Huge MediaVault

U320-R

User's Guide

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Thank You

Congratulations and thank you for purchasing the U320-R 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 U320-R 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 for DV to HD resolutions in a single SCSI channel.

Each U320-R contains one RAID controller and five removable disk modules. The U320-R 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, this translates to a huge performance at the SCSI interface, upward of 320MBytes/sec burst and 200MBytes/sec of sustained data rate with the U320-R.

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

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
- Internal disk rate from 300MB/sec to 130MB/sec.
- Sustained Data Rate 200MBytes/sec per SCSI channel in HDT mode.
- One Ultra320 SCSI channel
- One RAID controller
- RAID 0 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 high performance removable hard disk drives 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.

Les Considérations importantes de Sûreté

Pas la tentative pour entretenir cette unité. L'ouverture ou enlever la couverture vous exposera aux tensions dangereuses ou aux autres dangers.

Ne pas utiliser cette unité près de l'eau – tel que; la baignoire, le lavabo, l'évier de cuisine ou le baquet de lessive, dans un sous-sol mouillé de proche une piscine.

Ne pas placer cette unité sur une charrette instable, une position, un crochet ou une table. L'unité peut tomber, causant la blessure et les dommages sérieuse à l'unité.

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

Versuchen Sie nicht, diese Einheit zu warten. Öffnen oder Herausnehmen der Decke werden Sie zu gefährlichen Spannungen oder anderen Gefahren entblößen.

Benutzen Sie dieses Einheit nahes Wasser nicht – wie zum Beispiel; Badewanne, washbowl, Küche Ausguß oder Wäscherei Wanne, in einem nassen Kellergeschoß von nahe einem schwimmenden Teich.

Stellen Sie diese Einheit auf einen unsicheren Wagen, Gestell, Bügel oder Tisch nicht. Die Einheit kann fallen, verursachend ernste Verletzung und Schaden an der Einheit.

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.

Important Safety Considerations

Do not attempt to service this unit yourself other than the removal of the front panel and the disk drive modules. Opening or removing the top, rear and side covers will expose you to dangerous voltages or other hazards.

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.

Agency Approvals

This device complies with the following agencies:

FCC class A, TUV, CE , CSA

Model Numbering

The HMVU320-R model numbers are in the following pattern:

HMV - U320 R - (size) (channels)

Where: HMV is the Huge MediaVault.

U320 designate Ultra320 SCSI interface.

R designate the removable drive feature.

(size) is the capacity of the U320-R in Gigabytes in RAID 0 mode.

(channel) M designates Max for a single channel, DM is DualMax for dual channel.

HMV-U320R-1250M would represent 1250 Gigabytes (1.25 Terabytes) of storage in RAID 0 mode.

Specifications

Physical Dimensions:	6 ½" wide x 11" high x 12 ½" deep
Power:	Auto switching 100-240 VAC 50-60 Hz
Operating temperature:	5-40 degrees Celsius
Weight (shipping):	20 lbs / 9 Kg
Current draw 117VAC:	Start-up 1.0A / 117W
	Seek 0.64 / 75W
	Idle 0.4A / 47W
Current draw 220VAC:	Start-up 0.53A / 117W
	Seek 0.34A / 75W
	Idle 0.21A / 47W

Technical Support

World Wide Web:
www.hugesystems.com

e-mail:
support@hugesystems.com

Telephone:
818-991-1188
M-F: 8AM – 5PM PST.

FAX:
818-991-6893

Serviceability

The U320-R is designed to provide easy disk drive module replacement. Should a disk drive module needs to be serviced, simply remove the front cover, identify the bad module, loosen the thumb screws, unplug the defective drive module and install the new.

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 U320-R comes pre-assembled and ready to be connected to a SCSI Ultra320 compatible SCSI interface of your video edit computer equipment right out of the box. Using your computer you will need to format and/or partition the U320-R before storing data on it.

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

- One U320-R – Ultra 320 SCSI External Disk Storage Array.
- One SCSI Ultra320/160/LVD/SE dual mode terminator.
- One SCSI Ultra320 compatible interface cable.
- One AC power cord (for North America use only).
- One Diagnostic cable.
- This User's Guide.

