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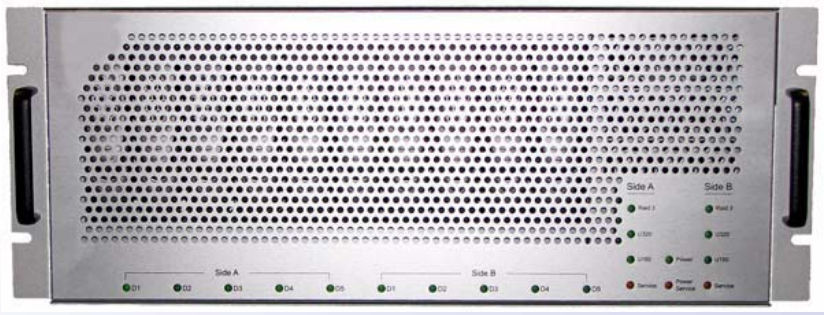

MediaVault™ U320-R, U320-RX

OSS-DT-RAID-U320-R
OSS-RM-3U-RAID-U320-RX

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Introduction

MV U320-R Features

TABLE Features of the MV U320-R

Feature	Number or Value
Number of RAID controllers (U320-RX)	2
Number of removable disk modules (U320-RX)	10
Internal data rate	306 MBytes/sec
Burst rate (maximum)	320 MBytes/sec per channel
Sustained data rate	200 MBtyes/sec per channel
Real Time RAID	RTR reconstructs data “on the fly” if a drive “glitches”
High Definition Turbo	HDT ensures 200 Mbytes per second per channel (with a reduction of capacity)
Ultra320 SCSI interface	Compatible with Ultra320/Ultra160/Ultra 2/LVD, Single Ended, Ultra Wide, Fast, SCSI-3, SCSI-2, SCSI interface and protocol
Removable disk drive modules	Ten high performance, removable, hot-swappable hard disk modules
Fans	Multiple cooling fans
Serial port	Two serial ports for detailed maintenance and support
Alarm	Audible Alarm and LED indicators
Functionality	Easy user selection of functionality via Mode Selection and Mode Set switches. No complicated software setup or maintenance.
Power supplies	Dual hot swappable power supplies
Mounting Configurations	Convertible Rack mount or Tower kit included

Features of the MV U320-RX

Features of the MV U320-RX Table

Feature	Number or Value
Number of RAID controllers (U320-RX)	2
Number of removable disk modules (U320-RX)	10
Internal data rate	306 MBytes/sec
Burst rate (maximum)	320 MBytes/sec per channel
Sustained data rate	200 MBtyes/sec per channel
Real Time RAID	RTR reconstructs data “on the fly” if a drive “glitches”
High Definition Turbo	HDT ensures 200 Mbytes per second per channel (with a reduction of capacity)
Ultra320 SCSI interface	Compatible with Ultra320/Ultra160/Ultra 2/LVD,Single Ended, Ultra Wide, Fast, SCSI-3, SCSI-2, SCSI interface and protocol
Removable disk drive modules	Ten high performance, removable, hot-swappable hard disk modules
Fans	Multiple cooling fans
Serial port	Two serial ports for detailed maintenance and support
Alarm	Audible Alarm and LED indicators
Functionality	Easy user selection of functionality via Mode Selection and Mode Set switches. No complicated software setup or maintenance
Power supplies	Dual hot swappable power supplies
Mounting configurations	Convertible Rack mount or Tower kit included

Checking the Package Contents

The MV U320-R or MV U320-RX comes pre-assembled and ready to be connected to the SCSI interface of your video edit computer equipment. The MV U320-R or MV U320-RX is shipped with the components and cables indicated in. Make sure that all components are included in the shipping carton. Notify your supervisor if components are missing.

Components Shipped with the MV U320-R

Components Shipped with the MV U320-R

Description	Quantity
Ultra 320 SCSI External Disk Storage Array.	1
SCSI terminator - Ultra320/160/LVD/SE dual mode.	1
SCSI Ultra320 compatible VHDCI interface cable (HD68-HD68 68 optional).	1
AC power cord (for North America use only).	1
Diagnostic cable.	1
This MV U320-R, MV U320-RX User Manual.	1

Ultra 320 dual channel External Disk Storage Array.	1
SCSI terminator - Ultra320/160/LVD/SE dual mode.	2
SCSI Ultra320 compatible VHDCI-68 interface cable (HD68-HD68 optional).	2
AC power cord (for North America use only).	1
Diagnostic cable.	1
Tower conversion kit	1
This MV U320-R, MV U320-RX User Manual.	1

Inspection

Examine the MV U320-R or MV U320-RX for:

• Correct part number on the barcode sticker at the rear of the unit (i.e., that the MVxxxxxxxxxx and SNxxxxxxxxx numbers on the barcode stickers match the information on the MV U320-R or MV U320-RX invoice).

• A front panel that is marked for U320 and U160 SCSI connections.

• Scratches, gouges, dents, or cracks in the enclosure.

• Cracked or loose handles and/or feet.

• Missing switches.

• Bent, scratched, or missing pins on the connectors.

• Rust, discoloration, or signs of corrosion or water, moisture, or chemical damage.

• Loose or missing screws.

• Ripped, illegible, or missing safety labels or stenciled lettering.

• Parts that rattle or slide around the inside of the unit, when the unit is lifted.

Installation

Hardware Installation and Configuration

The MV U320-R is available only in a mini-tower configuration; the MV U320-R cannot be rack-mounted. The MV U320-RX is shipped with 19-inch rack-mounting hardware installed. Additional hardware is provided to convert the MV U320-RX to a tower configuration.

Rack Mounting: MV U320-RX Only

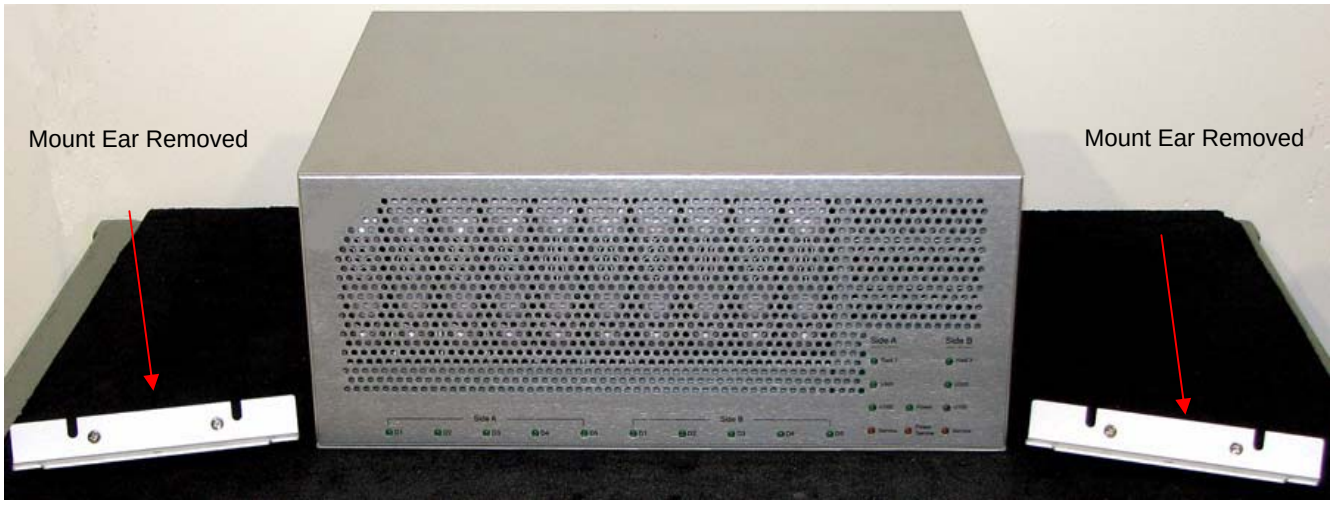
The MV U320-RX rack mount requires 4U (7 inches) of rack space for mounting. Place the MV U320-RX in the rack. Secure the unit with the appropriate screws (not included), using the four mounting points. See Below.

Tower Configuration: MV U320-RX

Remove the three screws from the left and right rack mount ears. See Below.

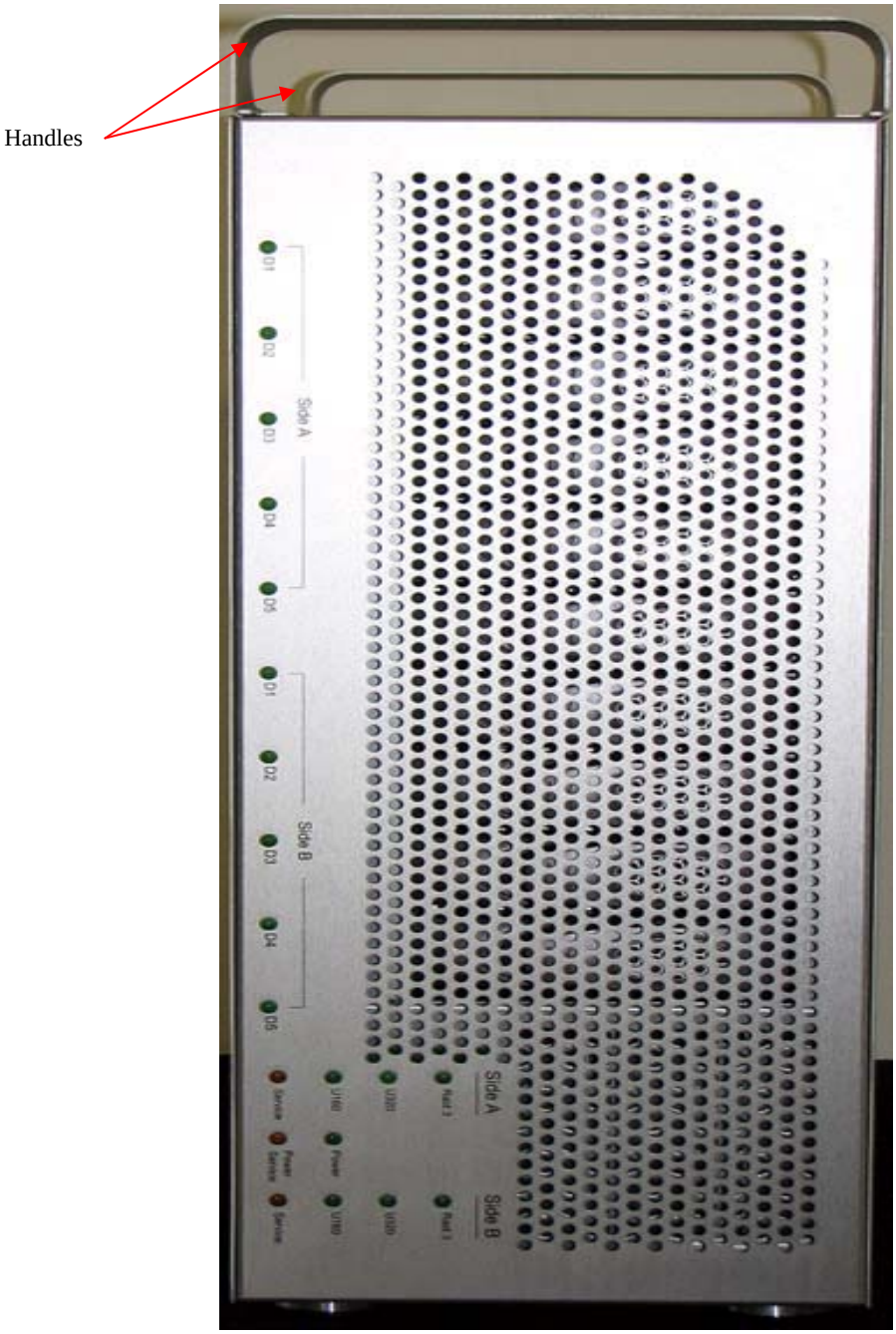
Tower Configuration

Rack mount ears removed.



Install the carrying handle and feet. Rotate the MV U320-RX clockwise, to its upright tower position. See table below.

Tower Configuration



Tower Configuration with the handles installed

Compatible SCSI Host Adaptors

Compatible Ultra 320 SCSI Host Adaptors

Ultra320	Apple G4	Apple G5	Mac Pro	PC & Compatibles
Dual Channel SCSI Adapters	ATTO UL4D	ATTO UL4D, UL5D, UL5D LP	ATTO UL4D, UL5D, UL5D LP	ATTO UL4D, UL5D, UL5D LP, LSI 1030, Adaptec 39320
Single Channel SCSI Adapters	ATTO UL4S	ATTO UL4S	n/a	ATTO UL4S Adaptec 29320

Compatible Ultra 160 SCSI Host Adaptors

Ultra160	Apple G4	Apple G5	Mac Pro	Intel & Compatibles
Dual Channel SCSI Adapters	ATTO UL3d, UL3D-66, UL3D-000	ATTO UL3D-66	ATTO UL4D, UL5D, UL5D LP	ATTO UL3D-000 ATTO UL3D-66 Adaptec 39160
Single Channel SCSI Adapters	ATTO UL3S-000	ATTO UL3S-66	n/a	ATTO UL3S-000 ATTO UL3S-66

- The MV U320-R or MV U320-RX communicates with your computer using an industry-standard SCSI interface. You must have a compatible SCSI Host Adapter installed in your computer to work with the MV U320-R or MV U320-RX storage system. Some computers have a built-in native SCSI port. Check your computer for availability.
- To maximize the Ultra320 interface of the MV U320-R or MV U320-RX, the SCSI host adapter in your computer should be rated for Ultra320. Ultra160, Ultra2, and Ultra Wide SCSI rated host adapters will work but at a slower transfer rate.
- Make sure the host adaptor is installed correctly, and that the appropriate host adapter drivers are installed and functioning properly, before connecting the MV U320-R or MV U320-RX to the host computer.

SCSC In/Out Connections

MV U320-R

The MV U320-R has a pair of SCSI 68-pin high density (68HD) connectors. This SCSI channel is compatible with Ultra320, Ultra160, Ultra2, and other SCSI standards. HVD (High Voltage Differential) is not supported.

Host Connections

Use Ultra320-rated SCSI cables to connect each side of the SCSI channel to your host computer.

- Connect the Side A SCSI IN to the first SCSI channel of the host computer.

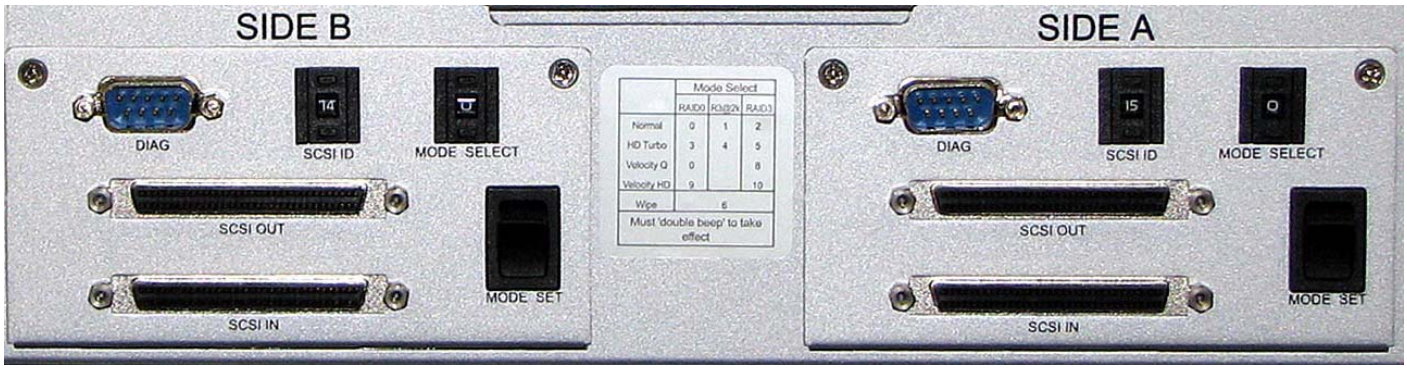
Terminator

Use an Ultra320-rated SCSI terminator to terminate the SCSI connection. Connect the terminator to SCSI OUT.

MV U320-RX

The U320-RX contains two RAID controllers (Side A and Side B). Each controller has a pair of SCSI high-density 68-pin connectors. Each SCSI channel is compatible with Ultra320, Ultra160, Ultra2, and other SCSI standards. HVD (High Voltage Differential) is not supported.

See the figure below for the SCSI configuration per Side A and Side B of the MV U320-RX.



Side A and Side B SCSI Connectors.

Host Connections

Use Ultra320-rated SCSI cables to connect each side of the SCSI channel to your host computer.

- Connect the Side A SCSI IN to the first SCSI channel of the host computer.
- Connect the Side B SCSI IN to the second SCSI channel of the host computer.

Terminator

Use two Ultra320-rated SCSI terminators to terminate the SCSI connections. Connect the terminators to the SCSI OUT on Side A and Side B.

Daisy Chaining

MV U320-R

Multiple SCSI devices can be connected by a daisy chain, as indicated in the figure below.

Make the following connections:

• Run a SCSI cable from the SCSI IN connector of the MV U320-R to the SCSI connector of the host computer.

• Run a SCSI cable from the SCSI OUT connector of the MV U320-R to the SCSI IN connector of another unit (such as another MV U320-R). The other unit must have a terminator inserted in the unused SCSI connector.

Keep in mind that all connected SCSI devices must be rated at, and configured to, run at Ultra320 for maximum data transfer. Mixing slower devices, such as Ultra2, Ultra Wide, narrow SCSI, etc., could reduce the data transfer rate to the slowest device on the SCSI channel.

Make sure of the following:

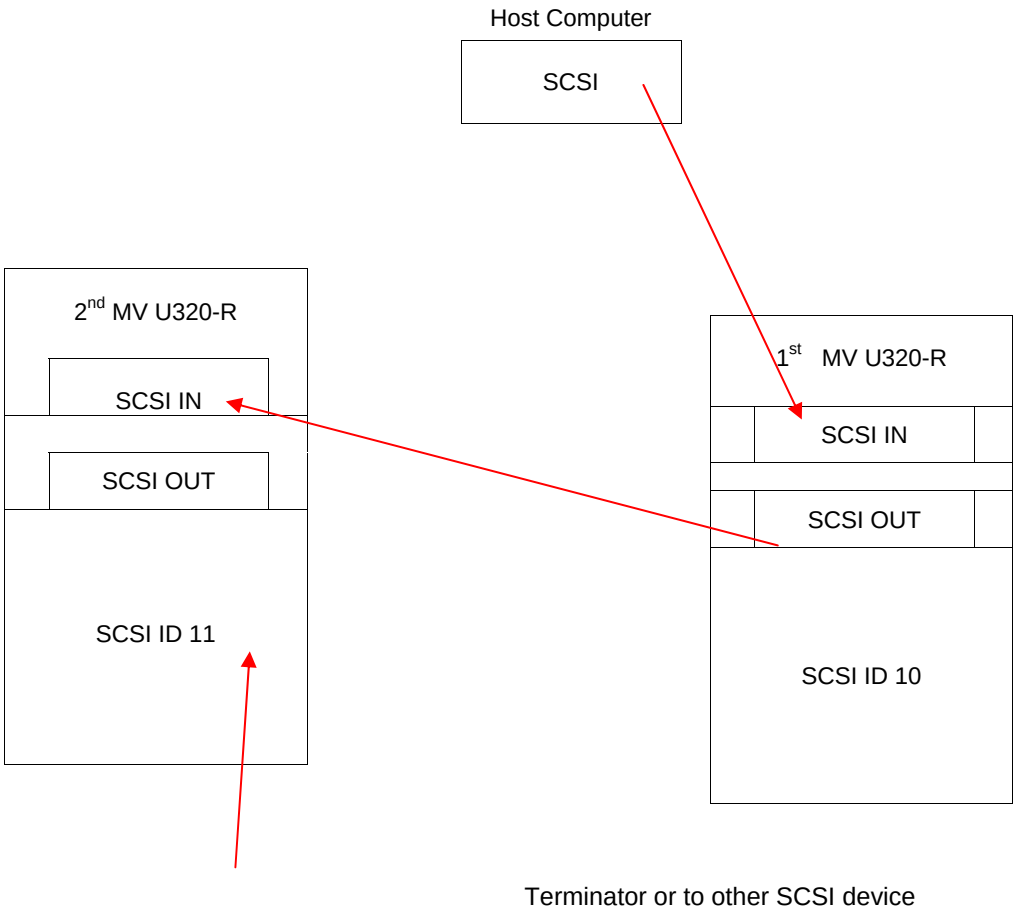
• That the total SCSI cable length is as short as possible (a maximum of two meters).

• To use a terminator at the end device of each SCSI chain.

• That there are no duplicated connections or SCSI ID conflict on any SCSI channel.

Do not exceed a maximum of four devices in a chain, to ensure the reliability of the SCSI data transfer.

A Daisy Chain between Two MV U320-R Units and the Host Computer



MV U320-RX

Multiple SCSI devices can be connected by a daisy chain, as indicated in the figure below.
Make the following connections:
• Run SCSI cables from the SCSI IN connectors of the MV U320-RX to the SCSI connectors of the host computer.
• Run SCSI cables from the SCSI OUT connectors of the MV U320-RX to the SCSI IN connectors of another unit (such as another MV U320-RX). The other unit must have a terminator inserted in the unused SCSI connector.

Keep in mind that all connected SCSI devices must be rated at, and configured to run at Ultra320 for maximum data transfer. Mixing slower devices, such as Ultra2, Ultra Wide, narrow SCSI, etc., could reduce the data transfer rate to the slowest device on the SCSI channel.

Make sure of the following:
• That the total SCSI cable length is as short as possible (a maximum of 12 meters).
• To use a terminator at the end device of each SCSI chain.
• That there are no duplicated connections or SCSI ID conflict on any SCSI channel. For the MV U320-RX Max, use only Side A.
Do not exceed a maximum of four devices in a chain, to ensure the reliability of the SCSI data transfer.

DIAG - Diagnostic Port

A serial diagnostic cable is supplied with the unit and allows unit diagnostics, as well as firmware updates.

Editing System Requirements

For video editing, the following video editing equipment, operating system, and video cards must be installed on your computer, or connected to the computer or to the MV U320-R or MV U320-RX.
• Ultra320 or compatible SCSI host adapters [for the MV U320-R], or an Ultra320 or compatible single or dual channel SCSI host adapter [for the MV U320-RX].
• Windows 2000, Windows Server 2003, Windows XP, Mac OS, IRIX, Linux.
• Video Editing software.
• A video input source.

Operations

Operational Functions

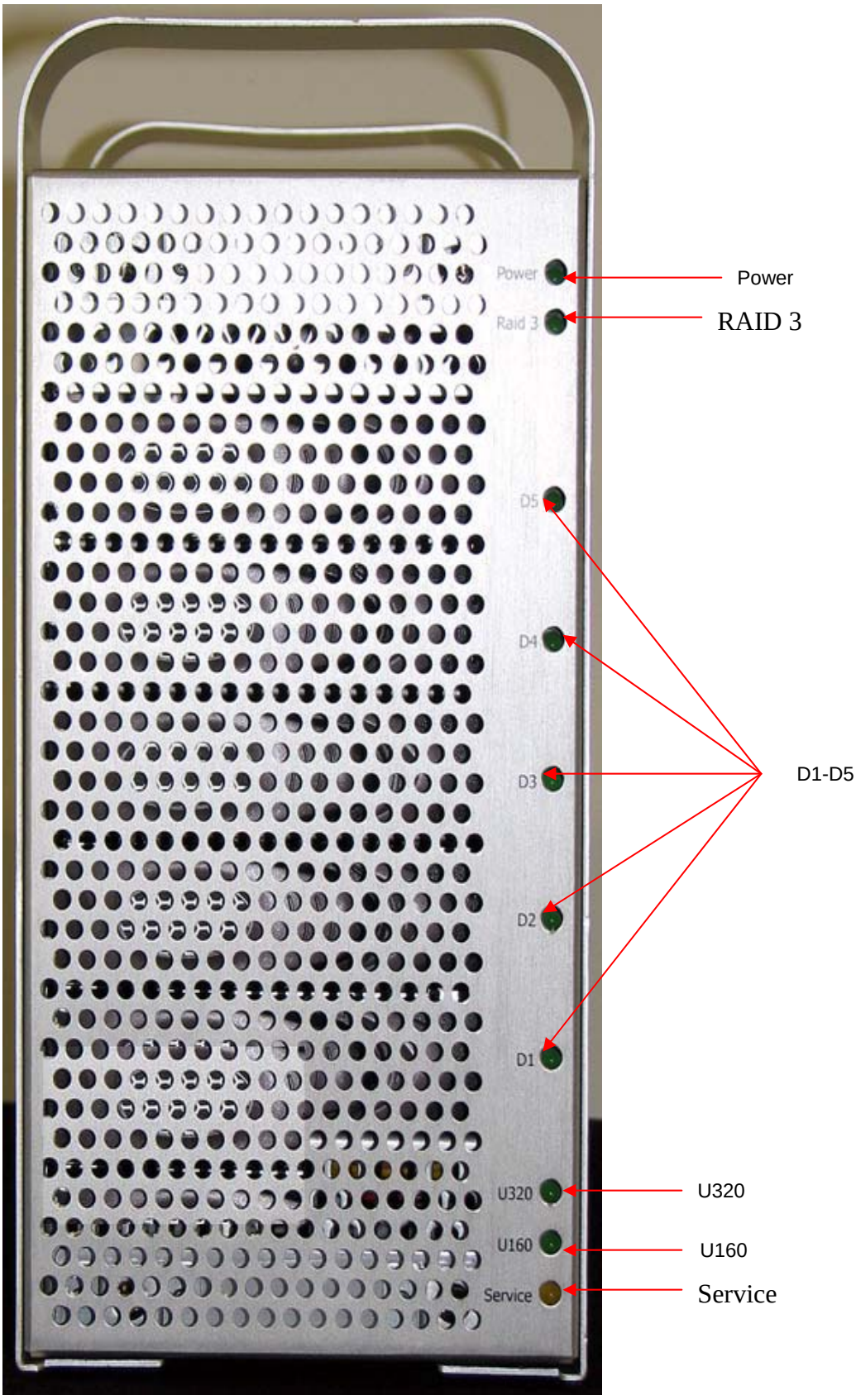
The operational functions for the MV U320-R or MV U320-RX are indicated in the table below.

Operational Functions for the MV U320-R or MV U320-RX

To Review this Function...
The front panel components used for MV U320-R operations.
The front panel components used for MV U320-RX operations.
The rear panel components used for MV U320-R operations.
The rear panel components used for MV U320-RX operations.
Unit power-up sequence.
LED power-on sequence.
The types of mode selection (RAID type) that can be selected for the MV U320-R or MV U320-RX.
Changing the SCSI ID.
Changing the mode (RAID type)
Using the Mode Set button.
Audible alarm.

