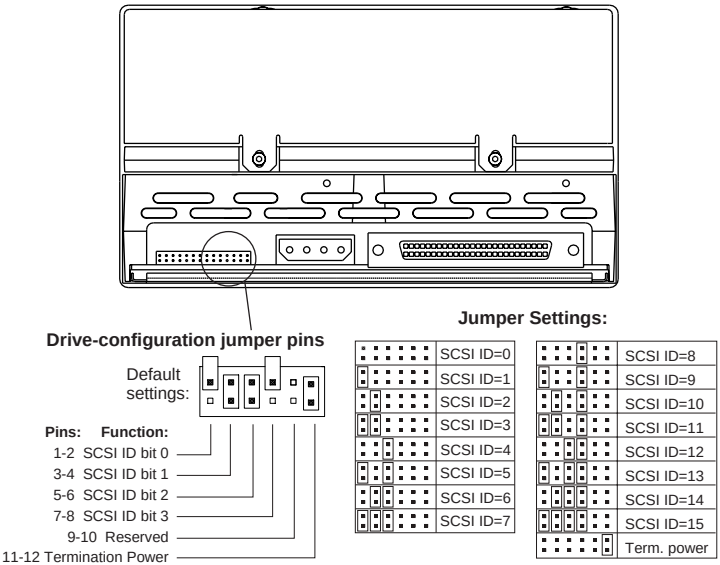


Figure 1. Jumper settings for the internal Viper 200 with LVD or HVD interface

SCSI Address Selection (pins 1 through 8)

You can select the SCSI address used by the drive by placing the appropriate jumpers on pin-pairs 1-2 through 7-8, as shown in Figure 1.

Note: Each SCSI device on a bus must have a unique SCSI ID. The SCSI controller or host adapter generally uses ID 7. In some systems, the boot drive uses ID 0 or ID 1.

Terminator power (pins 11 and 12)

Internal HVD and LVD Viper 200 drives are shipped with terminator power disabled, as shown in Figure 1. You can enable terminator power, if necessary, by placing a jumper across pins 11 and 12.

Note: The internal Viper 200 does *not* provide SCSI termination. Thus, a terminator must be installed on the drive if it is the last device in a SCSI chain. See “SCSI termination” on page 13 for more information.

Mounting an internal HVD or LVD drive

You can mount the internal Viper 200 either horizontally or vertically with the drives left side facing up (see Figure 2). If a drive is mounted vertically, the left side of the drive must face up and the side of the drive should be within 5 degrees of horizontal. If a drive is mounted horizontally, the base of the drive must be within 15 degrees of horizontal and the PCB side of the drive must face down.

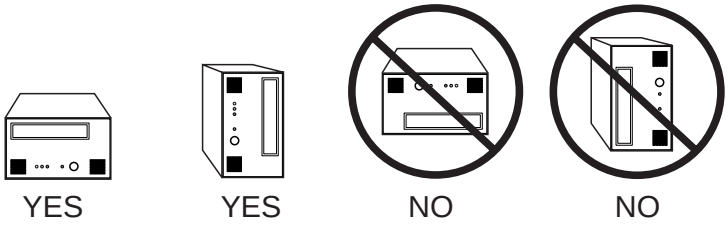


Figure 2. Acceptable mounting orientations for the internal Viper 200

Mount the drive in a 5.25-inch, full-height drive bay and secure it using two M3.0 metric screws on each side of the drive. The locations of screw holes are shown in Figure 3 on the following page. Do not use screws longer than 5 mm or you may damage the drive.

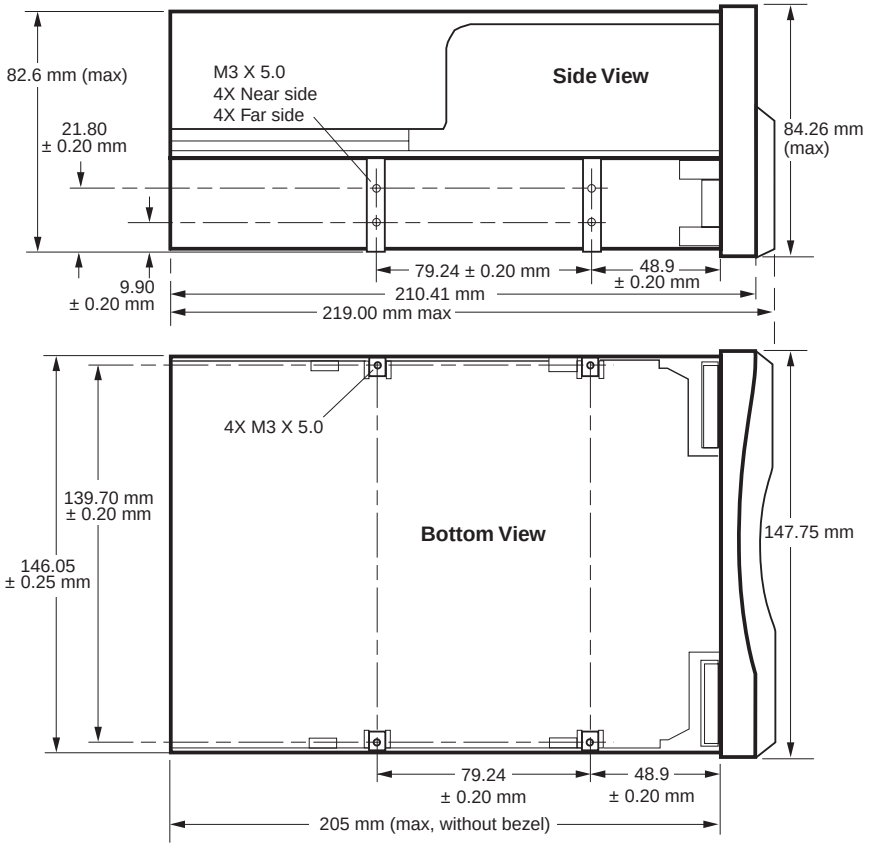


Figure 3. Viper 200 mounting dimensions

Cables and connectors (internal HVD or LVD drive)

Connecting the SCSI interface cable

Viper 200 drives are designed to be used with an Ultra2 SCSI interface with a 68-pin HVD or LVD SCSI connector. Before attaching or detaching cables, turn off all power to the drive and computer. Attach the interface cable to the 68-pin SCSI interface connector on the back of the drive (see Figure 4).

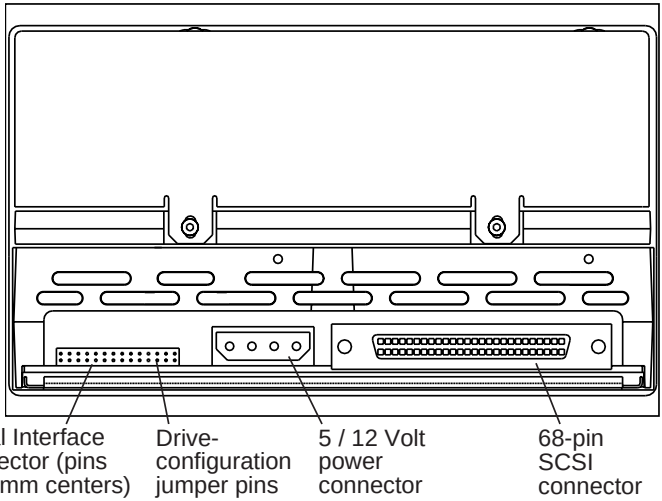


Figure 4. Rear view of the Viper 200 internal drive

Install an HVD drive only in an HVD environment and an LVD drive only in an LVD environment. Do not mix HVD and LVD devices. Look at the label above the drive's SCSI connector to determine if the drive is an HVD or an LVD model:

LVD label:

HVD label:

FC label:

Caution.	Plugging an HVD drive into an LVD bus or vice versa will make the entire bus non-functional and may permanently damage the drive or other SCSI devices on the bus.

SCSI Termination

The Viper 200 internal drive does *not* provide SCSI termination. You must place a SCSI bus terminator or a SCSI device with termination enabled at the end of a SCSI chain. Two examples of SCSI termination are shown in Figure 5. The Viper 200 does provide terminator power if a jumper is placed on the termination power jumper, as shown in Figure 1 on page 10.

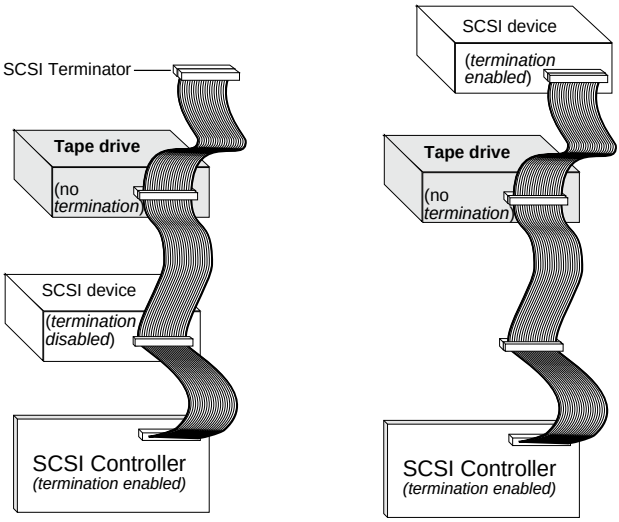


Figure 5. Two possible SCSI termination examples for internal Viper 200.

Connecting a Serial Interface Cable (for tape libraries)

The Viper 200 drive includes an RS-422 serial interface for tape libraries. The RS-422 serial interface connector is on the lower left side of the back of the drive, as shown in Figure 4 on the previous page. The pin descriptions for the Serial Interface connector are shown in the table on the following page. These pins are on 2-mm centers.

Pin numbers	Description
1 through 8	Reserved (do not use)
9	Lib RXD-P (input to drive)
10	GND
11	Lib RXD-N (input to drive)
12	GND
13	Lib TXD-P (output from drive)
14	GND
15	Lib TXD-N (output from drive)
16	GND

Connecting a Power Cable

Attach a four-pin 5-volt / 12-volt power cable to the power connector on the back of the drive. Figure 6 shows the location of the power connector.