Editing System Requirements

- Ultra320 or compatible SCSI host adapters
- 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

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 UL4D	ATTO UL4S	ATTO UL4S Adaptec 29320

Recommended Ultra 160 SCSI Host Adapters

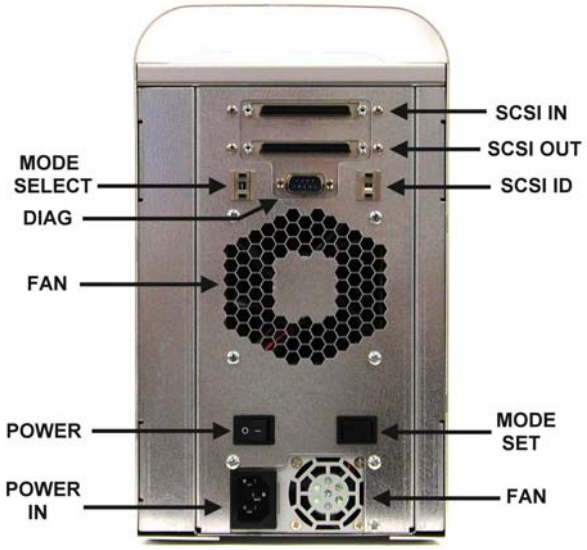
Ultra160	Apple G4	Apple G5	Intel & Compatibles
Dual Channel SCSI Adapters	ATTO UL3D-000 Adaptec 39160	ATTO UL3D-66 Adaptec 39160	ATTO UL3D-000 ATTO UL3D-66 Adaptec 39160
Single Channel SCSI Adapters	ATTO UL3S-000 Adaptec 29160	ATTO UL3S-66 Adaptec 29160	ATTO UL3S-000 ATTO UL3S-66 Adaptec 29160

The U320-R 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 U320-R storage system. Some computers have a built-in native SCSI port, check your computer for availability.

To maximize the U320-R'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 U320-R to your computer system.

Rear View



SCSI IN – SCSI connector.

SCSI OUT – SCSI connector.

SCSI ID – SCSI ID selection switch.

MODE SELECT – Mode Selection switch.

DIAG – Diagnostic connector.

FAN – Cooling fans.

MODE SET / REBUILD – Mode Selection Set and Start Rebuild switch.

POWER – Main power switch.

POWER IN – AC Power connector.

POWER IN

The U320-R is equipped with an auto ranging power supply, attach the supplied AC power cord to the U320-R at the rear and to an AC power source.

POWER

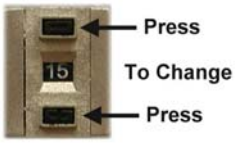
The power switch for the U320-R is located at the rear of the unit. Turn on the U320-R by pressing flipping the power switch to the ON (1) position, turn it off by flipping the switch to the OFF (0) position.

Turn on the U320-R first, wait 20 seconds then your computer.

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-R is the only device attached to this particular channel of the host adapter, ID 0 can be used.

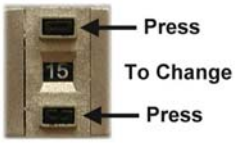


To change the value, use a pointy instrument (pointy pen) and press the buttons just above and just below the number to change it.

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

MODE Selection (RAID Level)

Mode Selection is a unique feature of Huge Systems and it is a convenient way to select the desired operating mode of the U320-R. 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-R.

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

RAID	*Mode Select	Additional information	Capacity	HD	SD	# of Channels
0	0	Data striped across all five drives of the RAID controller. Usable storage is the sum of all five drives.	Full	1st 80%	✓	1
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.	20% less	1st 62%	✓	1
0 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.	20% less	✓		1
3@2k 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.	50% less	✓		1
0	0	Use Operating System to stripe across two channels of HMV.	Full	✓		2
3@2k	1	Use Operating System to stripe across two channels of HMV.	Full	✓		2

*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.

Wipe	6	This mode will start a write operation to all the disk drives in the array. This is used to completely wipe out any previous configuration and settings.				
Mfg Test	7	This mode will over write 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.

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-R unit.
5) Press and hold the Mode Set Button.
6) Apply power to the U320-R.
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 SET / REBUILD 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-R is in the RAID 3 modes, this switch is used to start a drive rebuild process. When a defect drive has been replaced, this rebuild process brings the U320-R back up to it's fully protected mode. See Audible Alarm and Drive Replacement sections for additional information.