Components

Front Panel Components - MV U3

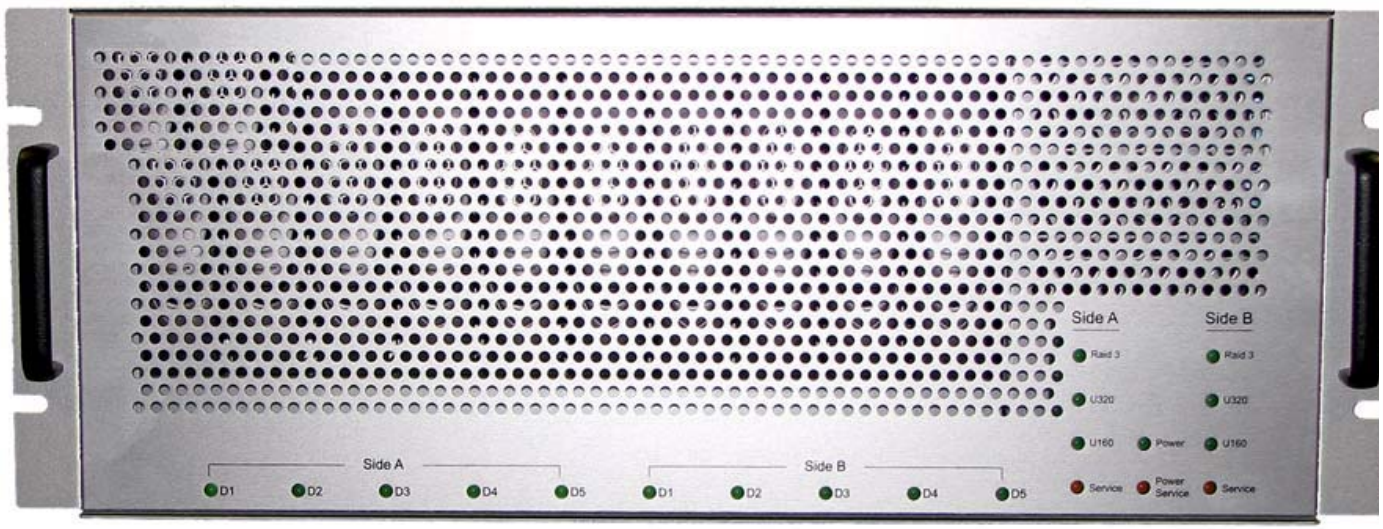


Description of the Front Panel Components- MV U320-R

Description of the Front Panel Components - MV U320-R

Component	Description
Power	"On" indicates that the unit is powered up and ready for operations. This indicator will flash rapidly for 20 seconds during the initial power-on self-test.
RAID 3	"On" indicates that the MV U320-R is operating in a RAID 3 protected mode. See the "Mode (RAID Type) Function" section in this chapter for additional RAID type information. When this indicator is off, the MV U320-R is operating in RAID 0 (performance) mode.
D1 to D5 (Drive 1 to Drive 5)	These LEDs indicate drive activity or drive fault. The LEDs will illuminate as the disk drives are being accessed. The LEDs are off when there is no drive activity. In a fault condition, associated with the Service LED and an audible alarm, the faulty drive is identified by a slow blinking drive LED.
U320	"On" indicates that the SCSI interface is operating at its optimum SCSI Ultra320 speed. When this indicator and the U160 speed indicator are off, the U320-R is operating at less than Ultra160 speed.
U160	"On" indicates that the SCSI interface is operating in SCSI Ultra160 speed. When this indicator and the U320 speed indicator are off, the U320-R is operating at less than Ultra160 speed.
Service	"On" indicates that a drive in the MV U320-R needs to be serviced. Normally this LED is associated with an audible alarm. One of the drive LEDs will flash slowly. A drive replacement might be necessary. See the "Audible Alarm" section.

Front Panel Components - MV U320-RX



Side A D1 - D5 LEDs

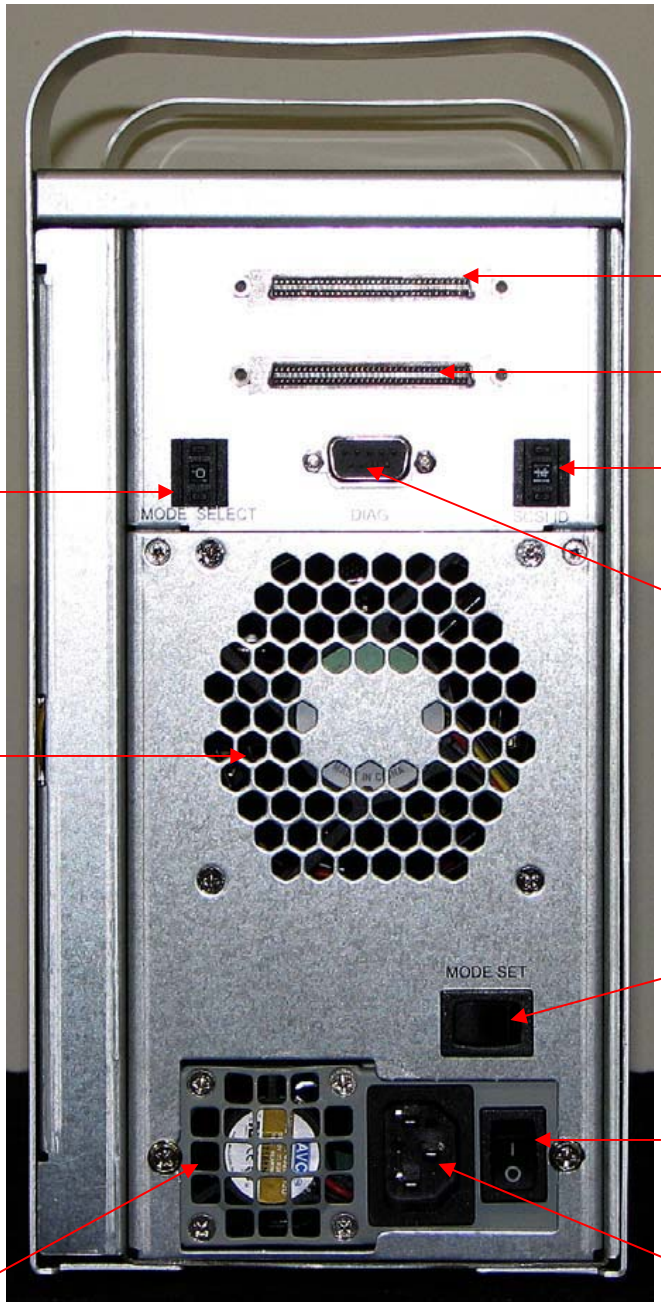
Side B D1-D5 LEDS

Description of the Front Panel Components - MV U320-RX

Description of the Front Panel Components - MV U320-RX

Component	Description
D1 to D5 (Drive 1 to Drive 5, Side A and Side B)	Drive activity LEDs or drive fault LED. The LEDs will illuminate as the disk drives are being accessed. The LEDs are off when there is no drive activity. In a fault condition, associated with the Service LED and an audible alarm, the faulty drive is identified by a slow-blinking drive LED.
RAID 3 (Side A and Side B)	”On” indicates the MV U320-RX is operating in a RAID 3 protected mode. See the “Mode Selection” section for additional RAID type information. When this indicator is off, the MV U320-RX is operating in RAID 0 (performance) mode.
U 320 (Side A and Side B)	“On” indicates that the SCSI interface is operating at its optimum SCSI Ultra320 speed. If this indicator and the U160 speed indicator are off, the U320-RX is operating at less than Ultra160 speed.
U 160 (Side A and Side B)	“On” indicates that the MV U320-R is operating in Ultra160 SCSI data transfer speed. When this indicator is off, the MV U320-RX is operating in RAID 0 (performance) mode.
Power	“On” indicates that the unit is powered up and ready for operation.
Service (Side A and Side B)	When this LED is illuminated, the MV U320-RX requires service. Normally this is associated with an audible alarm and one of the drives LED will flash slowly. A drive replacement might be necessary. See the “Audible Alarm” section.
Power Service	“On” indicates a power supply unit

Rear Panel Components - MV U320-R

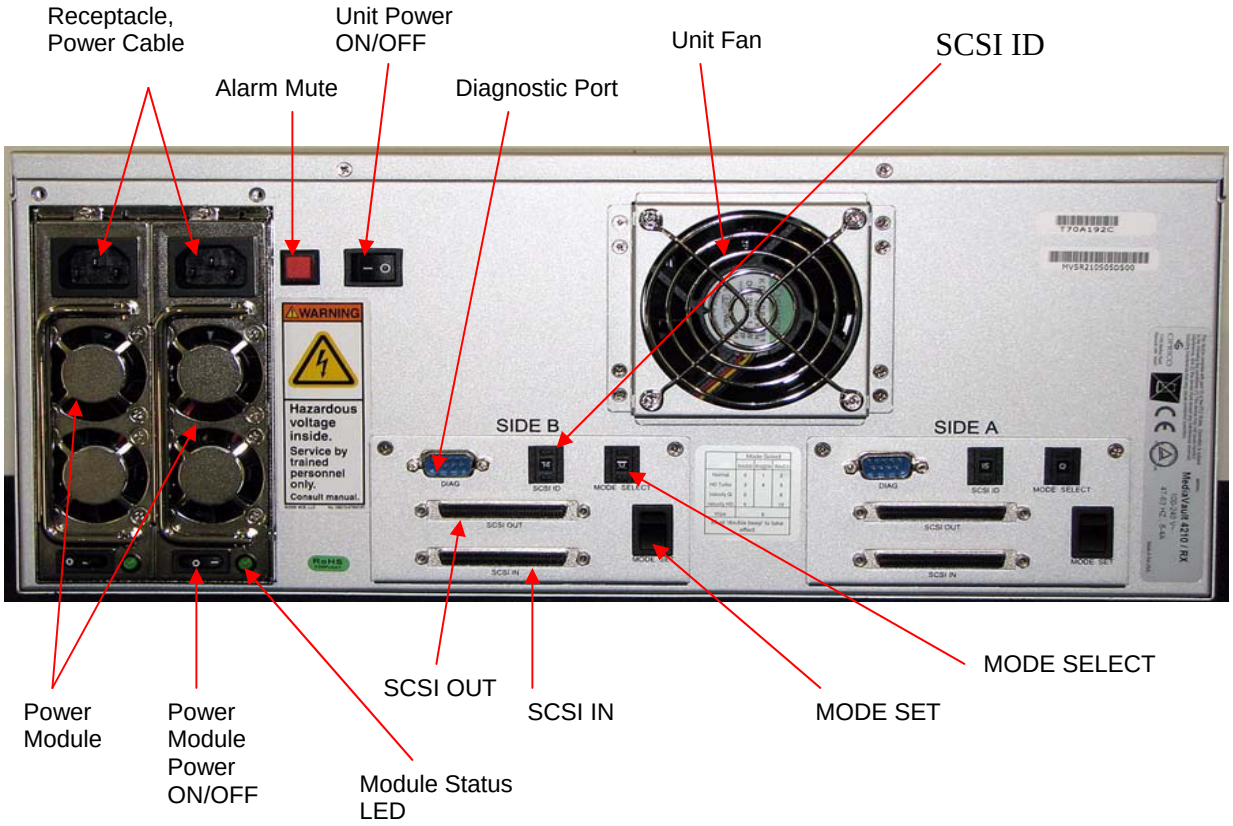


Description of the Rear Panel Components - MV U320-R

Description of the Rear Panel Components - MV U320-R

Indicator	Description
SCSI In	SCSI 68-pin high density (68HD) input connector compatible with Ultra320, Ultra160, Ultra2, and other SCSI standards. HVD (High Voltage Differential) is not supported.
SCSI Out	SCSI 68-pin high density (68HD) output connector compatible with Ultra320, Ultra160, Ultra2, and other SCSI standards. HVD (High Voltage Differential) is not supported.
SCSI ID	Allows the user to change the setting of the SCSI channel.
DIAG	The Diagnostic port is used to enable firmware downloads or perform special diagnostics.
MODE SET	A multi-function button. See the description in the “Mode Set Button”.
Fan, Power Supply	Vents heat from the power supply.
Receptacle, Power Cable	Power receptacle for 100-240 Vac power cable to the auto-ranging power supply.
POWER	In the “On” (1) position, the power switch provides power to the MV U320-R. In the “Off” (0) position, power is turned-off at the power connector. To completely remove power from the MV U320-R, disconnect the power cable from the power cable receptacle.
Unit Fan	Removes heat from the interior of the MV U320-R.
MODE SELECT	Used to change the mode (RAID type) number. See “Mode (RAID Type) Change Procedure”.

Rear Panel Components - MV U320-RX



Description of the Rear Panel Components - MV U320-RX

Indicator	Description
Power Modules	The power load is distributed between the power modules. If one module is removed or malfunctions, the load immediately transfers to the other power module and an audible alarm will sound. The removable power modules must be serviced by trained personnel only. Call One Stop Systems, Inc. technical support department for additional instructions.
Module Status	Each power module (power supply) has a status indicator. - Green means good operating module. - Amber or Off means the power module has failed and needs to be replaced, or that the power module has been removed from its slot.
Module Lock	Each power module has a thumb-wheel lock to secure the module in place. Turning the wheel completely to the left engages the lock and secures the module in place. Turning the wheel completely to the right disengages the lock and allows the module to be removed.
Power Module Fan	The fan removes heat from the power modules (power supplies).
Fans	The unit fans remove heat from Side A and Side B of the MV U320-RX enclosure.
Diagnostic Port	The diagnostic ports (Side A and Side B) enable firmware downloads or perform special diagnostics.
SCSI ID	The SCSI ID switches (Side A and Side B) allow the user to change the setting of the SCSI channels.
MODE SELECT	The Mode Select switches (Side A and Side B) allow the user to change the mode (RAID type) numbers. See “Mode (RAID Type) Change Procedure” .
MODE SET	Multi-function buttons (Side A and Side B). See the description in the “Mode Set Button” section.
SCSI IN	SCSI 68-pin high density (HD68) input connectors (Side A and Side B) that are compatible with Ultra320, Ultra160, Ultra2, and other SCSI standards. HVD (High Voltage Differential) is not supported.

Description of the Rear Panel Components - MV U320-RX (Continued)

SCSI OUT	SCSI 68-pin high density (HD68) output connectors (Side A and Side B) that are compatible with Ultra320, Ultra160, Ultra2, and other SCSI standards. HVD (High Voltage Differential) is not supported.
Power Alarm Mute	This button mutes the power module failure audible alarm.
Power Switch	In the “On” (1) position, the power switch provides power to the MV U320-RX. In the “Off” (0) position, power is turned off at the power input. To completely remove power from the MV U320-RX, disconnect the power cable from the power cable receptacle.
Power Module Power On/Off	Turns power to the power module (power supply) on or off.
Module Status LED	Indicates that the power module is powered-on and active.
Receptacle, Power Cable	Power receptacle for 100-240 Vac power cable to the power modules.

Unit Power-Up Sequence

- Always power-up the MV U320-R or MV U320-RX before powering-up the host computer.
- **IMPORTANT: Wait for the MV U320-R or MV U320-RX to completely boot-up before powering-up the host computer.**
- The unit power-up sequence allows the disk drive modules, and the data access/data transmission functions of the MV U320-R or MV U320-RX, to be fully operational before the host computer is booted-up and “sees” the MV U320-R or MV U320-RX activities.

LED Power-On Sequence

The front panel LEDs of the MV U320-R or MV U320-RX power-up in the following sequence. Depending on the size and type of drive, some LEDs might blink on momentarily, go off, and then illuminate fully after a minute or so.

LED Power-On Sequence

1. Power LED.
2. The drive LEDs blink in sequence, depending on the size and type of drive, and indicates that the unit is ready. (NOTE: This function is seen only when the unit is in RAID 3; it is not seen when the unit is in RAID 0).
3. RAID 3 LED flashes (it stays illuminated if the unit is in RAID 3).
4. The U320 LED or U160 LED illuminates if the host computer is powered-up and is Ultra320 or Ultra160
NOTE: On a DPS/Leitch Velocity Q, the U160 LED illuminates only when the array is active.

Mode (RAID Type) Functions

The MV U320-R or MV U320-RX allows you to choose the RAID type at which the unit will operate. In general, if you do not backup your data on a daily basis it is recommended to use the RAID 3 function.

Mode (RAID Type) Functions Table

Type	Mode*	Sector Size	Usable Capacity	Description and Advantages	If a Drive Fails...
RAID 0	0	512 bytes	Full	Used with all operating systems. There is full capacity for the array, but without any redundancy to protect your data. This mode stripes data across all 5 drives [U320-R] or 10 drives [U320-RX] for the total capacity of the array	Data is lost.
RAID 3 @ 2K	1	2048 bytes	80%	Used with any system except: Avid (Macintosh or PC), Media 100 (Macintosh or PC), Video Toaster, SGI, Linux, or Windows (when striping only). There is access to 80% of the total capacity with redundancy to protect your data. This mode stripes data across 4 drives with 1 drive as a parity drive for redundancy [U320-R], or 8 drives with 2 drives as parity drives for redundancy [U320-RX]. This mode uses a 2048 sector size.	Data is preserved
RAID 3 @ 512k	2	512 bytes	80%	There is access to 80% of the total capacity with redundancy to protect your data. This mode stripes data across 4 drives with 1 drive as a parity drive for redundancy [U320-R], or 8 drives with 2 drives as parity drives for redundancy [U320-RX]. This mode uses a 512 sector size.	Data is preserved

Mode (RAID Type) Functions Table (Continued)

Type	Mode*	Sector Size	Usable Capacity	Description and Advantages	If a Drive Fails...
RAID 0 HD Turbo**	3	512 bytes	80%	There is access to 80% of the total capacity without any redundancy to protect your data. This Turbo mode uses the highest data rate portions of the disk drives.	Data is lost
RAID 3 @ 2K HD Turbo**	4	2048 bytes	40%	Uses the highest data rate portions of the disk drives. *** There is access to 40% of the total capacity with redundancy to protect your data. This mode stripes data across 4 drives with 1 drive as a parity drive for redundancy [U320-R], or 8 drives with 2 drives as parity drives for redundancy [U320-RX]. This mode uses a 2048 sector size and uses the higher data portion of the disk drives.	Data is preserved
RAID 3 @ 512 HD Turbo**	5	512 bytes	40%	Uses the highest data rate portions of the disk drives. *** There is access to 40% of the total capacity with redundancy to protect your data. This mode stripes data across 4 drives with 1 drive as a parity drive for redundancy [U320-R], or 8 drives with 2 drives as parity drives for redundancy [U320-RX]. This mode uses a 512 sector size and uses the higher data portion of the disk drives.	Data is preserved
Wipe	6	This mode will start a write operation for all disk drives in the array. This function wipes out the first and last 256 sectors of an array. When the function is finished a series of 3 beeps is sounded.			
Diagnostic tests	7	The diagnostic tests are, in sequence: RAID 0 read test, RAID 0 write test, and read/write tests on individual drives. The cycle is repeated until stopped by the user.			
RAID 3 @ 512 Velocity Q	8	512 bytes	80%	For use with Leitch Velocity, Velocity Q, Reality, and Velocity HD in SD resolutions. Same functions as Mode 2.	Data is preserved

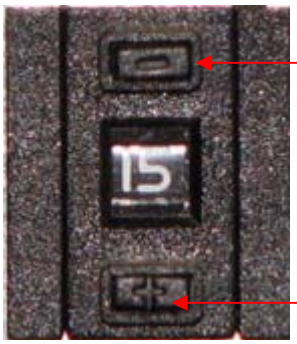
Mode (RAID Type) Functions Table (Continued)

Type	Mode*	Sector Size	Usable Capacity	Description and Advantages	If a Drive Fails...
RAID 0 Velocity HD	9	512 bytes	100%	For use with Leitch Velocity HD. Same function as Mode 0.	Data is lost
RAID 3 @ 512 Velocity HD	10	512 bytes	80%	For use with Leitch Velocity HD. Same function as Mode 2 (RAID 3 @512)	Data is preserved
Reserved	15	Reserved for future use.			

Changing the SCSI ID

- Each SCSI device attached to a SCSI channel must have its own unique ID setting. Valid ID for Wide SCSI are from 0 to 15.
- Most SCSI host adapters inside your computer typically occupy ID 7.
- Do not use the same SCSI ID as the host adaptor. If there are other SCSI devices on the SCSI channel, ensure that none of the SCSI IDs are the same.
- If you are unsure which ID to use and the MV U320-R or MV U320-RX is the only device attached to this particular channel of the host adapter, use ID 15.
- To change the value, use a pointy instrument (pointy pen) and press the buttons just above and just below the number to change it. See figure below.
- The MV U320-R or MV U320-RX must be turned off and back on again to have the new SCSI ID setting take effect.

SCSI ID Selection Buttons



Changing the Mode

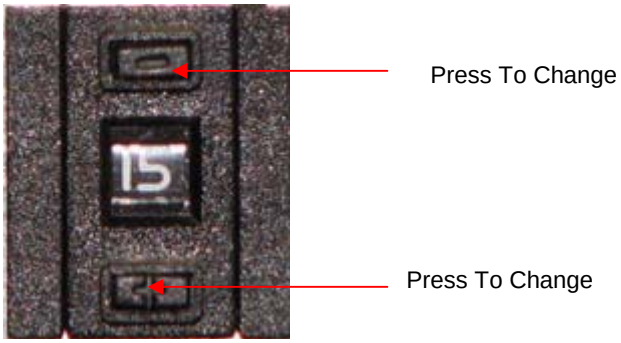
Mode selection allows the MV U320-R or MV U320-RX operator to choose the desired operating mode for the unit.

Mode Change Procedure

To change the mode, perform the following.

1. Turn off the computer.
2. Select a mode.
3. Set the mode number at the Mode Select buttons, located at the rear of the MV U320-R or MV U320-RX. See Figure below. Use a pointed object (such as a pen tip) to press the desired Mode Select button.
    - Press the upper button to decrease the mode number.
    - Press the lower button to increase the mode number.

Mode Select Buttons Figure



4. Turn off power to the MV U320-R or MV U320-RX.
5. Press and hold the **MODE SET** button
6. Apply power to the MV U320-R or MV U320-RX.
7. Keep holding down the button until two beeps are heard to confirm the mode change.
8. Release the **MODE SET** button.

Mode Set Button

This switch performs several functions:

• During power up, it acts as a Mode Set switch.

• During normal operation it is used to Silence Alarms and to start the rebuild process for a replaced drive.

During power up, the switch acts as a Mode Set switch and is used in conjunction with the Mode Selection option. See the “Mode (RAID Type) Change” procedure.

During normal operation, and only when the unit is in the RAID 3 modes, this switch is used to silence alarms and to start a drive rebuild process. When a defective drive has been replaced, this rebuild process brings the MV U320-R or MV U320-RX back up to its fully protected mode.

Mode Set Button Functions Table

Indicator	Description
Mode Set Button (for Mode Changes)	Used during the RAID Mode change procedure. Press and hold this switch and apply power to the MV U320-R or MV U320-RX. A double beep confirms the mode change. Release the switch after the double beep. The new Mode selection is now set
Mode Set Switch	Mutes the audible alarm when the MV U320-R or MV U320-RX requires service. Do a quick press & release to mute the alarm.
Mode Set Button (for drive rebuilds)	In RAID 3 mode, and when a drive is marked as “down,” this switch is used to start the drive rebuild process. After the alarm has been muted, press and hold the Mode Set button until you hear two beeps. The rebuild process has now started.

Audible Alarm

The MV U320-R or MV U320-RX sounds an alarm when there is a problem with a power supply or a drive. Corrective actions should be applied to fix the problem.

Description of the Audible Alarms

Description of the Audible Alarms

6 Rapid Beeps During Boot Time	6 rapid beeps during boot time is normally associated with SCSI cabling, SCSI termination, or related to the host computer boot-up sequence. Always power-on the MV U320-R or MV U320-RX first. Wait for the array to be powered-up, and then power-on the host computer. You might need to physically remove and re-insert the SCSI connectors and terminators along the SCSI path (this includes the connectors at the SCSI controller and at the MV U320-R or MV U320-RX). Check for bent pins. Check that there no other SCSI devices on the bus is using the same SCSI ID address. Make sure the SCSI ID is not set to “7”. Remove any other SCSI device that shares the same SCSI bus as the MV U320-R or MV U320-RX. (Leaving the MV U320-R or MV U320-RX as the only SCSI device helps identify if there is a conflict with other devices).
6 Rapid Beeps During Normal Operations	6 rapid beeps during normal operation indicate there is a SCSI interface issue or that a disk drive in the MV U320-R or MV U320-RX has timed-out. Check that all SCSI connections are securely in place. You might need to physically remove and re-insert the SCSI connectors and terminators along the SCSI path (this includes the connectors at the SCSI controller and at the MV U320-R or MV U320-RX). Check for bent pins.
Slow Beeps	Five or less slower beeps indicate a bad or intermittent drive. The number of beeps indicates which drive is having problems. When operating in RAID 3 mode the MV U320-R or MV U320-RX is still available for normal operation without performance degradation. The beeps indicate that a drive is down and that the MV U320-R or MV U320-RX is operating in a degraded RAID 3 state. If another drive fails you are in danger of losing data.
Constant Solid Beep	This indicates that a drive is down in RAID 3. The Service indicator should be on. One of the drive indicator LEDs should exhibit a slow blink (one second on, one second off). This drive needs to be serviced. See the “Disk Drive Module Replacement” section. You might need to mute the alarm by momentarily pressing the Mode Set button only once. Pressing the Mode Set button a second time will start the rebuild process. (You would typically only do this after a replacement drive module has been installed to replace a defective drive module).

Configuration

Partitioning and Formatting

- Partitioning and formatting the MV U320-R or MV U320-RX is required, in order to prepare the unit for usage.
- After the unit is physically connected to your computer, use the following sections as a guide to locate and execute the appropriate utility to partition and format the MV U320-R or MV U320-RX.

U320-R

- The MV U320-R is seen as one, large SCSI disk drive by the SCSI host adapter in your computer.
- Install the appropriate driver for your SCSI Host Adapter. No additional software or drivers are necessary to use the MV U320-R. Treat the MV U320-R as a normal ordinary hard disk drive when partitioning and formatting.

U320-RX

- The MV U320-RX is seen as two, large SCSI disk drives by the SCSI host adapter in your computer.
- Install the appropriate driver for your SCSI Host Adapter. No additional software or drivers are necessary to use the MV U320-RX. Treat the MV U320-RX as a pair of normal ordinary hard disk drives when partitioning and formatting.

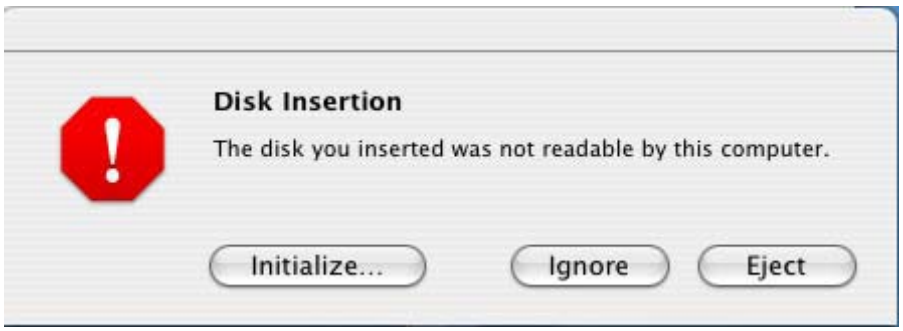
Macintosh OS X Partitioning/Formatting

- Use the following configuration to get maximum speed from the MV U320-R with OS 10.4.x for video capturing/playback and editing.
- Check and ensure you are using the latest recommended configuration for your SCSI controller card, video capture card and editing software. Update any software or drivers, as necessary.