The recommended 4-pin power connector for the internal Viper 200 is an AMP 1-48024-0 housing with AMP 60617-1 pins or equivalent.

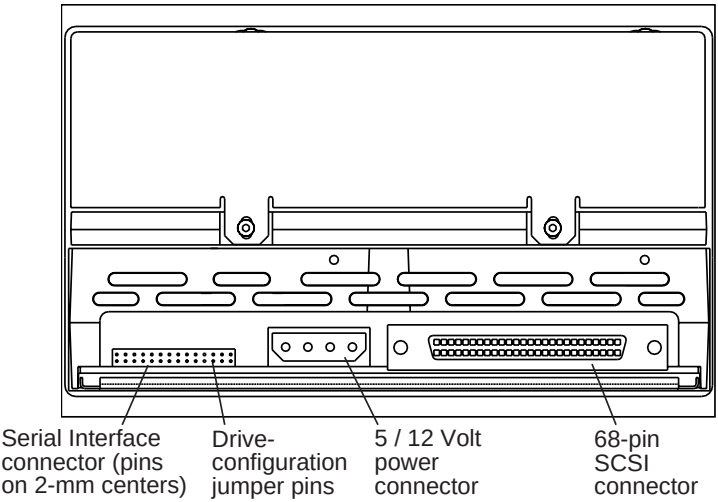


Figure 6. Rear view of the Viper 200 internal drive, showing 4-pin power connector

Installing an internal Fibre Channel Viper 200

This section describes the steps necessary to install an internal Viper 200 with a Fibre Channel LC Optical (FC) interface. For instructions on installing a drive with an Ultra 2 Wide SCSI LVD or Ultra Wide SCSI HVD interface, see page 7. For instructions on installing an external HVD or LVD drive, see page 23.

Before you begin

The following guidelines and cautions apply to handling and installing internal tape drives. Keep them in mind as you install the drive.

- Make sure your drive is an FC model. Install an FC model only in a Fibre Channel environment. Look at the label above the drive's connector to determine if the drive is an FC, HVD or an LVD model:

LVD label: 

HVD label: 

FC label: 

- The Viper 200 drive can transmit data at an instantaneous rate of 106.25 Mbytes/second and a sustained rate of 80 Mbytes/second. In a Fibre Channel loop environment, the maximum number of drives that can be used simultaneously depends on the bandwidth of the loop.
- Internal drives contain some exposed components that are sensitive to static electricity. To reduce the possibility of damage from static discharge, the drives are shipped in a protective antistatic bag. Do not remove the drive from the antistatic bag until you are ready to install it.
- Before you remove the drive from the antistatic bag, touch a metal or grounded surface to discharge any static electricity buildup from your body.

- Always lay the drive either on top of the antistatic bag or place it inside of the bag to reduce the chance of damage from static discharge.

Configuring an internal Fibre Channel drive

Before you install the tape drive in your computer, you may need to configure the drive's hard-assigned loop identifier and other drive features. Jumpers located on the back of the drive (see Figure 7) are used to configure the ID.

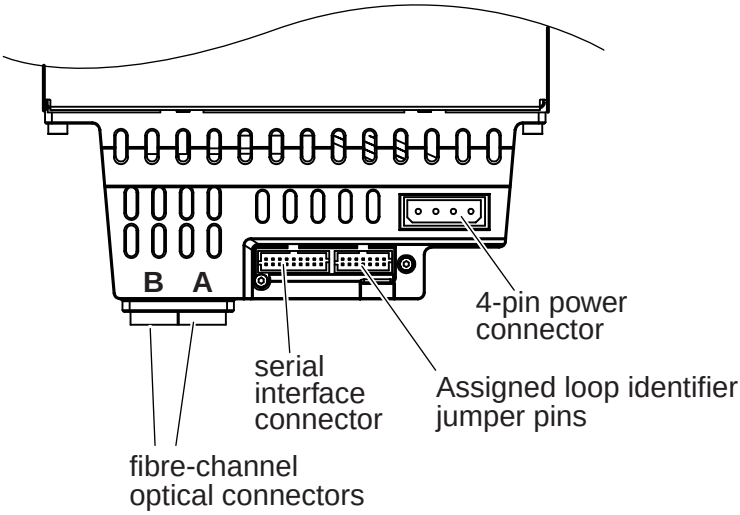


Figure 7. Connectors and jumpers on the back of the Viper 200 Fibre Channel drive

Jumper settings

Configuration jumpers on the back of the drive control the assigned loop identifier, which the drive will attempt to acquire during the LIHA (hard address) phase of the Loop Initialization Process (LIP). The jumpers can also be used for remote ID selection. Figure 8 shows the location of the assigned loop identifier jumper pins on the Viper 200 FC drive.

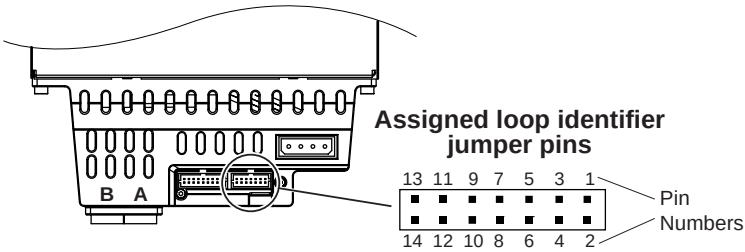


Figure 8. Assigned loop identifier jumper pins for the internal FC Viper 200

You can select the hard ID used by the drive by placing jumpers on the appropriate assigned loop identifier jumper pins. The seven sets of jumpers represent seven binary digits, with the lowest binary weight (2^0) on the left (pins 13-14) and the highest binary weight (2^6) on the right (pins 1-2). If a jumper is placed on a set of pins (ON), the bit is set as a "1." If no jumper is on a set of pins, the bit is set as "0."

The assigned loop identifier can be set from 0 to 125 (7Eh). The Viper 200 FC is shipped with no jumpers in place (an ID of 0000000).

The table below illustrates the system used for ID selection. "ON" indicates a jumper installed on the pins indicated. Blank cells indicate pins without a jumper installed.

	Jumper Pins (blank indicates no jumper)						
Loop ID	**13-14**	**11-12**	**9-10**	**7-8**	**5-6**	**3-4**	**1-2**
0							
1	ON						
2		ON					
3	ON	ON					
4			ON				
5	ON		ON				
6		ON	ON				
….							
125	ON	ON	ON	ON	ON		ON

Note: Setting an invalid ID (7Fh or 7Eh) will cause the drive not to participate in LIHA and to instead attempt to acquire an address during the LISA (soft address) phase of LIP.

Mounting an internal Fibre Channel drive

You can mount the internal Viper 200 either horizontally or vertically with the drives left side facing up (see Figure 9). If a drive is mounted vertically, the side of the drive should be within 5 degrees of horizontal. If a drive is mounted horizontally, the base of the drive must be within 15 degrees of horizontal and the PCB side of the drive must face down.

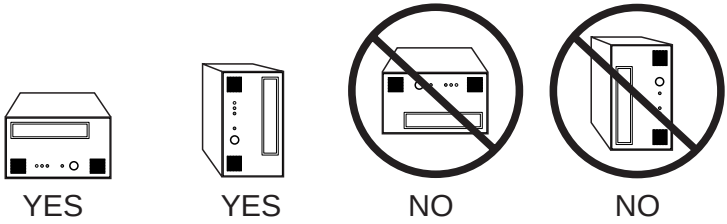


Figure 9. Acceptable mounting orientations for the internal Viper 200

Mount the drive in a 5.25-inch, full-height drive bay and secure it using two M3.0 metric screws on each side of the drive. The locations of screw holes are shown in Figure 10 on the following page. Do not use screws longer than 5 mm or you may damage the drive.

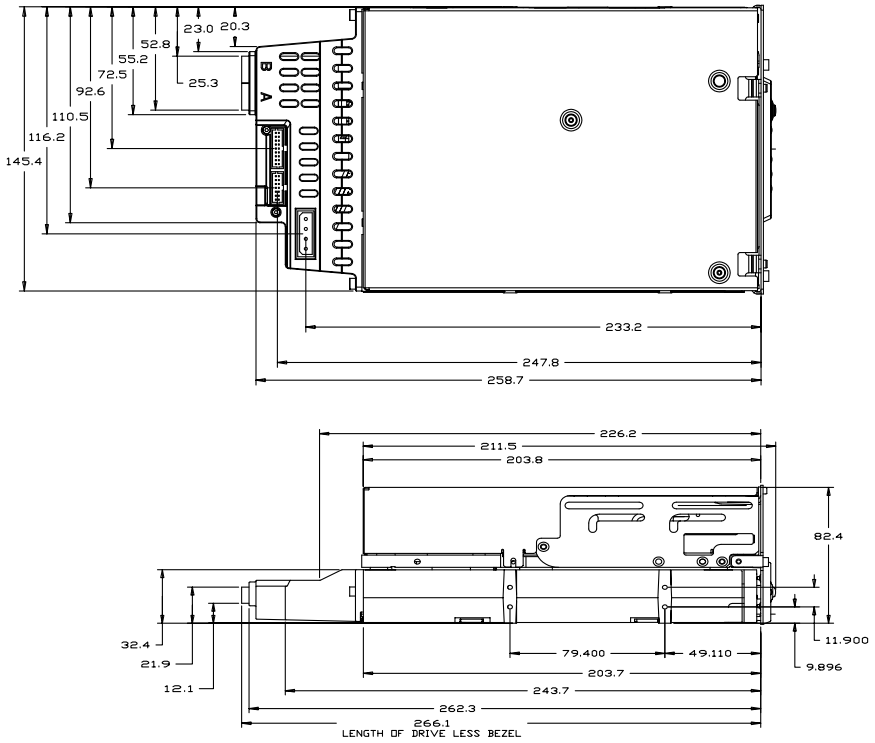


Figure 10. Mounting dimensions for the internal Viper 200 with Fibre Channel interface connector

Cables and connectors (internal Fibre Channel drive)

Connecting the Fibre Channel interface cable

Viper 200 FC drives are 100-M5-SN-I compliant and use LC style connectors. Either 50 or 62.5µm multimode optical fiber cables may be used. Attach the interface cable to either of the two LC optical interface connectors on the back of the drive (labeled A and B in Figure 11).

