RAID-800S

SCSI-to-SCSI
Disk Array Subsystem

Installation Reference Guide

Copyright Notice

This document is copyrighted, 1998, by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements to the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements upon the rights of third parties which may result from its use.

All brand and product names mentioned herein are trademarks or registered trademarks of their respective holders.

$C\,\epsilon$

Packing List

Before you begin installing your unit, please make sure that the following materials have been shipped:

• RAID-800S subsystem unit

• One power cord

• Two 120 cm external SCSI cables

• One 9P-female to 9P-female RS-232 cable

• Installation reference guide

• Spare screws, etc.

• Nine keys (seven for mobile racks, two for power supplies)

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

We have carefully inspected the RAID-800S mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt.

As you unpack the RAID-800S, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Additional Information and Assistance

1. Visit the Advantech Web sites at **www.advantech.com** or **www.advantech.com.tw** where you can find the latest information about the product.

2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:

   - Product name and serial number

   - Description of your peripheral attachments

   - Description of your software (operating system, version, application software, etc.)

   - A complete description of the problem

   - The exact wording of any error messages

Safety Instructions

1. Read these safety instructions carefully.

2. Keep this user's manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.

4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.

7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.

12. Never pour any liquid into an opening. This could cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If any of the following situations arises, get the equipment checked by service personnel:

    a. The power cord or plug is damaged.

    b. Liquid has penetrated into the equipment.

    c. The equipment has been exposed to moisture.

    d. The equipment does not work well, or you cannot get it to work according to the user's manual.

    e. The equipment has been dropped and damaged.

    f. The equipment has obvious signs of breakage.

15. DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). IT MAY DAMAGE THE EQUIPMENT.

The sound pressure level at the operator's position according to IEC 704-1:1982 is equal to or less than 70 dB(A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Wichtige Sicherheishinweise

1. Bitte lesen sie Sich diese Hinweise sorgfältig durch.

2. Heben Sie diese Anleitung für den späteren Gebrauch auf.

3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie Keine Flüssig-oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.

4. Die NetzanschluBsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.

5. Das Gerät ist vor Feuchtigkeit zu schützen.

6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.

7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor überhitzung schützt. Sorgen Sie dafür, daB diese Öffnungen nicht abgedeckt werden.

8. Beachten Sie beim AnschluB an das Stromnetz die AnschluBwerte.

9. Verlegen Sie die NetzanschluBleitung so, daB niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.

10. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.

11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.

12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.

13. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von authorisiertem Servicepersonal geöffnet werden.

14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:

    a - Netzkabel oder Netzstecker sind beschädigt.

    b - Flüssigkeit ist in das Gerät eingedrungen.

    c - Das Gerät war Feuchtigkeit ausgesetzt.

    d - Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioni ert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.

    e - Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.

    f - Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.

Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weiger.

DISCLAIMER: This set of instructions is given according to IEC704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Contents

x

General Information

- Introduction
- Key Features
- Unpacking Your Subsystem
- The Front Panel
- The Rear Panel

1.1 Introduction

The RAID-800S is a SCSI-to-SCSI RAID (Redundant Arrays of Independent Disks) Disk Array subsystem. A disk array is two or more disks grouped together to appear as a single disk to the host system.

This "Host Independent" RAID subsystem supports RAID level 0, 1, 0+1, 3 and 5 which provide improved data availability and reliability. Regardless of the RAID level your subsystem is configured, each RAID array consists of a set of disks which to the user appears to be a single large disk capacity.

One unique feature of these RAID levels is that data are spread across separate disks as a result from the redundant manner in which data is stored in a RAID disk array. If a disk in the RAID array fails, your subsystem continues to function without any risk of data loss. This is because redundant information are stored separate from the data. These redundant information will then be used to reconstruct any data that was stored on a failed disk. In other words, your subsystem can tolerate the failure of a drive without losing data and operates independently of each other.

The RAID-800S Ultra Wide SCSI subsystem allows very fast 40 Mbps transfer rate using a 16-bit SCSI bus thus providing faster data input and output. It supports a wide range of brands, capacities, models and access time hard disk drives. Its modular design allows hot-swapping of hard drives without interrupting subsystem operation.