Preparing a Single-Channel MV U320-R or MV U320-RX Max

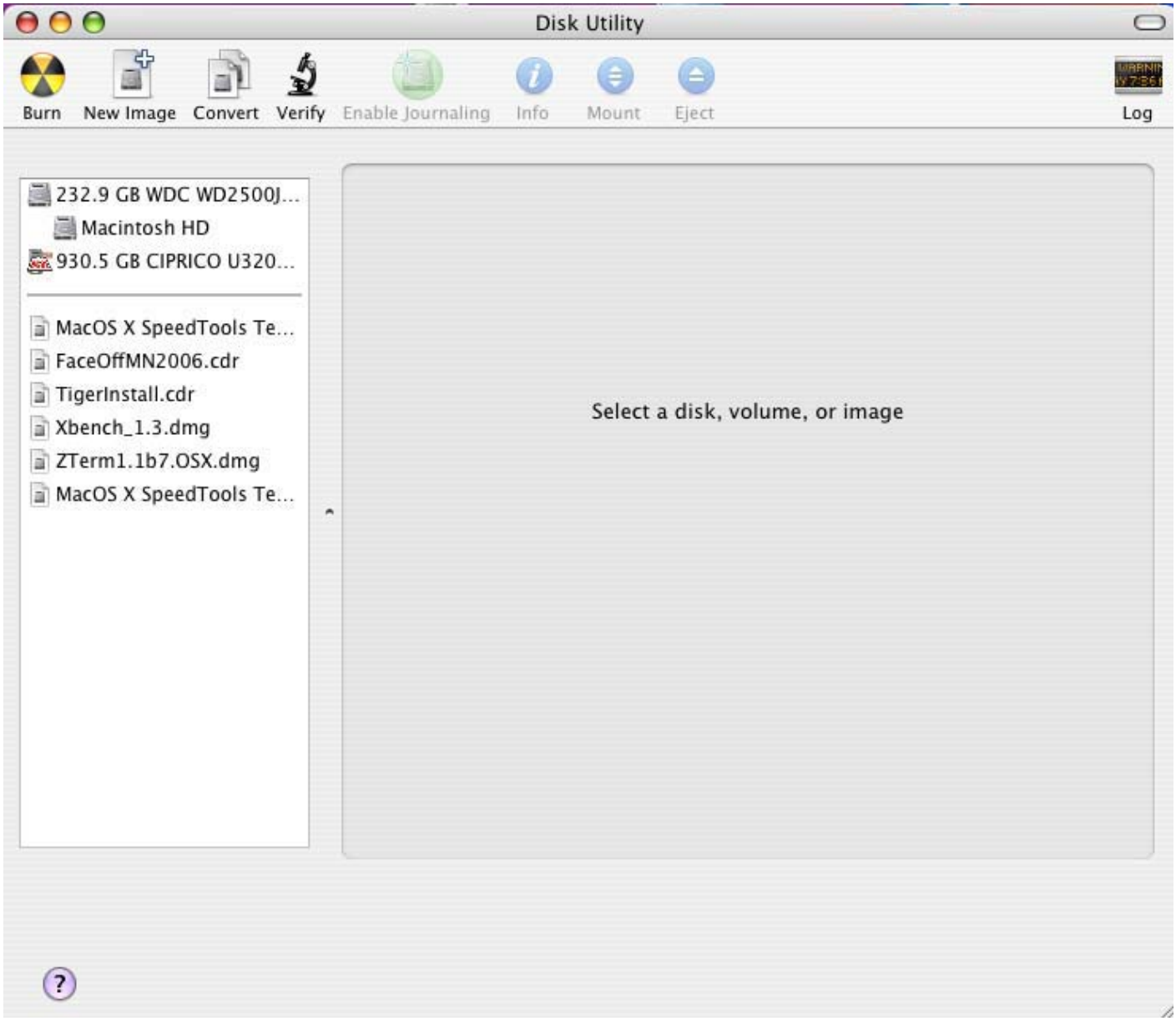
1. Launch the Apple Disk Utility program. (The Disk Utility is located at Macintosh HD > Applications > Utilities.)
2. If the MV U320-R or MV U320-RX is unformatted, a warning appears before the Apple Disk Utility program is launched. Click **INITIALIZE....**

Disk Insertion Warning for Unformatted MV U320-R Units



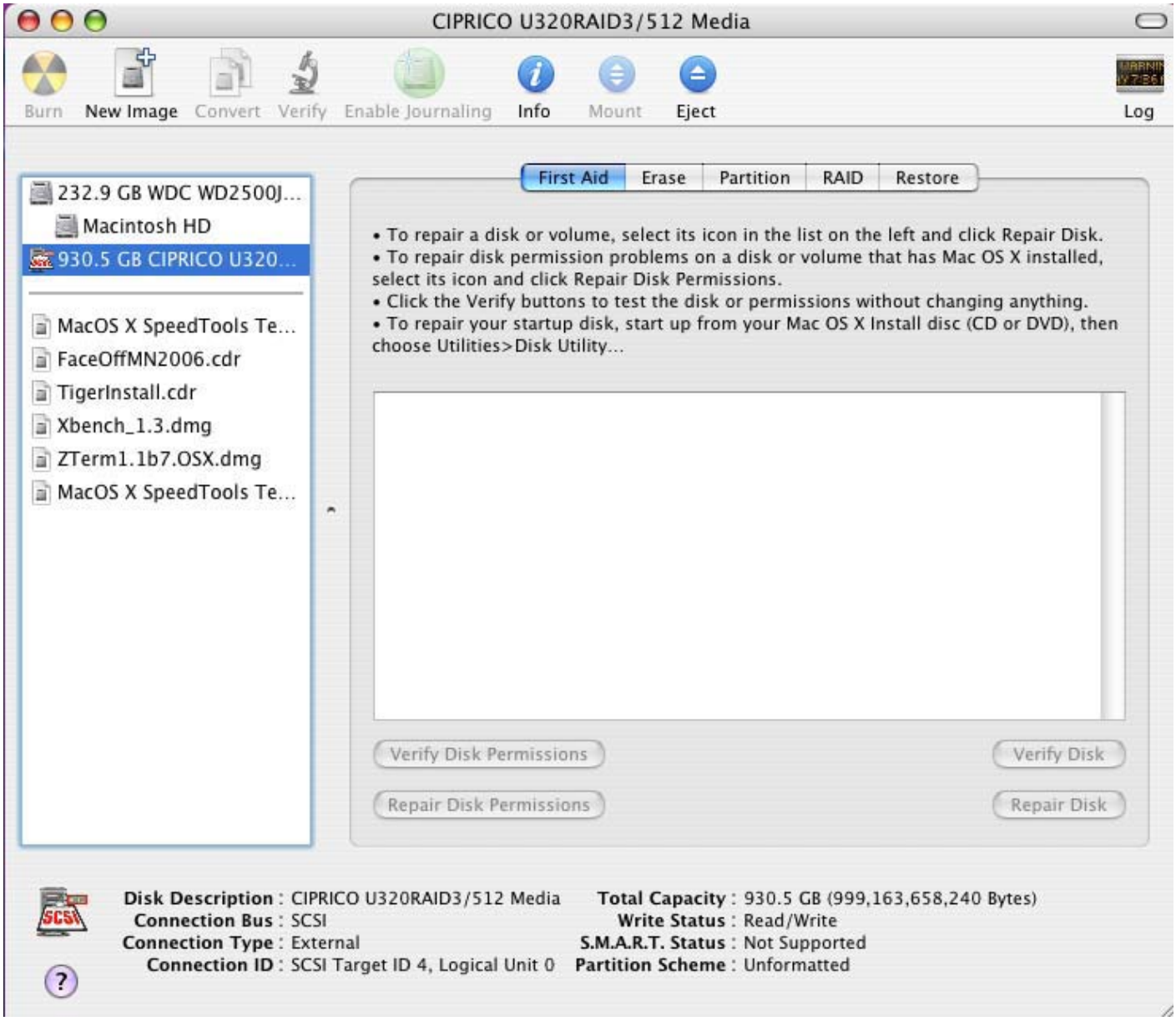
3. The *Apple Disk Utility* screen appears. In the example below, an icon of the “930.5 GB ONE STOP SYSTEMS, INC. U320...” drive of the MV U320-R is shown in the left side. See Figure below.

Apple Disk Utility Screen, Showing the “930.5 GB CIPRICO U320...” Icon



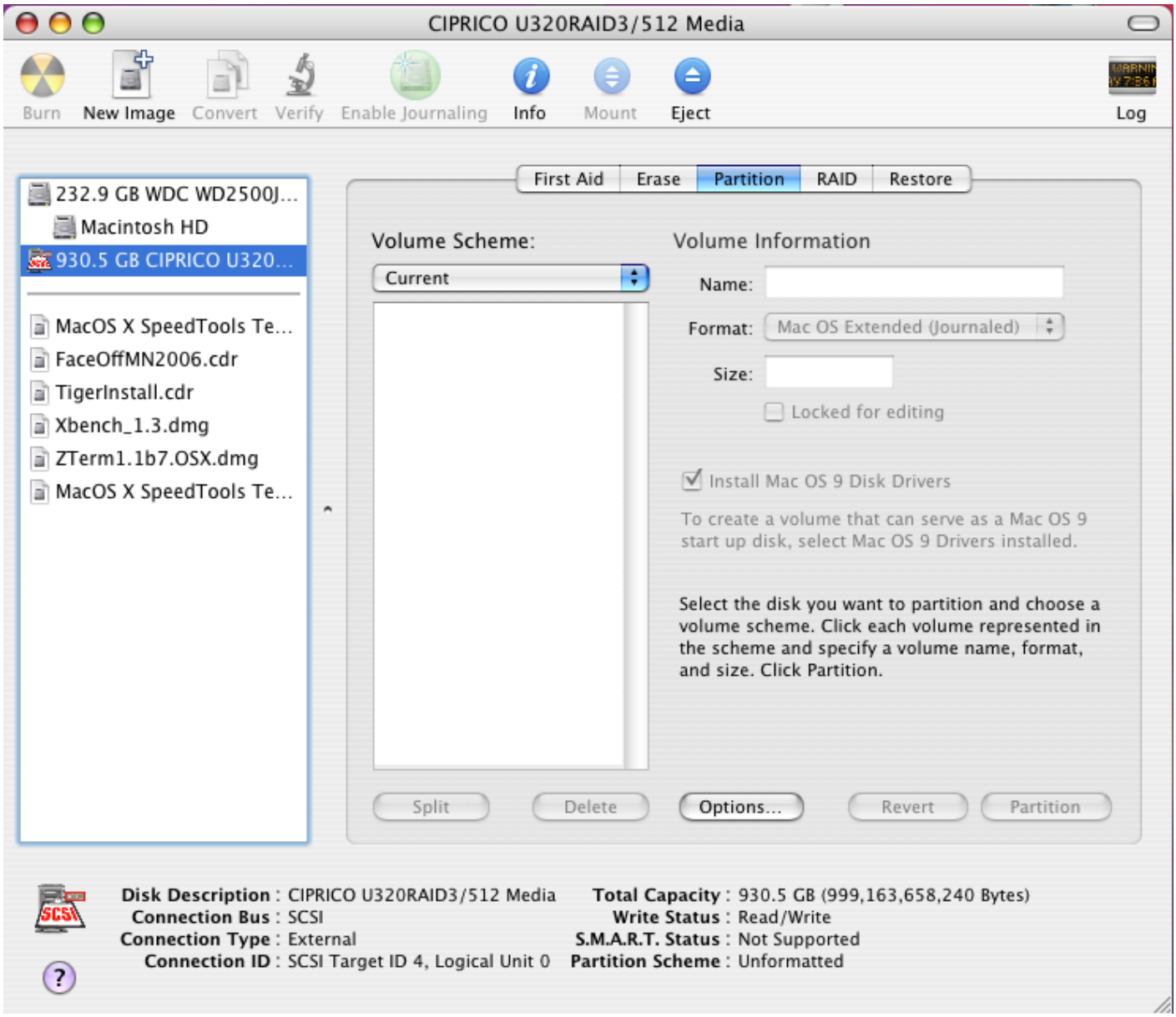
4. Click on the drive icon. The screen changes, with the “First Aid” tab highlighted by default. See Figure below.

Apple Utility Screen, with the “First Aid” Tab Highlighted by Default



5. Click the “Partition” tab at the upper right of the *Apple Disk Utility* screen. See Figure below.

Apple Utility Screen, with the “Partition” Tab Highlighted

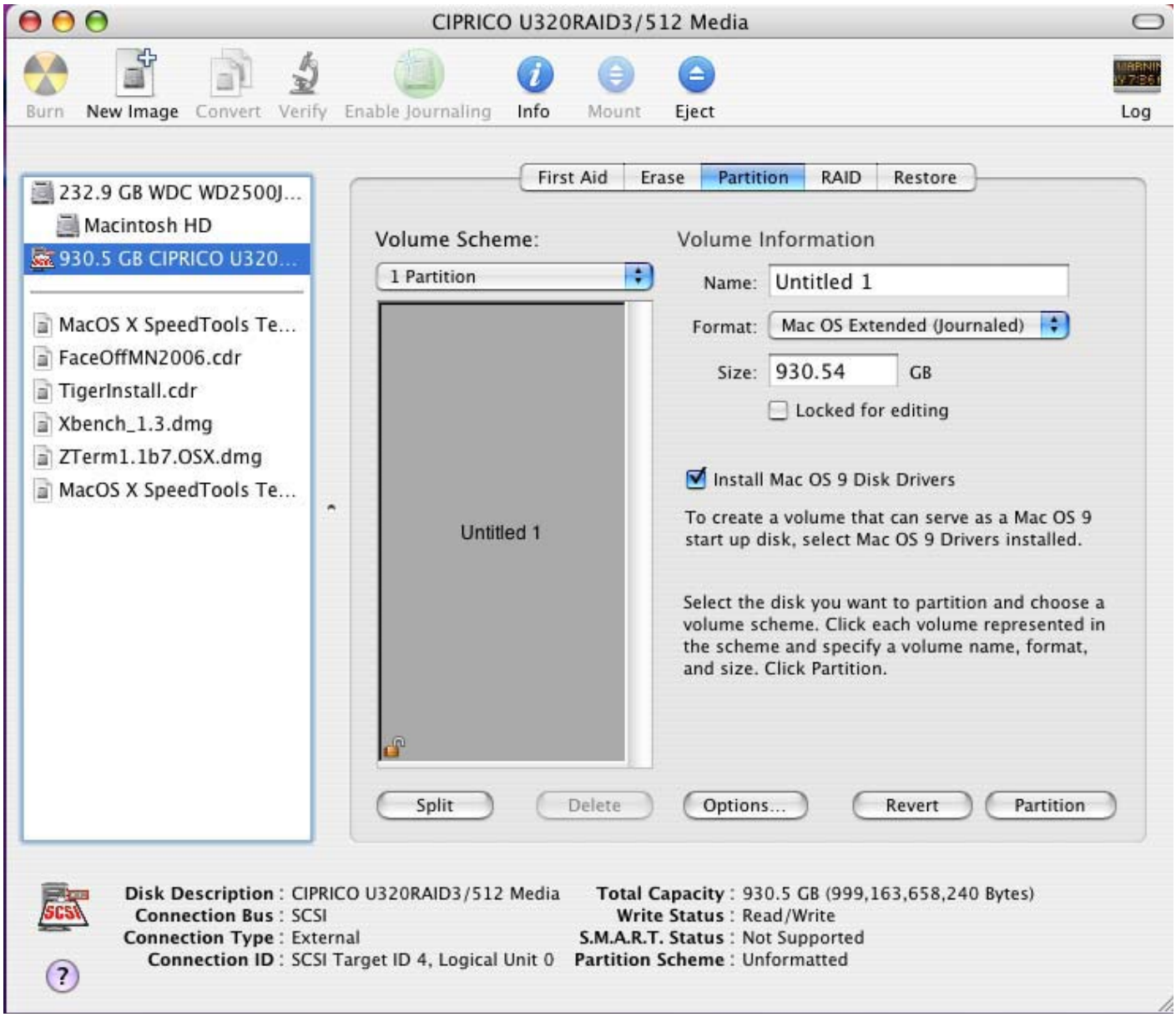


6. At the “Volume Scheme:” field choose “1 partition”. See Figure below.
7. At the “Name:” field, under “Volume Information,” choose a name for the volume. See Figure below.
8. In the “Format:” field, select “Mac OS Extended (Journaled)”. See Figure below.

   NOTE: Some versions of the Mac OS/X contain a checkbox:

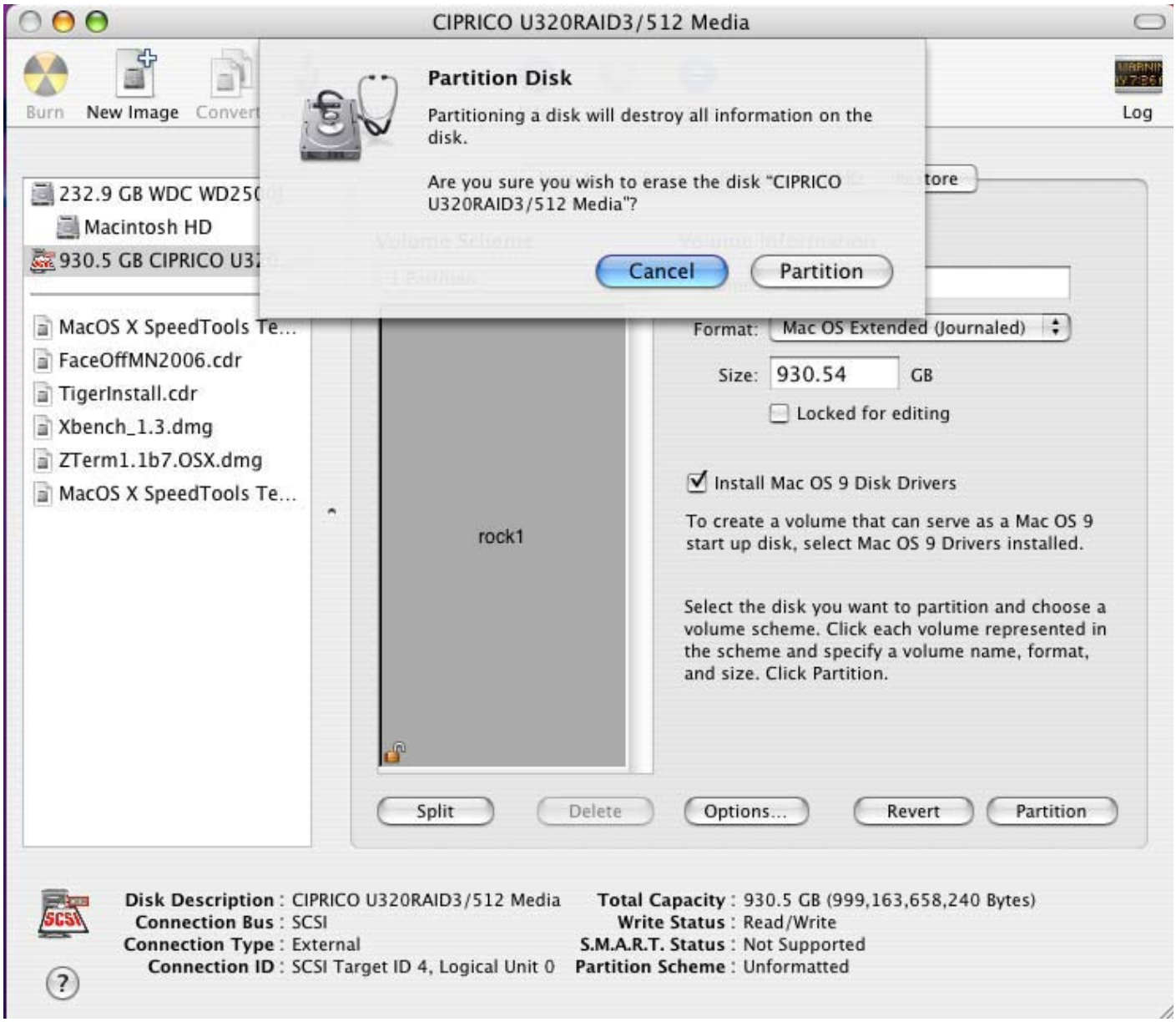
   “Install Mac OS 9 Disk Drivers”. Make sure to check this checkbox.
9. Click the **PARTITION** button at the lower right of the screen. See Figure below.
10.

Apple Utility Screen, with the Volume Scheme, Name, and Format Fields



11. A *Partition Disk* pop-up screen appears. It warns about destroying data when partitioning a disk. To continue with the partition process, click the **PARTITION** button. See Figure below.

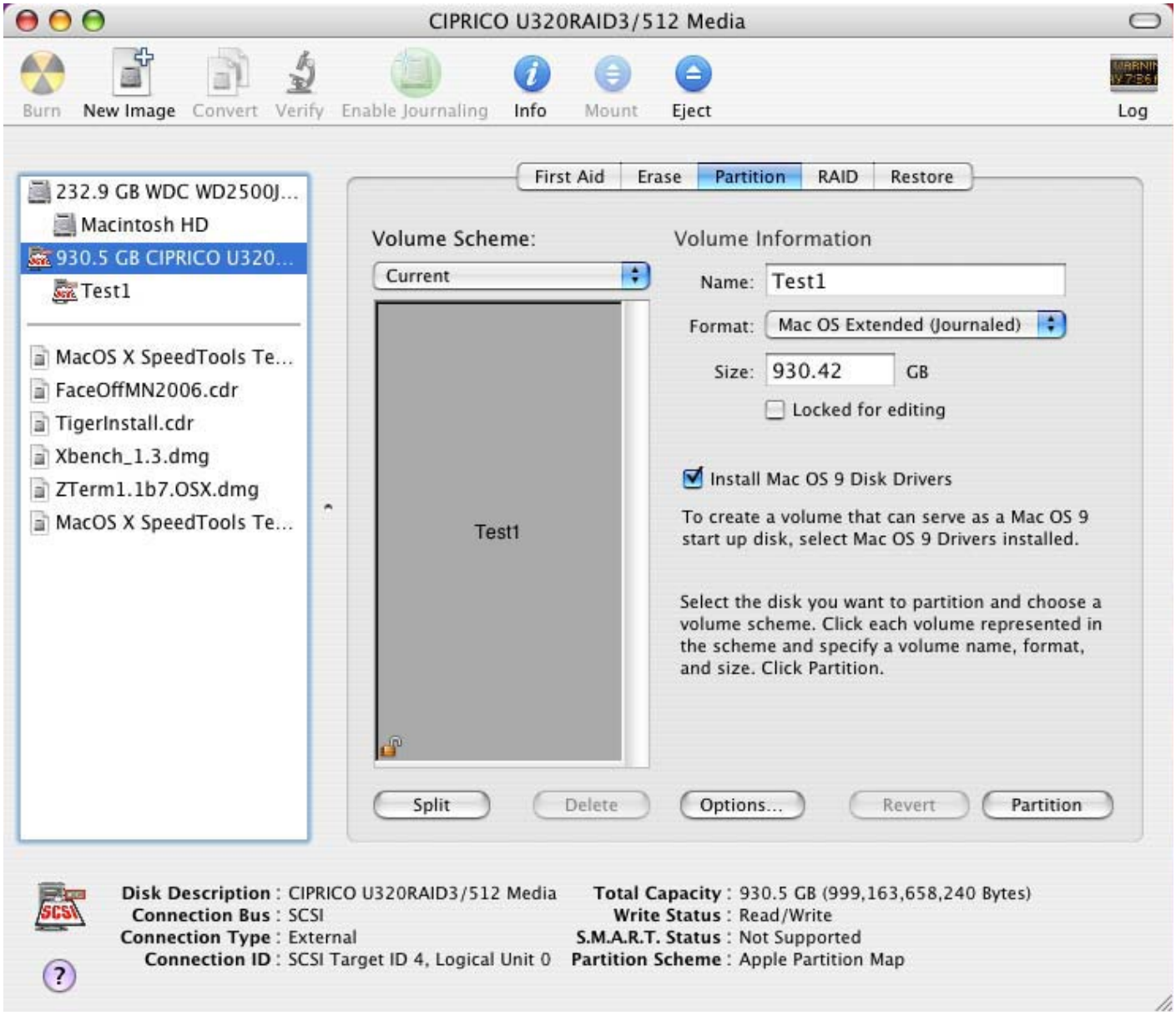
Partition Disk Pop-Up Screen



NOTE: Depending on system security, a dialog box might appear and require a system password.

12. When the partition process is finished, the named disk appears at the left side of the *Apple Disk Utility* screen. See Figure below.

The Name of the Newly Partitioned Disk at the Apple Disk Utility Screen



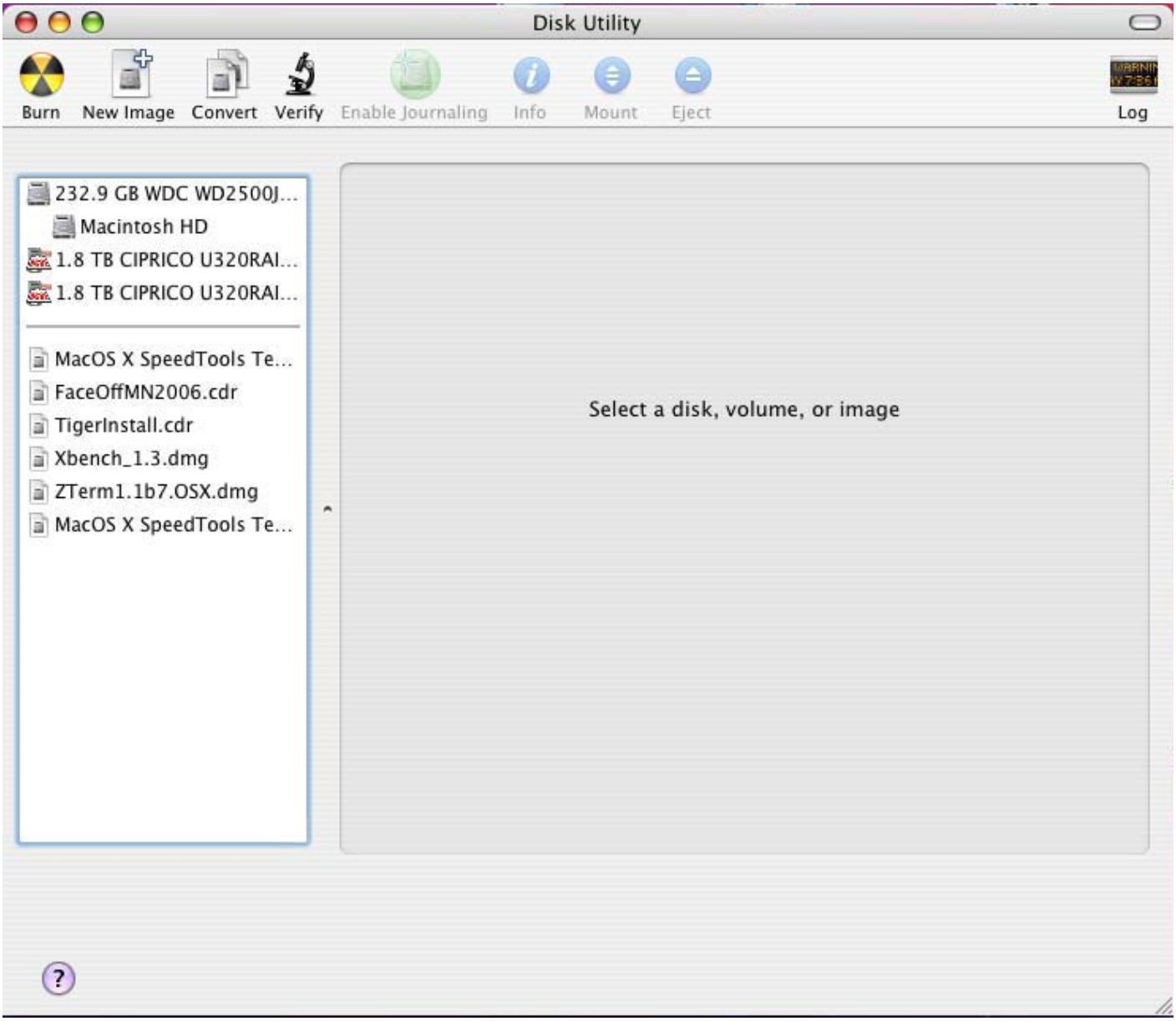
Preparing a Pair of MV U320-R Units or a Dual Channel MV U320-RX (striping)

1. Launch the Apple Disk Utility program. (The Disk Utility is located at Macintosh HD > Applications > Utilities.)
2. If the MV U320-R has not previously been formatted, a pop-up screen appears for each channel, before the Apple Disk Utility program is launched. Click **INITIALIZE...** for the first and second warning. See figure below.