In systems that support “failover,” both ports can be connected through separate loops or fabrics to the same set of host computers. This way, if one connection fails, the other can be used to continue the data transfer.

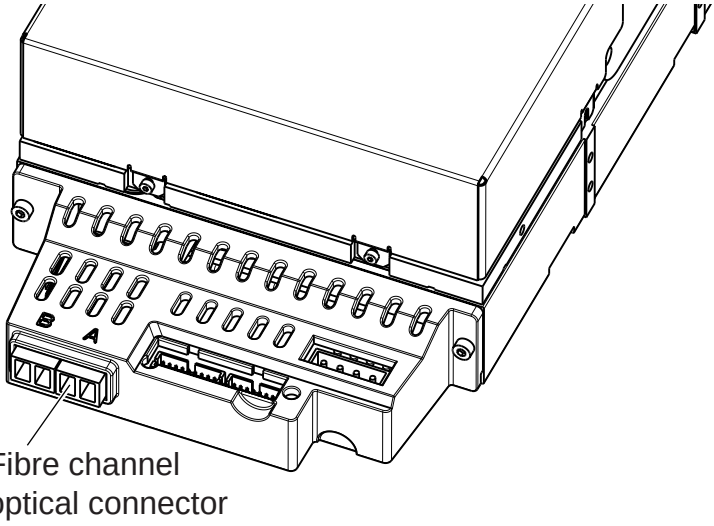


Figure 11. Rear view of the Viper 200 FC internal drive showing fibre channel optical connectors

Connecting a Serial Interface Cable (for tape libraries)

The Viper 200 drive includes an RS-422 serial interface for tape libraries. The RS-422 serial interface connector is on the top of the extension on the back of the drive, as shown in Figure 12.

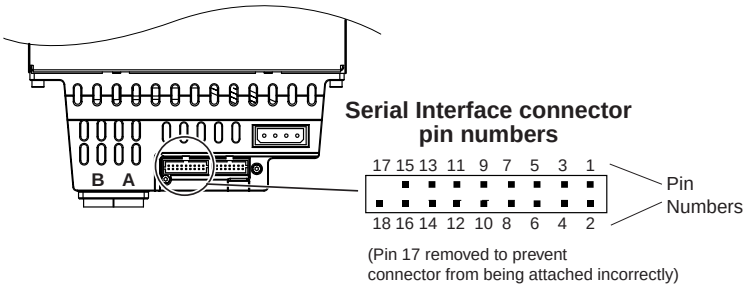


Figure 12. Rear view of the Viper 200 FC internal drive showing fibre channel optical connectors

Pin and signal descriptions for the Serial Interface connector are shown in the table below. These pins are on 2-mm centers.

Pin 1 is used by the drive to detect the presence of a tape library. The serial interface cable must connect this pin to the adjacent pin 3.

Pin number	Description
1	Library detect (cable should connect pin 1 to pin 3)
2	Lib TXn (output from drive, transmit negative)
3	GND
4	Lib TXp (output from drive, transmit positive)
5	GND
6	Lib RXn (input to drive, receive negative)
7	GND
8	Lib RXp (input to drive, receive positive)
9 through 18	Reserved (do not use)

Connecting a Power Cable

Attach a standard four-pin 5-volt / 12-volt power cable to the power connector on the top of the extension on the back of the drive. Figure 13 shows the location of the power connector.

The recommended 4-pin power connector for the internal Viper 200 is an AMP 1-48024-0 housing with AMP 60617-1 pins or equivalent.

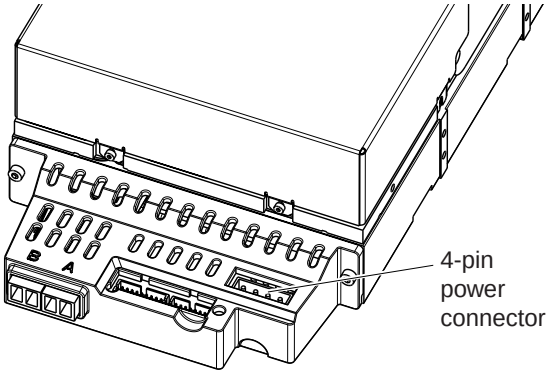


Figure 13. Rear view of the Viper 200 FC internal drive, showing 4-pin power connector

Installing an external Viper 200

The external Viper 200 drives (STU62001LW and ST62001WD) are compact external units that connect to the host computer through an external SCSI port. Installing the external drive involves the three simple steps: configuring the drive, attaching the SCSI cable(s), and attaching the power cord.

Configuring an external drive

Setting the SCSI ID

Make sure that the drive is turned off. Then set the SCSI ID for the drive using the push-button switch on the back of the external drive, as shown in Figure 14. The change will take effect when you turn the drive back on.

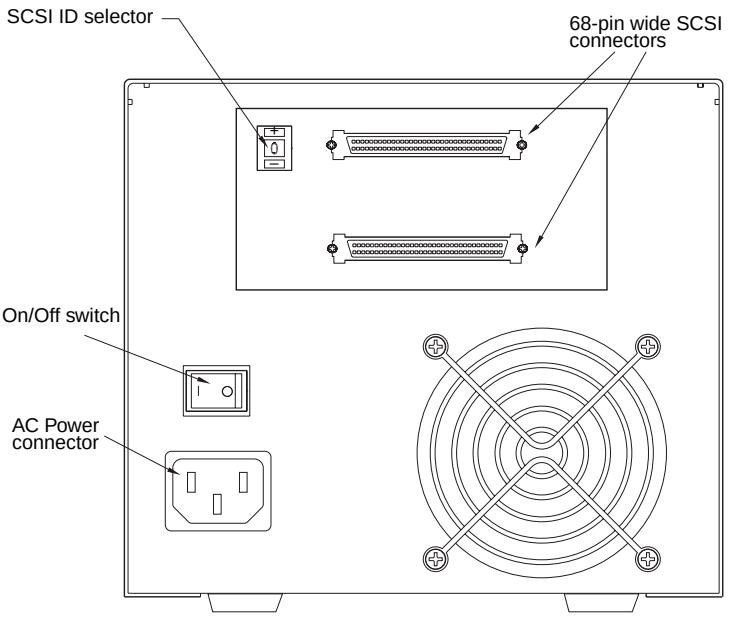


Figure 14. Back of external Viper 200 showing switches and connectors

Connecting the SCSI interface cable

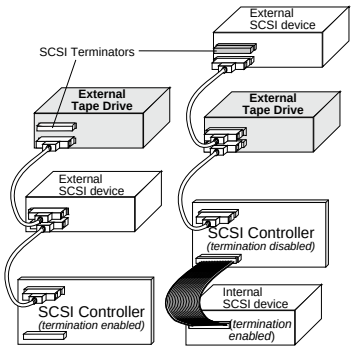
The external Viper 200 provides two 68-pin, shielded connectors on the rear panel of the enclosure (as shown in Figure 14). Either connector can be used as a SCSI IN or SCSI OUT connection, so you can use either connector to attach the drive to a host computer or to another SCSI device.

Note: Turn off all power before connecting or disconnecting SCSI cables.

SCSI termination

If the Viper drive is the last device or the only device in a SCSI chain, you must install a terminating plug on the unused SCSI connector. See Figure 15 below for two SCSI termination examples. You can purchase terminating plugs on the web at http://buytape.seagate.com.

Note. Termination power is enabled as a default for the external Viper 200 drive.



Example 1: SCSI termination in a system that has only external SCSI devices.

Example 2: SCSI termination in a system that has both internal and external SCSI devices.

Figure 15. SCSI termination examples (external drive)

Connecting the power cord

Attach the power cord securely to the power connector on the back of the drive (see Figure 14 on the previous page).

Operating and maintaining the Viper 200

This chapter describes how to use your Viper 200. It explains the meaning of the LEDs on the front of the drive and describes how to use and care for the Ultrium tape drive and Ultrium cartridges.

Front Panel Display

There are several front panels available for the Viper 200. Different panels may be used, depending on whether the drive will be used in an automation environment, such as a tape library, or as a stand-alone drive. A generalized view of the front-panel display is shown in Figure 16.

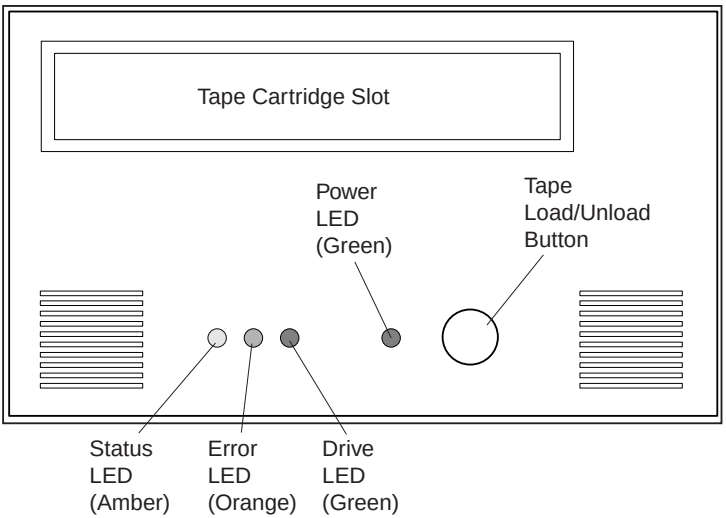


Figure 16. Generic front panel display for Viper 200

All Viper 200 drives have a Load/Unload button on the front panel. All drives also have four LEDs on the front panel. The functions, colors and status of the lights are summarized in the following paragraphs.