SCSI connections

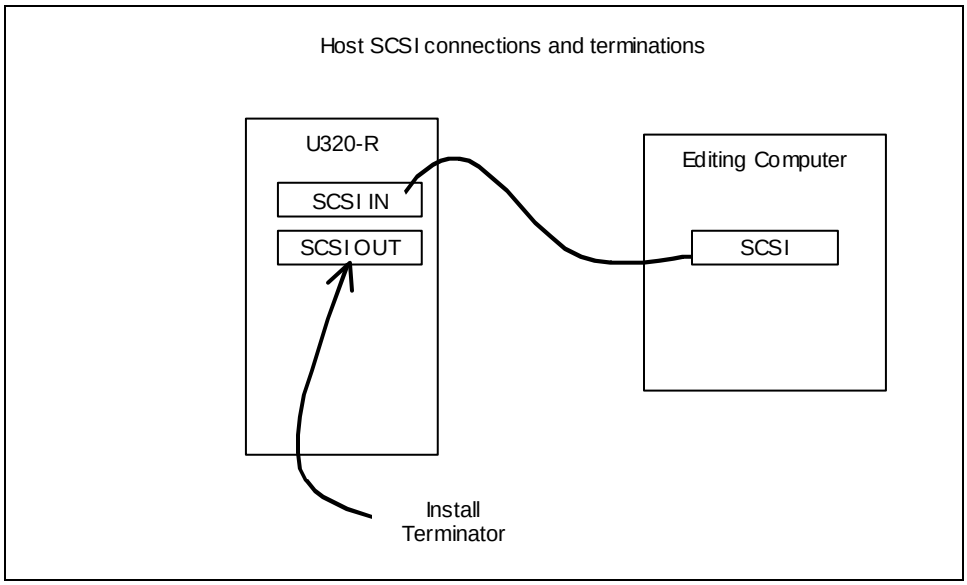
The U320-R have a pair of SCSI 68-pin high density (68HD) connectors. They function as an IN and an OUT connection with internal loop-through for the SCSI channel. This SCSI channel is compatible with Ultra320, Ultra160, Ultra2, and other SCSI standards. HVD (High Voltage Differential) is not supported.

Host connections

Use a Ultra320 rated SCSI cable to connect the SCSI channel to your host computer. Connect the SCSI IN of the U320-R to the SCSI channel of the computer.