Disk Insertion Warning Pop-Up Screens for Unformatted MV U320-R Units

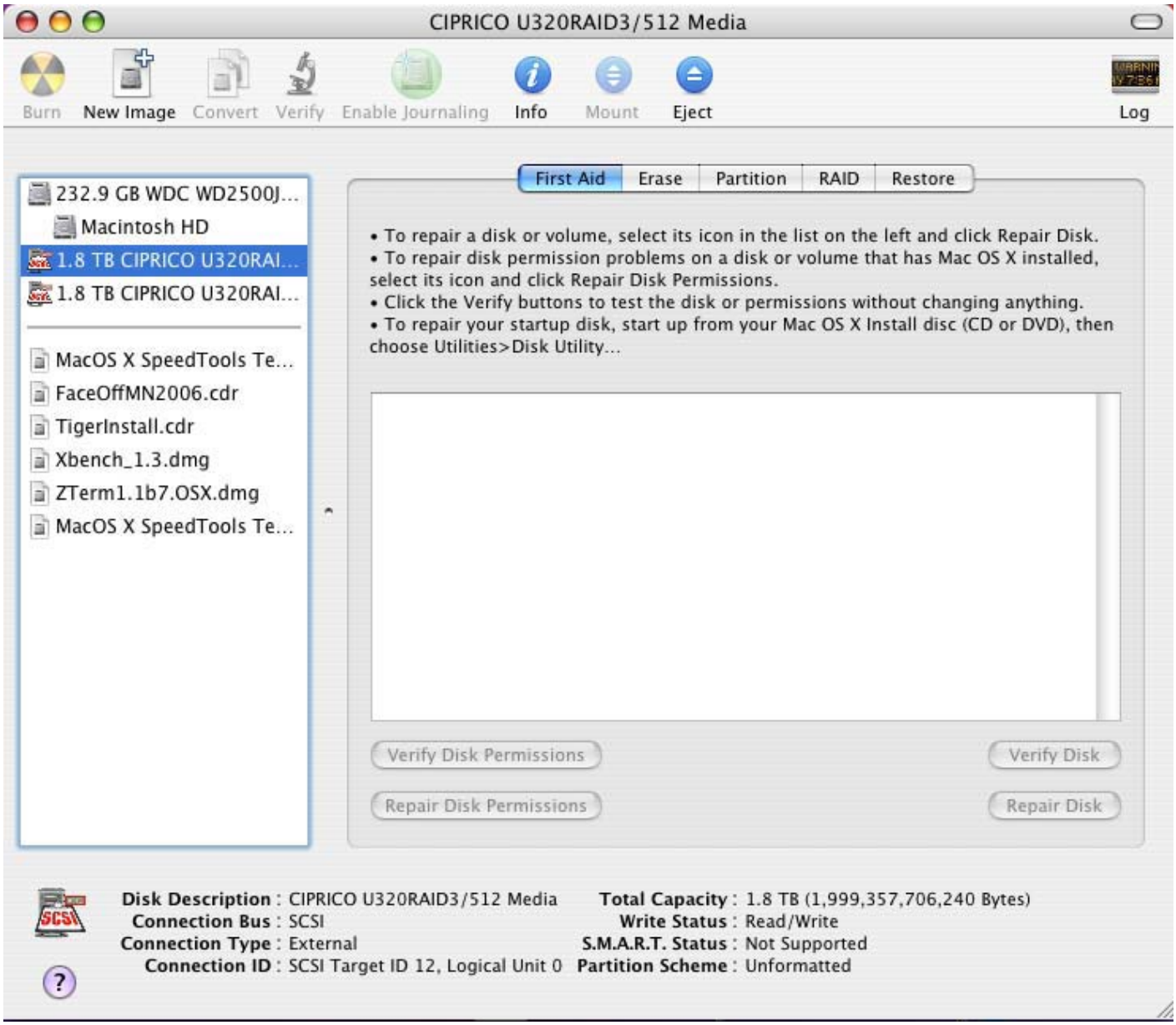
3. The *Apple Disk Utility* screen appears. In the example below, icons of the “1.8 TB CIPRICO U320RAI...” drives of the MV U320-RX are shown in the left side. See Figure below.

Apple Disk Utility Screen, Showing the “1.8 TB CIPRICO U320RAI...” Drives



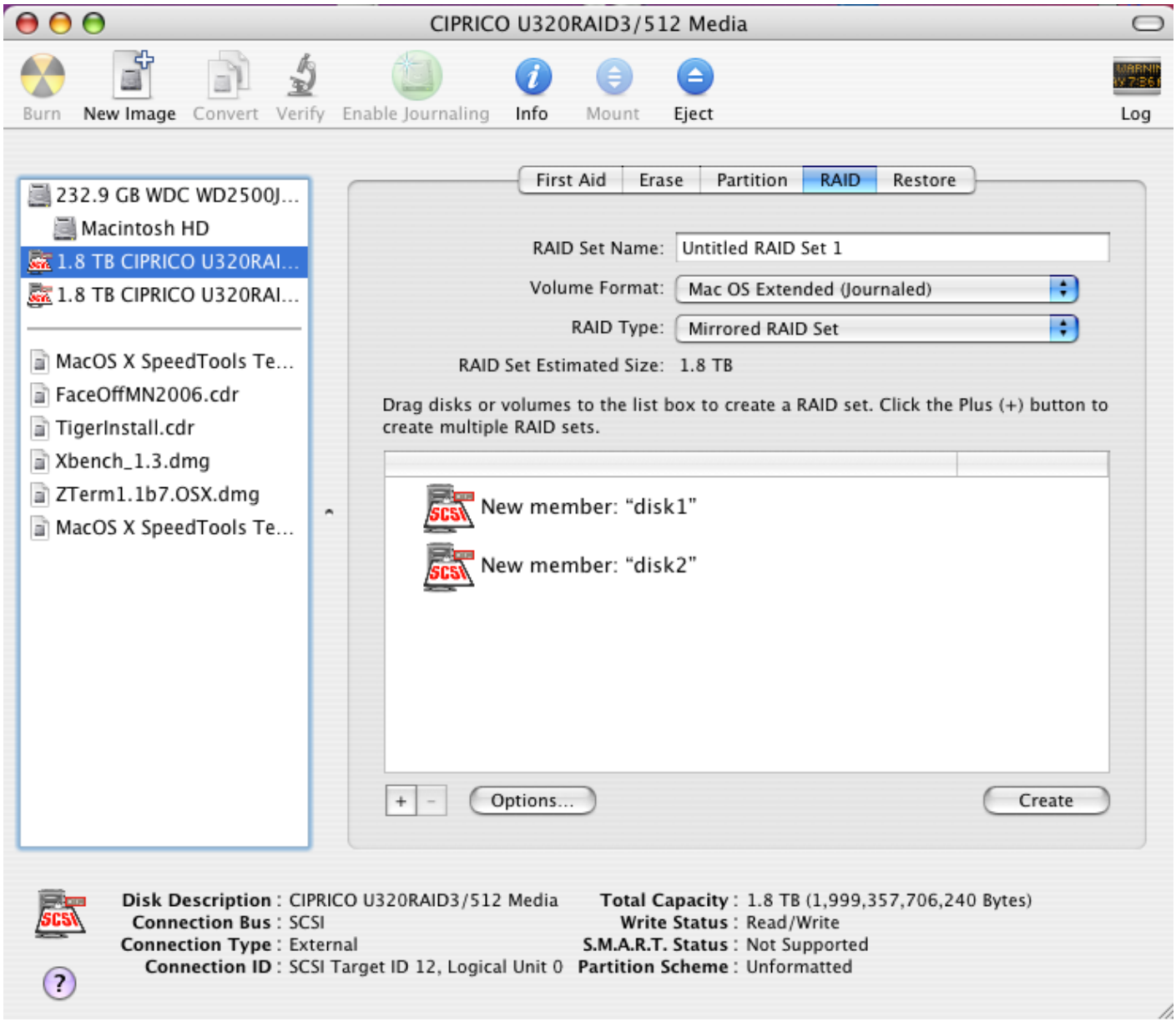
4. Click on the drive icon. The right side of the screen changes, with the “First Aid” tab highlighted by default. See Figure below.

Apple Utility Screen, with the “First Aid” Tab Highlighted by Default



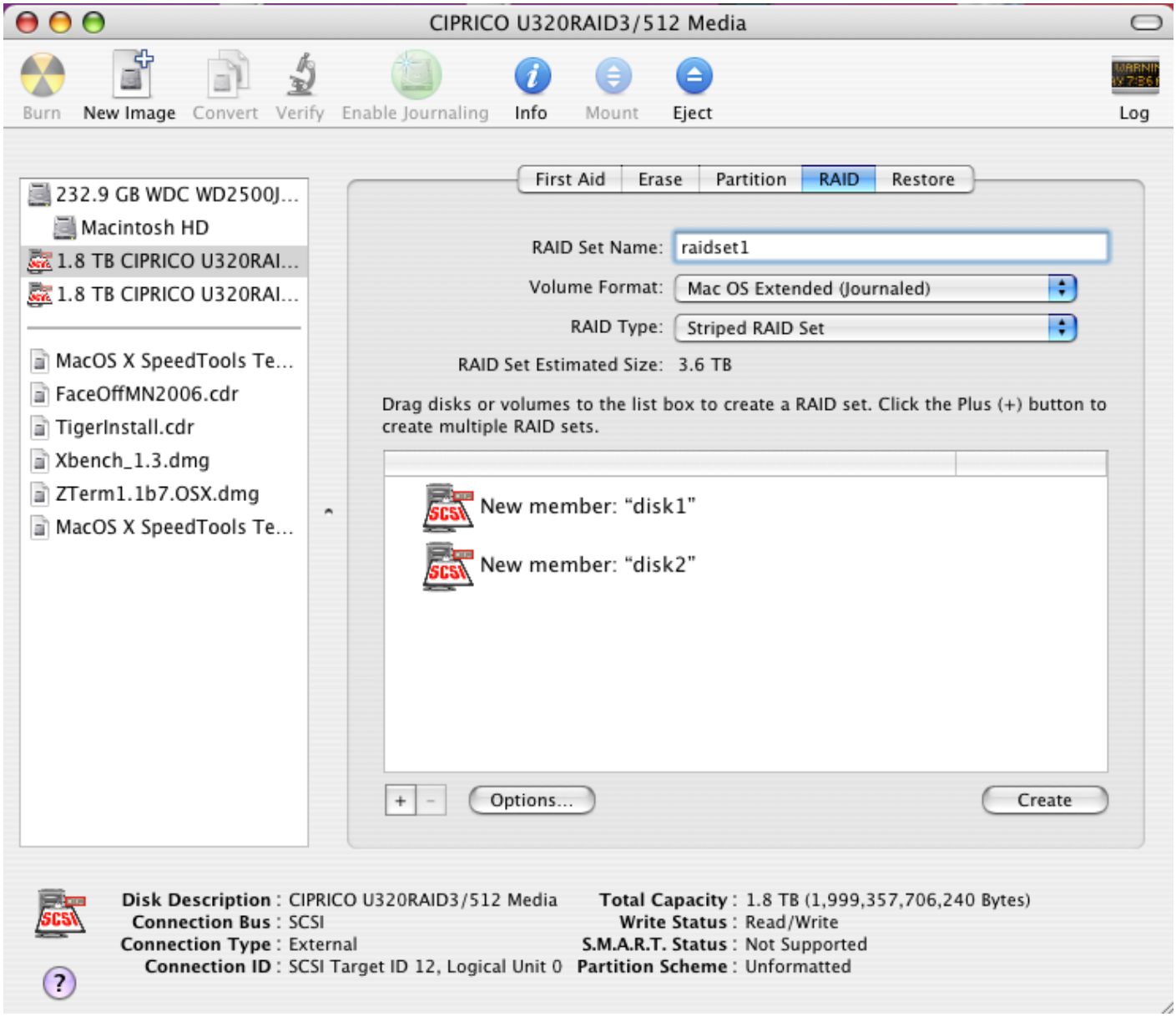
5. Click the “RAID” tab the top of the screen.
6. Drag the two icons of the disk set from the left side to the large side open area on the right side of the screen. See Figure below.

Apple Disk Utility Screen, Showing the Disk Set on the Right Side



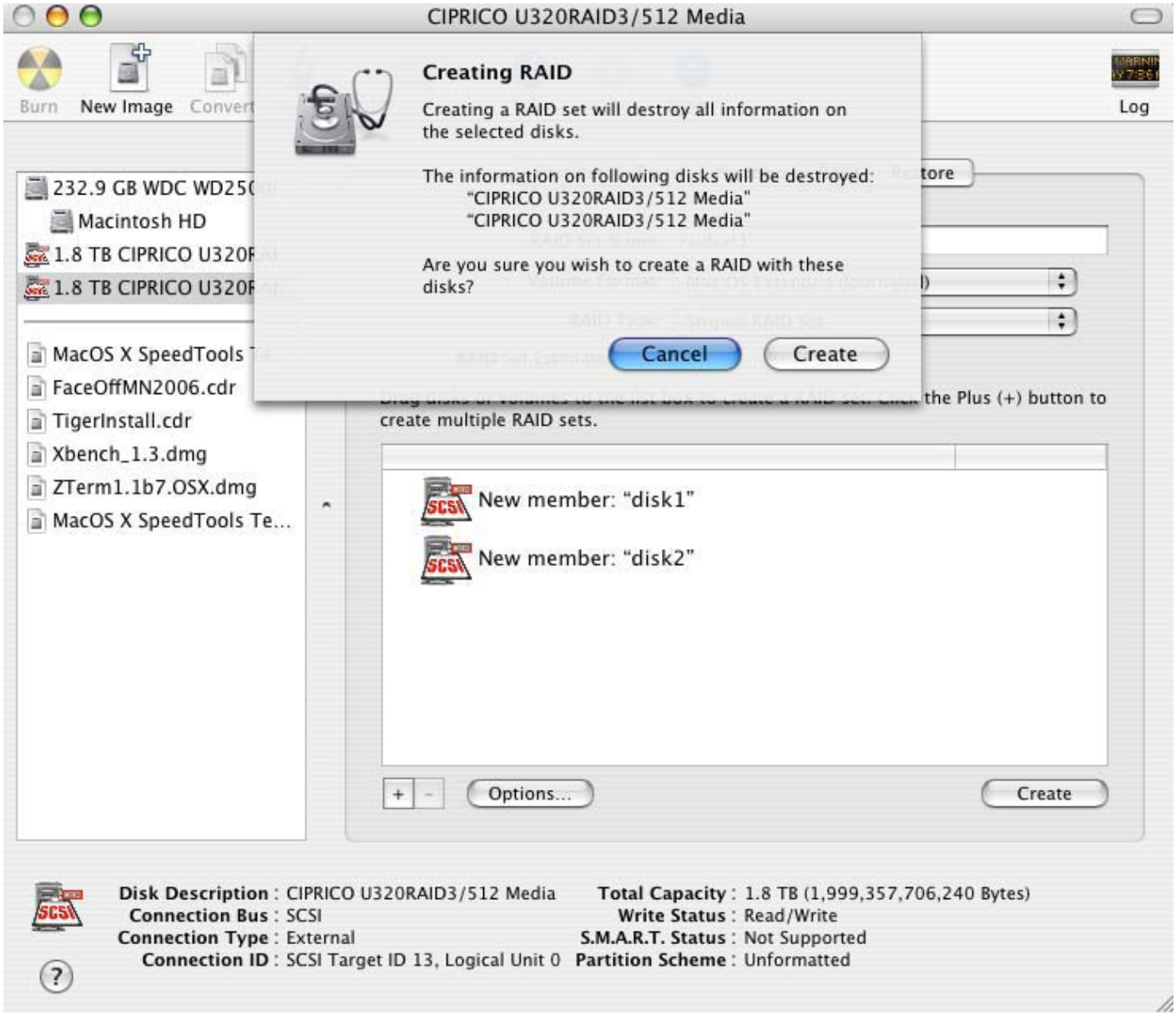
7. For the “RAID Scheme,” select “Striped RAID Set”. See Figure below.
8. For “RAID Set Name” type a name for the volume. Make sure that it is not the same name as another existing volume. See Figure below.
9. For “Volume Format” select “Mac OS Extended (Journaled)”. See Figure below.
10. Click on “Create” at the lower right of the screen. See Figure below.

Apple Disk Utility Screen: RAID Set Name, Volume Format, and RAID Type Fields



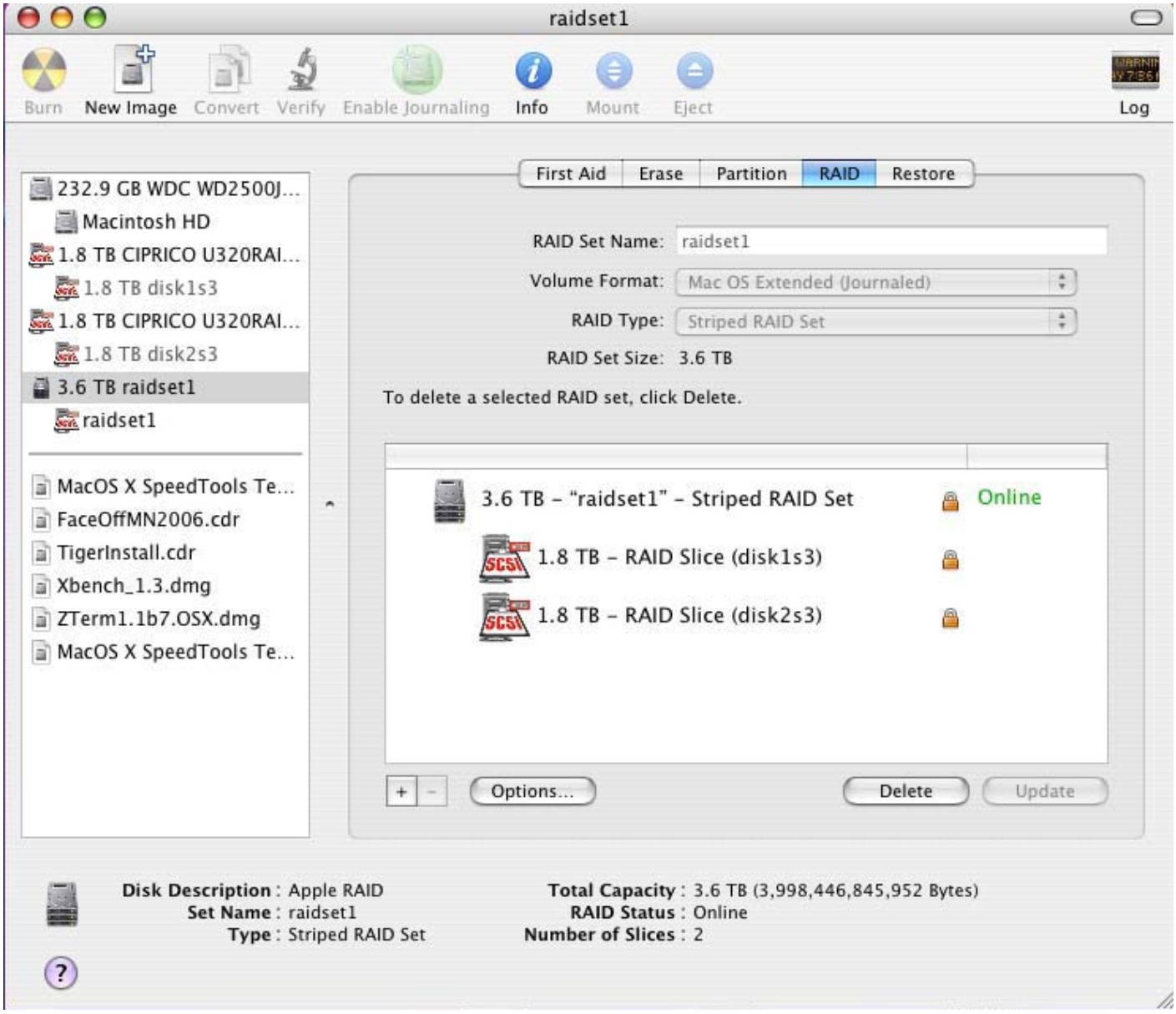
11. A *Creating RAID* pop-up screen appears. Read the statement. If you wish to proceed, click **CREATE.** See Figure below.

Creating RAID Pop-Up Screen



12. The named volume appears on the left side of the Apple Disk Utility screen, as well as on the computer desktop. See Figure below.

Apple Disk Utility Screen, Showing the Newly Named “raidset1” Volume



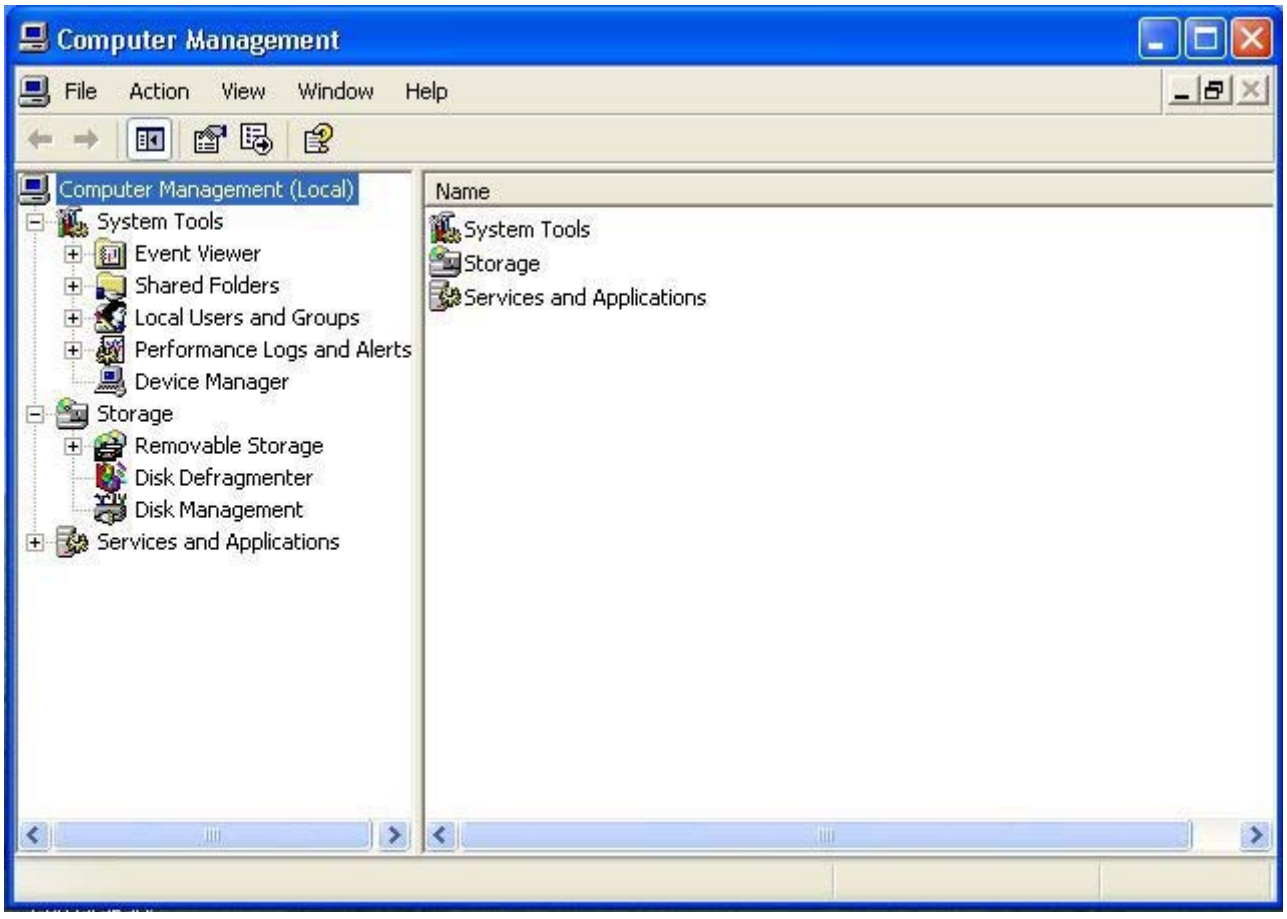
Windows 2000, Windows Server 2003, Windows XP Partitioning/Formatting

Preparing an MV U320-R or MV U320-RX

- **NOTE: Steps 1 through 9 of this section describe a process that is common to single (unstriped) and dual (striped) volumes.**
- **The process diverges after step 9. At that point,**

1. After the computer boots-up, right-click on the “My Computer” icon on the desktop (Windows 2000) and select “Manage”. Or, for Windows XP and Windows Server 2003, left-click on Start, then right-click on “My Computer,” then select “Manage”.
2. The *Computer Management* screen appears. Click “Disk Management” at the left side. See Figure below.

