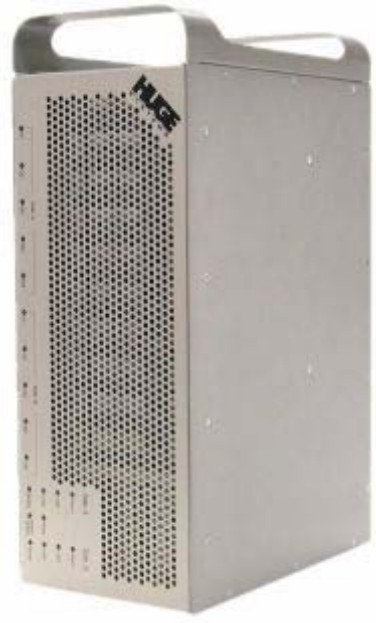
Huge MediaVault

U320-RX

User's Guide

Rack Mount



Tower

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Thank You

Congratulations and thank you for purchasing the Huge MediaVault U320-RX product from Huge Systems Inc. A leader in huge performance, huge quality, and huge cost savings storage product for your video editing and storage requirements.

Your HMV (Huge MediaVault) U320-RX storage system utilizes the latest SCSI Ultra320 technology. SCSI Ultra320 affords system operations at blazing speeds, enabling you to maximize valuable system time and the highest of video quality resolutions.

HMV U320-RX Dual Max contains two independent RAID controllers and ten removable disk modules. HMV U320-RX Max contains two RAID controller and five removable disk modules and five un-used drive bays for future expansion. HMV U320-RX uses the latest in high performance disk drives and the latest transfer mode. Huge throughput per disk drive pumping data into our RTR (Real Time RAID) engine for fault tolerant and maximum transfer rates, coupled with the RTC (Real Time Cache) at an internal data rate of 500MBytes/sec per controller, this translates to a huge performance at the SCSI interface, upward of 320MBytes/sec burst and 200MBytes/sec of sustained data rate per controller.

Data protection are available with the built-in RAID 3@512 and RAID 3@2k mode. A simple and easy to use Mode Selection switch selects either RAID 0 or RAID 3@512 or RAID 3@2k operations.

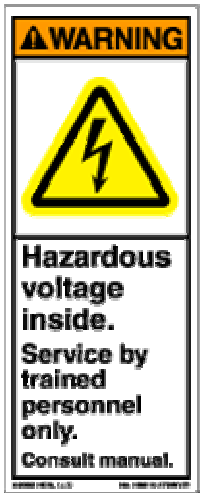
If you have any comments, suggestions or questions, please call, FAX or e-mail us. We value input from the most important people, you our customer.

Again, we thank you.

Features and benefits

- Max Burst Data Rate 320MBytes/sec per SCSI channel.
- Internal disk rate from 300MB/sec to no less than 130MB/sec.
- Sustained Data Rate 200MBytes/sec per SCSI channel in HD Turbo (HDT) mode.
- Up to two Ultra320 SCSI channels
- Up to two RAID controllers
- RAID 0 or RAID 3@512 or RAID 3@2k
- RTR - Real Time RAID reconstructs data “on the fly” should a drive “glitch”
- HDT - High Definition Turbo mode insures 200 Mbytes per second per channel (with 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.
- Daisy chain of multiple SCSI devices with the built-in “In and Out” SCSI connectors.
- Five or ten high performance removable hot swappable hard disk modules.
- Multiple cooling fans.
- Easy user selection of functionality via Mode Selection and Mode Set switches. No complicated software setup or maintenance.
- Serial port for detail level maintenance and support.
- Audible Alarm and LED indicators.
- Dual redundant hot swappable power supplies.
- Convertible Rack mount or Tower kit included.

Important Safety Considerations (English)



Do not attempt to service this unit yourself other than the removal of the front panel, and the disk drive modules. The removable power supplies must be serviced by trained personnel only, call our technical support department for additional instructions. Opening or removing the top, rear and side covers will expose you to dangerous voltages or other hazards.

Risk of Shock: The power supplies are removable, hazardous voltage levels maintained on removable module. After disengaging, do not completely remove the power supply module for 30 seconds to permit power dissipation.

Risk of Damage: The power supplies are removable. After disengagement of power supply, wait 30 seconds before re-engagement.

Do not use this unit near water – such as; bathtub, washbowl, kitchen sink or laundry tub, in a wet basement of near a swimming pool.

Do not place this unit on an unstable cart, stand, bracket or table. The unit may fall, causing serious injury and damage to the unit.

Do not block the front and rear ventilation. Proper airflow is required to ensure reliable operation and to protect the product from over heating.

Do not defeat the safety purpose of the grounding power plug. Use a grounding type power outlet and the power connector intended for the unit. The power cord should be routed so that they are not likely to be walked on or pinched by items placed upon or against them.

Power cord provided is for North America use only. Outside of North America the proper power cord must be procured and used.

Les Considérations importantes de Sûreté (French)

Pas la tentative pour entretenir cette unité vous autrement que l'enlèvement du panneau de devant, et les modules de lecteur de disque. Les alimentations détachables doivent être entretenues en train le personnel seulement, appeler notre département de soutien technique pour les instructions supplémentaires. L'ouverture ou enlever le sommet, l'arrière et les couvertures latérales vous exposera aux tensions dangereuses ou aux autres dangers.

Le risque de Choc: Les alimentations sont les niveaux de tensions détachables et hasardeuses ont maintenu sur le module détachable. Après avoir déclenché, ne pas complètement enlever le module d'alimentation pour de 30 seconde pour permettre la dissipation de pouvoir.

Le risque de Dommages: Les alimentations sont détachables. Après le désengagement d'alimentation, attendre de 30 seconde avant le re-engagement.

Ne pas bloquer le devant et la ventilation postérieure. Le flux d'air correct est exigé assurer l'opération fiable et protéger le produit de par-dessus le chauffage.

Ne pas battre le but de sûreté de la prise de courant mettree à terre. Utiliser une sortie de pouvoir qui met à la terre et l'arrivée secteur a projeté pour l'unité. Le cordon d'alimentation devrait être mis en déroute pour qu'ils ne sont pas probables être marché sur ou pincé par les articles placés sur ou contre eux.

Le cordon d'alimentation fourni est pour l'usage d'Amérique du nord seulement. Hors de l'Amérique du nord que le cordon d'alimentation correct doit être procuré et doit être utilisé.

Wichtige Sicherheitsberücksichtigungen (German)

Versuchen Sie nicht, diese Einheit sich zu warten, anders als die Enthebung vom vorderen Unterausschuß, und den Plattenlaufwerkenmoduln. Das abnehmbare Kraftzubehör muß von ausgebildetem Personal nur gewartet werden, ruft unsere technische Stützenabteilung für zusätzliche Anweisungen. Öffnung oder Herausnehmen des Oberteils, der Hinterseite und der Seitendecken werden Sie zu gefährlichen Spannungen oder anderen Gefahren entblößen..

Risiko des Schocks: Das Kraftzubehör ist abnehmbare, gefährliche Spannungshöhen, die auf abnehmbarem Modul beibehalten werden. Nachdem Entkuppeln, nimmt den Netzteilmodul für 30 Sekunden nicht vollständig heraus, Kraftauflösung zuzulassen.

Risiko des Schadens: Das Kraftzubehör ist abnehmbar. Nach Freimachung des Netzteils wartet 30 Sekunden vor Betr. Verabredung.

Hemmen Sie die Front und die hintere Belüftung nicht. Passender Luftstrom ist erfordert, zuverlässigen Betrieb zu sichern, und, das Produkt von über Heizung zu schützen.

Besiegen Sie den Sicherheitszweck Stöpsel der Erdungskraft nicht. Benutzen Sie einen Erdungstyp Netzanschluß und den Kraft Verbinder haben vorgehabt für die Einheit. Das Netzkabel sollte umgeleitet werden, damit sie nicht wahrscheinlich sind, auf gelaufen zu werden, oder zusammengedrückt durch Punkte, die auf oder gegen sie gestellt werden.