- **Status LED** (amber) – If the Status LED stays on continuously, the drive needs to be cleaned. Other changes in drive or cartridge status are indicated by

various blinking patterns, which are described in the table below.

- **Error LED** (orange) – The Error LED blinks if the drive has experienced a non-recoverable error.
- **Drive LED** (green) – The Drive LED is lit whenever a tape is loaded and ready for use. The Drive LED blinks whenever a tape is loaded and moving.
- **Power LED** (green) – The Power LED blinks during drive power-up and Power-on Self Test (POST). If there is an error during the POST, the Power LED remains on (not blinking), along with the Status LED. During normal operation, the Power LED remains on (not blinking).

The following table summarizes all the “blink codes” used by the Viper 200.

Drive Condition	Status LED (Amber)	Error LED (Orange)	Drive LED (Green)
Cleaning Request	ON		
Write Protected	1/4 sec ON 1/4 sec OFF		
Prevent Media Removal Mode Active	1/2 sec ON 1/8 sec OFF		
Hardware or Firmware Error		1/8 sec ON 1/8 sec OFF	
Positioning – Loading, Unloading, Rewinding, Spacing or Locating			ON continuously
Tape Active – Writing, Reading or Verifying			1/2 sec ON 1/8 sec OFF
SCSI Active			1/4 sec ON 1/8 sec OFF
Manual Intervention Required	1/8 sec ON 1/8 sec OFF	1/8 sec ON 1/8 sec OFF	
Power On Self Test (POST) Failure	ON	1/2 sec ON 1/2 sec OFF	
Excessive Rewrites or Read C2 errors		1/4 sec ON 1/4 sec OFF	1/8 sec ON 1/8 sec OFF
Cleaning Cartridge Present	ON		ON
Cleaning Cartridge at EOT	1/8 sec ON 1/8 sec OFF		ON
SCSI bus reset	1/4 sec ON 1/8 sec OFF		1/4 sec ON 1/8 sec OFF
Servo Initialization	1/2 sec ON		1/2 sec ON

Drive Condition	Status LED (Amber)	Error LED (Orange)	Drive LED (Green)
	1/2 sec OFF		1/2 sec OFF
Power On Self Test (POST) In Progress	1/4 sec ON 1/4 sec OFF	1/4 sec ON 1/4 sec OFF	1/4 sec ON 1/4 sec OFF
Cleaning Failure	1/8 sec ON 1/8 sec OFF	1/8 sec ON 1/8 sec OFF	ON
Microcode Download	1/8 sec ON 1/8 sec OFF	1/4 sec ON 1/4 sec OFF	1/8 sec ON 1/8 sec OFF
Microcode Download Error	1/8 sec ON 1/8 sec OFF	1/8 sec ON 1/8 sec OFF	1/8 sec ON 1/8 sec OFF

Using Ultrium Cartridges

Loading a cartridge

To load an Ultrium cartridge into the Viper 200, place the cartridge in the slot and then push it to the detent. Then:

- Continue to push the cartridge the rest of the way into the drive; or
- Press the load/unload button on the front of the drive to seat the cartridge; or
- Use a library or host command to finish loading the tape.

After you insert the cartridge, there will be a brief delay while the drive identifies the cartridge type and state and moves the tape to the data area.

Unloading a cartridge

To unload an Ultrium cartridge from the Viper 200, either:

- Push the load/unload button on the front of the drive; or
- Use a library or host command to unload the tape.

Caution.	Several seconds may elapse between the time you press the eject button and the time the cartridge is ejected. Do not power down the tape drive or the host computer until the Viper 200 has completely ejected the cartridge.

Using a Blank Cartridge

A blank cartridge has prewritten servo patterns and cannot be bulk erased. New cartridges should be retensioned before use.

Write-protecting a cartridge

Ultrium cartridges have a sliding write-protect switch near the back right corner of the cartridge, as shown in Figure 17. If you slide the switch to the position farthest from the corner of the cartridge, data can be read from the cartridge but not written to it. If you slide the switch all the way toward the corner (as shown in Figure 17 below), data can be both read from and written to the cartridge.

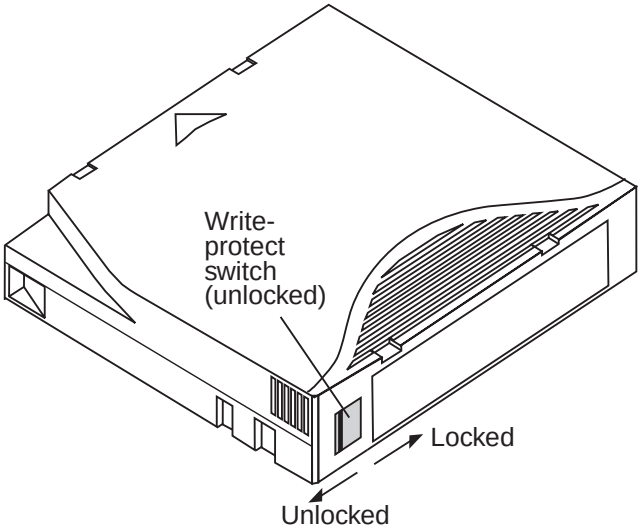


Figure 17. Ultrium cartridge showing write-protect switch

Cartridge handling and maintenance

To protect the data on your Ultrium data cartridges, observe the following precautions:

- Always remove the cartridge from the drive when not in use and store it in its protective case.
- Do not expose cartridges to dirt, dust or moisture.

- Do not touch the tape media within a cartridge.
- Do not use data cartridges outside the specified operating conditions: 10° C to 45° C, 10% to 80% relative humidity.

  If a data cartridge has been exposed to temperature or humidity changes within the limits listed above, allow the tape cartridge to acclimate to its surroundings for at least one hour before use. Then retension the tape (as described below) to allow the tape pack to become stable, for better performance.

  If, during storage and/or transportation, a data cartridge has been exposed to conditions outside the above range, it must be conditioned before use in the operating environment. The conditioning process requires exposure to the operating environment for a time equal to, or greater than, the time away from the operating environment, up to a maximum of 24 hours. The data cartridge should then be retensioned (as described below).
- Keep the cartridge away from direct sunlight and heat sources, such as radiators, heaters or warm air ducts.
- Keep the cartridge away from sources of electromagnetic fields, such as telephones, computer monitors, dictation equipment, mechanical or printing calculators, motors, magnetic tools, and bulk erasers.
- Avoid dropping the cartridges. This can damage components inside the cartridge, possibly rendering the tape unusable. If a tape is dropped it is advisable to open the cartridge door and make sure that the leader pin is in the correct position. A dropped cartridge should be re-tensioned before use.
- Do not bulk erase Ultrium cartridges. Bulk-erased cartridges cannot be reformatted by the tape drive and will be rendered unusable.

Tape Retensioning

Retensioning reduces pack shift and stabilizes the tape pack. See your backup software manual for instructions on how to

retension a tape cartridge. You should retension a tape cartridge under the following circumstances:

- If the cartridge is being used for the first time.
- If the tape cartridge has not been used for over a month.
- If the tape cartridge has been exposed to changes in temperature (first allow the media to acclimate to its surroundings).

Drive maintenance

Cleaning the tape drive

Excessive tape debris or other material may accumulate on the tape heads if the drive is used with non-approved media or operated in a hot, dusty environment. In this case, the drive may experience excessive errors while reading or writing, and the amber Status LED will remain on during operation. This means that the drive heads need to be cleaned.

The LTO cleaning cartridge has the same dimensions as the data cartridge and contains an LTO-CM (Cartridge Memory), but is loaded with cleaning media instead of recording media. Always keep the cleaning cartridge in its protective case when not in use.

To clean the drive, insert a Seagate-approved cleaning cartridge. During the cleaning process, both the Status and Drive LEDs will remain lit. After the cleaning process is completed, the cartridge may be ejected automatically, or you may need to press the Eject button to remove the cartridge. Each time you use the cleaning cartridge, write the date on the label for future reference.

Note: If the Status LED comes on continuously within 24 hours after a cleaning cycle, run the cleaning cycle again. If, after three cleaning cycles in a 72-hour period, the Status LED lights up again, contact Seagate technical support.

Each time the drive is cleaned, the cleaning tape advances to a new, unused section of media. After approximately 50

cleanings, all of the media will be used up and you must purchase a new cleaning cartridge. When a cleaning cartridge is used up, the amber Status LED flashes while the green Drive LED remains on. Do not attempt to reuse a spent cleaning cartridge

Note: The cleaning procedure will not run and the cleaning cartridge will be ejected in the following circumstances:

- The drive does not recognize the cartridge as an LTO cleaning cartridge.
- The cleaning cartridge has been used too recently. (The drive tries to prevent excessive cleaning, which can cause wear on the heads.)
- All of the tape on the cleaning cartridge has been used up (at EOT). In this case, the Status LED will flash rapidly while the Drive LED remains on.

Parking the drive for shipping

Seagate recommends that you "park" the Viper 200 before shipping it or placing it in an environment where it may be subject to physical shock. Parking the drive moves the tape mechanism to the configuration that is resilient to shock. You can park the Viper 200 using the Load/Unload button on the front of the drive, or by running special software on your host system. In either case, the drive must be powered up in order to enter park mode.

Parking the drive using the load/unload button

To park a drive manually, press and hold the load/unload button for 15 seconds or more. After you release the load/unload button, the green Drive LED lights up and the parking process begins. During the parking process, the picker arm moves into the take-up reel and the cartridge carrier moves to the load (down) position. After the process is complete, the Drive LED goes off, indicating that the drive has been successfully parked.

After parking the drive, you can turn the drive off and pack it for shipping. When you turn the drive on again, it will automatically return to normal operating mode.

If you need to unpark the drive without cycling power, press and hold the load/unload button for more than 5 seconds but less than 15 seconds.

Parking the drive using software

You can also park a Viper 200 using the diagnostic software that communicates with the drive through its SCSI interface. This utility program, called Seagate Tape Diagnostics (STDIAG), is available on the Viper Resource CD and from the technical support section of the Seagate web site, at www.seagate.com/support. This utility software supports firmware downloading and several Viper commands, one of which can be used to park the Viper 200.