Computer Management Screen

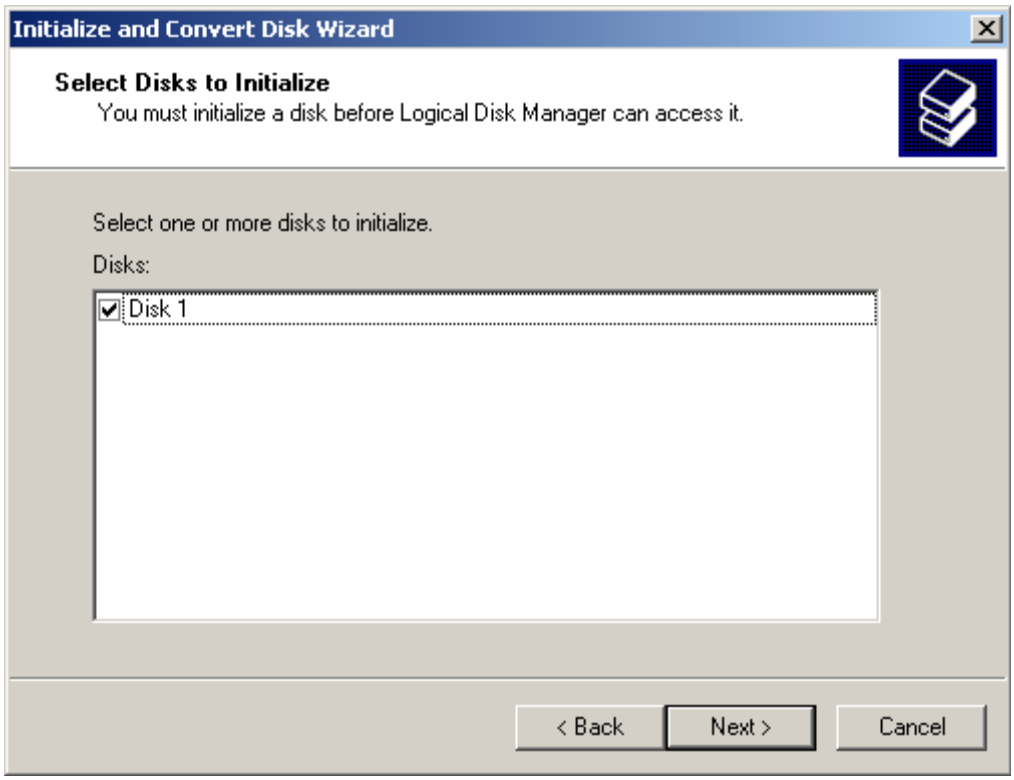


3. If this is the first time that the array has been used on the PC, the *Initialize and Convert Disk Wizard* screen appears. Click **NEXT >**. See Figure below.

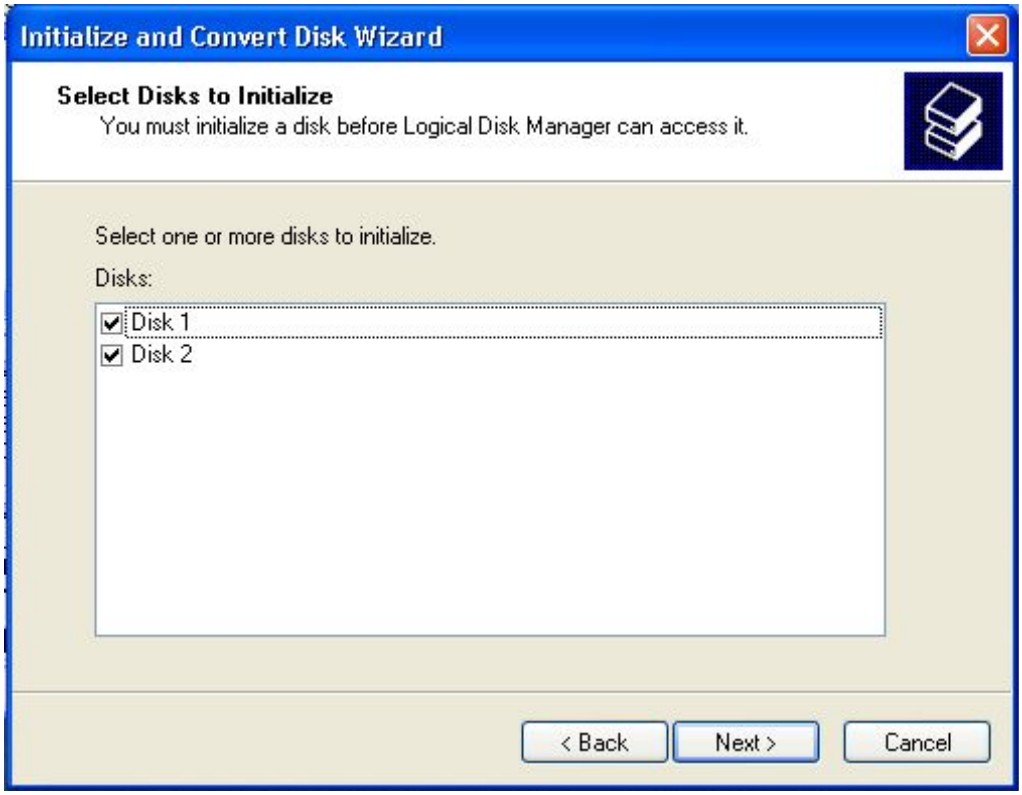
Initialize and Convert Disk Wizard Screen

4. At the Initialize and Convert Disk Wizard - Select Disks to Initialize screen, make sure the Disk 1 [MV U320-R only] or Disk 1 and Disk 2 [MV U320-RX only] checkboxes are checked (the number of disks can vary). Click **NEXT >**. See both figures below.

Initialize and Convert Disk Wizard - Select Disks to Initialize Screen, Showing Disk 1 [MV U320-R only]

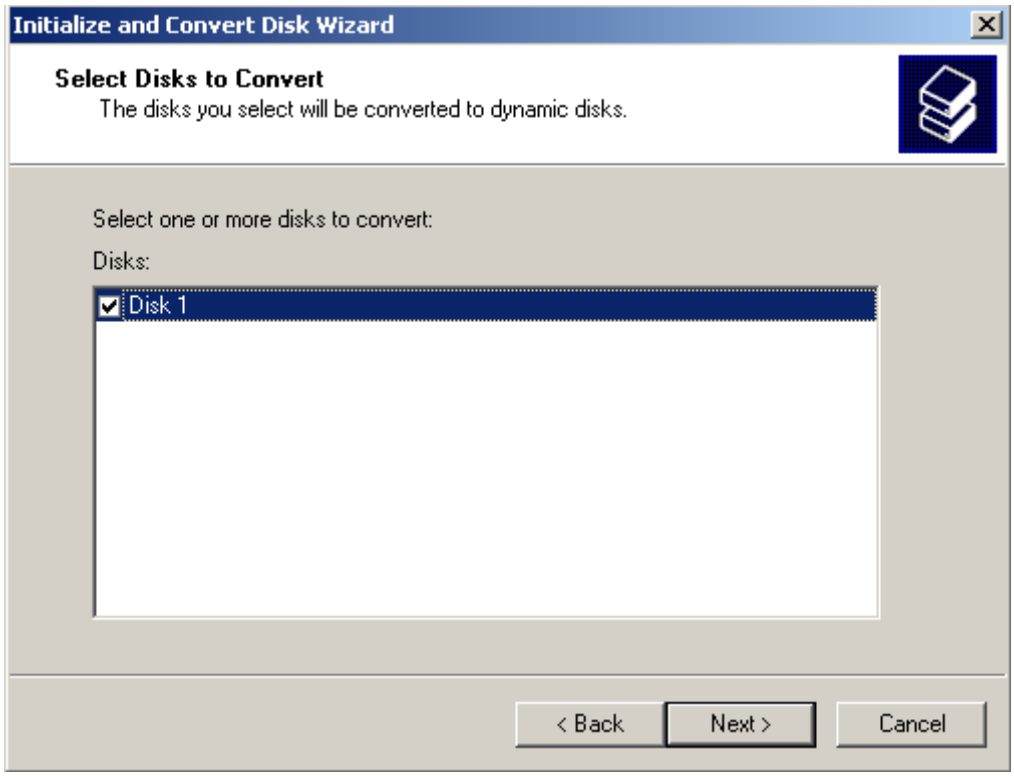


Initialize and Convert Disk Wizard - Select Disks to Initialize Screen, Showing Disk 1 and Disk 2 [MV U320-RX only]

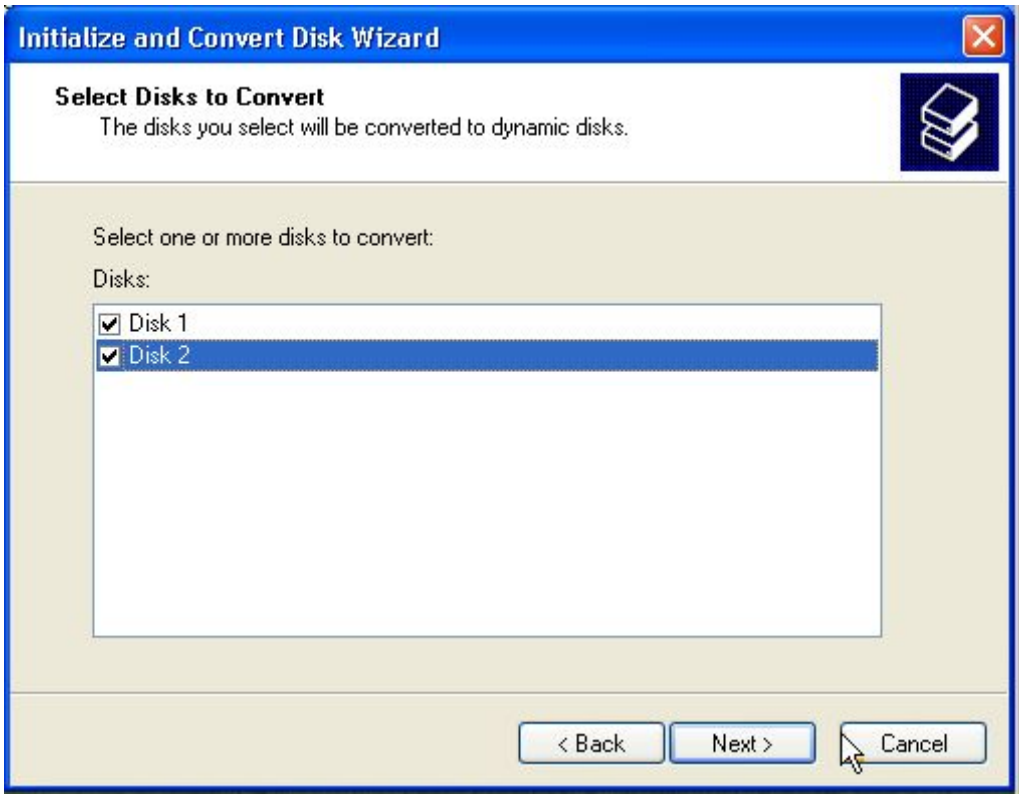


5. At the Initialize and Convert Disk Wizard - Select Disks to convert screen, check the Disk 1 [MV U320-R only] or Disk 1 and Disk 2 checkboxes [MV U320-RX only]. Click NEXT >. See Figures below.

Initialize and Convert Disk Wizard - Select Disks to Convert Screen, Showing Disk 1 [MV U320-R only]

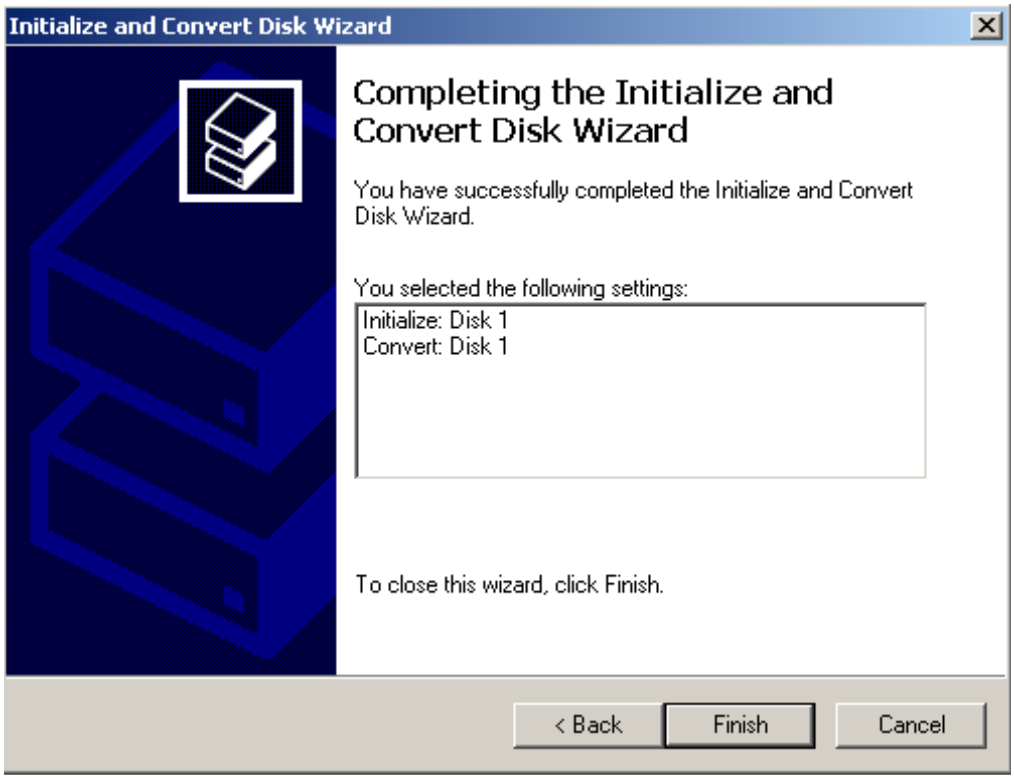


Initialize and Convert Disk Wizard - Select Disks to Convert Screen, Showing Disk 1 and Disk 2 [MV U320-RX only]

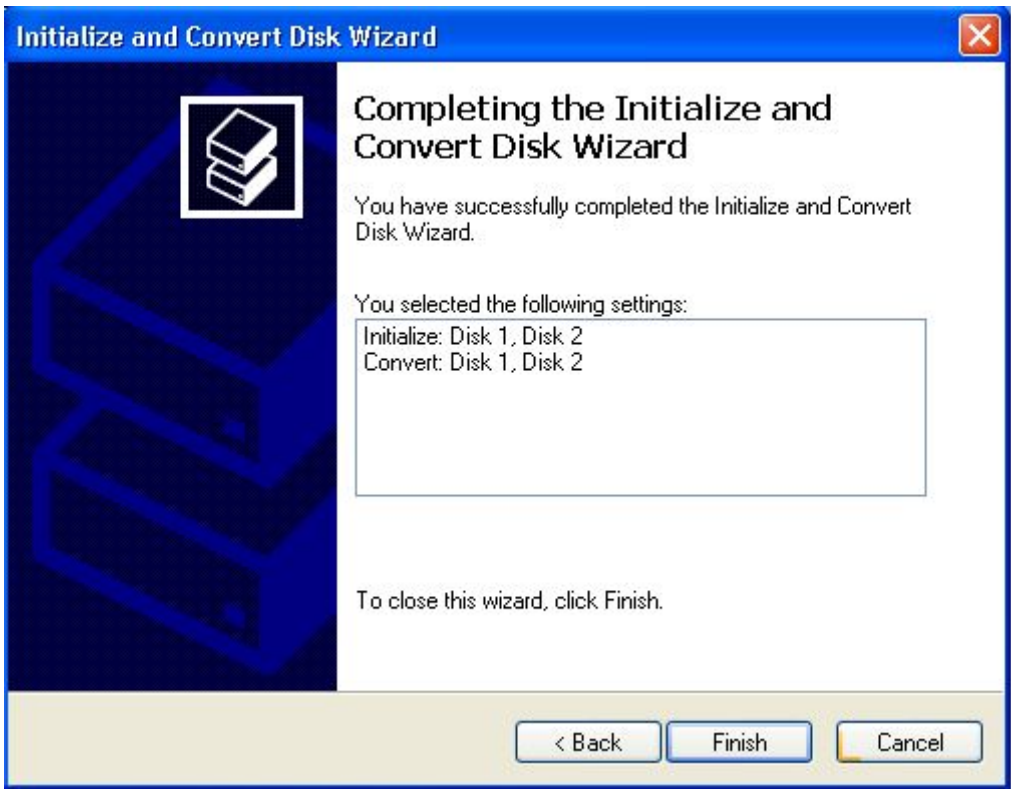


6. When the Initialize and Convert Disk Wizard - Completing the Initialize and Convert Disk Wizard screen appears, review the information. If it is OK, click **FINISH**. See both figures below.

Initialize and Convert Disk Wizard - Completing the Initialize and Convert Disk Wizard Screen for Disk 1 [MV U320-R only]



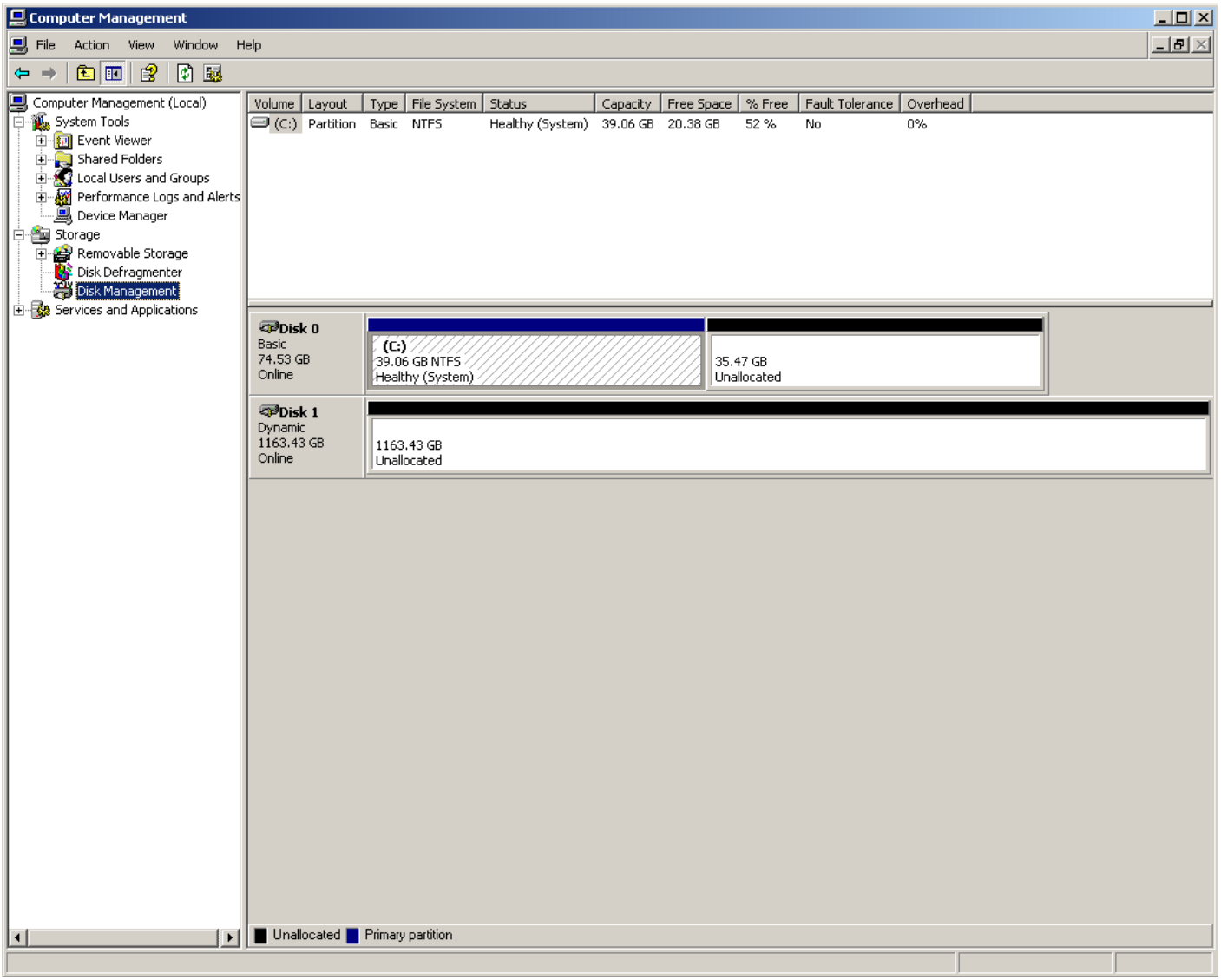
Initialize and Convert Disk Wizard - Completing the Initialize and Convert Disk Wizard Screen for Disk 1 and Disk 2 [MV U320-RX only]



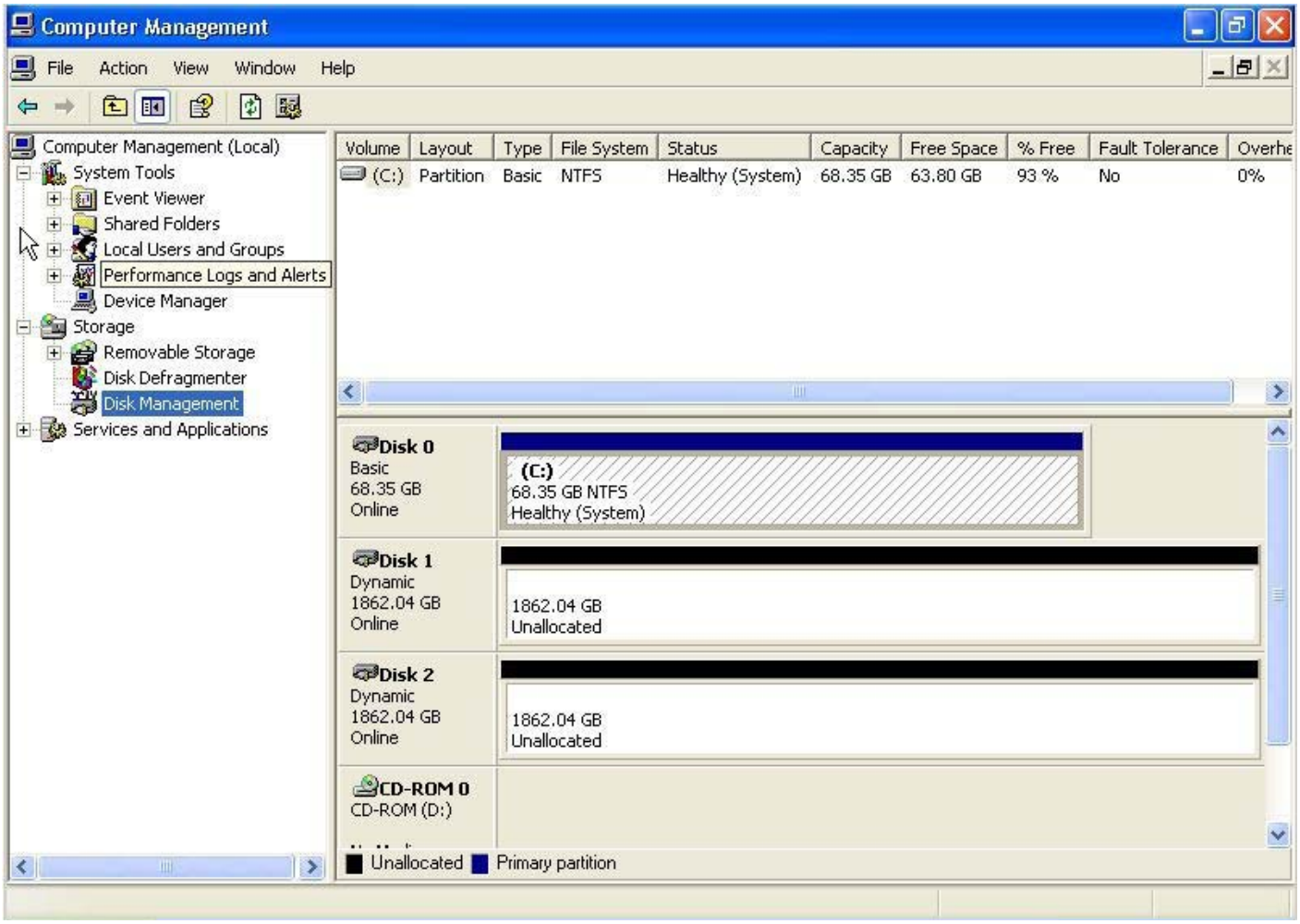
7. The *Computer Management - Disk Management* screen appears. It shows Disk 1 [MV U320-R only] or Disk 1 and Disk 2 [MV U320-RX only]. See Figure below and on the top of the next page.

NOTE: Windows 2000 and Windows XP have limits of 2 TB per disk array. If the array size exceeds this limit, the disk array will not appear in Disk Management.

Computer Management - Disk Management Screen, Showing Disk 1 [MV U320-R only]

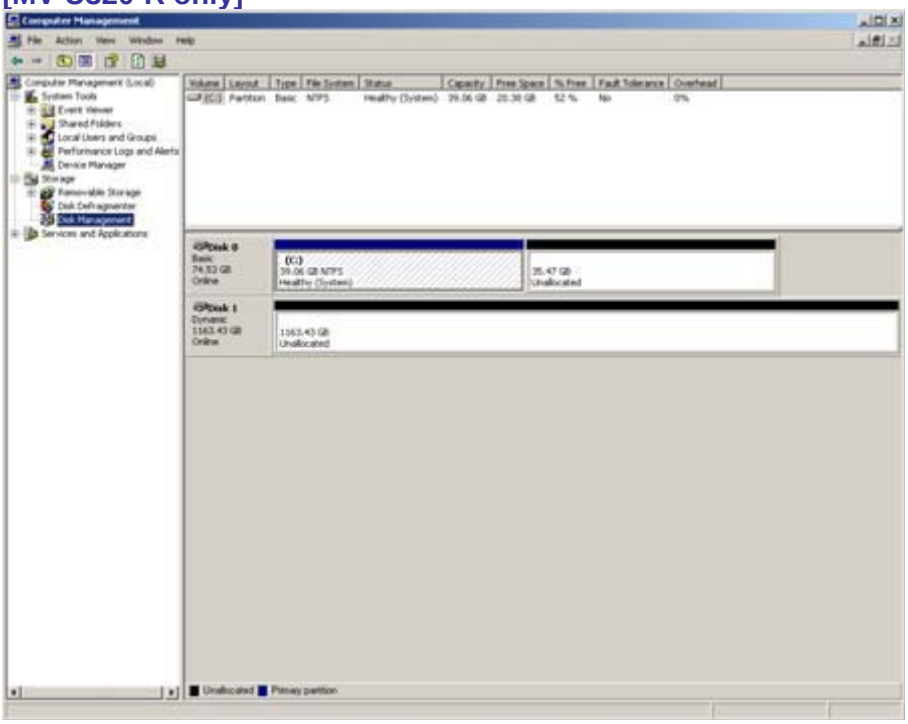


Computer Management - Disk Management Screen, Showing Disk 1 and Disk 2 [MV U320-RX only]

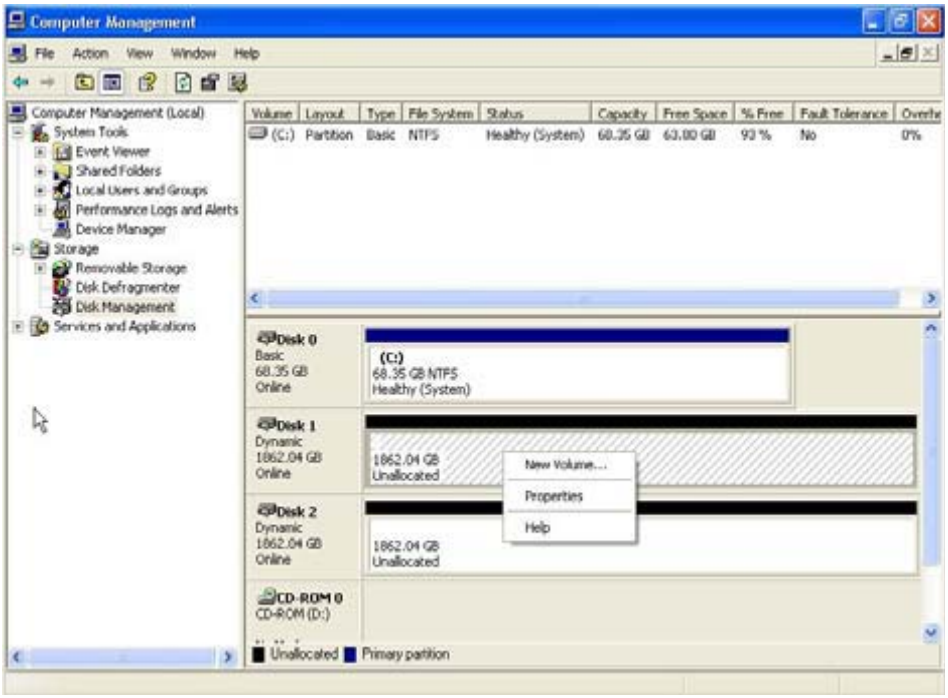


8. Right-click anywhere within the area below the black bar for Disk 1 [MV U320-R only) or Disk 1 or Disk 2 area [MV U320-RX only] below the black bar. Select “New Volume...” in the pop-up menu. See Figures below.