Terminator

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



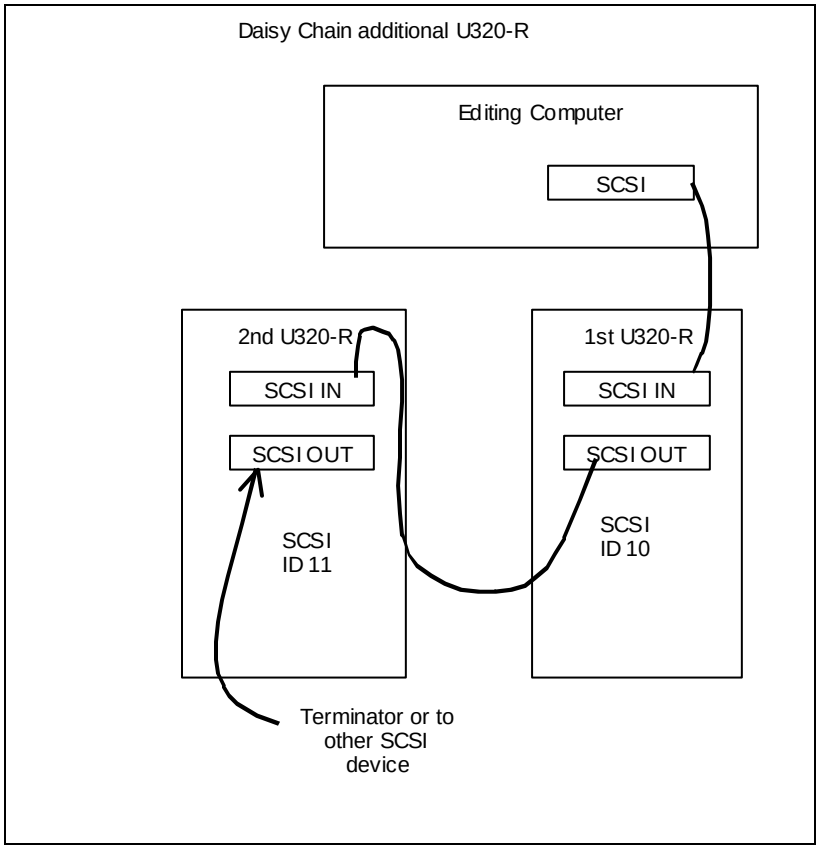
Daisy chaining

If you have multiple SCSI devices to connect, they can be daisy chained together as shown. At the back of the U320-R you will have at the SCSI IN connector a SCSI cable connected to your host computer, and at the SCSI OUT connector a SCSI cable connected to your other SCSI device.

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.

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.

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

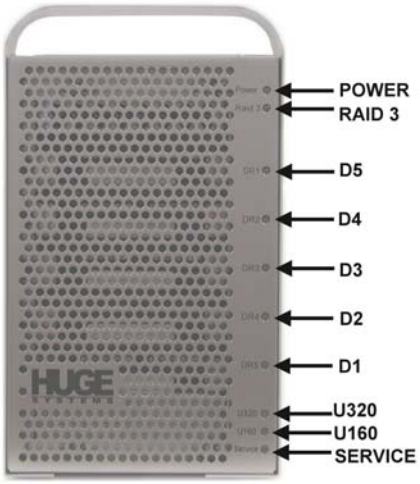


DIAG - Diagnostic Port

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 – Power On and Ready indicator.

RAID 3 – RAID 3 mode in operation.

D1 to D5 – Drive activity or fault.

U320 – SCSI in Ultra320 mode.

U160 – SCSI in Ultra160 mode.

SERVICE – Service required.

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.

RAID 3

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

D1 to D5

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-R 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-R is operating at less than Ultra160 speed.

SERVICE

If this indicator is lit, the U320-R 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 U320-R 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 U320-R first, then turn on the 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 U320-R.

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 U320-R, leaving just the U320-R 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 U320-R 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 and terminators along the SCSI path, this includes the connectors at the SCSI controller, and at the U320-R.

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@2K mode the U320-R is still available for normal operation without performance degradation, but the beeps indicate that a drive is down and you are running without RAID 3 protection. Should another drive fail your are in danger of loosing 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.

Drive Replacement

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

Remove the front panel

The front panel snaps on to four snap pins, to remove the front panel, simply lift the front of the U320-R by a couple of inches using the front handle, locate the edge of the lower panel with your other hand and pull the lower part of the panel towards you 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.

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-R.

Completely loosen the captive thumb screws to the left and right of 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-R, slowly and gently insert the module all the way into the U320-R 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-R back on. Wait 30 seconds.

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 / Rebuild switch to start the rebuild process. The audible alarm will stop but the Service indicator will still be lit during this rebuild time.

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 U320-R 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 U320-R.

The 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 U320-R. Treat the U320-R as a normal ordinary hard disk drive when partitioning and formatting.

Macintosh G4 / G5 in OS X

Use the following configuration to get maximum speed from the U320-R with OS 10, 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 U320-R

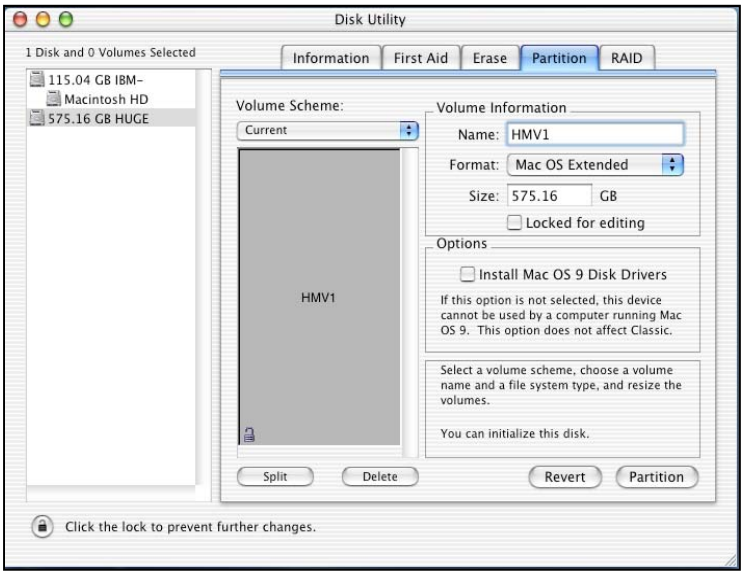


Fig. 1

Launch the Apple Disk Utility software and select the ***"Partition"*** tab. Change the Volume Scheme to 1 segment. Highlight your Huge drive on the left.