Netzkabel hat für Nördlich Amerika Gebrauch nur versorgt ist. Außerhalb Nördlich Amerikas des passenden Netzkabels muß verschafft werden und muß benutzt werden.

Agency Approvals

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

EC Declaration of Conformity:
Conforms to Standards EN 50081-1:1992 EN 55022: 1998

Model Numbering

The HMV U320-RX model numbers are in the following pattern: HMV - U320 - RX - (size) (channels)

Where HMV is Huge MediaVault
U320 designate Ultra320 SCSI interface.
RX designate the removable drive modules and rack mountable.
(size) is the capacity of the Media Vault in Gigabytes in RAID 0 mode.
(channels) is either DualMax for 2 SCSI channels or Max for single SCSI channel.

HMV U320-RX-2500-DM would represent removable rack mount 2.5 Terabytes of dual SCSI channels.

Specifications

Physical Dimensions:	19 wide x 7 high x 12.25" deep 4U rack mount	
Power:	Auto switching 100-240 VAC 50-60 Hz	
Operating temperature:	5-40 degrees Celsius	
	Max (Single)	DualMax (Dual)
Weight:	40 lbs / 12 Kg	50 lbs / 16 Kg
Current draw 117VAC:	Start-up 1.0A / 117W	2.0A / 234W
	Seek 0.6A / 75W	1.28A / 150W
	Idle 0.4A / 47W	0.8A / 94W
Current draw 220VAC:	Start-up 0.53A / 117W	1.0A / 234W
	Seek 0.34A / 75W	0.68A / 150W
	Idle 0.21A / 47W	0.43A / 94W

Technical Support

Huge Systems web site:	www.hugesystems.com
Huge Systems knowledge base:	Go to web site, click on Support, click on Knowledge Base
Huge Systems support e-mail:	support@hugesystems.com
Creative Cow:	www.creativecow.net

Phone Support: 818-991-1188 M-F: 8AM – 5PM PST.
FAX: 818-991-6893

Serviceability

The U320-RX is designed to provide easy disk drive module and power supply replacement. Should a component needs replacement, simply un-plug the defective unit and install the new. Please refer to the "Important Safety Considerations" section for the power supply replacement and the "Drive Replacement" section for disk drive module replacement.

Firmware Update

From time to time firmware updates are made available to maintain compatibility with latest software releases or correct problems. If you are experiencing problems with the MediaVault you might want to go on-line and visit our web site (www.hugesystems.com) to check for any available firmware download for the MediaVault.

Getting Started

The HMV U320-RX comes pre-assembled and ready to be connected to the SCSI Ultra320 compatible SCSI interfaces of your video edit computer equipment right out of the box.

Unpacking

- **Remove all components from the shipping container. Retain all boxes and packing materials in case you might need to reuse them later.**
- Examine the components for shipping damage. Contact the freight carrier immediately if damage exists.

Check List

- HMV U320-RX – Max or Dual Max External Disk Array.
- Rack mounting hardware and tower configuration hardware.
- One or two SCSI terminator - Ultra320/160/LVD/SE dual mode.
- One or two SCSI cables - Ultra320 compatible.
- A Power Cord (for North America use only).
- A Diagnostic cable.
- This User's Guide.

Editing System Requirements

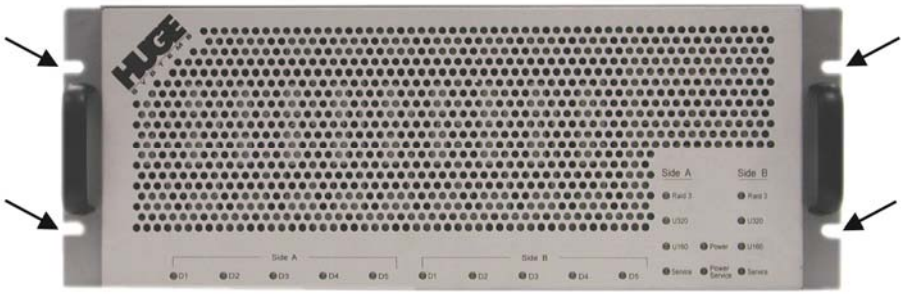
- Ultra320 or compatible Single or Dual channel SCSI host adapter
- Windows 9x/NT/ME/2000,XP, Mac OS9.2/X, IRIX, Linux
- Video Capture card
- Video Editing software
- Video player or other source of video input

Hardware Installation and configuration

The U320-RX comes pre-configured for stand 19” rack mounting. Additional hardware is provided to convert the U320-RX to the tower configuration.

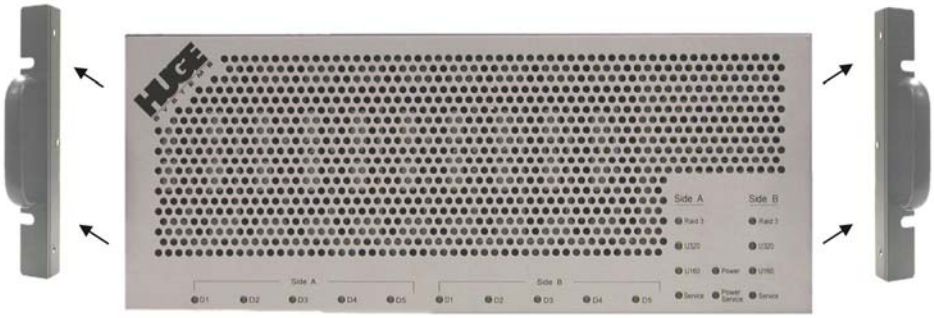
Rack Mounting

The U320-RX rack mount requires 4U (7 inch) of rack space for mounting. Place the U320-RX in the rack and secure the unit with the appropriate screws using the four mounting points.

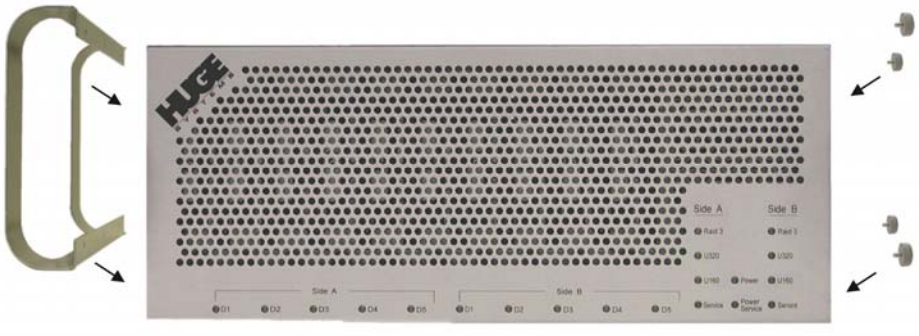


Tower Configuration

For tower configuration, remove the left and right rack mount ears:



Install the handle and feet as shown, then rotate the U320-RX clockwise to it’s upright tower position:



SCSI Host Adapters

Recommended Ultra 320 SCSI Host Adapters

Ultra320	Apple G4	Apple G5	Intel & Compatibles
Dual Channel SCSI Adapters	ATTO UL4D	ATTO UL4D	ATTO UL4D Adaptec 39320
Single Channel SCSI Adapters	ATTO UL4S	ATTO UL4S	ATTO UL4S Adaptec 29320