Computer Management Screen, Showing “New Volume...” Selected for Disk 1 [MV U320-R only]



Computer Management Screen, Showing “New Volume...” Selected for Disk 1 or Disk 2 [MV U320-RX only]



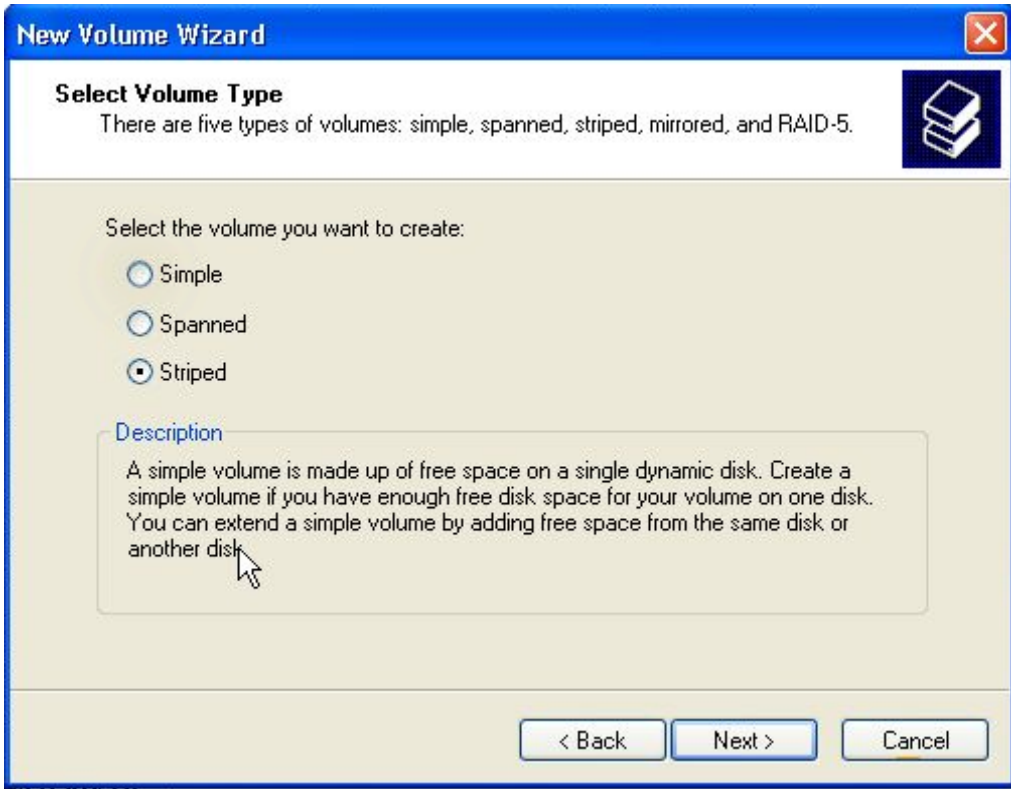
9. The *New Volume Wizard* screen appears. Click **NEXT**. See Figure below.

New Volume Wizard Screen

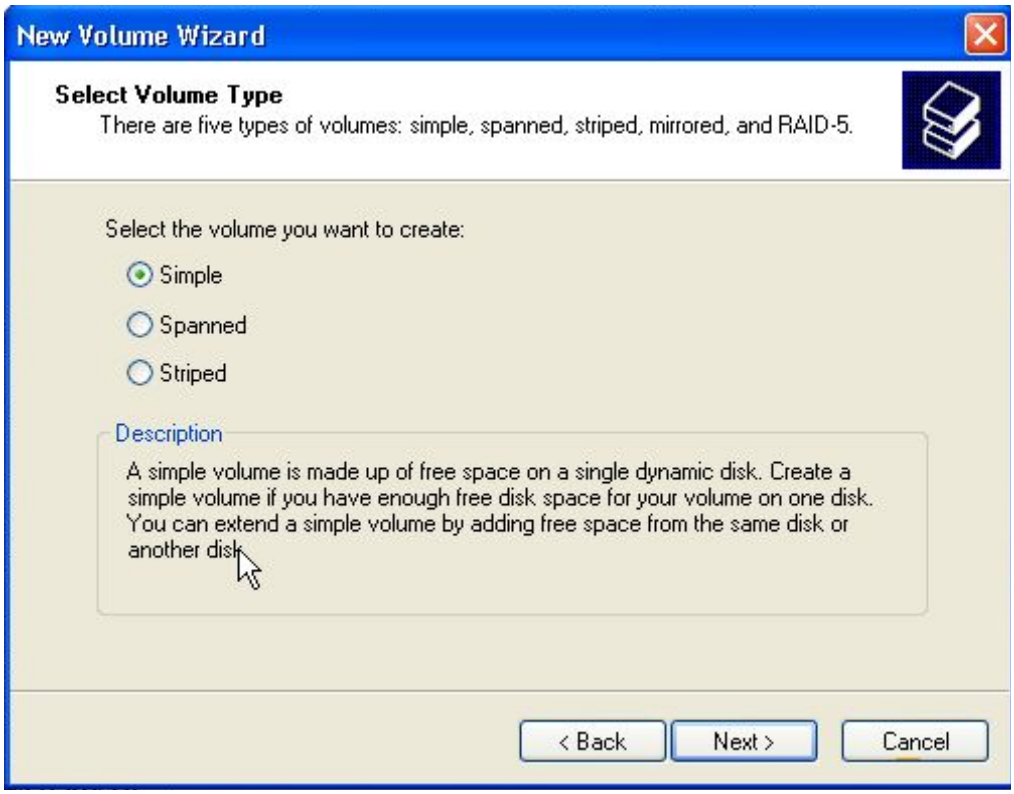
Preparing a Single (Unstriped) MV U320-R

1. When the *New Volume Wizard - Select Volume Type* screen appears, select “Simple”. Click **NEXT >**. See Figures below.

New Volume Wizard - Select Volume Type Screen [MV U320-R only]

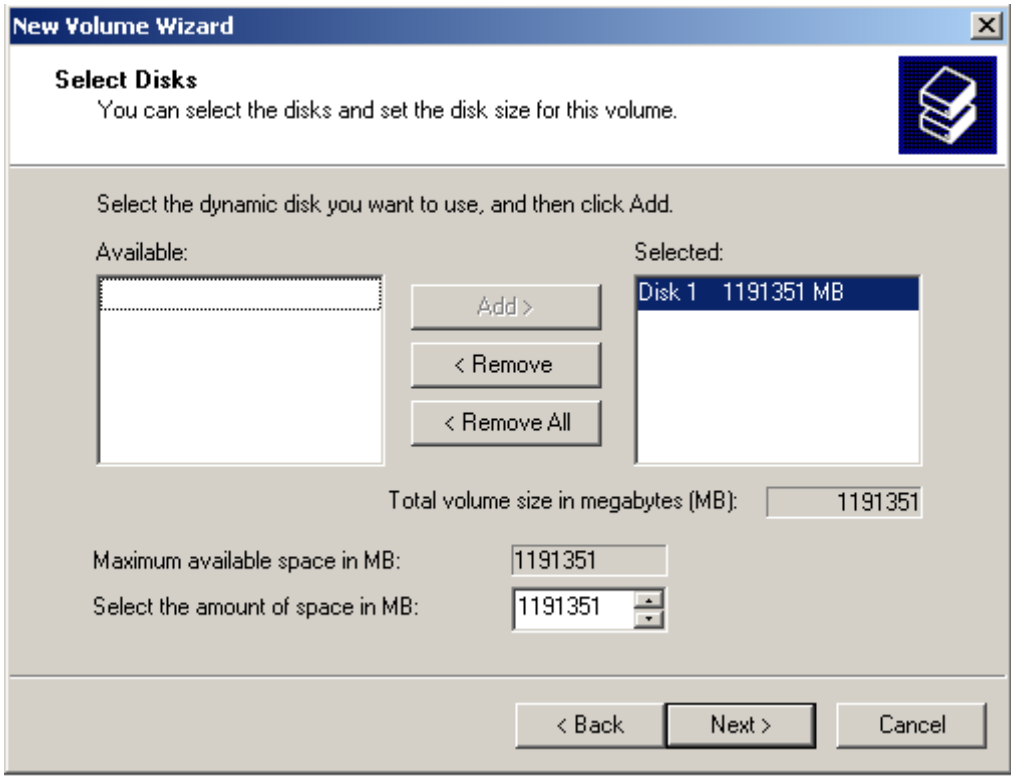


New Volume Wizard - Select Volume Type Screen [MV U320-RX only]

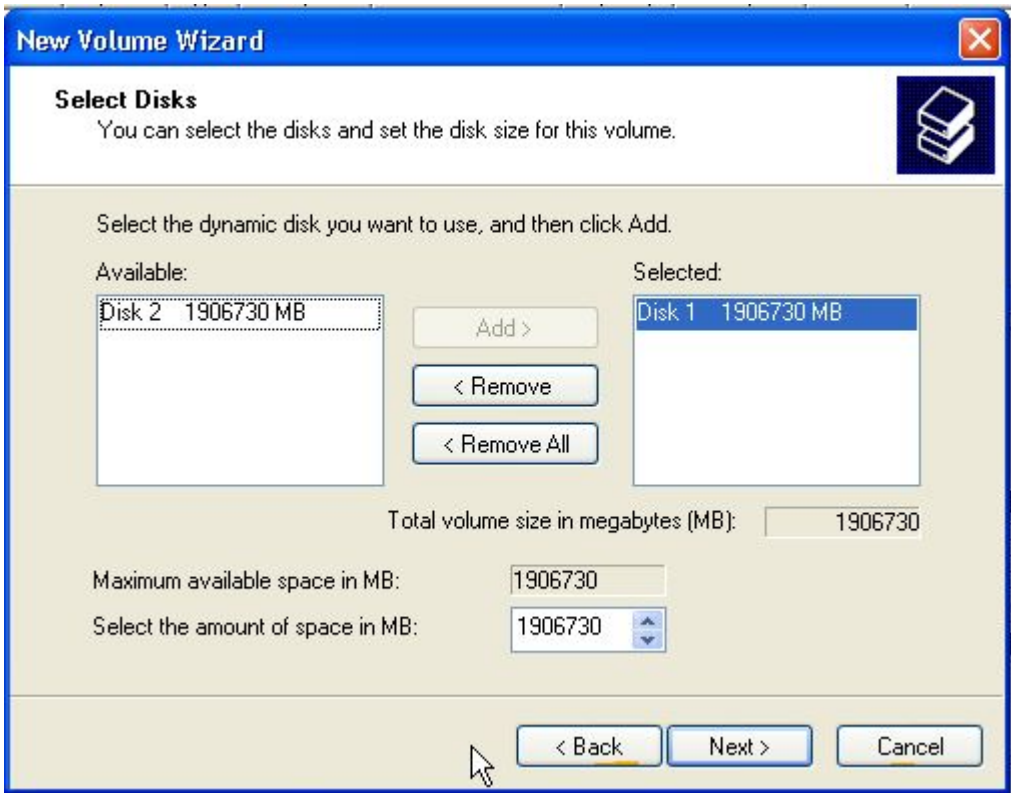


2. The *New Volume Wizard - Select Disks* screen appears. Make sure that “Disk 1” is selected. Click **NEXT >**. See Figure below.

New Volume Wizard - Select Disks Screen [MV U320-R only]

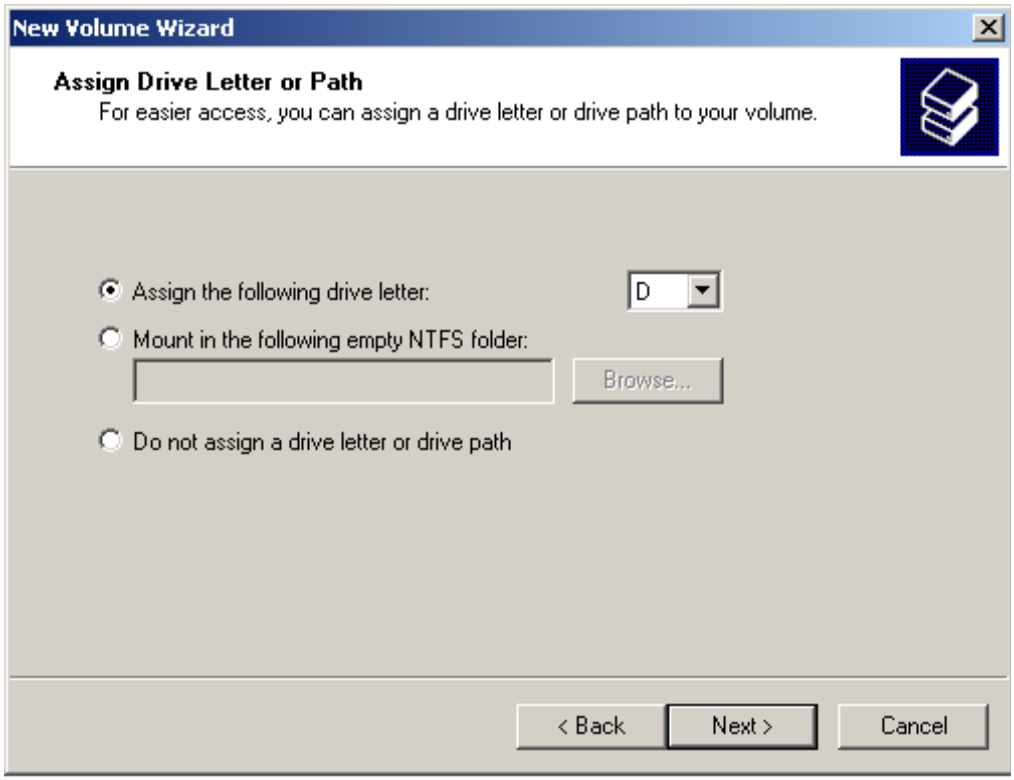


New Volume Wizard - Select Disks Screen [MV U320-RX only]



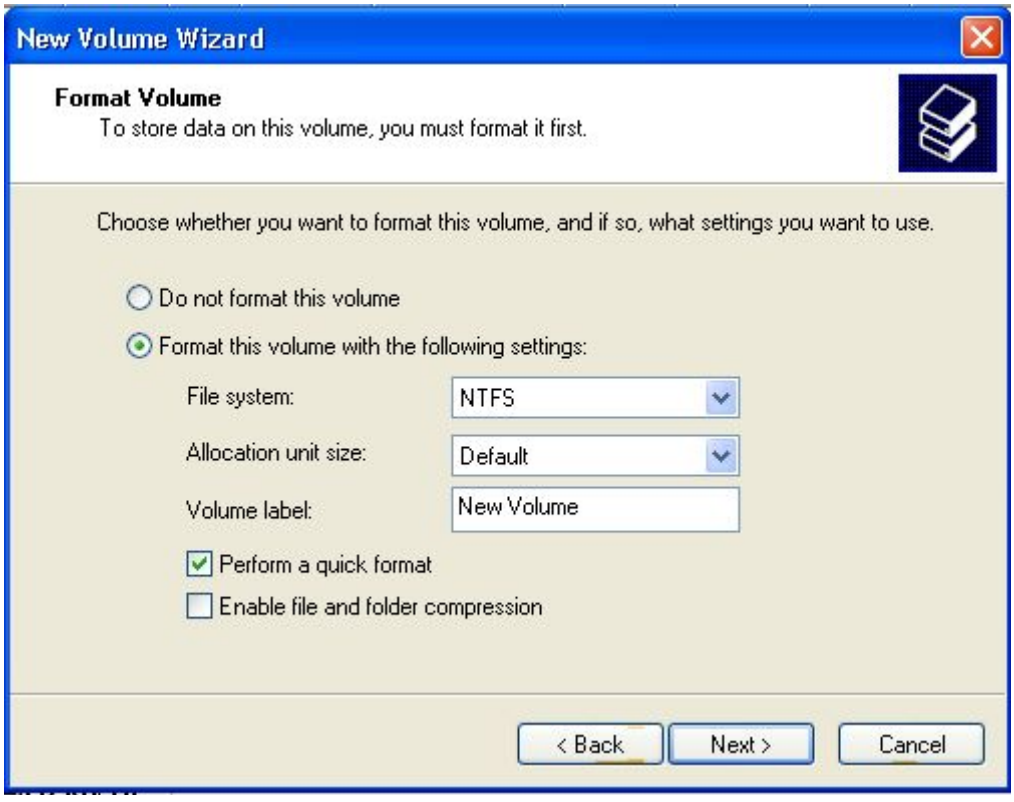
3. The *New Volume Wizard - Assign Drive Letter or Path* screen appears. Change the drive (array) letter, if you desire. Click **NEXT >**. See Figure below.

New Volume Wizard - Assign Drive Letters or Path Screen [MV U320-R or MV U320-RX]



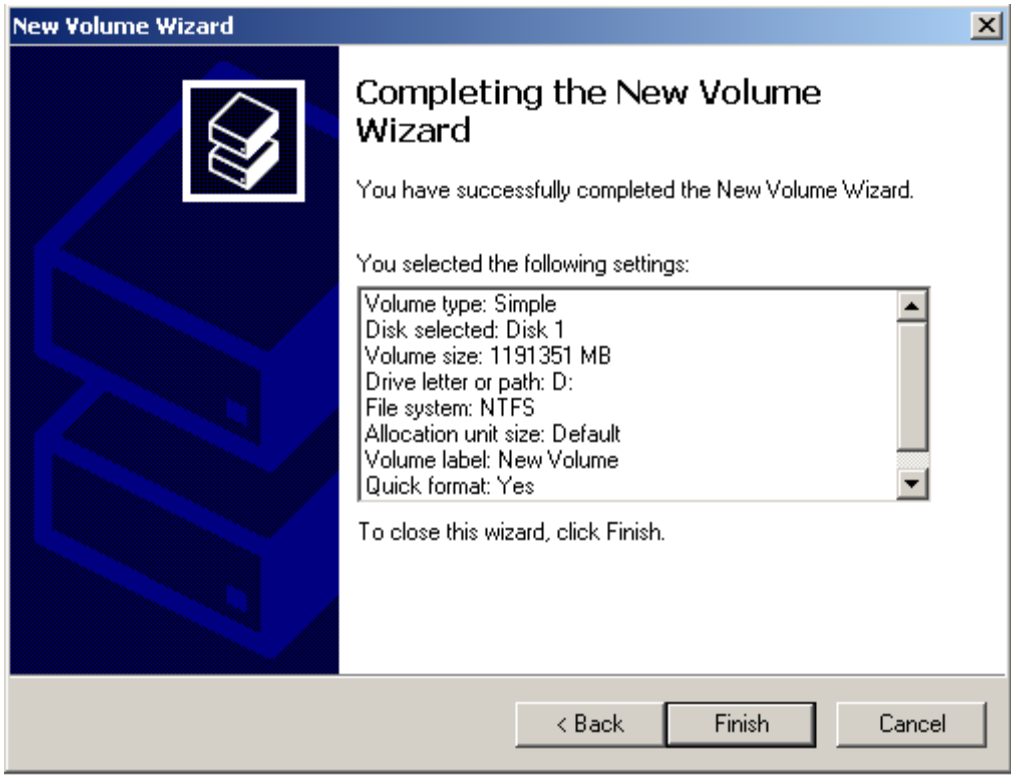
4. The *New Volume Wizard - Volume Format* screen appears. As desired, change the "Volume label". Make sure the "Perform a quick format" checkbox is checked. Click **NEXT >**. See Figure below.

New Volume Wizard - Format Volume Screen



5. The *New Volume Wizard - Completing the New Volume Wizard* screen appears. Review the settings that have been made. See figure below.
    - If incorrect, click **< BACK** to make any corrections.
    - •If OK, click **FINISH**.

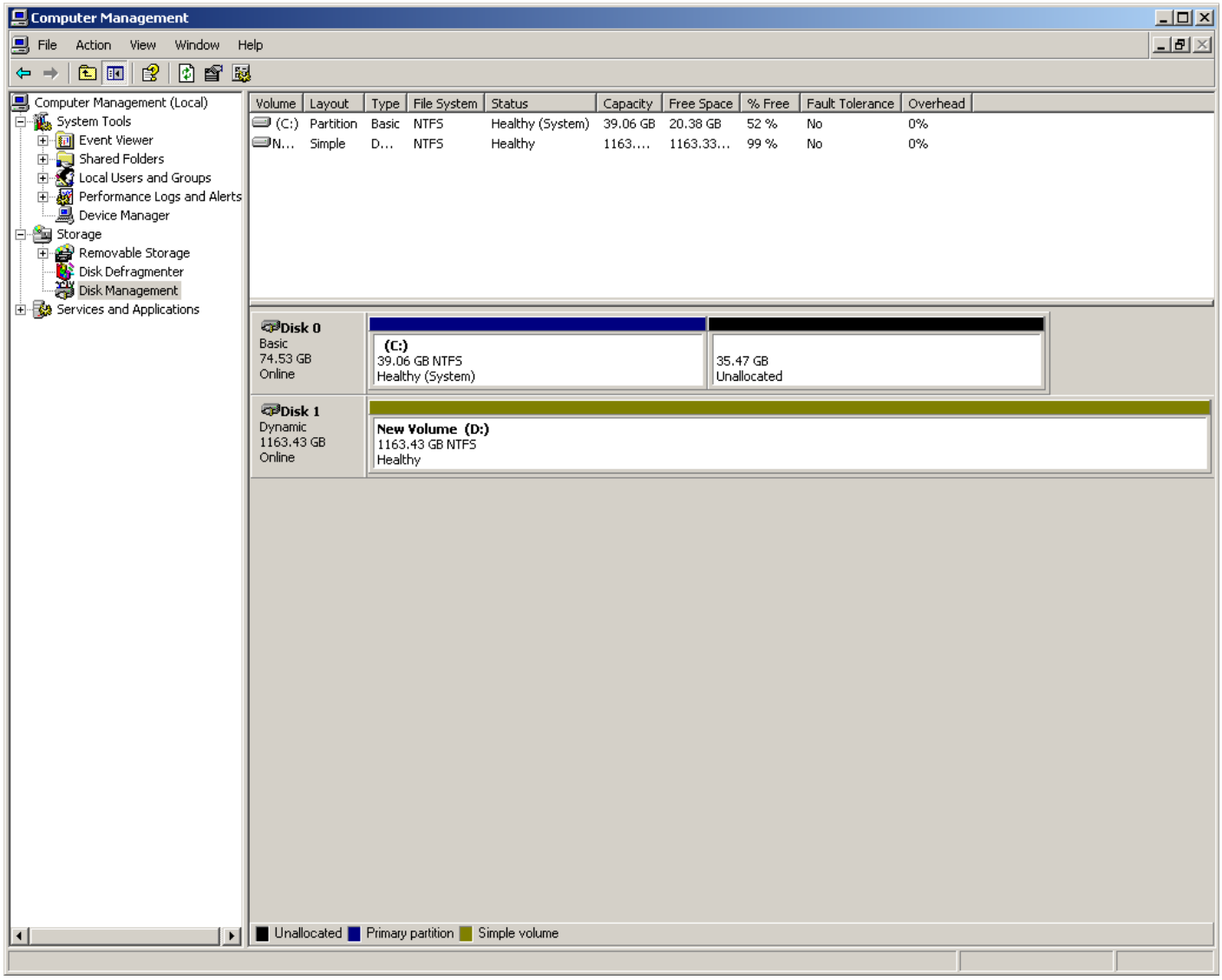
New Volume Wizard - Completing the New Volume Wizard Screen



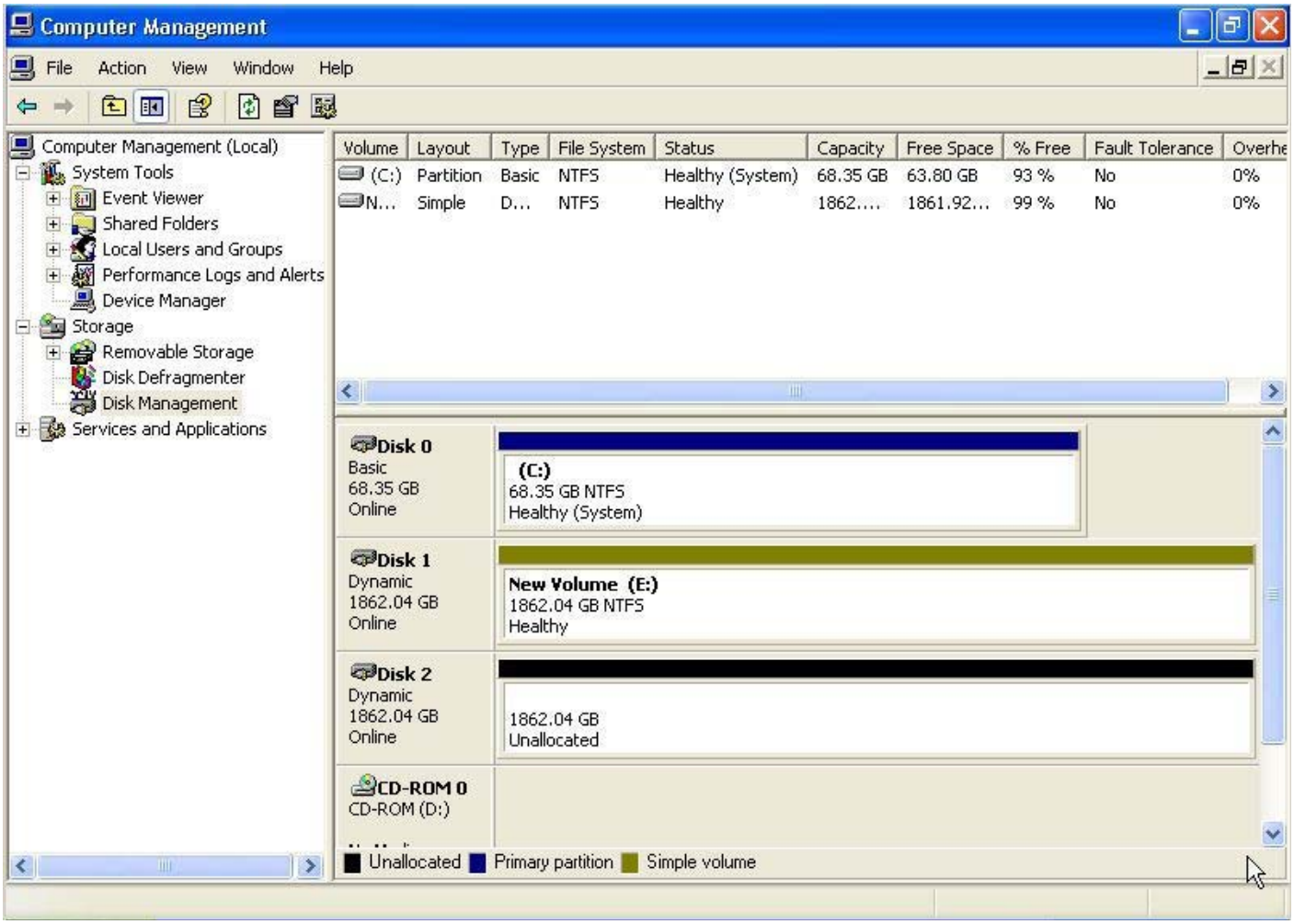
6. The Computer Management screen appears. In the examples show, it displays the settings of “New Volume (D :)” for Disk 1 [MV U320-R only] or “New Volume (D :)” for Disk 1 [MV U320-RX only]. See the figure below [for an MV U320-R only] or Figure on the next page [for an MV U320-RX only].