Fill in the Name field.

Select Mac OS Extended format.

Click on the ***"Partition"*** button to proceed.

Disk Utility is located at Macintosh HD > Applications > Utilities.

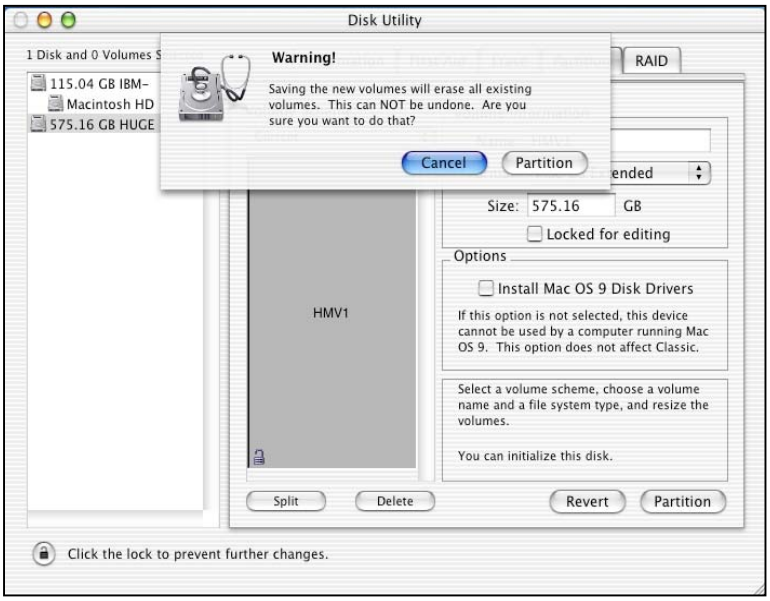


Fig. 2

You will be given a warning.

Click the ***"Partition"*** button.

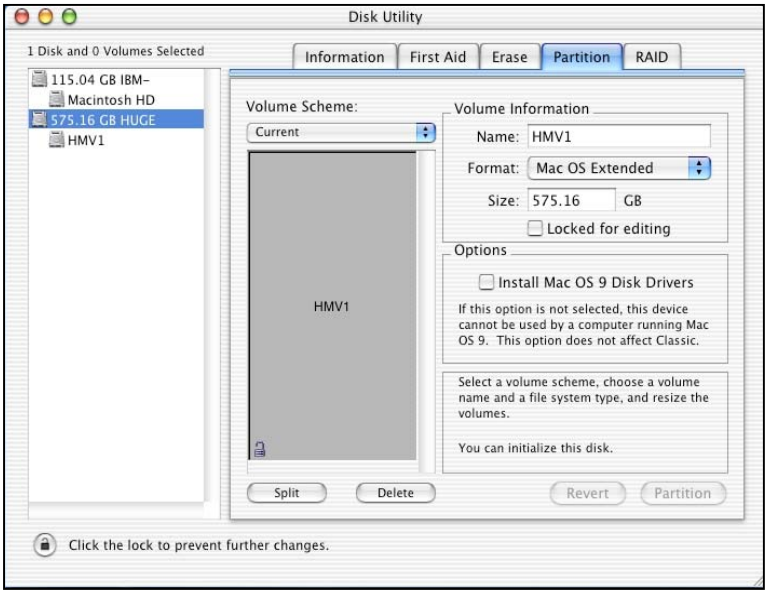


Fig. 3

You should now see your named volume as show on the left hand side of the screen.

Congratulations! You have successfully prepared your U320-R. You will find your new volume on the desktop.