Recommended Ultra 160 SCSI Host Adapters

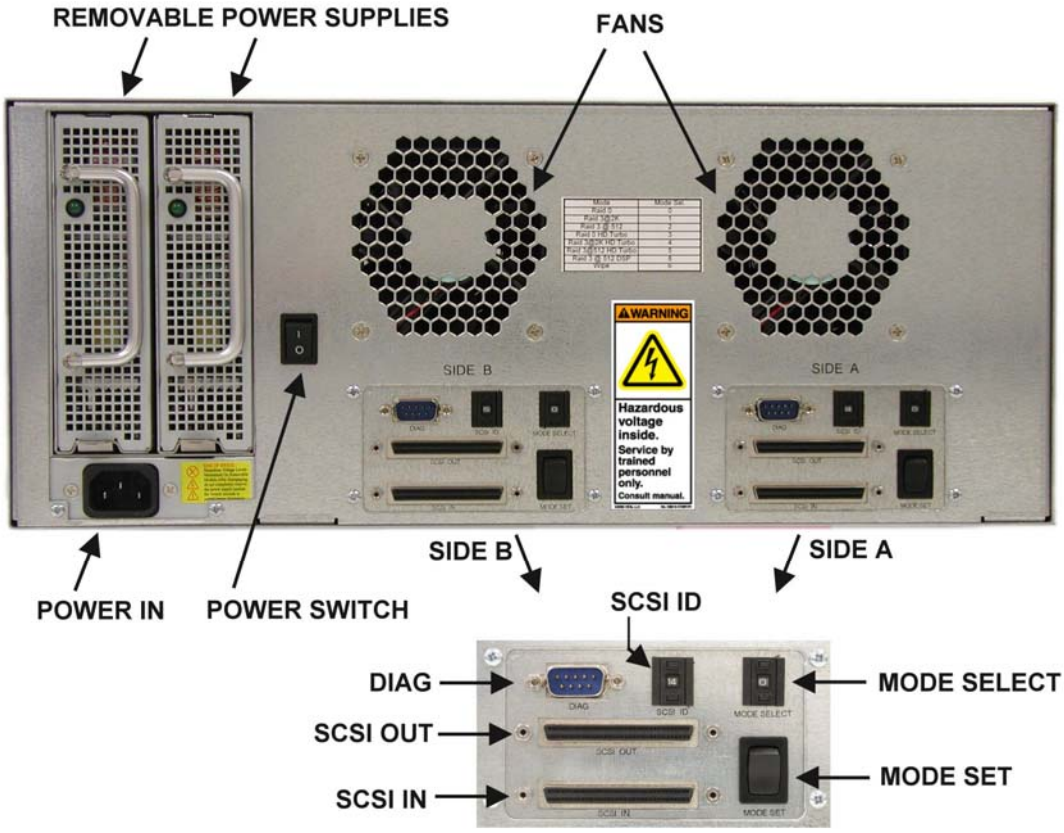
Ultra160	Apple G4	Apple G5	Intel & Compatibles
Dual Channel SCSI Adapters	ATTO UL3D-000 Adaptec 39160	ATTO UL3D-66 Adaptec 39160	ATTO UL3D-000 ATTO UL3D-66 Adaptec 39160
Single Channel SCSI Adapters	ATTO UL3S-000 Adaptec 29160	ATTO UL3S-66 Adaptec 29160	ATTO UL3S-000 ATTO UL3S-66 Adaptec 29160

The HMV U320-RX communicates with your computer using the industry standard SCSI Ultra320 interface. You must have a compatible SCSI Host Adapter installed in your computer to work with the HMV U320-RX storage system. Some computers have a built-in native SCSI port, check your computer for availability.

To maximize the HMV U320-RX's Ultra320 interface, the SCSI Host Adapter in your computer should also be rated for Ultra320. However, the slower Ultra160, Ultra2 and Ultra Wide SCSI rated host adapters will work but at a lower transfer rate.

Check to make sure the Host Adapter is physically installed correctly and the appropriate Host Adapter drivers are loaded and functioning properly before connecting the HMV U320-RX to your computer system.

Rear View



POWER IN

The U320-RX is equipped with an auto ranging power supply. When an AC power source is provided, the unit will be in a power standby mode.

POWER SWITCH

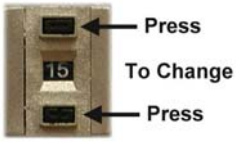
This is not the main power switch. In the ON (1) position, the U320-RX provides power to the entire U320-RX. In the OFF (0) position, the U320-RX switches to power standby mode and remove power to the disk drives and controllers, but some standby power remains. The OFF(0) position does not remove the main power to the U320-RX. Removing the power source from Power In will completely remove power.

REMOVABLE POWER SUPPLIES

The removable power supplies must be serviced by trained personnel only, call our technical support department for additional instructions.

SCSI ID

Each SCSI device attached to a SCSI channel must have it's own unique ID setting. Valid ID for Wide SCSI are from 0 to 15. Most SCSI host adapters inside your computer typically occupies ID 7. If there are other SCSI devices on the SCSI channel, ensure that there are no SCSI ID conflicts. If you are unsure which ID to use and the U320-RX is the only device attached to this particular channel of the host adapter, ID 0 can be used.



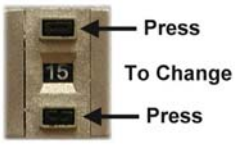
To change the value, use a pointy instrument (pointy pen) and press the buttons just above and just below the number to change it.

The U320-RX must be turned off and back on again to make a new SCSI ID setting take effect.

MODE Selection (RAID Level)

(see table on right)

Mode Selection is a unique feature of Huge Systems and it is a convenient way to select the desired operating mode of the U320-RX. No need of complicated software and serial port configuration procedures.



To change the value, use a pointy instrument (pointy pen) and press the buttons just above and just below the number to change it.

IMPORTANT: Changing the Mode can cause any existing data to be over written. Make sure any data you want to keep is stored elsewhere before making any changes.

Remove or delete any known partitions before changing the mode, this will keep the OS from getting confuse due to left over file systems information left on the U320-RX.

Consult the RAID Compatibility table in the Application Notes section to ensure proper operation.

Double Beep

As a precautionary measure to protect from un-intentional mode changes. A combination of holding down the Mode Set Button and turning the unit on must be performed to cause the change.

1) Turn off the computer.
2) Determine the Mode desired and note the Mode Selection value.
3) Set the value on the Mode Selection switch. Use a pointed instrument and press the tiny button above or below the number window.
4) Turn the power off to the U320-RX unit.
5) Press and hold the Mode Set Button.
6) Apply power to the U320-RX.
7) Within about 20 seconds you will hear two beeps to confirm the change.
8) Release the Mode Set Button.
9) Turn the computer on.

Mode Selection table:

Function	*Mode Select	Additional information	Usable Capacity
RAID 0	0	Data striped across all five drives of the RAID controller. Usable storage is the sum of all five drives.	Full
RAID 3@2k	1	Block size is based on 2048 bytes. Data striped across four drives plus one drive for redundant information. Usable storage is the sum of four drives.	80%
RAID 3@512	2	Block size is based on 512 bytes. Data striped across four drives plus one drive for redundant information. Usable storage is the sum of four drives.	80%
RAID 0 HD Turbo **	3	Data striped across all five drives of the RAID controller. This Turbo mode uses the highest data rate portions of the disk drives.	80%
RAID 3@2k HD Turbo **	4	Block size is based on 2048 bytes. Data striped across four drives plus one drive for redundant information. This Turbo mode uses the highest data rate portions of the disk drives.	40%
RAID 3@512 HD Turbo **	5	Block size is based on 512 bytes. Data striped across four drives plus one drive for redundant information. This Turbo mode uses the highest data rate portions of the disk drives.	40%
RAID 3@512 DPS	8	For use with Leitch Velocity, Velocity Q and Reality. Same function as RAID 3@512 (mode 2)	80%
Wipe	6	This mode will start a write operation to all the disk drives in the array until the operator turns it off. This is used to completely wipe out any previous configuration and settings.	
Manufacturing Test	7	This mode will overwrite data on the HMV U320 as the diagnostic will perform read and write tests on every drive and on every block of data. The unit records vital parameters of each disk drive's performance, and it can be retrieved using the Diagnostic Port for further analysis.	