After copying the software to your system, you can park the Viper 200 by selecting *park* on the dialog box (Windows version) or by launching the following command-line function:

diagsv park –id:x (*where x is the SCSI ID of the drive*)

To return the drive to normal operational mode, you can either turn the drive off and then turn it on again, or selecting *unpark* on the diagnostic software dialog box (Windows version) or by launching the following command-line function:

diagsv unpark –id:x (*where x is the SCSI ID of the drive*)

See the diagnostic user guide for software installation details and command syntax for non-Windows operating systems.

Emergency reset and emergency cartridge eject

If the Viper 200 ever stops communicating with the host computer, use the following procedure to reset the drive and eject a cartridge (if necessary).

Caution.	When you perform an emergency cartridge eject, any data currently in the drive or host's buffers will *not* be written to the tape and the tape record may not be correctly terminated with an End of Data mark. If the End of Data mark is not written to the tape, it will be impossible to append any data to that tape, unless you overwrite the existing data on the tape.

To perform an emergency reset, hold down the load/unload button for five seconds, and then release it. If there is no tape in the drive, the drive firmware reboots the drive and begins the power-on self-test sequence.

If there is a tape in the drive when you perform an emergency reset, the drive ignores all outstanding SCSI commands and ejects the tape. The drive then reboots and begins the power-on self-test sequence.

If the procedures above do not cause the cartridge to be ejected from the drive, it may be necessary to remove the cartridge manually, as described below.

Manual cartridge removal

The remainder of this section provides instructions for manually removing a data cartridge from an internal Viper drive. This should *only* be done if the cartridge cannot be removed by pushing the buttons on the front of the drive or by issuing commands from a host device. This should only be necessary if you must remove a data cartridge prior to returning the drive to Seagate.

Caution:	After following these procedures, you *must* return the drive to Seagate for repair. Do *not* attempt to use the drive until after it has been serviced.

Before you start

1. Issue all possible commands and run diagnostics prior to using the procedures in this manual.
2. Turn off all power to the drive.
3. Unplug all connectors to the drive.

4. Remove the drive from its operating environment.
5. Place the drive on a workbench with proper ESD grounding: attach a wrist strap to the bench and the other end to your wrist.
6. Remove the top cover of the drive by removing eight screws. (You will need a 1.5-mm hex driver).

   Note. Do NOT remove the front bezel or the bottom cover from the drive.

7. Inspect the drive to determine which procedure you should follow:

   - Case 1: The cartridge is loaded and the leader pin is still in the cartridge (see Figure 18). Follow the procedure on page 34.
   - Case 2: The cartridge is loaded and seated, and the tape is threaded or partially threaded on the take-up hub. Follow the procedure on page 36.

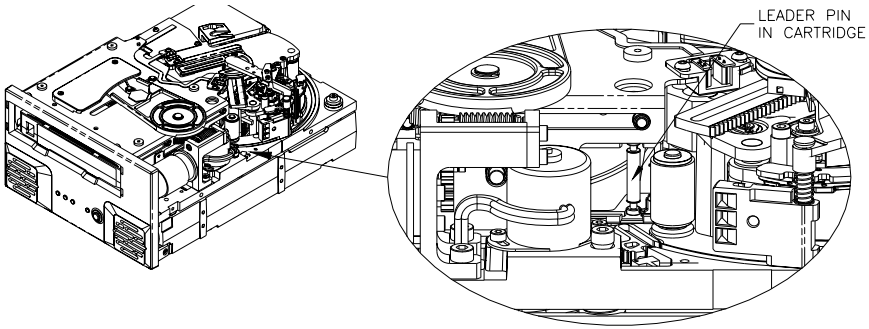


Figure 18. Diagram of Viper 200 showing leader pin inside LTO cartridge (tape* not *threaded on take-up hub)

Case 1: Cartridge is loaded and seated

If the cartridge is loaded and seated and the leader pin is still inside the cartridge, follow these steps to remove the cartridge. To remove the cartridge you will need a small, flat-blade screwdriver

1. Verify that the leader pin is still inside the cartridge as shown in Figure 18 on the previous page. If the leader pin

has been pulled out of the cartridge and is still in the tape path, follow the steps in ***Case 2: Cartridge is loaded and tape is partially threaded*** on the following page.

2. Use a flat-blade screwdriver to turn the worm gear counter clockwise (to the left). Figure 19 shows the location of the worm gear. This will gradually raise the cartridge elevator and cause the cartridge to slide partially out of the drive.

Note. Do not touch any other part of the drive mechanism during this process.

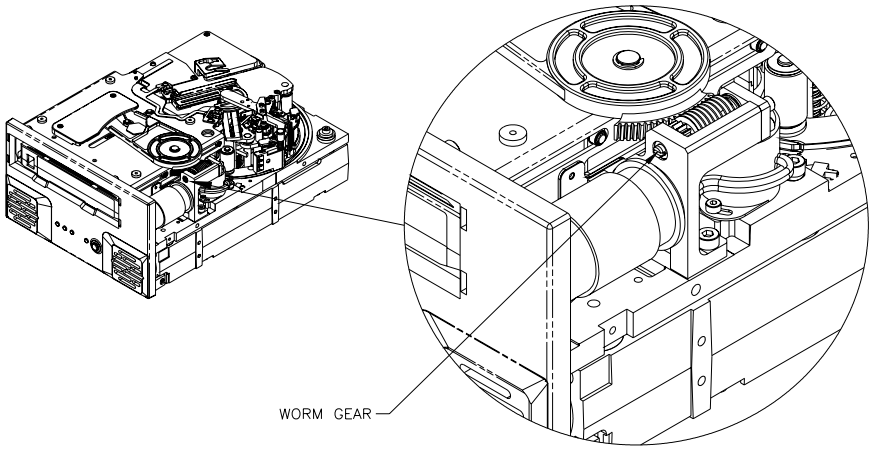


Figure 19. Diagram of Viper 200 showing worm gear

3. Continue turning the worm gear until the cartridge is sticking out of the unit approximately 17 mm (0.66”). Then carefully pull the cartridge out by hand.

4. After you have removed the cartridge, put the top cover back on the drive; then replace and tighten the screws.

5. Return the drive to Seagate.

Caution. Do NOT use the drive after you have removed a cartridge. The drive must be returned to Seagate for servicing.

If you have any questions on this process, contact Seagate Technical Support for Tape Products (see the last chapter of this manual for contact numbers).

Case 2. Cartridge is loaded and seated and tape is threaded

Follow these steps if the cartridge is loaded and seated, and the tape is entirely or partially threaded into the drive. You will need a small, flat-blade screwdriver and a 1.5-mm hex wrench. Figure 20 shows key components of the drive mechanism that are referred to in the text below.

Note. Do not touch any part of the drive mechanism except for the components specified in the instructions. Be especially careful not to touch the tape head assembly. The MR elements in this assembly are highly susceptible to damage from static electricity.

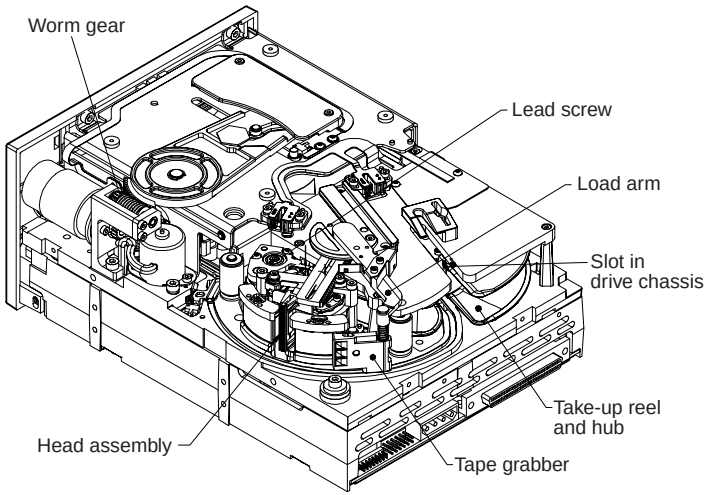


Figure 20. Diagram of Viper 200 showing key components used in manual cartridge removal (no tape cartridge in drive)

1. Make sure the head assembly is in the lowered position by turning the lead screw (shown in Figure 21) clockwise with the flat blade screwdriver. This is necessary to allow the load arm to clear the head assembly when it is moved back toward the cartridge.

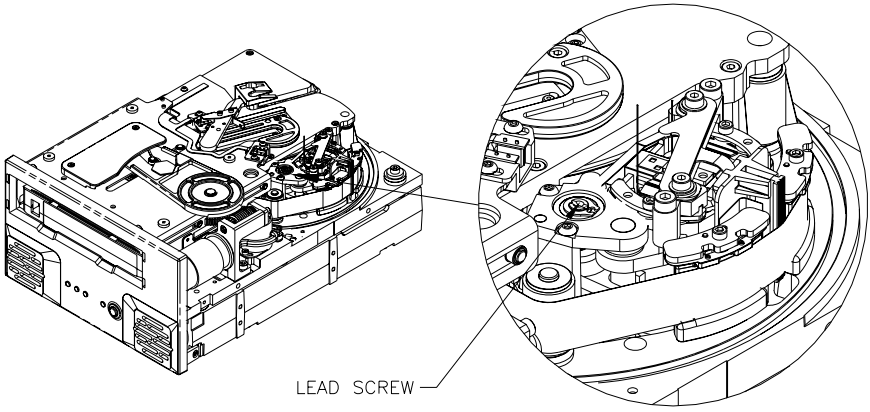


Figure 21. Diagram of Viper 200 showing lead screw (tape threaded on take-up reel)

2. Replace the drive cover to protect the gear and spooling assemblies. You do not need to replace all the screws.

3. Turn the drive upside down.

4. Insert the 1.5-mm hex wrench through the hole in the bottom plate shown in Figure 22. Turn the hex wrench clockwise slowly and smoothly to rewind the tape into the cartridge. This may take some time.