Preparing a pair of U320-R (striping)

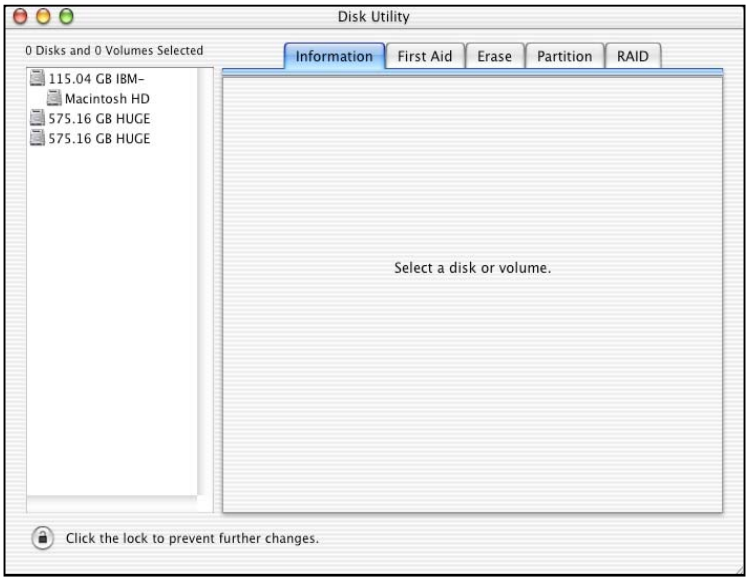


Fig. 1

Launch the Apple Disk Utility software and click on the ***RAID*** tab.

Disk Utility is located at Macintosh HD > Applications > Utilities.

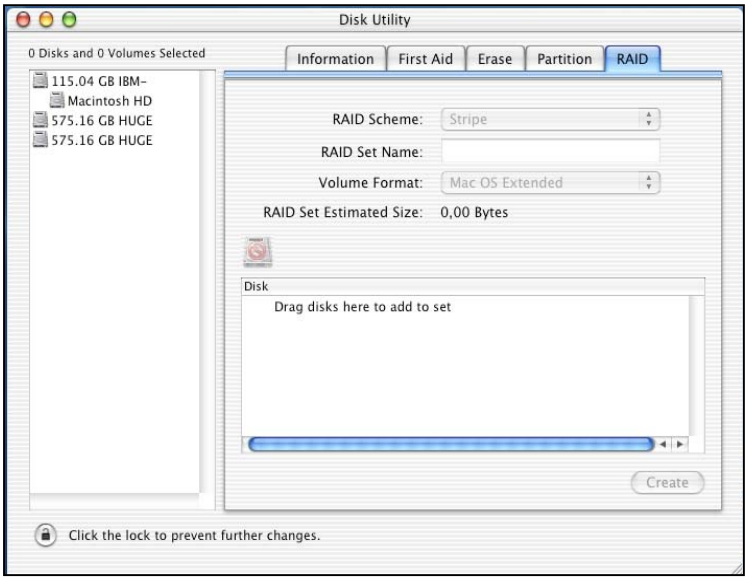


Fig. 2

Drag the disk set to stripe into the area on the right side of the screen.

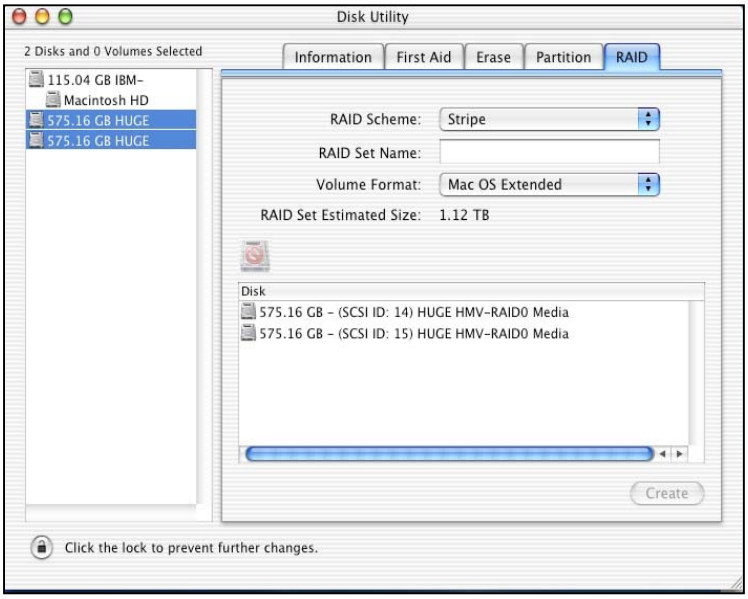


Fig. 3

Select your RAID scheme,

Give the RAID set a name,

Click on the ***Create*** button.