*Make sure to "Double Beep" to set the mode.

** No need to use the HD Turbo mode in a striped two channel configuration. For a single channel configuration, the HD Turbo mode ensures the highest data rates are used of the disk drives to provide sufficient performance required for HD video resolution operation, the trade off is a reduction in storage capacity. If full capacity AND HD performance is required, the solution is to stripe two channels of the HMV-U320 using the Operating System stripping utility.

MODE SET Button

This switch has a dual role function. During power up, it acts as a Mode Set switch and during normal operation it is used as the Start Rebuild switch.

During the 1st 20 seconds of power up, this switch acts as a Mode Set switch and is used in conjunction with the Mode Selection option. See the Mode Selection section for additional information.

During normal operation and only when the U320-RX is in the RAID 3 modes, this switch is used as an alarm mute and drive rebuild start button. When a defect drive has been replaced, this rebuild process brings the U320-RX back up to it's fully protected mode. See Audible Alarm and Drive Replacement sections for additional information.

SCSI IN / OUT

The HMV U320-RX Dual Max contains two RAID controllers (Side A and Side B), each controller have a pair of SCSI 68-pin high density connectors. They function as an IN and an OUT connection with internal loop-through for the SCSI channel. This SCSI channel is compatible with Ultra320, Ultra160, Ultra2, and other SCSI standards. HVD (High Voltage Differential) is not supported.

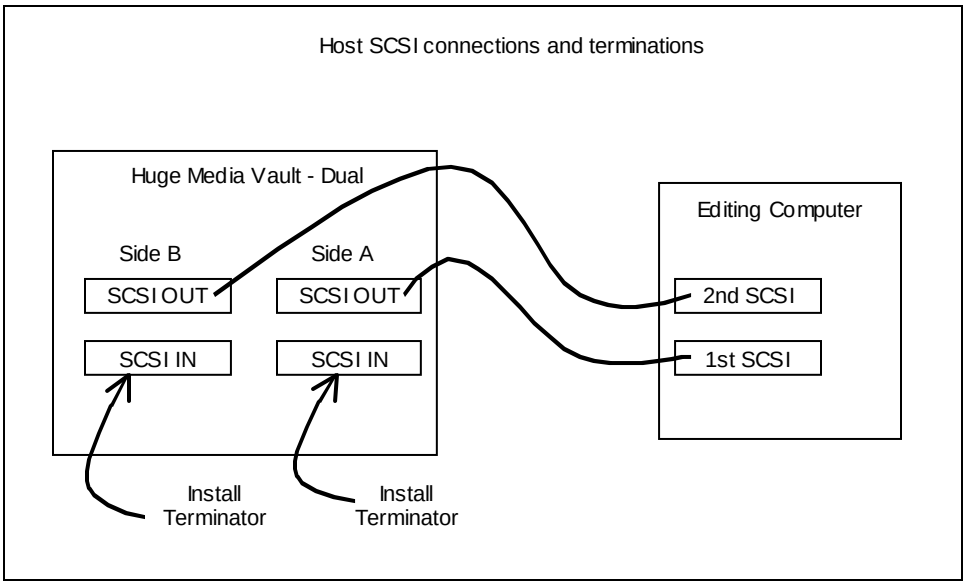
Side B	Side A
SCSI OUT	SCSI OUT
SCSI IN	SCSI IN

Host connections

Use an Ultra320 rated SCSI cables to connect each side of the SCSI channel to your host computer. Connect the Side A SCSI IN to the 1st SCSI channel in the computer, and connect the Side B SCSI IN to the 2nd SCSI channel.

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.



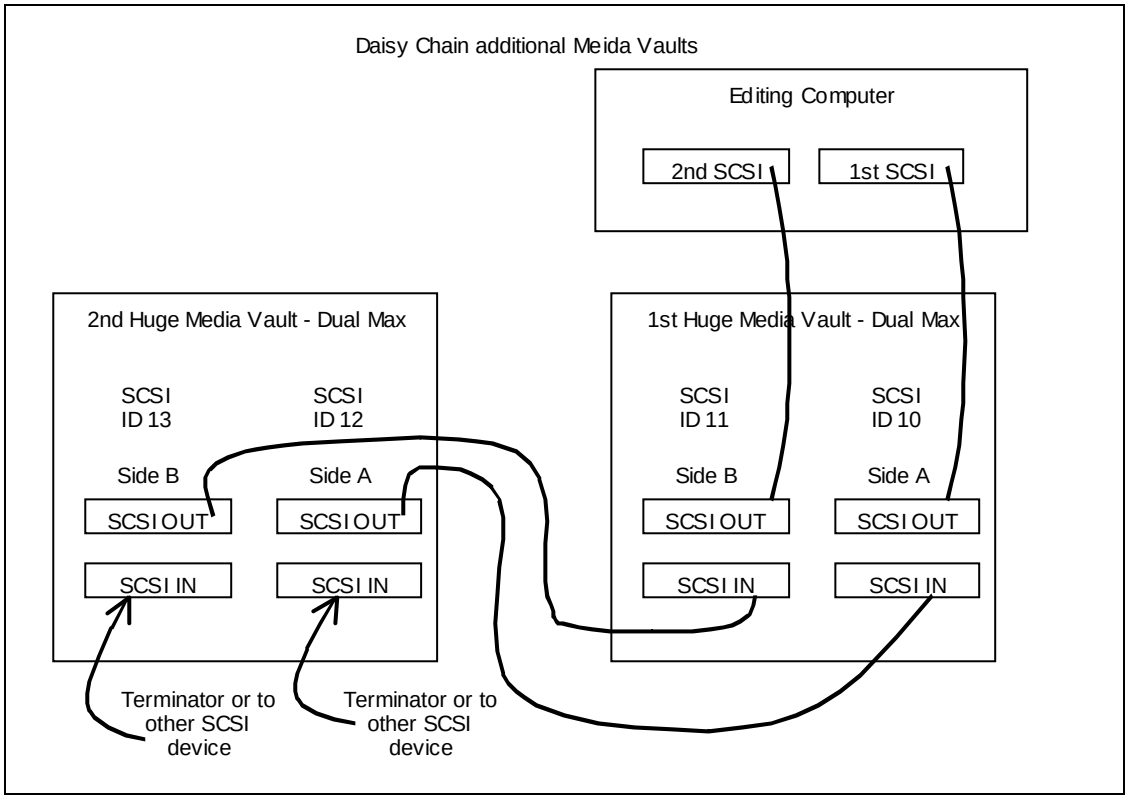
Daisy chaining

If you have multiple SCSI devices to connect up, you can connect (daisy chain) other SCSI devices as shown. At the back of the HMV U320-RX you will have at the SCSI IN connectors SCSI cables connected to your host computer, and at the SCSI OUT connectors SCSI cables connected to your other SCSI devices.

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 Ultra160, Ultra2, Ultra Wide, narrow SCSI, etc… will reduce the data transfer rate to the slowest device on the SCSI channel.

Please ensure that 1) the total SCSI cable length are kept as short as possible (Maximum 12 meters); 2) remember to use a terminator at the end device of each SCSI chain; 3) No duplicated or SCSI ID conflict on any particular SCSI channel. For HMV U320-RX Max, only Side A applies.