NOTE: The operating system determines the drive letter that is available, based on the hard-drives, CD-ROM drive(s), peripherals, etc., that are connected to the computer. The drive letter can vary, as shown in the examples on the following pages.

Computer Management Screen, Showing the New Volume for Disk 1 (MV U320-R)



Computer Management Screen, Showing the New Volume for Disk 1 (MV-U320-RX)

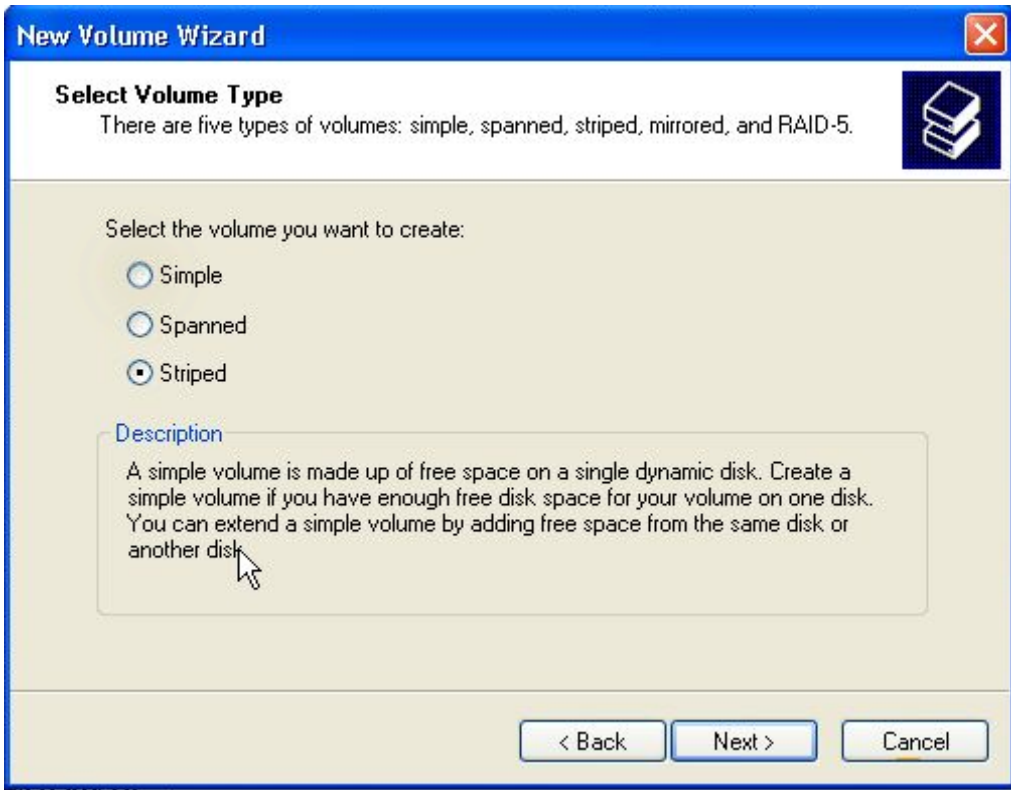


7. Perform one the following sub-steps, depending whether the unit is an MV U320-R or an MV U320-RX:
    - For an MV U320-R, close the *Computer Management* screen after reviewing the settings of the new volume for Disk 1. The single (unstriped) MV U320-R is ready for operations.
    - For an MV U320-RX, right-click in the area below the black bar of Disk 2 and select “New Volume”. Repeat steps 1 through 6 of this section for Disk 2, then proceed to step 8.
8. For an MV U320-RX only, close the *Computer Management* screen after reviewing the settings of the new volume for Disk 2. The single (unstriped) MV U320-RX is ready for operations.

Preparing Two (Striped) MV U320-R Units or an MV U320-RX

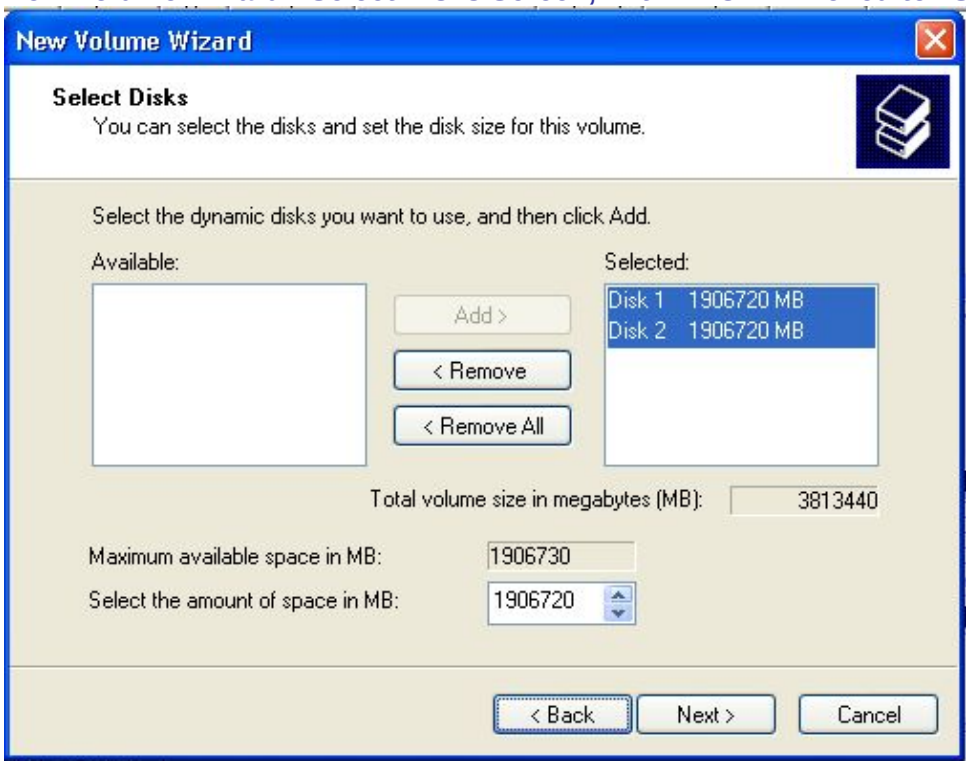
1. When the *New Volume Wizard - Select Volume Type* screen appears, set the “Volume Type” to “Striped”. Click **NEXT >**. See Figure below.

New Volume Wizard - Select Volume Type Screen, Showing “Striped” Selected



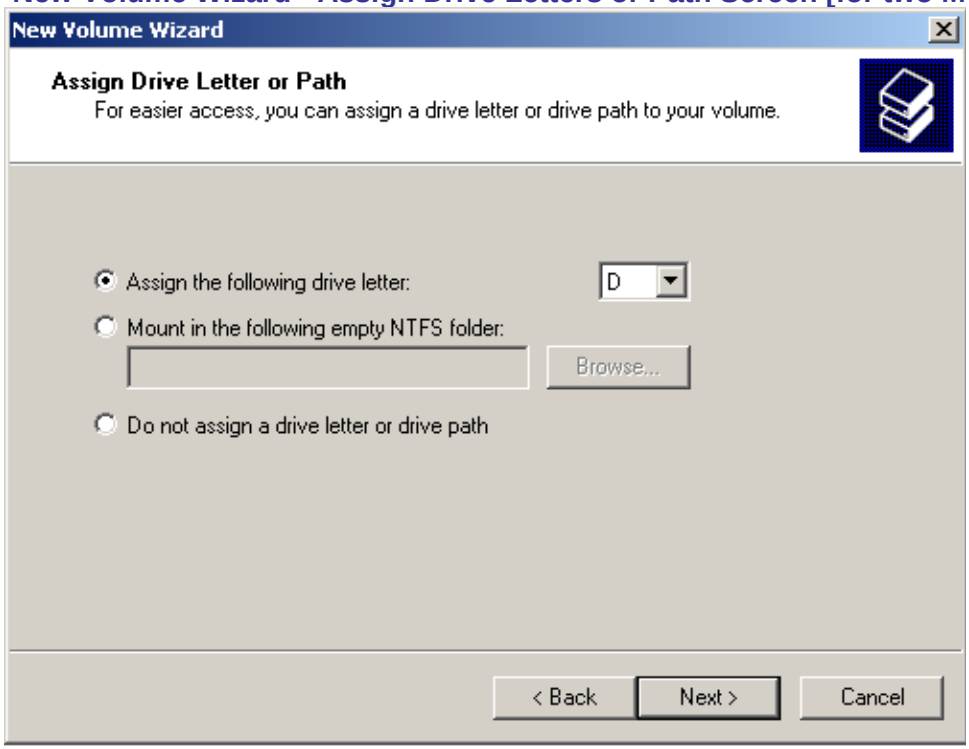
2. The *New Volume Wizard - Select Disks* screen appears. Highlight “Disk 2” in the “Available:” field. Click **ADD >** to move “Disk 2” to the “Selected:” field. See Figure below.
3. At the bottom of the screen, at “Select the amount of space in MB:” select a number that is at least 10MB less than the maximum available space of the disk. Click **NEXT >**. See Figure below.

New Volume Wizard - Select Disks Screen, With “Disk 2” Moved to “Selected:”



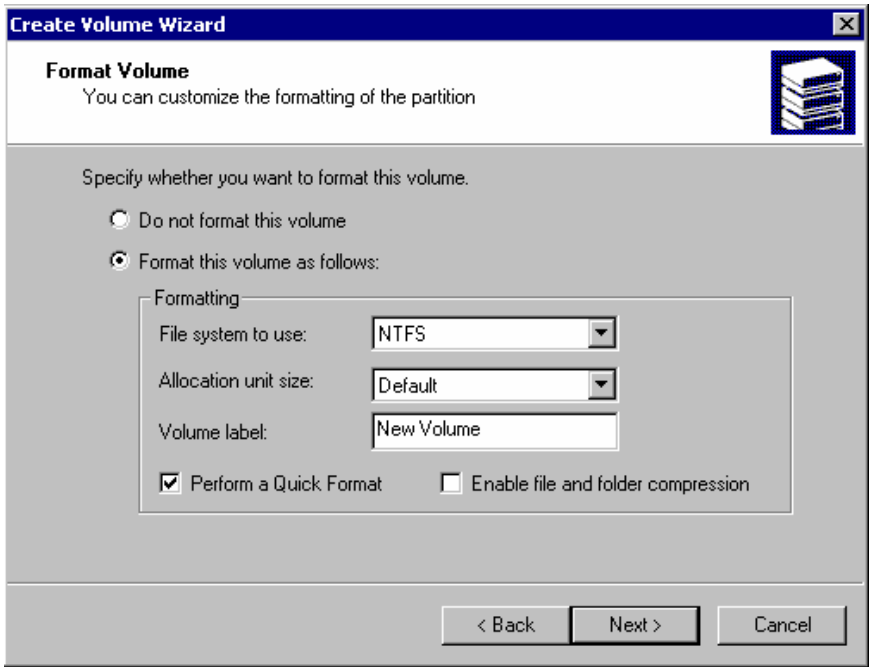
4. The *New Volume Wizard - Assign Drive Letter or Path* screen appears. Change the drive (array) letter, as desired. Click **NEXT >**. See Figure below.

New Volume Wizard - Assign Drive Letters or Path Screen [for two MV U320-R units only]



5. Perform one of the following sub-steps, depending whether the One Stop Systems, Inc. WINLDM utility is used or not used:
    - If the One Stop Systems, Inc. WINLDM utility is used (recommended).
    - If the One Stop Systems Inc. WINLDM utility is not used, continue with step 6.
6. The *New Volume Wizard - Format Volume* screen appears. Select “Format this volume as follows” and check “Perform a Quick Format”. Name the “Volume Label:,” if you like. Click **NEXT >**. See figure below.

New Volume Wizard - Format Volume Screen

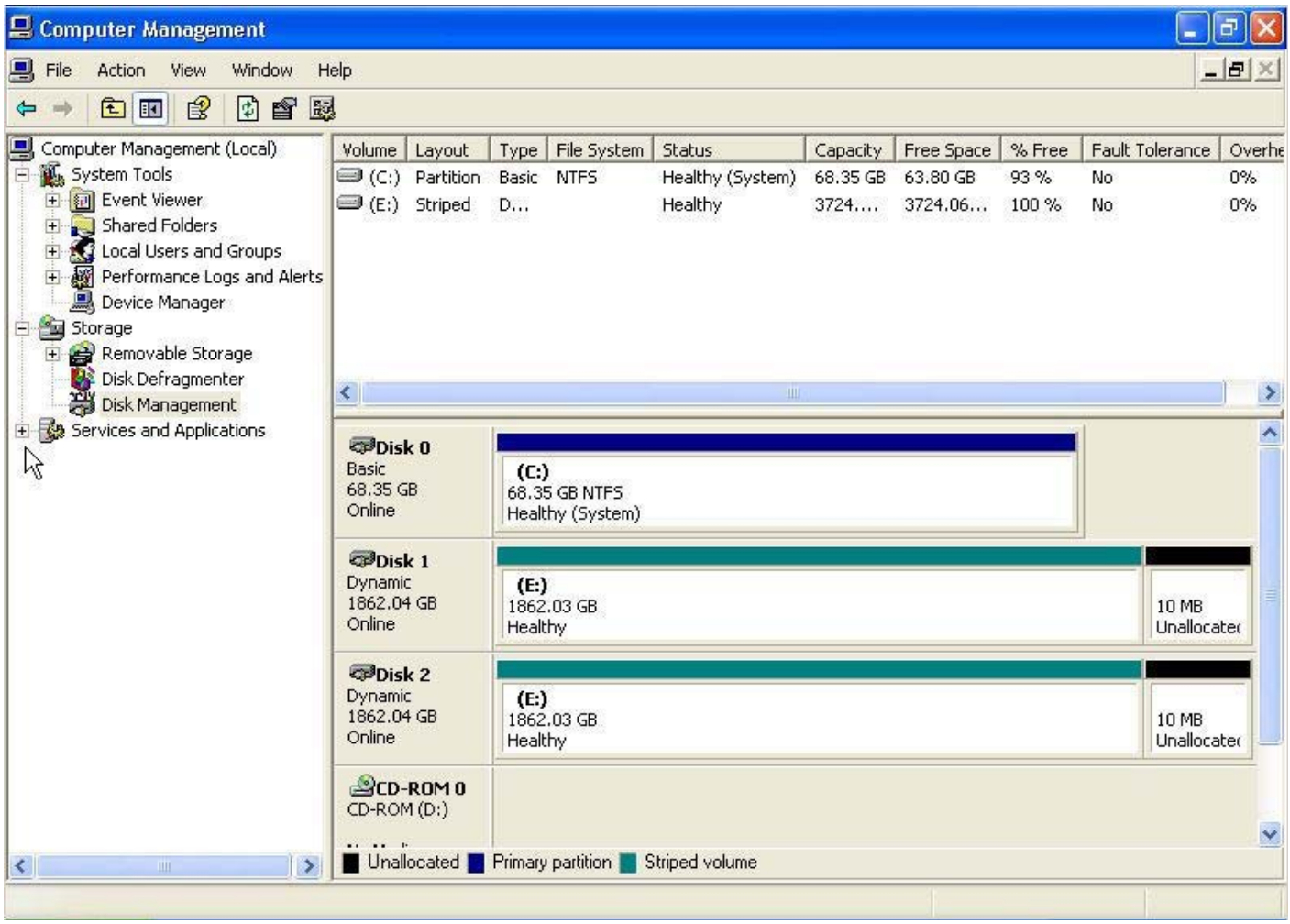


7. The *New Volume Wizard - Completing the New Volume Wizard* screen appears. Review the settings that have been made. If incorrect, click **< BACK** to make any corrections.
    - If OK, click **FINISH**. See Figure below.

New Volume Wizard - Completing the New Volume Wizard Screen

8. The *Computer Management* screen appears. It shows the settings of “New Volume (E:)” for Disk 1 and “New Volume (E:)” for Disk 2. Close the screen. See Figure below.

Computer Management Screen, Showing Formatted Disk 1 and Disk 2

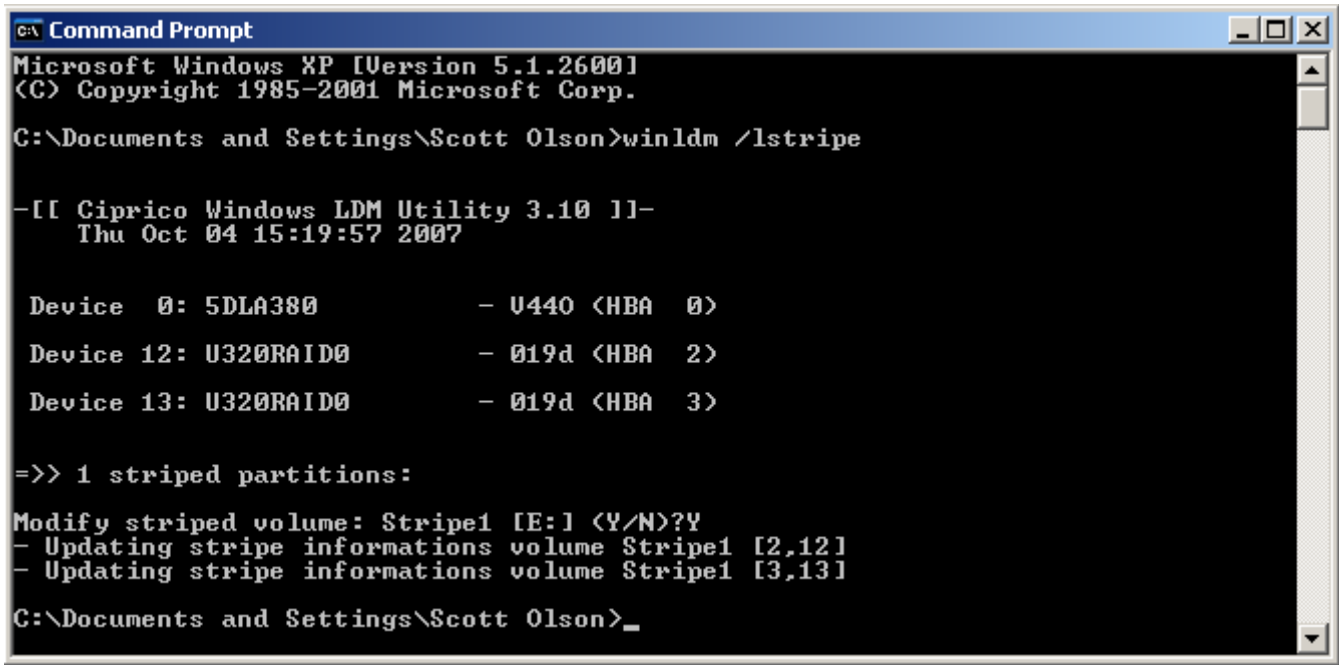


Using the One Stop Systems, Inc. WINLDM Utility

When striping a pair of MV U320-R units, or an MV U320-RX dual channel on a system that runs Windows 2000, Windows Server 2003, or Windows XP a significant performance increase can be made by using One Stop Systems, Inc. WINLDM utility.

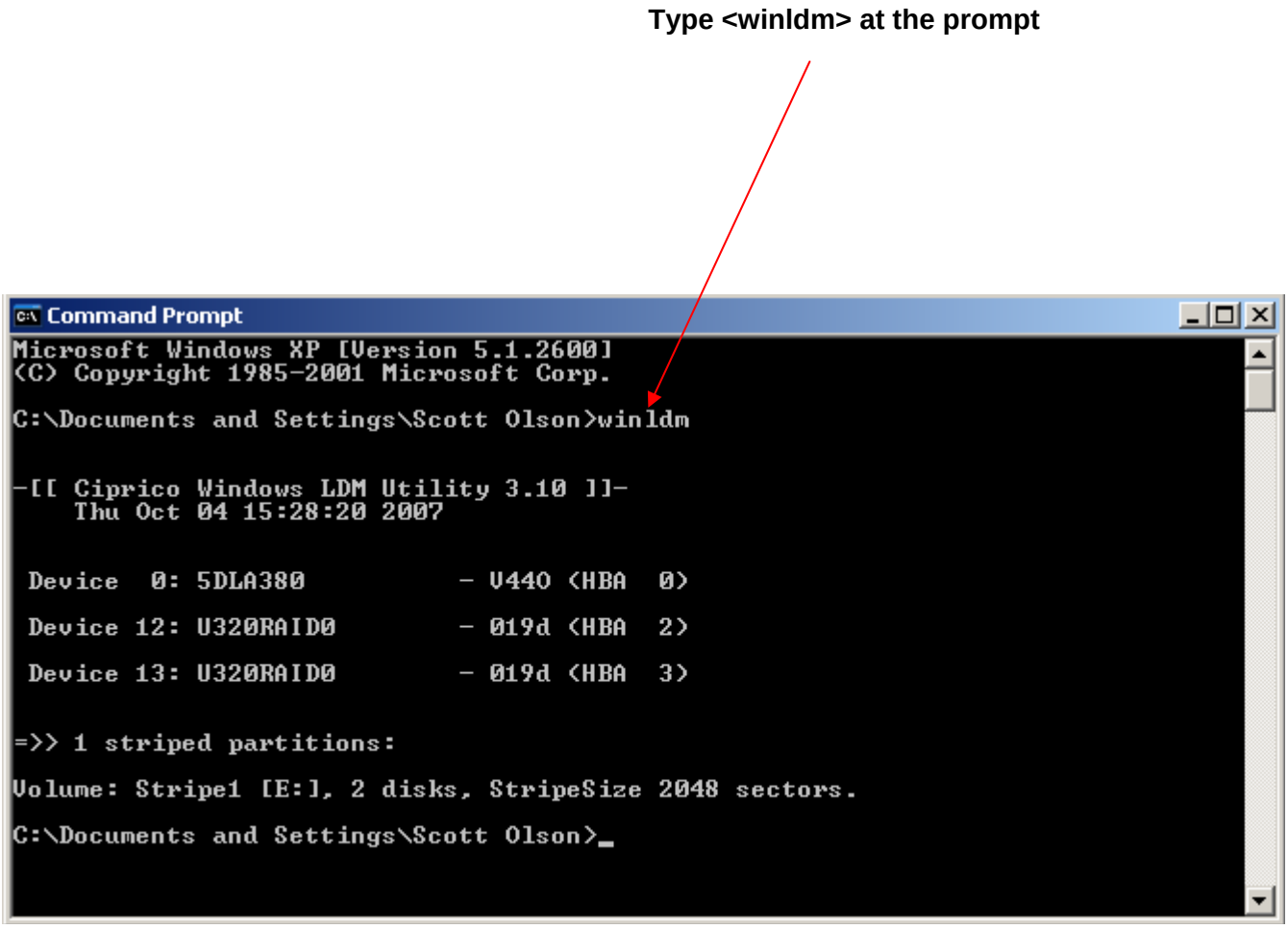
1. Access Start > All Programs [Programs] > Accessories > Command Prompt.
2. At the *Command Prompt* screen, type "winldm /lstripe". Press **ENTER**.
3. The *Command Prompt* screen lists all of the drives (devices) on the system. It inquires if you want to modify the striped partition. Type “Y” (make sure the “Y” is uppercase). Press **ENTER**. See Figure below.

Command Prompt Screen, Showing the Listed Drives [Devices] and a “Y” Response to the “Modify striped volume...?” Inquiry



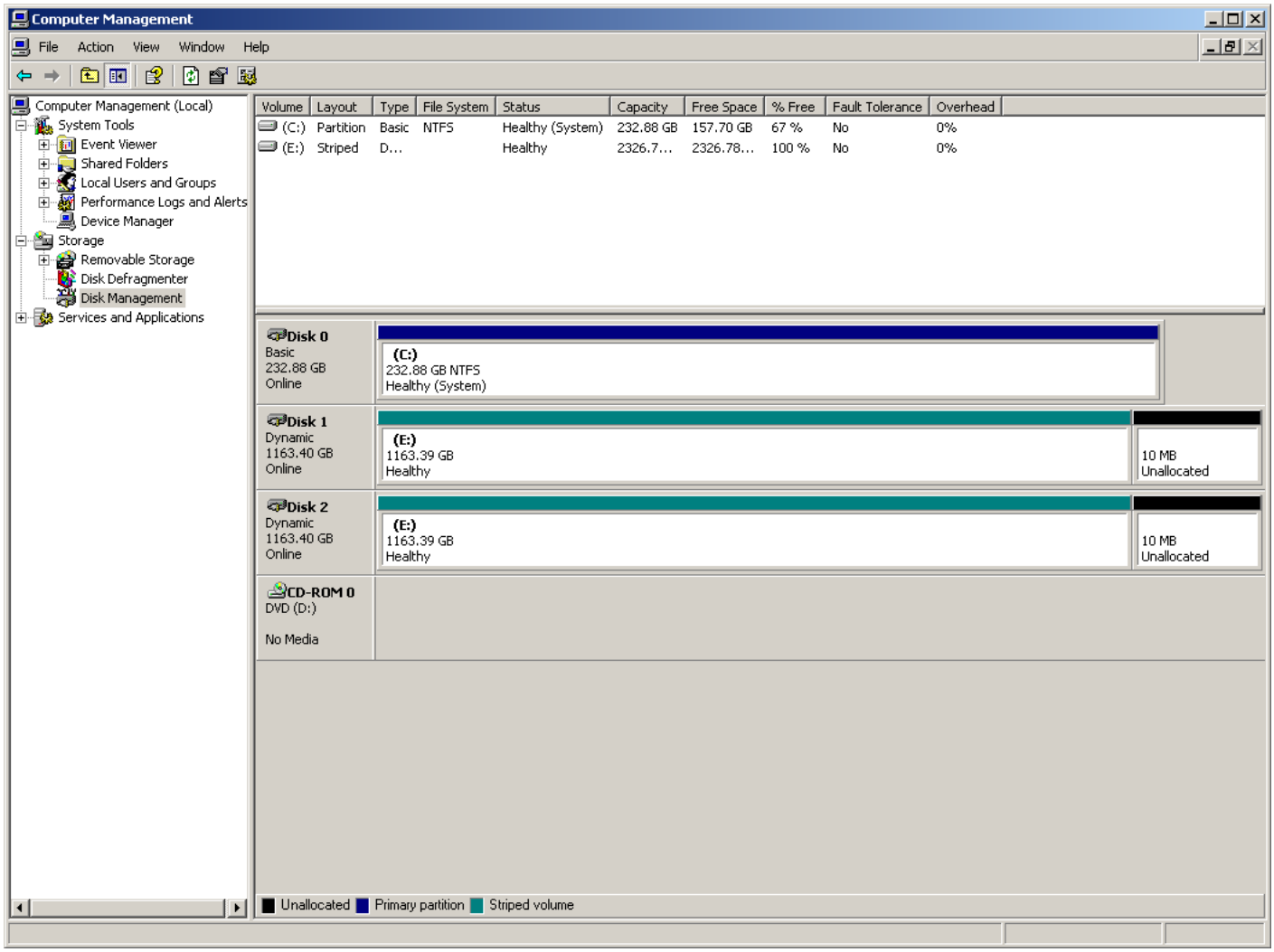
4. Type “Exit”. Press **ENTER** to close the *Command Prompt* screen.
5. Reboot the computer.
6. Return to the *Command Prompt* screen. Check that the stripe is 2048 sectors by typing “winldm” at the prompt. See Figure below.
7. Repeat step 4 to exit the *Command Prompt* screen.