Caution: If you turn the hex wrench quickly or unevenly, you may create a tape loop, which could cause tape contamination.

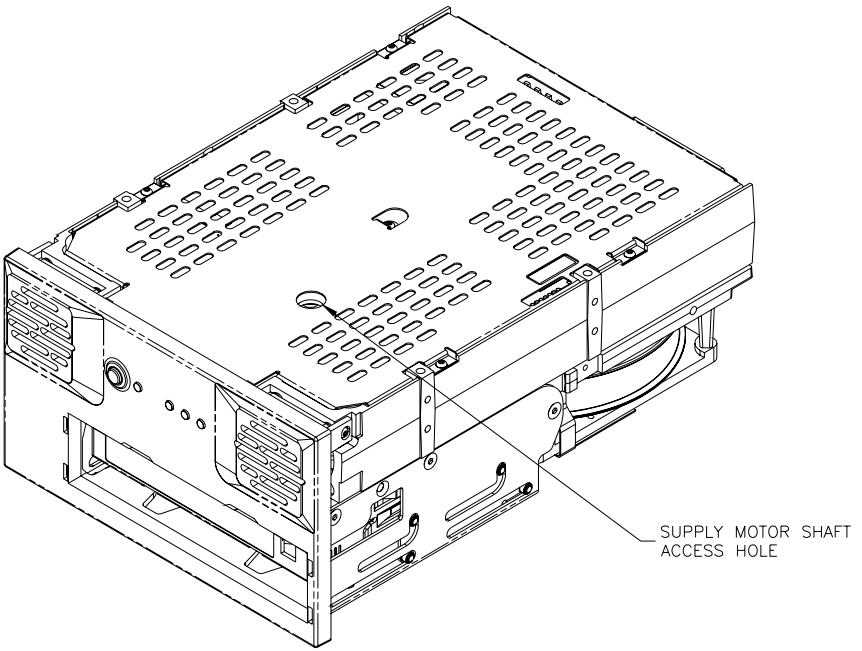


Figure 22. Diagram of underside of Viper 200 showing supply motor access hole

5. When all of the tape has been spooled off of the take-up reel, turn the drive right side up.

6. Rotate the hub to align the slot in the hub with the slot on the drive chassis (see Figure 20).

7. Set the drive on its left side. Rotate the load arm until the tape grabber clears the hub.

Caution. Be especially careful not to touch the tape head assembly. The MR elements in this assembly are highly susceptible to damage from static electricity.

8. Take up the slack tape again using the 1.5-mm hex wrench, as described in step 4 above.

9. Carefully push the grabber in toward the cartridge, as shown in Figure 23.

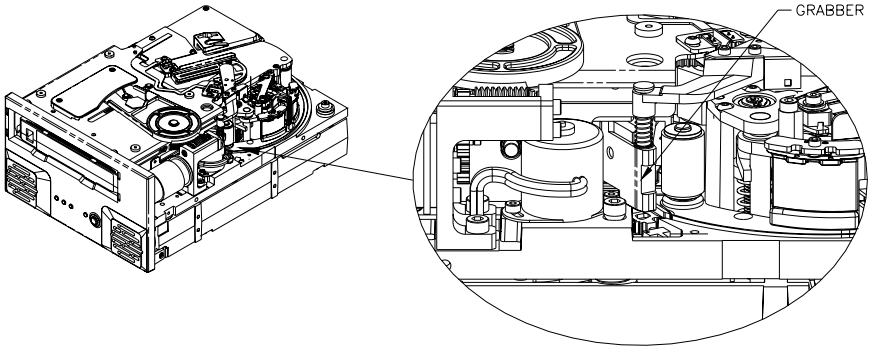


Figure 23. Diagram of underside of Viper 200 showing tape grabber near cartridge

10. When the leader pin and the tape grabber reach the cartridge, gently push the grabber toward the front of the cartridge. Use the grabber to push the leader pin gently into the cartridge until it seats in place (you should hear a click).

11. Using a flat-blade screwdriver, pivot the white lower track toward the drive bezel to disengage the leader pin.

11. After the grabber has released the leader pin, pull the loader arm out of the way.

12. Use a flat-blade screwdriver to turn the worm gear counter clockwise (to the left). Figure 24 shows the location of the worm gear. This will gradually raise the cartridge elevator and cause the cartridge to slide partially out of the drive.

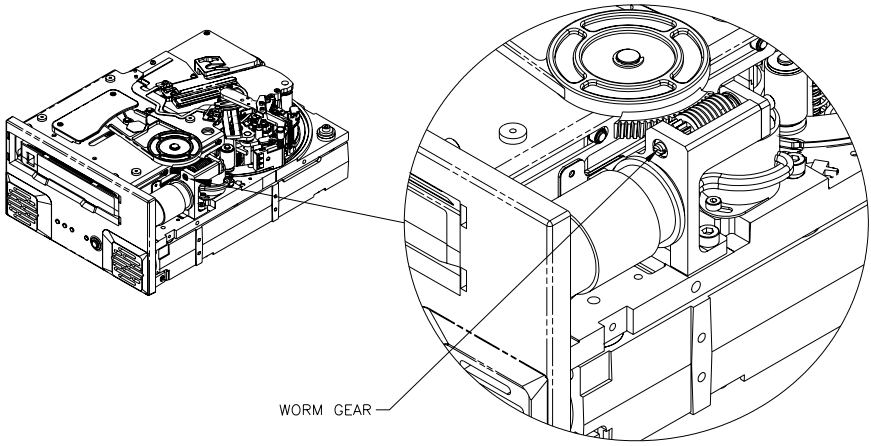


Figure 24. Diagram of Viper 200 showing worm gear

13. Continue turning the worm gear until the cartridge is sticking out of the unit approximately 17 mm (0.66”). Then carefully pull the cartridge out by hand.

14. After you have removed the cartridge, put the top cover back on the drive; then replace and tighten the screws.

15. Return the drive to Seagate.

Caution. Do NOT use the drive after you have removed a cartridge. The drive must be returned to Seagate for servicing.

Note. Any tape cartridge removed using this procedure should be retensioned before it is used for reading or writing data.

If you have any questions on this process, contact Seagate Technical Support for Tape Products (see Section 8 for contact numbers).

Unix configuration settings

This section describes how to configure various UNIX systems to recognize and obtain optimal performance from the Seagate Viper 200 LTO Ultrium tape drive. It summarizes drive configuration options, as well as changes that may be required at the operating system level. In some cases, this involves editing system files. Make a backup copy of any system files before doing this.

A word about SCSI controllers

The Viper 200 is capable of transferring date at 32 Mbytes per second with 2:1 compression of the data. The Viper 200 also supports the SCSI Ultra2 specification and can transfer data at burst rates of up to 80 Mbytes per second. In order to achieve maximum drive performance, it is important to choose high performance disk drives for your system, as well as high performance SCSI controllers. The table below lists the types of SCSI controllers that Seagate recommends, in order of least preferred to most preferred.

Controller type	Maximum Transfer rate
Fast Wide SCSI	20 Mbytes per second
Wide Ultra SCSI	40 Mbytes per second
Wide Ultra2 SCSI	80 Mbytes per second
Ultra 3 SCSI	160 Mbytes per second

(For definitions of the terms used above, please refer to SCSI Trade Organization web site: http://www.scsita.org/aboutscsi/index01.html)

Configuring for the DEC/Compaq Unix Environment

Finding existing SCSI controllers and devices

SCSI ID #7 is almost always dedicated to the SCSI controller. Never configure your target device for ID 7 unless you are absolutely sure that the controller is not addressed for ID 7. Figure 25 shows the locations of the SCSI ID address jumpers for the Viper 200.

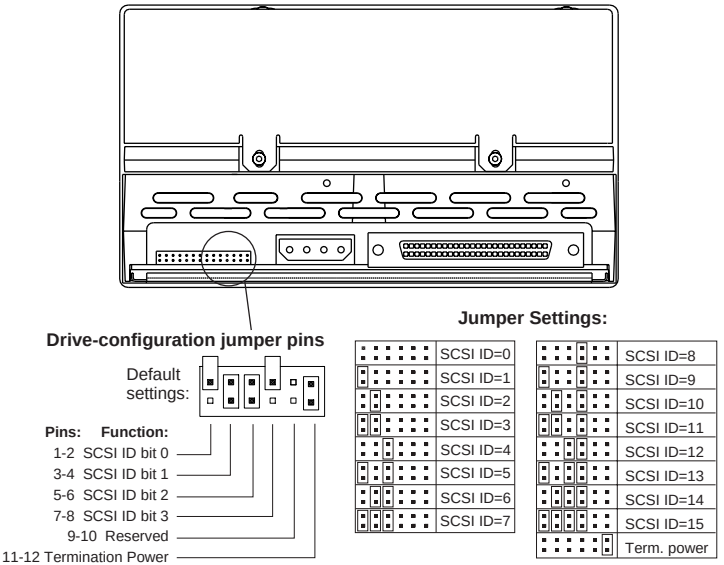


Figure 25: SCSI jumper settings for the Viper 200

Configuring Digital UNIX Version 4.0 and later/Compaq Tru64 Unix 5.x

Use File Manager to open the file /etc/ddr.dbase and create an entry as follows:

```
SCSIDEVICE
    #
    Type = tape
    Name = "SEAGATE" "ULTRIUM"
    #
    PARAMETERS:
        TypeSubClass        = tk
        TagQueueDepth       = 0
```

```
        MaxTransferSize     = 0x0ffffff  # (16MB - 1)
        ReadyTimeSeconds    = 180         # seconds
              CMD_PreventAllow    = supported
              CMD_ExtReserveRelease = supported
              BlockSize           = 0
              PwrMgmt_capable     = 0

    DENSITY:
        #
        DensityNumber = 0,2,3,4,5,6,7
        DensityCode = default
        CompressionCode = 0x0
        Buffered = 0x1

    DENSITY:
        #
        DensityNumber = 1
        DensityCode = default
        CompressionCode = 0x1
        Buffered = 0x1
```

Save the file. Then run the following command:

```
ddr_config -c
```

ddr_config will take the default input file, ddr.dbase, and build a new device database. This is effective immediately, and there is no need to rebuild the kernel.