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

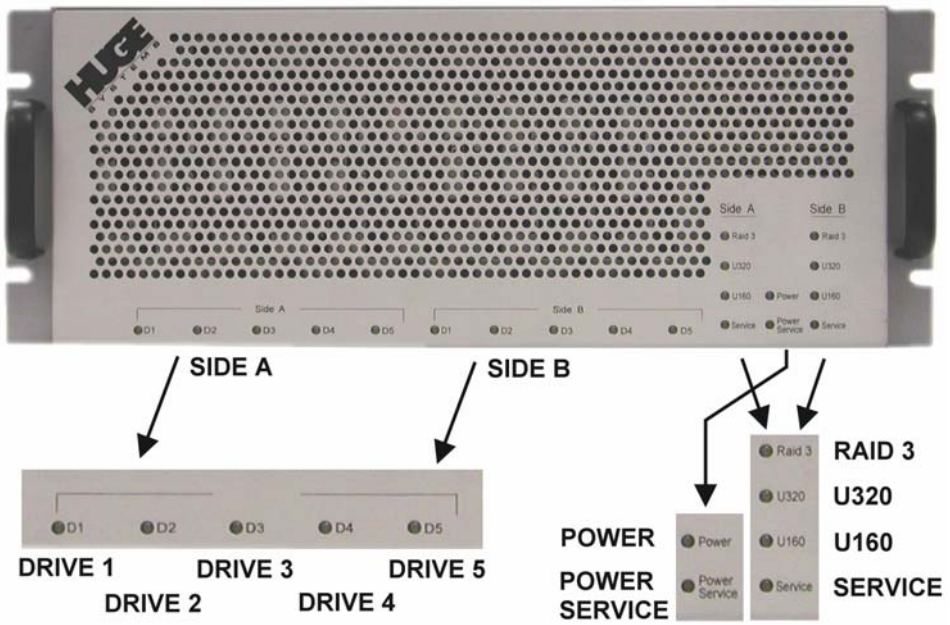


DIAG - Diagnostic Port

A serial Diagnostic Port cable is supplied to enable future firmware download and any special diagnostic requirements. Under normal operating circumstance there is no need to hookup the serial port.

Should you have any need to journey into the Diagnostic Port, please call our Technical Support Department and they will be happy to assist you.

Front View - Indicators



POWER
On solid indicates unit is powered up and ready for operation. This indicator will flash rapidly during initial power on self test for 20 seconds.

POWER SERIVCE
On solid indicates a power supply unit is in need of service.

RAID 3
Indicates the U320-RX is operating in a RAID 3 protected mode. See the Mode Selection section for additional RAID level information. When this indicator if off, U320-RX is operating in RAID 0 (un-protected) mode.

DRIVE 1 to DRIVE 5
Drive activity indicators or drive fault indicator. The indicators will blink as the disk drives are being accessed. Indicators will be off when there are no drive accesses.

In a fault condition, associated with the SERVICE Indicator and an audible alarm, the faulty drive is identified by a slow blinking drive indicator.

U320
On indicates the SCSI interface is operating at it's optimum SCSI Ultra320 speed. If this indicator and the U160 speed indicator are off, the U320-RX is operating at less than Ultra160 speed.

U160
On indicates the SCSI interface is operating in SCSI Ultra160 speed. If this indicator and the U320 speed indicator are off, the U320-RX is operating at less than Ultra160 speed.

SERVICE
If this indicator is lit, the U320-RX requires help. Normally this is associated with an audible alarm and one of the drive indicator will be flashing slowly. A drive replacement might be necessary. See Audible Alarm section.

Audible Alarm

The HMV U320-RX will sound an alarm if there is a problem with the RAID operation. Corrective actions can be applied to rectify the problem.

6 Rapid Beeps During Boot Time

6 rapid beeps during boot time is normally associated with SCSI cabling, SCSI termination, or power up sequence related. Always turn on the MediaVault on first, then turn on the computer. You might need to physically remove and re-insert the SCSI connectors along the SCSI path, this includes the connectors at the SCSI controller, at the MediaVault and the terminators.

Check to ensure there are no other SCSI devices on the bus using the same SCSI ID address.

Try removing any other SCSI devices that shares the same SCSI bus as the Media Vault, leaving just the Media Vault as the only SCSI device will help to identify if there is a conflict with other devices.

6 Rapid Beeps During Normal Operation

6 rapid beeps during normal operation indicates either there is a SCSI interface issue or a disk drive in the MediaVault has timed out. Check to ensure all SCSI connections are securely in place, you might need to physically remove and re-insert the SCSI connectors along the SCSI path, this includes the connectors at the SCSI controller, at the MediaVault and the terminators.

Slow Beeps

One or more slower beeps indicate a bad drive or an intermittent drive, the number of beeps indicates which drive is having problems. When operating in RAID 3 mode the HMV U320-RX is still available for normal operation without performance degradation, but the beeps indicate that a drive is down and you are running in a degraded RAID 3 state. Should another drive fail your are in danger of loosing data.

To service the unit, any data needs to be kept must be off loaded to another fully functional unit. Sent the entire defective unit to the service center, the defective component will be replaced or repaired and then returned back to the sender. Data will not be preserved by the service center. Upon receiving the repaired unit, reformat and partition the U320-RX and restore any needed data.

Constant Solid Beep

This would indicate a drive is down. The SERVICE indicator should also be on. One of the drive indicator should exhibit a slow blink (one second on then one second off). This drive needs to be serviced. See Drive Replacement section for more instructions.

You may mute the alarm by pressing the Mode Set button once. Pressing the Mode Set button a second time will start the rebuilt process, you typically only would do this after a replacement drive module had been installed to replace a defective drive module.

Power Supply Replacement

The removable power supplies must be serviced by trained personnel only, call our technical support department for additional instructions.

Drive Replacement

Access to the disk drive modules are from the front of the U320-RX unit. The Front Panel needs to be removed to access the modules. While modules may be removed and inserted when the U320-RX is 'hot' (powered on), but we recommend turning off the U320-RX when servicing the disk modules. Make sure to shutdown the computer properly first before turning off the U320-RX.

Remove the front panel

The front panel snaps on to four snap pins, to remove the front panel:

Tower configuration - Lift the front of the U320-RX by a couple of inches using the front handle, locate the cut out of the lower panel with your other hand and pull the lower part of the panel forward until it un-snaps, then continue the forward pull and lift up, the top panel snaps will un-snap as the forward and up movement is continued.

Rack mount configuration – Locate the cut out next to the right hand side handle, pull the front panel forward until it un-snaps, then continue to forward pull till the left side of the panel un-snaps.

Removing disk drive module

Identify and make a note of the module to replace by locating the slow blinking light next to it.

Shutdown the computer and turn off the U320-RX.

Completely loosen the captive thumb screws to the disk drive module.

Grab the handle of the disk drive module and GENTLY pull it towards you. Set the defective module a side.

Insert the replacement disk drive module GENTLY by aligning the rails to the slots in the U320-RX, slowly and gently insert the module all the way into the U320-RX until it engages the internal connections and snaps into place.

Secure the left and right hand thumb screws.

Install the front panel.

Turn the U320-RX back on. Wait 30 seconds before rebuild.

Rebuilding a down drive (RAID 3 mode only)

The expected slow beeps followed by a continuous beep would indicate that a drive is still down. Press the Mode Set switch one time to mute the alarm, pressing the Mode Set switch a second time will start the rebuild process. During rebuild, the audible alarm will be silent but the Service indicator will be lit during rebuild, it will go off when rebuild is complete.

Rebuild time will vary depending on your system work load, when system is idle the rebuild time is approximately 12Gbytes/min or 83 minutes to rebuild a 1TByte unit.

Formatting and Partitioning

Formatting and Partitioning of the Media Vault is required 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 format and partition the Media Vault.

The HMV 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 HMV U320-RX. Treat the HMV U320-RX as a pair of normal ordinary hard disk drives when partitioning and formatting.

Macintosh G4 / G5 in OS X

Use the following configuration to get maximum speed from the U320-RX with OS 10.3.x for video capturing/playback and editing.

Check and ensure you are using the latest recommended configuration for your capture card and editing software, update any software or drivers as necessary.