Command Prompt Screen, After Modifying the Striped Partition



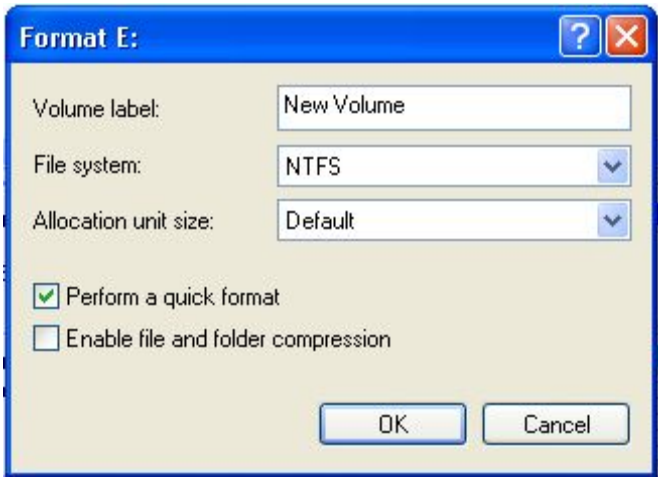
8. After the computer boots-up, right-click on the “My Computer” icon on the desktop and select Manage (Windows 2000). Or, left-click on Start, then right-click on My Computer > Manage. (For Windows XP or Windows Server 2003, click on **START**).
9. The *Computer Management* screen appears. Click “Disk Management” at the left side.
10. At the center of the screen, right-click on the “(E:)” drive at Disk 1 or Disk 2. From the pop-up menu select “Format...” See Figure below.

Computer Management Screen, Showing the Pop-Up Menu and “Format...”



11. The *Format E:* screen appears. At “Volume label:” give the volume a name. Make sure that the “Perform a quick format” checkbox is checked. See Figure below.

Format E: Screen

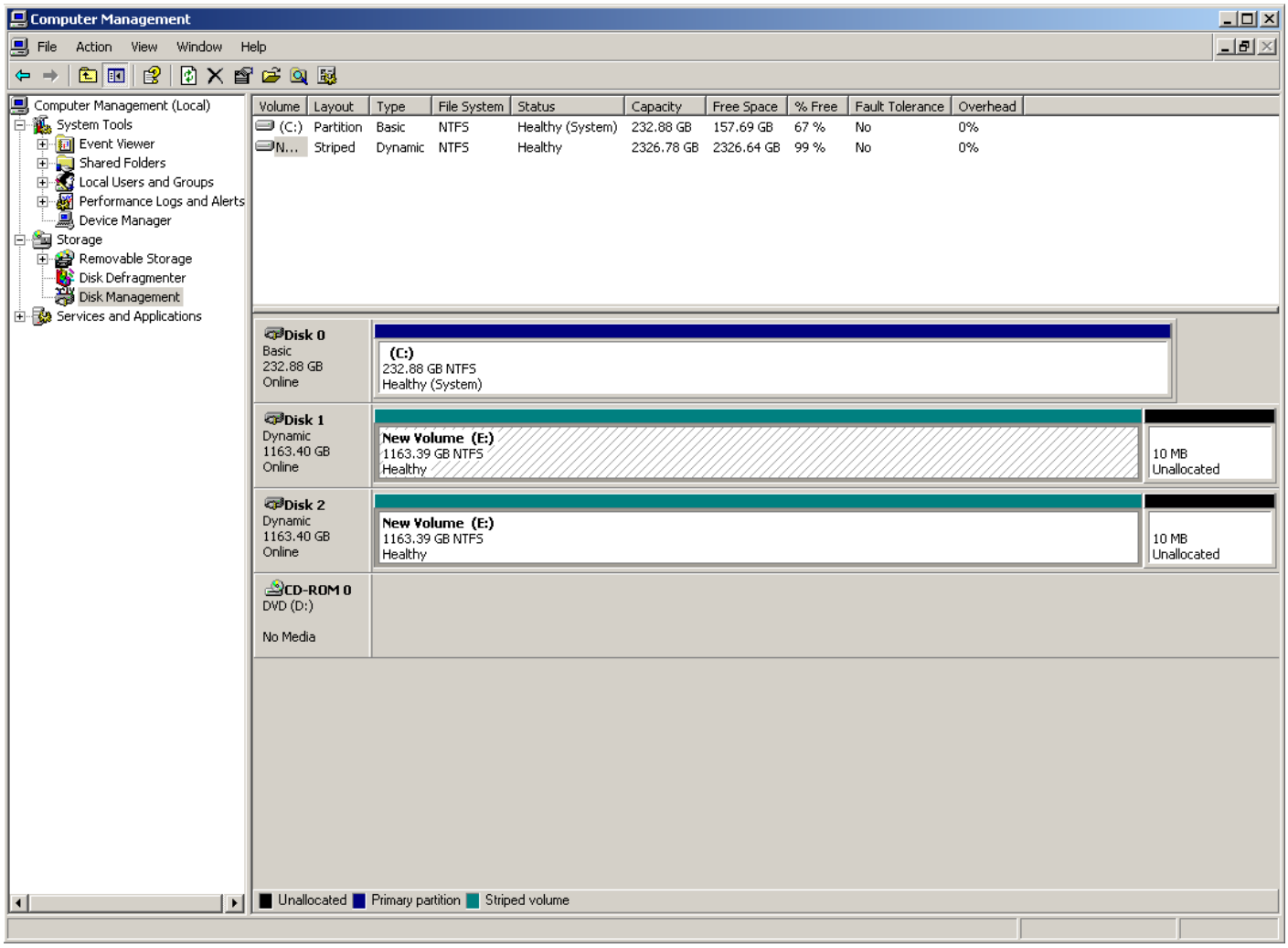


12. The *Format E:* warning dialog box appears. Click **OK**. See below.

Format E: Warning Dialog Box

13. The *Computer Management* screen appears. The volume name, file system, and allocation unit size appear. See below [for an MVU320-RX only].

Computer Management Screen, Showing the Volume Name



14. Close the *Computer Management* screen. The unit is ready for operations.

Problem Solving

Problem Solving Issues & Answers

Review the following sections and tables for typical questions/problems, likely causes, and recommendations.

Problems, Likely Causes, and Recommended Solutions

Issue/Problem	Likely Causes	Recommended Solutions
Adaptec U160 29160 and 39160 SCSI cards do not negotiate at U160 speeds after the OS is loaded or in the BIOS during host computer initialization.	A problem with the SCSI drivers, not the host computer's RAID drivers installed on the OS.	1. After the OS is loaded, uninstall the drivers (using "Device Manager"). 2. Re-install the drivers. The U160 LED illuminates, and the SCSI cards should now negotiate at U160 speeds.
MV U320-RX only: Power supply beeper (Low-pitched continuous tone) Indicates a problem with the power supply frame or power supply module.	While it is rare, the frame can fail. Otherwise this is usually caused by a bad power supply module.	1. Swap the power supply modules to determine if the problem follows the module or stays with that position on the frame.
LED(s) stuck on immediately on power up Indicates that a controller is not getting power.	Can be caused by loose power connector to controller, defective controller, or defective power supply frame, or severed LED board cable.	Contact One Stop Systems, Inc. technical support for further instructions.
Immediate continuous tone (high-pitched) on power-up Indicates that the controller either isn't getting proper power or that the controller failed or that there is a possible power supply failure.	Can be caused by any of the above problems, or that the power supply is not functioning properly.	Contact One Stop Systems, Inc. technical support for further instructions.
Other Hardware Failure	Includes: LED failure, beeper failure, switch failure, or a problem inside the chassis.	Contact One Stop Systems, Inc. technical support For further instructions.
Lost Volume	Includes: - Drive or multiple drives down - Faulty controller - Incorrect driver installed when array was formatted/striped - Incorrect/corrupt driver installed now - Failed host adapter - Computer virus - SAN software not controlling the volume - Array powered off while writ-ing - Incorrect/faulty cable - Failed SFP - Application failed to write properly - Host computer locked up - OS is corrupt - Boot drive security is corrupt.	1. Depends on the cause, as listed the problems above. 2. If all hardware, OS, drivers, and array are verified good, then data recovery software might be needed to get the data back.

Frequently Asked Questions (FAQs)

Frequently Asked Questions Table

Frequently Asked Questions Table

What is the proper placement of my MediaVault?	The MV U320-R can be operated vertically in a mini-tower configuration only. The MV U320-RX can be operated in a rack or tower configuration. Whenever possible, do not place the unit near the floor, as will pick up more dust.
What is striping?	Striping is a technique where different parts, called sectors, of different disk drives are used alternately in sequence. This is done for several possible reasons: a) Gaining performance; b) Increasing reliability; or c) Increasing capacity.
What is spanning/concatenation?	This is a technique where hard disk drives are used end-to-end, i.e. where one fills up the data continues on to the next. This is strictly done for capacity, and has no gains in either speed or reliability.
What is mirroring?	Mirroring is where data, when written, is written to two different disks or sets of disks -- i.e. the same copy in both places. This offers reliability, at the cost of capacity and speed.
What is RAID 0?	In RAID 0, the disk drives are striped with corresponding sectors of other drives, called strips, sequentially. Data written goes to sector 1 of drive 1, then sector 1 of drive 2, and so on. RAID 0 sacrifices data protection to gain capacity and performance. To do RAID 0 requires a minimum of 2 disk modules. The MV U320-R uses 5 disk modules; the MV U320-RX uses 10 disk modules.

Frequently Asked Questions Table (Coninued)

What is RAID 3?	• In RAID 3, all of the drives except one (this one called a parity drive) are striped in RAID 0, as above. • However this one drive has a special purpose: Through a simple mathematical calculation, it is able to operate if one of the RAID 0 drives goes down. • If, for example, you set a rule that all of the bits (like switches - on/off) on all of the drive have to add up to an odd number, such as 0111 (with 1 being on, 0 being off), the extra drive stores the extra piece of data necessary to keep this number odd. In the case of 0111, the 5th bit would be 0, so that 0+1+1+1+0 = 3 (which is odd). • If one of any of the bits is lost, suppose the 2nd one: 0?110, by using the same rule (all numbers must add up to an odd number), it is possible to calculate the missing number: 0+?+1+1+0=2 (which is even), so the missing number must be 1 in order to make that formula add up to an odd. • To do RAID 3 requires a minimum of 3 disks - the 4210 uses two sets of 5 (The reason you couldn't use two disks is that you would be mirroring, with the 2nd drive in the mirror being the inverted version of the first).
What is RAID 5?	• RAID 5 is the same as RAID 3, except instead of having a dedicated parity drive, the parity is distributed across all of the disks, alternating disks in order. • In the first strip of sectors (i.e. sector 0 of all of the drives), the 5th drive would have the parity, then on the 2nd strip (sector 1 of all drives), drive 1 would have parity, then drive 2, etc. RAID 5 requires a minimum of 3 drives - the 4210 does not support RAID 5 - only RAID 3 • (The drawback with RAID 5 is that additional calculation for the location of the parity within a strip -- in most cases, arrays have to be pre-formatted, and when a drive is down, RAID 5 performance goes down as well).

Frequently Asked Questions Table (Continued)

What is the self-healing feature I've heard about?	This is a new name given to a slightly new technique for relocating bad sectors on the disks. Rather than relocate the actual sector, a pointer for the sector number is used. When a bad sector is found, the pointer updates to skip that area - this is done while the drive is reading/writing. If you were to watch the performance of this bad sector, as the performance appears to increase, it could be said the sector was "cured."
Can I increase the capacity of the MV U320-R or MV U320-RX by installing larger drives?	a) For the most part, if the firmware supports them and your host OS supports it, then yes. b) The drives must be One Stop Systems tested/approved in order to maintain the warranty on the unit. c) The drives must be One Stop Systems, Inc. tested/approved in order to work on the unit.
Do I need to do any software-based preventative maintenance on the array	No. Programs, such as Disk First Aid, Scan Disk, etc. are not recommended
How do I defragment the array?	Defragmenting software is not recommended. The best way to defragment the array is to back it up, reformat/restripe it, then restore the backup.
What is journaling and should I use it?	Journaling is where the computer (in the background), logs all disk transactions, such as file open, file write, file read, and file close. In the event of volume corruption, this journal is easy for recovery programs to find on the disk and make repairs, based on this file. We recommend journaling (if your OS supports it), in case of such corruption.
I've heard journaling makes the array run slower - should I still use it?	Journaling only slows down the array by about 2KB/sec. For the most part, when a journal entry is written, it is usually only a few bytes of data, and doesn't update non-stop. The benefits greatly outweigh the small decrease in data rate
Do I need to do anything to keep my MV U320-R or MV U320-RX clean?	Although the outside of the MV U320-RX might appear to be metal, this is paint. Clean the unit with a soft cloth. If further cleaning is necessary, use a mild liquid soap. The outside of the MV U320-R is metal.
Can I attach a 2nd computer to the "B" channels?	No. You must use a switch and SAN software if you want to attach multiple computers.

Maintenance

Disk Drive Replacement

Removing, replacing, and rebuilding a disk drive consists of four inter-related procedures. Perform these four procedures in sequence:

1. “Power-Off the Host Computer and MediaVault Unit” (see below).
2. “Remove the Front Panel”.
3. “Remove the Disk Drive”.
4. “Install and Rebuild a Disk Drive”. Rebuild the disk drive, depending on whether the disk drive failed in RAID 0 mode or RAID 3 mode.

Power-Off the Host Computer and MediaVault Unit

Before removing and replacing any components from the MV U320-R or MV U320-RX, perform the following:

1. Power-off the host computer (PC or Macintosh).
2. Power-off the MV U320-R, MV U320-RX.

Remove the Front Panel: MV U320-R

The front panel is attached to the chassis by four snap pins. To remove the front panel:

3. Grabbing the bottom edge of the front panel, use your index and middle finger to pull the front panel forward and un-snap it from the pins.
4. Continue to pull forward to remove the front panel from the MV U320-R.

Front Panel Partially Removed - MV U320-R

Front Panel Fully Removed - MV U320-R

Remove the Front Panel: MV U320-RX

The front panel is attached to the chassis by four snap pins. To remove the front panel:

1. Locate the finger slot. See Figure below.
2. Use your index and middle finger to pull the front panel forward to un-snap it from the pins.

The Finger Slot at the Front Panel of the MV U320-RX

Finger slot, for removing the front panel

Remove a Disk Drive: MV U320-R or MV U320-RX

1. Identify the disk drive to be replaced, by locating the slow blinking light next to it.
2. Shutdown the host computer and turn off the MV U320-R or MV U320-RX.
3. Push down on the button of the disk drive to be removed. The handle pops-up automatically
4. Lift the handle while pulling forward on the disk drive. See Figure below.

Handle and Button on a Disk Drive (MV U320-R shown)

5. Perform the install and rebuild process.

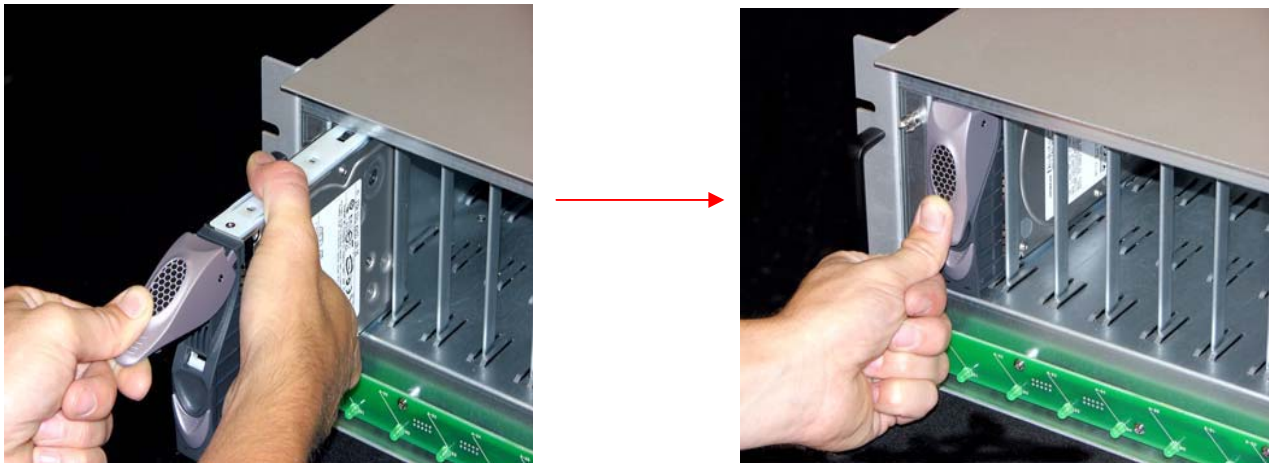
Install and Rebuild a Disk Drive

Install a Disk Drive

The following procedure can be used for installing disk drives in a newly purchased MV U320-R or U320-RX or when rebuilding a disk drive in RAID 0 mode.

1. Remove the replacement disk drive from its protective anti-static bag. (Save the bag, for returning a defective disk drive).
2. Locate the drive number on the disk drive. The number will be matched to the number on the disk drive slot of the MV U320-R or U320-RX.
3. Align a disk drive at the left-most side of the disk drive slots, starting with drive A-D1. Make sure the drive labels coincide with the designations on the LED board below it.
4. Carefully insert the disk drive, using a modest amount of steady hand pressure. Do not force the disk drive into the slot or use any tools to tap the disk drive into the slot. See Figures below.

Inserting a Disk Drive into Its Slot; Closing the Handle on the Disk Drive



5. Push down on the handle while pushing the disk drive inwards, until a “click” is heard.
6. Repeat steps 1 to 5 until all disk drives have been installed.
7. Reinstall the front panel of the MV U320-R or U320-RX..

Rebuilding a Disk Drive in RAID 0 Mode

A failed disk drive in RAID 0 mode is indicated by a series of beeps. The beep indicates the number of the drive that failed. As the beeps occur, the LED nearest the defective disk drive is illuminated.

1. If not already accomplished, remove the damaged disk drive by using the “Remove the Disk Drive” procedure.
2. Install the replacement disk drive(s) by using the “Install a Disk Drive” procedure.
3. Apply power to the MV U320-R or U320-RX (the beeps should no longer be heard).
4. Apply power to the host computer.
5. Format/partition/stripe the array using the procedures described in the Configuration section. Restore data to the array if a backup is available.

CAUTION: The previous volume might appear on the monitor. Do not attempt to use this volume! The data on this volume is corrupt.

Rebuilding a Disk Drive in RAID 3 Mode

- This procedure assumes that the MV U320-R or U320-RXis formatted in a RAID 3 mode, and is running at least 2.7 firmware version.
- A failed disk in RAID 3 mode is indicated by three sets of beeps (each set of beeps will be the number of the disk drive) when the MV U320-R or U320-RX is powered-up. The sets of beeps are followed by a continuous tone.
- In addition, the LED located next to the failed disk drive will flash, and the service LED for that channel will be illuminated.
    1. Power-up the MV U320-R or U320-RX. (The series of 3 sets of beeps are heard).
    2. When a continuous tone is heard, quickly press the **MODE SET** button at the back of the MV U320-R or U320-RX once. The continuous tone is silenced.
    3. Remove the front panel from the MV U320-R or U320-RX.
    4. Remove the replacement disk drive from its protective anti-static bag. (Save the bag, for returning the defective disk drive).
    5. Locate the drive number on the disk drive. The number will be matched to the number on the disk drive slot of the MV U320-R or U320-RX.
    6. Align a disk drive at the left-most side of the disk drive slots, starting with drive A-D1. Make sure the drive labels coincide with the designations on the LED board below it.
    7. Push down the handle while gently inserting the disk drive, until a “click” is heard.
    8. Repeat steps 4 to 7 for other replacement disk drives.
    9. Install the front panel onto the MV U320-R or U320-RX.
    10. Press and hold the **MODE SET** button until two beeps are heard. Release the button.
    11. All of the drive LEDs for that channel will illuminate. This indicates that the rebuild (reconstruction) process has begun.

NOTE: Rebuild (reconstruction) times vary, depending on the system’s work load. When the system is idle the rebuild time is approximately 16.5 Gbytes/minute (that is, it takes approximately 60 minutes to rebuild 1TByte).

NOTE: The service LED stays illuminated and the RAID 3 LED blinks. After the rebuild process is finished, the drive LEDs and service LED go off.

12. As a precaution, after the rebuild (reconstruction) process is finished, power-down the array.
13. Power-up the array.
14. Power-up the host computer.

Product Information

Specifications for the MV U320-R

Specifications for the MV U320-R

Specification	Value or Range
Physical dimensions	6.5-in. wide x 11-in. high x 12.5-in. deep (165 mm wide x 279 mm high x 317.5 mm deep)
Power	Auto switching 100-240 Vac, 50-60 Hz
Operating temperature	41 to 104 degrees Fahrenheit (5 to 40 degrees Celsius).
Weight (shipping)	20 lbs. (9 kg.)
Current draw, 117 VAC	• Start-up 1.0A / 117W • Seek 0.6A /75W • Idle 0.4A / 47W
Current draw, 220 VAC	• Start-up 0.53A / 117W • Seek 0.34A / 75W • Idle 0.21A / 47W

Specifications for the MV U320-RX Table

Specifications for the MV U320-RX

Specification	Value or Range
Physical dimensions	• 19-in. wide x 7-in. high x 12.25-in. deep • (482.6 mm wide x 177.8 mm high x 312.2 mm deep)
Power	Auto switching 100-240 Vac, 50-60 Hz
Operating temperature	41 to 104 degrees Fahrenheit (5 to 40 degrees Celsius)
Weight	50 lbs. (23 kg.)
Current draw, 117 VAC	• Start-up 1.0A / 117W • Seek 0.6A / 75W • Idle 0.4A / 47W
Current draw, 220 VAC	• 0.53 A / 117W • Seek 0.34A / 75W • Idle 0.21A / 47W

Model Numbering

The MV U320-R, MV U320-RX model number follows this pattern:

MV U-320-R: MVU320RaaaaSMbc

MV U-320-RX: MV320RXaaaaDMbc

Definitions

MV = MediaVault family

320 or U320 = Indicates that the unit is Ultra 320 SCSI

R = Indicates that the unit has removable disk drives

X = Indicates that the unit is convertible from rack-mount to desktop

aaaa = the capacity of the array in GB (for 10TB models, it shows 10TB)

SM = Indicates that the array is single channel

DM = Indicates that the array is dual channel

b = When used, indicates that a kit is included with the unit

b = Indicates product revision level

For example:

MVU320R1250SMa indicates an MV U320-R 1.25TB capacity, single channel array, revision A.

MV320RX2500DMbb indicates an MV U320-RX, 2.5TB capacity, dual channel array, with a kit, revision B.

Video Resolution Data

Video Resolution Data Rates

Video Resolution	Data Rate, Megabytes/Sec
DV/DV25	3.7
DV 50	7.4
29.97 fps	20
29.97 fps, 4:2:2	27
59.94 fps	120
59.94 fps, 4:2:2	155
30p	110
30p, 4:2:2	138

Video Resolution vs. Hours per Terabyte

Video Resolution	Hours per Terabyte (1000 gigabytes)
DV/DV25	75.1
DV 50	37.5
29.97 fps	13.9
29.97 fps, 4:2:2	10.3
59.94 fps	2.3
59.94 fps, 4:2:2	1.8
30p	2.5
30p, 4:2:2	2.7

RAID Compatibility for Macintosh Operating Systems

Compatibility by Mode and Partition

Compatibility by Mode and Partition

Media Vault Mode Select	Non-Striped Partition (standard)	Striped Partition (RAID 0)
RAID 0 (mode 0) Windows 2000, Windows Server 2003, Server XP	OK	OK
RAID 3/2K (mode 1) Windows 2000, Windows Server 2003, Server XP	Basic Disk only, no Dynamic	Not compatible
RAID 3 (mode 2) Windows 2000, Windows Server 2003, Server XP	OK	OK
RAID 0 (mode 3) Windows 2000, Windows Server 2003, Server XP	OK	OK
RAID 3/2K (mode 4) Windows 2000, Windows Server 2003, Server XP	Basic Disk only, no Dynamic	Not compatible
RAID 3 (mode 5) Windows 2000, Windows Server 2003, Server XP	OK	OK
RAID 3 (mode 8) Windows 2000, Windows Server 2003, Server XP	OK	OK
RAID 0 (mode 9) Windows 2000, Windows Server 2003, Server XP	OK	OK
RAID 3 (mode 10) Windows 2000, Windows Server 2003, Server XP	OK	OK

For Windows 2000, Windows Server 2003, and Windows XP Operating Systems

Compatibility by Mode and Partition

Media Vault Mode Select	Non-Striped Partition (standard)	Striped Partition (RAID 0)
RAID 0 (mode 0) Windows 2000, Windows Server 2003, Server XP	OK	OK
RAID 3/2K (mode 1) Windows 2000, Windows Server 2003, Server XP	Basic Disk only, no Dynamic	Not compatible
RAID 3 (mode 2) Windows 2000, Windows Server 2003, Server XP	OK	OK
RAID 0 (mode 3) Windows 2000, Windows Server 2003, Server XP	OK	OK
RAID 3/2K (mode 4) Windows 2000, Windows Server 2003, Server XP	Basic Disk only, no Dynamic	Not compatible
RAID 3 (mode 5) Windows 2000, Windows Server 2003, Server XP	OK	OK
RAID 3 (mode 8) Windows 2000, Windows Server 2003, Server XP	OK	OK
RAID 0 (mode 9) Windows 2000, Windows Server 2003, Server XP	OK	OK
RAID 3 (mode 10) Windows 2000, Windows Server 2003, Server XP	OK	OK