A warning message might pop up. It reports "the RAID set is not functioning properly. Some disks may be damaged or missing. " There is nothing wrong, just click OK and wait a few seconds for the system to catch up.

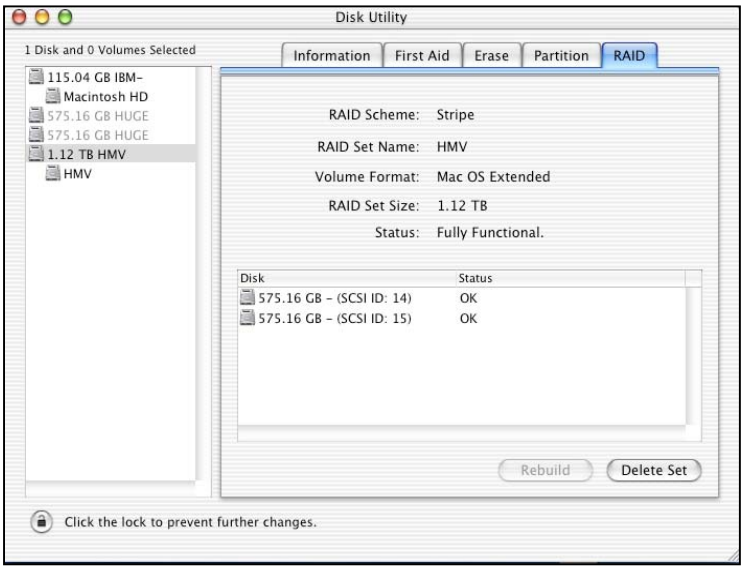


Fig. 4

You should now see your named volume as show on the left hand side of the screen. Congratulations! You have successfully prepared your disks.

You will find your new volume on the desktop.

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 U320-R should appear as a disk entry with “Free Space”.

Preparing a single U320-R

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 pair of U320-R (striping)

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.

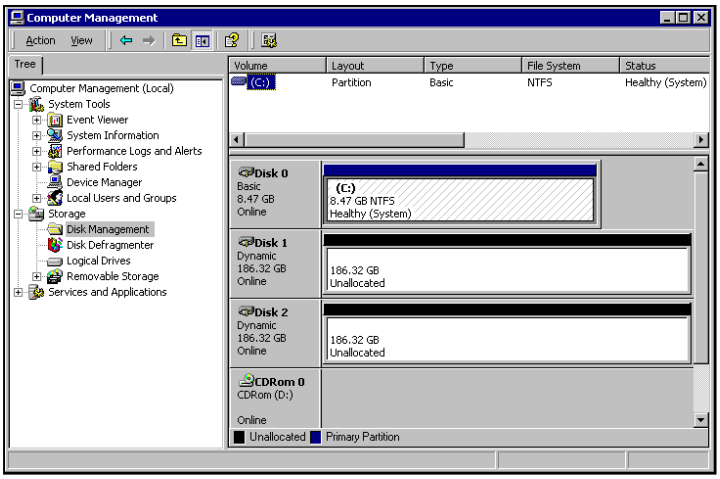
The changes must be committed before going further, right click on the “Unformatted” section of one of the disk and click on “Commit Changes Now”. Click Yes to save the changes. Click OK to confirm “Disks were updated successfully”.

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.