Preparing a single channel U320-RX Max

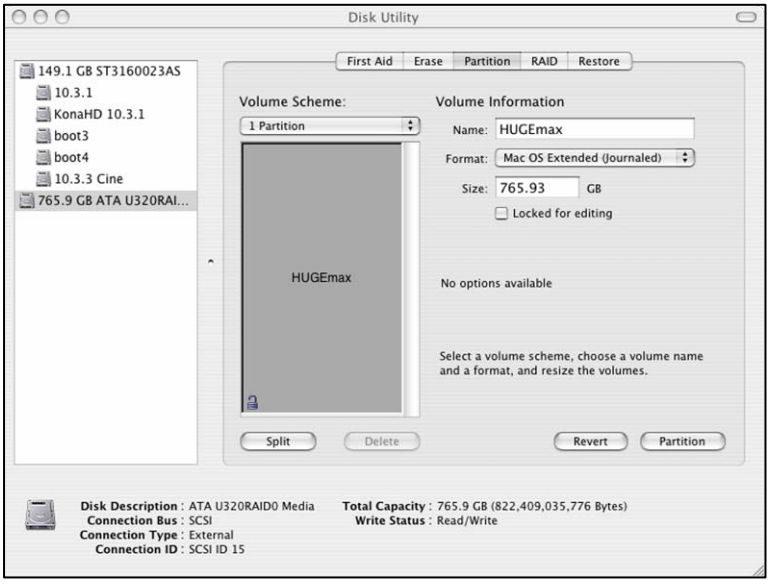


Fig. 1

- Launch the Apple Disk Utility program. (*Disk Utility is located at Macintosh HD > Applications > Utilities.)*
- Click on the drive to prepare on the left side.
- Select the ***"Partition"*** tab.
- Change the Volume Scheme to 1 partition.
- Fill in the Name field.
- Select Mac OS Extended (journaled) format.
- Click on ***"Partition"*** (lower right) to proceed.

Preparing a single channel U320-RX Max (continue)

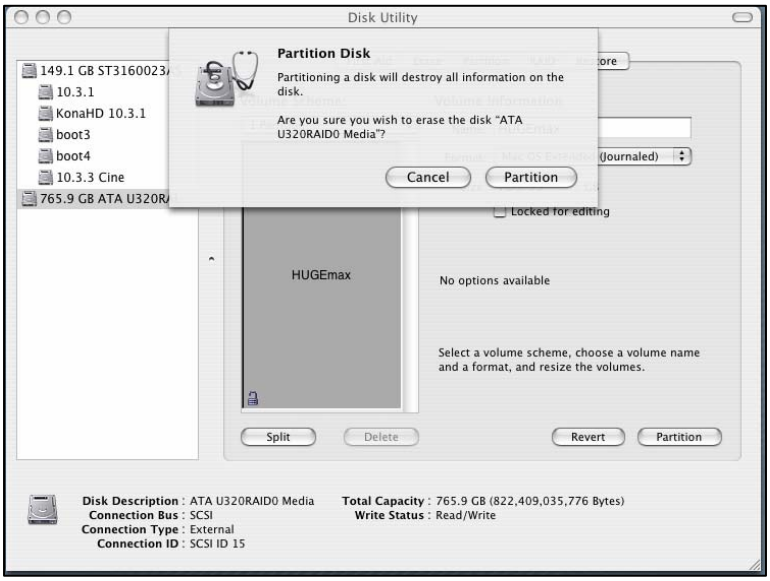


Fig. 2

- You will be given a warning.
- Click the ***"Partition"*** button to proceed.

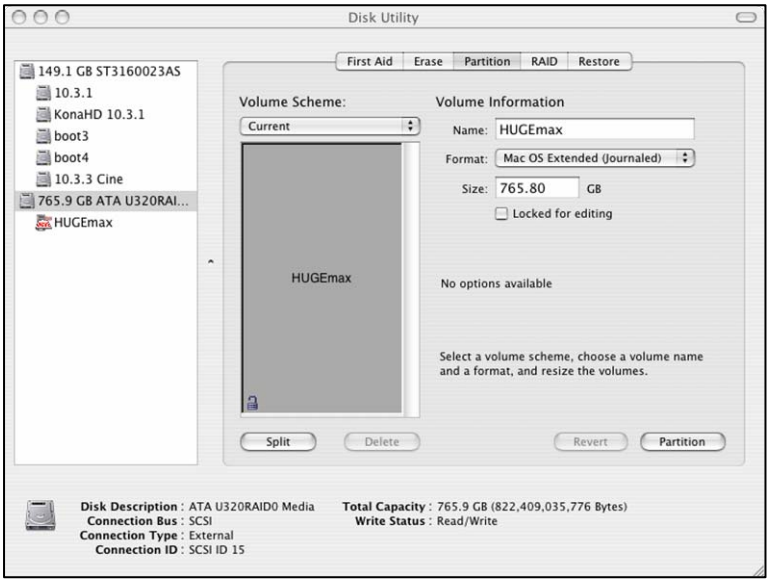


Fig. 3

- You should now see your named volume as show on the left hand side of the screen and also on the Desktop.
- Congratulations! You have successfully prepared your U320-RX.

Preparing a dual channel U320-RX Dual Max (striping)

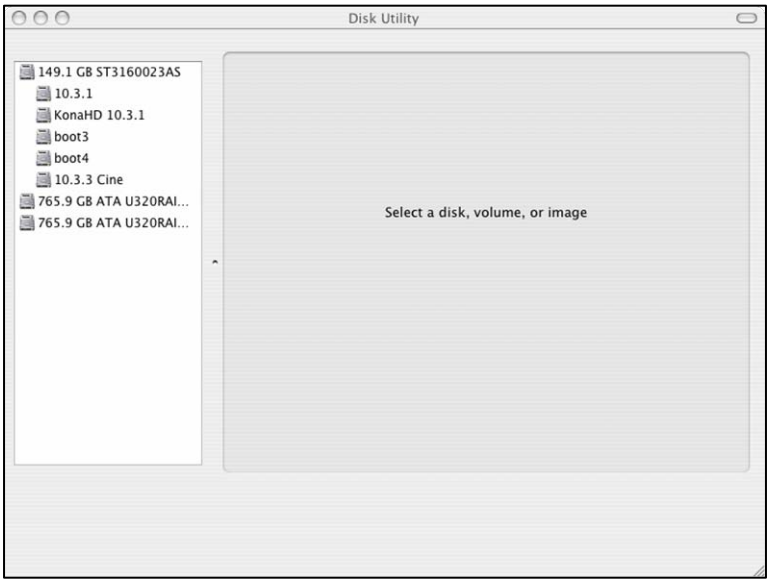


Fig. 1

- Launch the Apple Disk Utility program. (*Disk Utility is located at Macintosh HD > Applications > Utilities.)*
- Select the disks to stripe on the left by using shift click.

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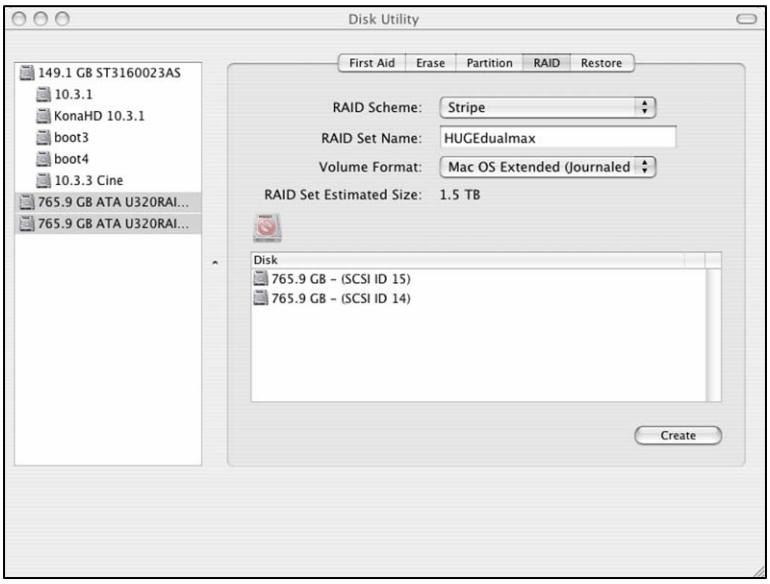


Fig. 2

- Click on the RAID tab.
- Drag the disk set into the area on the lower right side of the screen.
- Select Stripe for the RAID Scheme.
- Fill-in the RAID Set Name.
- Select Mac OS Extended (journaled) format.
- Click on Create (lower right).