Note: ddr.dbase is a Unix shell script and is not written in C. This means # is used to signify a comment, not /* and */ or //, as used in C. Make sure any comments included in this file are preceded with the # character.

To enable the tape driver to turn on data compression when writing data to tape use the ‘c’ option.

For commands that use density and tape size settings the tape density is 124,000 bpi and the tape length is 1800 feet. For commands that use a blocking factor we recommend a blocking factor of 64 as a minimum, preferably 128.

Configuring for the Sun Environment (Solaris 2.4, 2.5, 2.6, 7, and 8)

Use the following for attaching the Viper 200 to Sun Sparc and Intel systems.

Finding current SCSI controllers and targets

In order to properly attach SCSI devices to hosts it is necessary to ensure that each target device has a unique SCSI address. The commands 'modinfo' and 'dmesg' can be used to find the SCSI controllers in use and the SCSI target devices installed.

For example, the command "dmesg | egrep "target" | sort | uniq" can find all SCSI controllers and SCSI targets. The output may look similar to:

```
sd32 at ithps0: target 2 lun 0
sd34 at ithps0: target 4 lun 0
st21 at ithps1: target 0 lun 0
st22 at ithps1: target 1 lun0
```

In this case the Viper 200 could be set for SCSI ID address 2 thru 6 and attached to controller ithps1 (this particular controller also supports SCSI addresses 8 thru 15). See figure 1 to view how to set the SCSI ID address jumpers for the Viper 200.

Types of controllers

You may be able to view the main pages of three types of SCSI controllers for Sun Sparc systems, esp, glm and isp. We recommend that the Viper 200 not be attached to esp controllers. This controller is not fast enough to work with the Viper 200. The minimum recommended controller would be a glm controller, which is an Ultra Wide controller.

We recommend Ultra2 SCSI capable controllers capable of 80MB/s data transfer. Ultra 3 controllers supporting 160MB/s transfer rates can also be used.

Configuring the device file st.conf

To configure Solaris 2.4 and above to use the Viper 200 correctly, add the following lines to the file `st.conf` in the directory `/kernel/drv`.

```
tape-config-list=
"SEAGATE ULTRIUM06242-XXX","Seagate
LTO","SEAGATE_LTO";
SEAGATE_LTO =
1,0x36,0,0x1d639,4,0x00,0x00,0x00,0x00,1;
```

Note: The inquiry string above contains one space between SEAGATE and ULTRIUM.

The value 0x1d639 equates to the manner in which the Viper 200 will be configured to operate in the Solaris environment. This value enables the Viper 200 to:

- Support variable length records (variable length block size)
- Backspace over files (same as 'mt bsf' command to backspace over filemarks)
- Backspace over records (same as 'mt bsr', backspace over individual tape blocks)
- Long timeout for long erase function (it is not recommended to try and erase the entire tape)
- Viper 200 knows when end of data has been encountered
- Device driver is unloadable
- Long timeouts (5 times longer than normal)
- Buffered writes supported
- Variable record size not limited to 64k
- Uses Mode Select Page 10h to enable/disable compression

Once `st.conf` has been modified, the kernel must be reconfigured by booting the system using the `boot -r`

command. If you are replacing a tape device with the same SCSI ID you may want to delete the st devices from the /dev/rmt directory (recommended).

When using commands that require a blocking factor such as tar, ufsdump, ect., we suggest a minimum factor of 64. The preferred factor is 128.

For commands that use density and tape size settings the tape density is 124,000 bpi and the tape length is 1800 feet. We suggest using the ufsdump/ufsrestore commands. These commands automatically detect end of tape without the need of the density and tape length settings.

To enable the st driver to turn on data compression when writing data to tape use the ‘c’ option. For example, tar cf /dev/rmt/0**c** would cause the Seagate Ultrium tape drive to compress the data before writing the data to tape.

Configuring for the IBM AIX Environment (AIX Version 4.1.x and later)

Finding existing SCSI controllers and devices

Enter the following command: `lsdev -Cs scsi`. This will show all of the SCSI target id's known to the system. Note the SCSI target id's and choose a SCSI id for the Viper 200 that will not conflict with the id's shown from the lsdev command. SCSI ID #7 is almost always dedicated to the SCSI controller. Never configure your target device for ID 7 unless you are absolutely sure that the controller is not addressed for ID 7. See figure 1 to view how to set the SCSI ID address jumpers for the Viper 200.

Configuring the Viper 200 using SMIT

The Seagate Viper 200 tape drive can be configured to work with AIX Versions 4.1.x and later by using the SMIT "Other SCSI Tape Drive" option***. NOTE: Record the SCSI ID of the tape drive before installing it***. To configure AIX using the SMIT utility, use the following procedure:

1. Enter SMIT at the Tape Drive menu by typing "smit tape"
2. Select "Add a tape Drive"
3. Select the type of tape drive you will be adding. Use the "Other SCSI Tape Drive" option.
4. Select the Parent SCSI Adapter from the available list
5. The Add a tape Drive "Entry Fields" now appears. Some of the standard options can be changed to maximize drive performance and functionality:
    1. Set the Connection Address with the Drives Target and Lun (always use Lun 0). In the list, the Target is the first number and the Lun is the second. For example, if the drive is ID 5, choose 5,0
    2. Set the "BLOCK size" to 0
    3. Set "Use DEVICE BUFFERS during writes" to yes.
    4. Set "RETURN error on ape change or reset" to no

5. Set “Use EXTENDED file marks” to yes.

6. Set “RESERVE/RELEASE support” to yes

7. Set “BLOCK SIZE for variable length support (Num.)” to 0

8. Set “Density 1” to 0

Leave the “Set delay. . .” and “Set timeout. . .” lines at the default value. Click on OK and the drive will be installed in the system database, and devices created. There is no need to reboot the system.

Now exit SMIT

Notes: We suggest using the AIX commands ‘backup’ and ‘restore’ when transferring data to and from the Viper 200. These commands transfer data more quickly than other commands such as tar and cpio. For cpio we suggest a blocking factor of 128. For tar we suggest using the –N option and a factor of 128. Some older systems with poor video controllers may experience a reduction in performance when using the –v option, which prints the path names on the standard console during the backup. Unless there is a real need to see the filenames as they are backed up we suggest not using the –v option. For commands that use density and tape size settings the tape density is 124,000 bpi and the tape length is 1800 feet.

Configuring for SCO Open Server 5.0.x

Finding existing SCSI controllers and devices

The files /usr/adm/hwconfig and /var/adm/messages list the devices found during boot up of Open Server. The current SCSI controllers can be found using the command:

```
grep adapter /usr/adm/hwconfig
```

which will produce and out similar to:

```
%adapter 0x6400 – 0x64FF    11 type=alad ha=0
bus=0 id=7 fts=st0.
```

The current tape drives can be found using the command:

```
grep tape /usr/adm/hwconfig
```

which will produce and out similar to:

```
%tape type=S ha=0 id=6 lun=0 bus=0 ht=alad
```

The information above shows that an Adaptec SCSI controller is installed (`alad`) and a SCSI tape drive (`type=S`) is installed as target id 6. SCSI ID #7 is almost always dedicated to the SCSI controller. Never configure your target device for ID 7 unless you are absolutely sure that the controller is not addressed for ID 7. See figure 1 to view how to set the SCSI ID address jumpers for the Viper 200.

Configuring the Viper 200 with mkdev

Once connected to the system, installation of the drive is carried out using the following command:

```
mkdev tape
```

A numeric based menu will appear. If you are replacing an existing SCSI tape drive use option 3 to remove the existing tape drive from the configuration files. Then follows the instructions below to add the Viper 200.

1. From the menu choose “Configure a SCSI or Enhanced IDE tape drive”.

2. From the next menu choose “Install a SCSI tape drive”.
3. When prompted enter the SCSI adapter string. You may want to use the `h` option to view the list of supported SCSI adapters.
4. Enter the number of the SCSI host adapter the drive is attached to. If only one SCSI adapter exists then enter the number zero (0).
5. Enter the number of the SCSI bus the drive is attached to on the adapter. Refer to the SCSI adapter documentation (for many adapters this will be zero (0).
6. Enter the SCSI id of the drive as shown by the jumpers on the rear of the drive (see Figure 1).
7. Enter the number zero (0) for the LUN of the device.
8. When prompted to “Update the SCSI configuration? (y/n)” enter `y`.
9. Enter “SEAGATE” when prompted for Vendor Identification string (no quote marks).
10. Enter the number three (3) when prompted to enter the SCSI version that the tape drive conforms to.
11. Enter the number two (2) when prompted to enter the Response Data Format the tape drive uses.
12. When prompted choose the Generic SCSI-1/SCSI-2 tape drive option.
13. When the process takes you back to the two Main Menu screens press ‘q’.
14. When asked to create a new kernel enter, "yes". When asked if you want the new kernel to boot by default press ‘y’. When asked if you want the kernel environment to be rebuilt press ‘y’. When finished reboot the system.

Notes: Not all of the SCO ‘tape’ commands will operate or be applicable to the Seagate Viper 200 drive (execute the command ‘man tape’ for the specifics on how the tape command works). The following tape commands are

not available for use with the Viper 200: getcomp, setcomp (the Viper 200 will always compress the data before writing the data to tape under SCO Open Server 5.0.x), partition, setpart, getpart, getspeed, setspeed, rsm, wsm. The following tape commands are available for use with the Viper 200: status, load, reset, rewind, retention, getblk, setblk, unload, eod.

When using the GUI Backup Manager utility set the block size to 32768 minimum, 65536 preferred. When using commands such as tar we suggest using the tape command to set the block size to 512 and then using a blocking factor of 80 for the tar command. For commands that use density and tape size settings the tape density is 124,000 bpi and the tape length is 1800 feet.