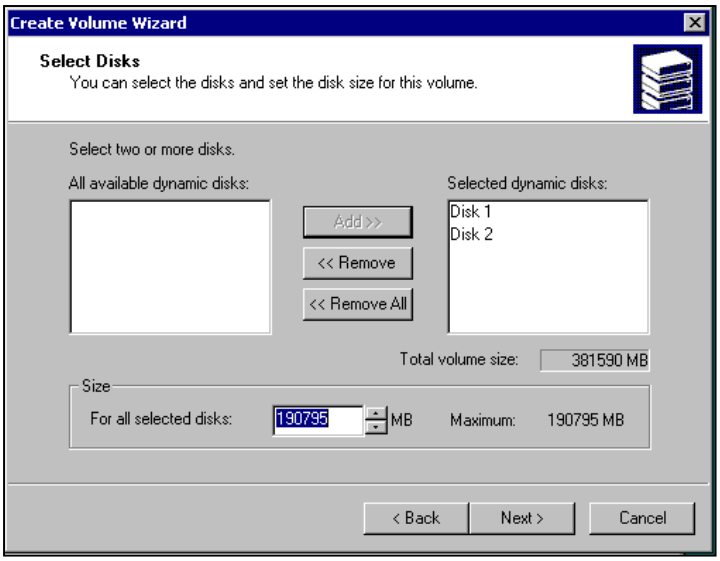
Each channel of the U320-R should appear as a disk entry with "unallocated".

Preparing a single U320-R

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 pair of U320-R (striping)

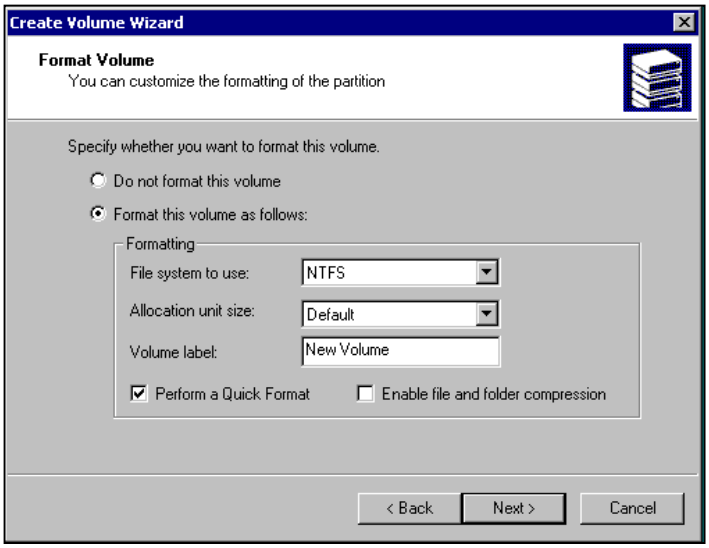


Right click on "Unallocated", left click on Create Volume > Next.

Select Striped volume > Next.

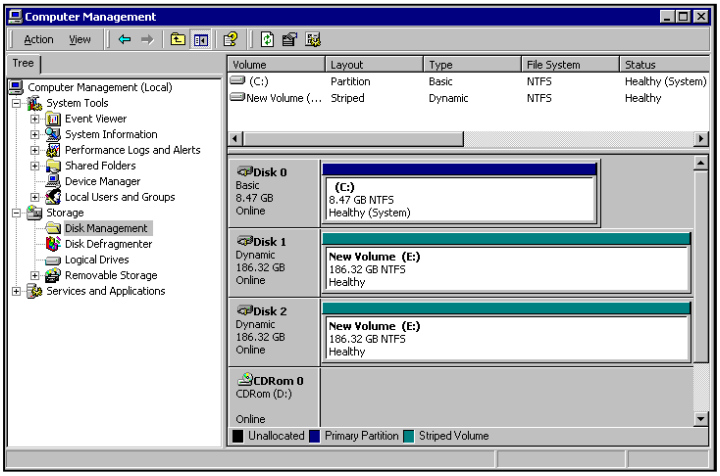
Highlight the available dynamic disk you which to add to the stripe click Add > Next.

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

U320-R Mode Selection	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

U320-R Mode Selection	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
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 the Adaptec controllers will enable maximum data throughput performance.

Update the registry manually by following the steps below.

Run REGEDT32 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

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 BIOS striping

Maximum data rate can be obtained by enabling an optional feature within the ATTO controller. You will need to purchase ATTO's ExpressRAID software to enable this BIOS striping feature.

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

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

In preparing the U320-R's two steps are required:

1) Use the ExpressRAID (BIOS stripe) to stripe the U320-R's.
2) Use Windows Disk Administrator (NT) or Disk Manager (Win2K, XP) to format the BIOS stripped disk.

End of Document

<end of User's Guide>