Preparing a dual channel U320-RX DualMax – striping (continue)

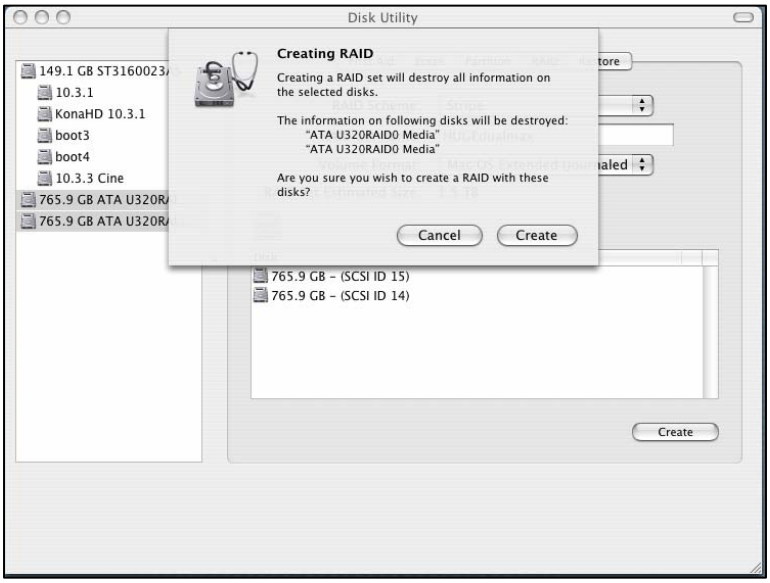


Fig. 3

- You will be given a warning.
- Click Create to proceed.

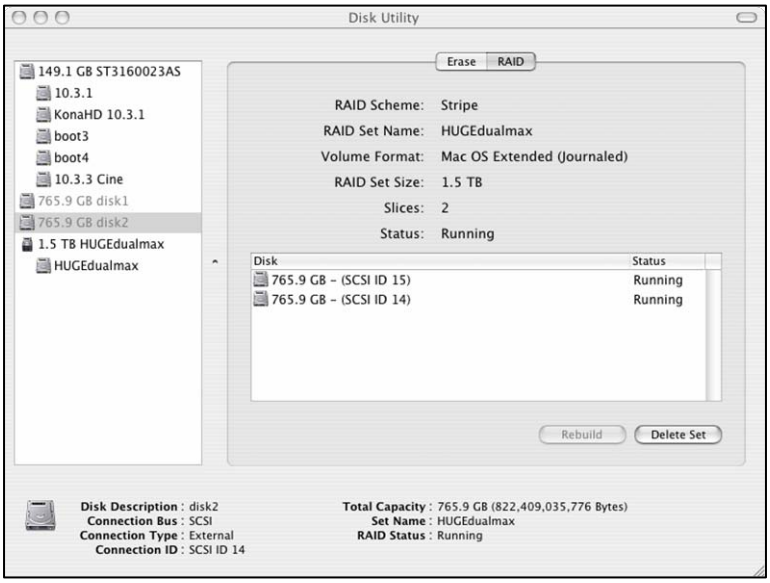


Fig. 4

- You should now see your named volume as show on the left hand side of the screen and also on the Desktop.
- Congratulations! You have successfully prepared your U320-RX.

Windows NT Partition / Format

Windows NT provides a utility to partition and format disks. Locate and start the Disk Administration program by clicking:

Start > Program > Administrative Tools > Disk Administrator.

Each channel of the Media Vault should appear as a disk entry with “Free Space”.

Preparing a HMV U320-RX Max (single channel)

Right click on the “Free Space”, left click on Create, confirm the size of the partition you desire, click OK. Click Yes to confirm partition creation.

The changes must be committed before going further, right click on the “Unformatted” section of the disk and click on “Commit Changes Now”. Click Yes to save the changes. Click OK to confirm “Disks were updated successfully”.

After the partition is created, it must be formatted. Right click on the “Unknown” section of the disk and click Format. Change the File System to NTFS, change the Volume Label as desire, check the Quick Format box, and leaving the other selections as they are. Click Start > OK to begin the formatting operation.

A progress meter will show the progress, at completion a confirmation dialog box will appear, click OK > Close. Note the newly prepared disk will have a drive letter associated with it. Exit program if done.

Preparing a HMV U320-RX Dual Max (dual channel)

Select the disks you which to stripe together by Left click on the first disk with “Free Space”, then press Control and left click on the second disk with “Free Space”. Right click on either one of the selected “Free Space”, left click on Create Stripe Set, confirm the size of the partition you desire, click OK.

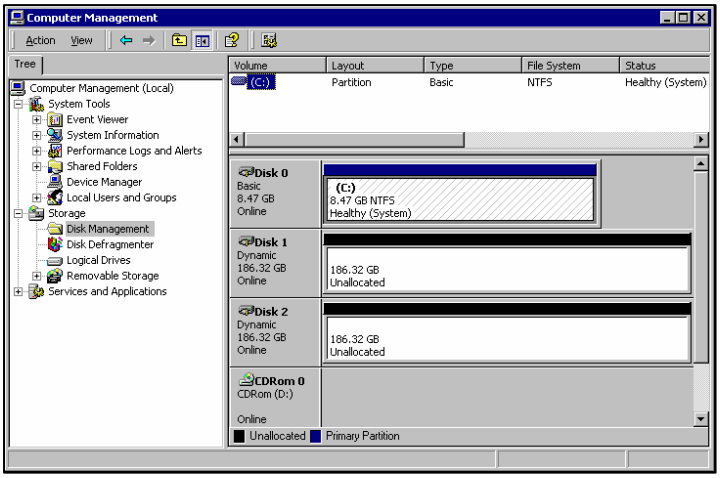
The changes must be committed before going further, right click on the “Unformatted” section of one of the disk and click on “Commit Changes Now”. Click Yes to save the changes. Click OK to confirm “Disks were updated successfully”.

After the partition is created, it must be formatted. Right click on the “Unknown” section of one of the disk and click Format. Change the File System to NTFS, change the Volume Label as desire, check the Quick Format box, and leaving the other selections as they are. Click Start > OK to begin the formatting operation.

A progress meter will show the progress, at completion a confirmation dialog box will appear, click OK > Close. Note the newly prepared disks will have a drive letter associated with it. Exit program if done.

Windows 2000 and XP Partition / Format

Windows 2000 and XP provides a utility to partition and format disks. Locate and start the Disk Management program by clicking:



Start > Settings > Control Panel > Administration Tools > Computer Management > under the Computer Management tree Storage > Disk Management.

A Write Signature dialog will open if fresh disks are detected, click Next, and check the new disk(s) > Next > Finish.

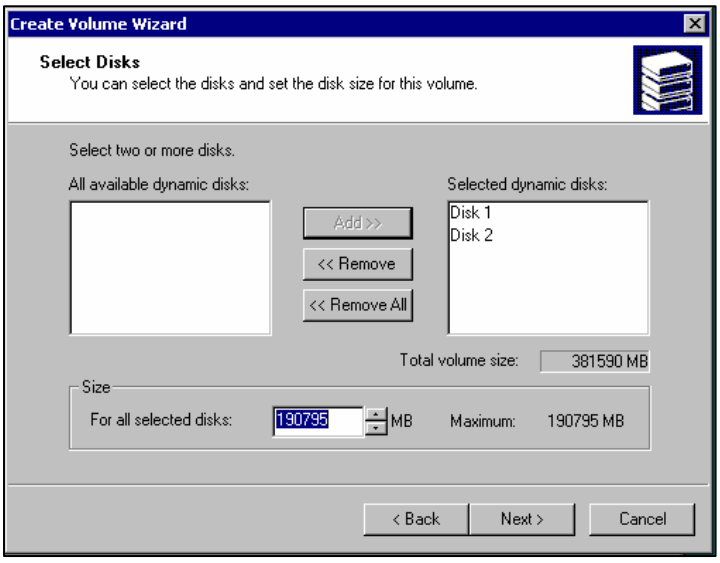
Each channel of the Media Vault should appear as a disk entry with "unallocated".