1.2 Key Features

- Two 16 character LCD back-light display panels

- Four easy to use push buttons on the front panel (ESC, SEL, Up, Down)

- Selectable RAID levels (Level 0, Level 1, Level 0+1, Level 3 and Level 5)

- Cache memory up to 128MB

- SCSI channels with modular expansion capability

  - Four Ultra Wide SCSI channels on the base module (two host channels and two device channels)

  - Additional channels as option

- Multi-host attachment

- Up to 4 logical drives with different RAID levels

- Up to 8 LUNs per host channel, each with different RAID levels

- Disk drive failure rebuilding

  - Hot standby disk drive and automatic rebuild

  - Hot-swap and automatic on-line rebuild right after replacing the failed hard drive

- Bad sector reassignment

- Concurrent I/O tagged command queuing

- Two RS-232 serial ports for controller management and direct modem connection - remote notification (FAX & pager)

- Flash EEPROM for easy firmware upgrade

- Hot swappable with fail-over capability controller (available soon)

1.3 Unpacking Your Subsystem

Before we continue, you need to unpack your RAID-800S subsystem and verify that the contents of the shipping carton are all there and in good condition. Before removing the subsystem from the shipping carton, you should visually inspect the physical condition of the shipping carton. Exterior damage to the shipping carton may indicate that the contents of the carton are damaged. If any damage is found, do not remove the components; contact the dealer where you purchased your subsystem for further instructions.

Your package contains the following items:

• RAID-800S subsystem unit

• One power cord

• Two 120 cm external SCSI cables

• One 9P-female to 9P-female RS-232 cable

• Installation reference guide

• Spare screws, etc.

• Nine keys (seven for mobile racks, two for power supplies)

If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

Note: *Before you begin to use your RAID-800S subsystem, read sections 1.4 and 1.5 to learn about the major components installed in the subsystem and how they can be used.*

1.4 The Front Panel

The front panel consists of a RAID Disk Array Controller and seven mobile racks (Slots 1 to 3 and Slots 5 to 8, Slot 4 is default - not installed because there is no more space for another hard drive).

Figure 1-1: Front Panel

1.4.1 RAID Disk Array Controller

The RAID Disk Array Controller is the major component of the entire RAID-800S subsystem. This is where you will configure the RAID disk array and RAID level of your subsystem.

Figure 1-2: Front View of the Controller

Parts	Function
LCD screen	The LCD screen on the left displays the config-uration of your subsystem such as the memory size, firmware version, as well as the brand and capacity of the hard drives installed in your subsystem. Through this screen, you will also be able to enter the Main Menu to further configure your subsystem.
Up and Down arrow buttons	Use the Up or Down arrow button to go through the information on the LCD display screen. This is also used to move between each menu when you configure your subsystem.
SEL button	This is used to enter the option you have selected.
ESC button	Press this button to return to the previous menu.
ACC LED	Red blinking LED indicates data is being accessed.
PWR LED	Green LED indicates power is on.
Reset	This is used to restart the Disk Array Controller.
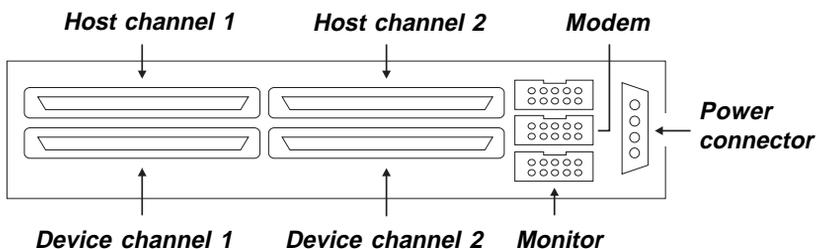
Figure 1-3: Rear View of the Controller
(visible only inside the chassis)

1.4.2 Mobile Racks

The subsystem is equipped with 7 aluminum frame mobiles racks used for housing hard drives. The aluminum frame provides better heat dissipation. It is equipped with a fan located at the front of the mobile rack. The fan provides sufficient airflow and ventilation in the mobile rack. In case the fan fails to function, you can easily replace the fan from the front of the mobile rack.

Access LED

Keylock

Power LED

Fan holder
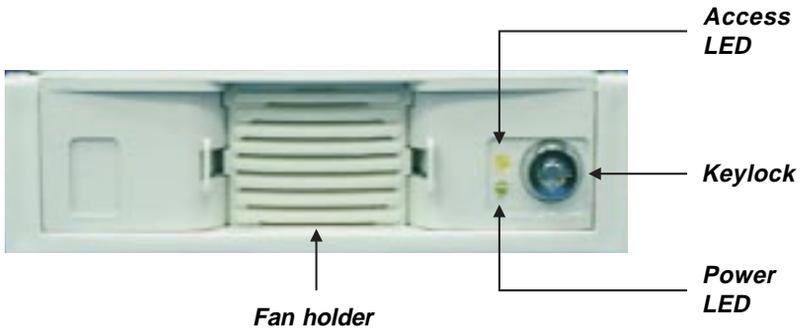
Figure 1-4: Front View of the Mobile Rack

Parts	Function
Keylock	Used to turn on or off the power of the hard drive and locks the mobile rack to the sub-system.
Power LED	Green LED indicates power is on. If there is no power, the LED is red.
Access LED	Blinking LED indicates data is being accessed from the hard drive. If the hard drive is not being accessed, the LED will not illuminate.
Fan holder	Holds the fan located at the front of the mobile rack.