Configuring for Linux

Finding existing SCSI controllers and devices

Before installing the Seagate Viper Ultrium tape drive first ensure that the requisite SCSI controllers and device drivers are installed on your system.

To find existing SCSI controllers execute the command:

```
dmesg | grep SCSI
```

You may see output similar to:

```
(scsi0)<Adaptec AHA-294XX Ultra2 SCSI host
adapter> found at PCI 0/16/0
```

To find existing SCSI devices execute the command:

```
cat /proc/scsi/scsi
```

You may see output similar to:

```
Host: scsi0 Channel: 0 Id:6 Lun:00
Vendor: SEAGATE   Model: ULTRIUM06242-XXX
Type: Sequential Access          ANSI SCSI
Revision 03
```

Use the output of these two commands to see which SCSI target id numbers are free. In the above example a tape drive is attached at target id 6. SCSI ID #7 is almost always dedicated to the SCSI controller. Never configure your target device for ID 7 unless you are absolutely sure that the controller is not addressed for ID 7. See figure 1 to view how to set the SCSI ID address jumpers for the Viper 200.

The widely available distributions of Linux will automatically install the proper SCSI and tape device drivers. If you executed the cat command above you are already ensured that the SCSI driver for your controller is installed. To view currently loaded modules execute the `lsmod` command. Ensure that one of the entries is `st`.

To view the st device number for your attached tape drive execute the command:

```
dmesg | grep tape
```

You should see output similar to:

```
Detected SCSI tape st0 and scsi0 . . .
```

Using the Viper 200

The Viper 200 can be configured via the mt command options and a default configuration can be setup using the 'stsetoptions' command from within the mt command. Refer to the man page for mt for details. We suggest not using the erase command nor commands which attempt to partition the tape. Partitioning is not supported in the LTO format.

For commands that use density and tape size settings the tape density is 124,000 bpi and the tape length is 1800 feet. For commands that use a blocking factor, we suggest a factor of 128.

Configuring for SGI Irix

Finding current SCSI controllers and targets

In order to properly attach SCSI devices to hosts it is necessary to ensure that each target device has a unique SCSI address. The command `hinv` can be used to find all attached SCSI controllers and target devices. To search for all SCSI controllers and devices use the command:

```
hinv –v | grep SCSI
```

The output of the command will be similar to the following:

```
Integral SCSI controller 0: Version ADAPTEC 7880
Disk drive unit 1 on SCSI controller 0
CD ROM unit 4 on SCSI controller 0
Integral SCSI controller 1: Version ADAPTEC 7880
Tape drive: unit 6 on SCSI controller 1: DAT
```

This output shows that a tape drive is present on SCSI controller 1 at SCSI ID address #6. Available SCSI ID's are 0,2,3,5 6, 8 – 15 on controller 0 and ID's 1 – 5 and 8 – 15 on controller 1 (this particular controller supports Wide/Ultra SCSI).

Note: SCSI ID #7 is almost always dedicated to the SCSI controller. Never configure your target device for ID 7 unless you are absolutely sure that the controller is not addressed for ID 7. See figure 1 to view how to set the SCSI ID address jumpers for the Viper 200.

Modifying the IRIX configuration file

To attach the Viper 200 to IRIX the file ‘scsi’ needs to be modified by a text editor. The file can be found in /var/sysgen/master.d. Open the file and use the text editor to add the following at the end of the tape device entries:

For IRIX 6.2 :

```
{DATTAPE, TPDAT, 7, 12, “SEAGATE”, “ULTRIUM06242”, 0,0,
{0},
MTCAN_BSF | MTCAN_BSR | MTCAN_APPEND | MTCAN_SETMK |
MTCAN_PREV | MTCAN_SYNC | MTCAN_SPEOD | MTCAN_CHKRDY |
MTCAN_VAR | MTCAN_SETSZ | MTCAN_SILI | MTCAN_SEEK |
MTCAN_COMPRESS,
40, 5*60, 10*60, 10*60, 3*3600, 512, 256*512, 0,
(u_char*) 0},
```

For IRIX 6.4/6.5:

```
{DATTAPE, TPDAT, 7, 12, “SEAGATE”,
“ULTRIUM06242”, 0,0, {0},
MTCAN_BSF | MTCAN_BSR | MTCAN_APPEND | MTCAN_SETMK |
MTCAN_PREV | MTCAN_SYNC | MTCAN_SPEOD | MTCAN_CHKRDY |
MTCAN_VAR | MTCAN_SETSZ | MTCAN_SILI | MTCAN_SEEK |
MTCAN_COMPRESS,
40, 5*60, 10*60, 10*60, 3*3600, 512, 256*512,
tpsc_default_dens_count, tpsc_defalt_hwg_dens_names,
tpsc_default_alias_dens_names, {0}, 0, 0, 0, (u_char*)
0},
```

After modifying the configuration file, recompile the kernel with the “autoconfig” command and reboot the system. If you are replacing an existing storage device with the same SCSI ID remove the device files prior to using the autoconfig command and rebooting the system.

Configuring for HP-UX 11.0

Finding current hardware/driver configuration

To find currently installed SCSI controllers and devices the `ioscan` command can be used. The syntax would be `ioscan -f`. This command will list all of the system devices and their device names.

Attaching the Seagate Viper 200

Choose a SCSI address that does not conflict with any already attached SCSI devices on your SCSI controller. See figure 1 for jumper installation for the Viper 200. Attach the Viper 200 LTO drive and apply power to the Viper 200 and the host system. After the boot process is complete and you have logged in as superuser issue the command:

```
ioscan -C tape -f.
```

You should see output similar to:

```
Class   I  H/W Path  Driver  S/W State  H/W type    Description
Tape    7  8/12.6.0  stape   Claimed     Device     SEAGATE ULTRIUM
```

From the root directory and as superuser issue the command:

```
/sbin/insf -C tape.
```

Now issue the command:

```
/sbin/mksf -d stape -H x/x.x.x -I y -c 1
-n -u /dev/rmt/zcnb
```

Where `x` is the data under `H/W Path` from the ioscan, `y` is the data under `I` from the ioscan and `z` is tape device identifier number. You can execute an `ls` command for the /dev/rmt directory to choose an identifier number which has not already been used. Also, you can choose a unique device name such as `cnb` to more easily remember which device name will enable data compression during write. Please refer to the man pages for mksf to review

settings for rewind/no rewind, Berkeley mode, AT&T mode, ect.

After performing the `insf` and `mksf` commands check the installation by using the command `ioscan -fn | grep -C tape`. You should see output showing the hardware and device addressing and also the device name attached to the Viper 200.

Technical support

If you experience problems installing or using your tape drive, contact one of the technical support services listed below.

World-wide services:

Worldwide web: A wide variety of technical support services are available on Seagate's World Wide Web site, located at **http://www.seagate.com**

Seagate E-mail Technical Support: You can e-mail questions or comments to: **tapesupport@seagate.com**

Regional services

Seagate provides technical support through several regional centers worldwide. These services may include:

- **Seagate phone technical support:** For one-on-one help, you can talk to a technical support specialist during local business hours. Before calling, note your system configuration and drive model number.
- **Seagate Technical Support FAX:** You can FAX questions or comments to technical support specialists. Responses are sent during local business hours.
- **SeaFAX:** You can use a touch-tone telephone to access Seagate's automated FAX system to receive technical support information by return FAX. This service is available 24 hours daily.
- **SeaBOARD:** SeaBOARD is Seagate's automated computer bulletin board system, available 24 hours daily. Set your communication software to eight data bits, no parity and one stop bit (8-N-1).

Support services in the Americas

Telephone support
(you will be directed to a product-specific phone or SEAFAX number)
US customers: 1-800-SEAGATE
International customers: 1-405-936-1234

Seagate Technical Support FAX (US and international): 1-405-936-1683

SeaTDD (Telephone support for the deaf; US and international): 1-405-936-1687

Support services in Europe

For European customer support and SeaFAX, dial the toll-free number for your specific country from the table below. The **Seagate Technical Support FAX** number for all European countries is 31-20-653-3513.

Country	Phone / SeaFAX
Austria	0 800-20 12 90
Belgium	0 800-74 876
Denmark	80 88 12 66
France	0 800-90 90 52
Germany	0 800-182 6831
Ireland	1 800-55 21 22
Italy	800-790695
Netherlands	0 800-732 4283
Norway	800-113 91
Poland	00 800-311 12 38
Spain	900-98 31 24
Sweden	0 207 90 073
Switzerland	0 800-83 8411
Turkey	00 800-31 92 91 40
United Kingdom	0 800-783 5177

If your country is not listed in the table above, dial our European call center in Amsterdam at 31-20-316-7222

between 8:30 A.M. to 5:00 P.M. (European central time) Monday through Friday or send a FAX to 31-20-653-3513.

Support services for Africa and the Middle East

For presales, technical support, warranty repair and FAX services in Africa and the Middle East, dial our European call center in Amsterdam at 31-20-316-7222 between 8:30 A.M. to 5:00 P.M. (European central time) Monday through Friday, or send a FAX to 31-20-653-3513.

Support services in Asia and the Western Pacific

For presales and technical support in Asia and the Western Pacific, dial the toll-free number for your specific country. The East Asian toll-free numbers are available Monday through Friday from 6:00 A.M. to 10:45 A.M. and 12:00 P.M. to 6:00 P.M. (Australian Eastern Time). If your country is not listed here, please use one of the direct-dial numbers.

Country	Phone number	FAX number
Australia	1800-14-7201	—
China	—	+852-10-6871-4316
Hong Kong	800-90-0474	+852-2368 7173
India	1-600-33-1104	—
Indonesia	001-803-1-003-2165	—
Japan	—	+81-3-5462-2978
Malaysia	1-800-80-2335	—
New Zealand	0800-443988	—
Singapore	800-1101-150	+65-6488-7525
Taiwan	+886-2-2514-2237	+886-2-2715-2923
Thailand	001-800-11-0032165	—