Preparing a HMV U320-RX Max (single channel)

Right click on "Unallocated", left click on Create Volume > Next > Simple volume > Next > confirm the desired disk is in the Selected dynamic disks box > Next > confirm the desired Drive Letter > Next > check the Perform a Quick Format box > Next > Finish.

Formatting starts and will take a minute or so. At the completion of format, note the newly prepared disks will have a drive letter associated with it. Exit program if done.

Preparing a HMV U320-RX Dual Max (dual channel)

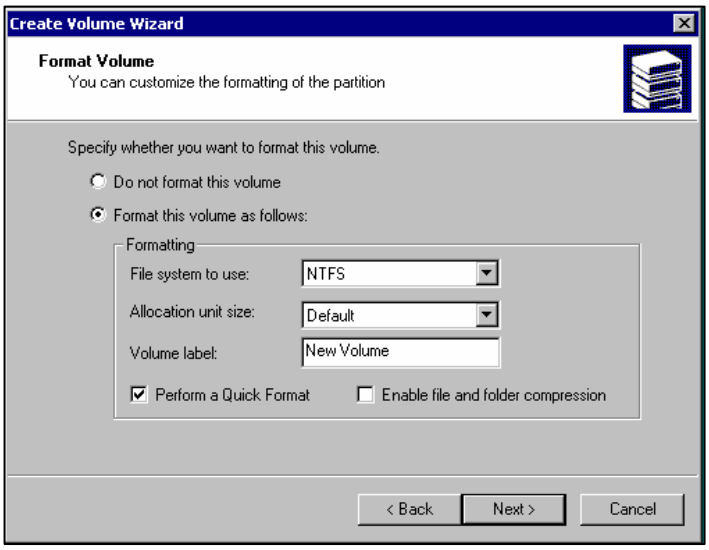


Right click on "Unallocated", left click on Create Volume > Next.

Select Striped volume > Next.

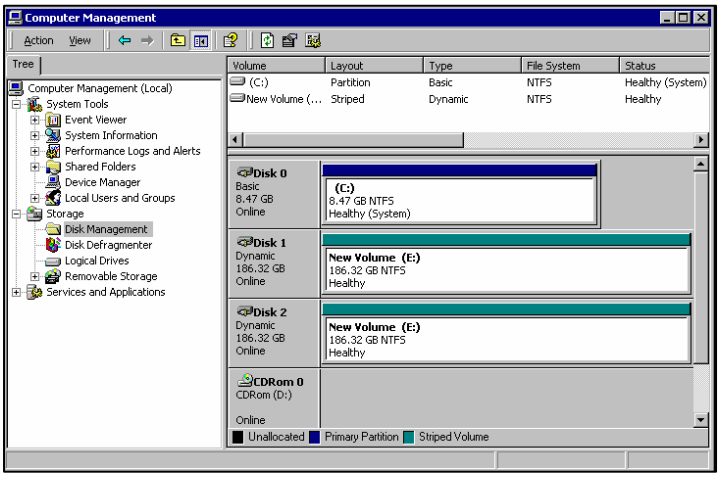
Highlight the available dynamic disk you which to add to the stripe click Add > Next.

Confirm the desired Drive Letter > Next.



Check the Perform a Quick Format box > Next.

Formatting starts and will take a minute or so.



At the completion of format, note the newly prepared disks will have a drive letter associated with it.

Exit program if done.

Application Notes

General

Video Resolution Data Rates

Video Resolution	Data Rate Megabytes / Sec
DV/DV25	3.7
DV50	7.4
SD 8 bit	20
SD 10 bit	27
HD 1080i 8 bit	120
HD 1080i 10 bit	155
HD 720 8 bit	110
HD 720 10 bit	138

Hours per Terabyte Table

Video Resolution	Hour per Terabyte (1000Gigabyte)
DV/DV25	75.1
DV50	37.5
SD 8 bit	13.9
SD 10 bit	10.3
HD 1080i 8 bit	2.3
HD 1080i 10 bit	1.8
HD 720 8 bit	2.5
HD 720 10 bit	2.7

Macintosh

RAID Compatibility

Media Vault Mode Select	Apple Non-Striped Partition (Standard)	Apple Striped Partition (RAID 0)
RAID 0 (mode 0)		
OS X ATTO ExpressStripe	Okay	Okay
OS X Apple Disk Utility	Okay	Okay
RAID 3/2k (mode 1)		
OS X ATTO ExpressStripe	Not Compatible	Not Compatible
OS X Apple Disk Utility	Okay	Okay
RAID 3 (mode 2)		
OS X ATTO ExpressStripe	Okay	Okay
OS X Apple Disk Utility	Okay	Okay

Windows NT / 2000 / XP

RAID Compatibility

Media Vault Mode Select	Non-Striped Partition (Standard)	Striped Partition (RAID 0)
RAID 0 (mode 0)		
NT / Win2K / XP	Okay	Okay
RAID 3/2k (mode 1)		
NT	Okay	Okay
Win2K / XP	Basic Disk only, no Dynamic	Not Compatible
Win2K / XP With ATTO controller and ATTO ExpressRAID	Basic Disk only, no Dynamic	Basic Disk only, no Dynamic
RAID 3 (mode 2)		
NT / Win2k / XP	Okay	Okay

MaximumSGList

NTFS – Enlarge Scatter Gather List value.

NTFS is used in Windows NT, 2000, and XP Operating Systems. Applying this registry change to the Scatter-Gather List when using various SCSI controllers will enable maximum data throughput performance.

Update the registry manually by following the steps below.

Run REGEDIT to edit the system register.

Go to \HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Service\
- If U320 Adaptec then continue to \adpu320
- If U160 Adaptec then continue to \adpu160m
- If Ultra2 Adaptec then continue to \aic78u2
- If non-Ultra2 Adaptec then continue to \aic78xx
- If LSI (Symbios) then continue to \symmpi
- If ATTO then continue to \express2

Continue to \Parameters\Device. If they do not exist, then create them.

Create a “Parameters” key (without quotations). Edit > New > Key and enter Parameters.
Go to \Parameters
Create a “Device” key (without quotations). Edit > New > Key and enter Device.
Go to \Device

If it does not exist, create a “MaximumSGList” value name (no quotations). Edit > DWORD value and enter MaximumSGList. Enter FF for Value data, make sure Hexadecimal is set.

Exit Regedit and reboot.

ATTO striping

Maximum data rate can be obtained by using an optional striping feature from ATTO. You will need to purchase ATTO's ExpressRAID software to enable this striping feature.

Striping can be done either using Windows (NT, Win2K, XP) built-in striping tool, or ATTO Striping. We recommend using ATTO striping as this is more efficient and results in faster data rates. Windows striping uses smaller block requests whereas ATTO stripe uses larger and more efficient block sizes.

Using the ATTO striping, a pair of U320-RX Max or one U320-RX Dual Max can be striped together, this in turns is seen as one large disk drive to the Operating System.

In preparing the U320-RX two steps are required:

1) Use the ExpressRAID to stripe the U320-RX. (Do not use the BIOS to configure the stripe).
2) Use Windows Disk Administrator (NT) or Disk Manager (Win2K, XP) to format the ATTO stripped disk.

End of Document

<end of User's Guide>