Figure 1-5: Opening the Mobile Rack

SCSI ID
selector
cable

Power
connector

Drive
activity
cable

68-pin
SCSI flat
cable

Figure 1-6: Internal Structure of the Mobile Rack

Figure 1-7: Installing the Hard Disk Drive

Note: Refer to section 3.2.3 for more information.

1.5 The Rear Panel
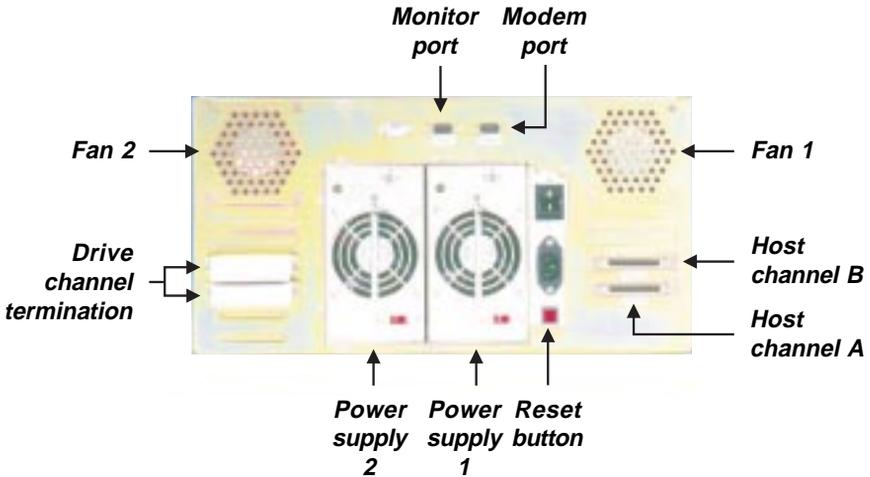
Figure 1-8: Rear Panel

1.5.1 Power Supplies

Your subsystem comes with 2 power supplies (Power supply 1 and Power supply 2) located at the rear of the subsystem. During normal operation, the color of the "Power 1" and "Power 2" LEDs (located at the front panel) are green. You may use one power supply but in case of failure or damage, you will not have a backup power for your subsystem. If two power supplies are in use and one failed to function, an alarm will sound warning you of power failure. Press the Reset button (located at the rear panel) to stop the alarm.

The LED of the power supply that needs to be replaced will turn red. The color will return to normal (green) only after you have replaced the defective power supply. Refer to section 3.4 for instructions on replacing a power supply.

1.5.2 Fans

Your subsystem is equipped with 2 fans (Fan 1 and Fan 2) located at the rear of the system unit. This provides sufficient airflow and heat dispersion inside the chassis. Refer to section 3.5 for instructions on replacing a fan.

1.5.3 Host Channels

Your subsystem is equipped with 2 host channels (Host channel A and Host channel B) allowing you to connect external SCSI devices. Each channel is connected to a 68-pin connector. Refer to section 3.3 for more information.

1.5.4 Drive Channel Termination

Refer to section 3.2 for descriptions on how drive channels are terminated.

1.5.5 Monitor Port

Your subsystem is equipped with a serial monitor port allowing you to connect a PC or terminal. Refer to section 3.8 for more information.

1.5.6 Modem Port

Your subsystem is equipped with a serial modem port allowing you to connect a modem. Refer to section 3.9 for more information.

Functions

This chapter describes the general
functions of RAID-800S.

2.1 Features of the Controller Unit

- Full RAID/SCSI Disk Array configuration and management

- No special softwares or drivers needed

- Highly flexible user interface including a full-function external monitor-control or built-in front panel key controls and LCD display

- Automatic rebuild function without user intervention

- Automatic fault monitoring and recovering function

2.2 Functions of the Controller Unit

2.2.1 RAID/SCSI Disk Array Management

- Supports multiple RAID Levels (0, 1, 0+1, 3 and 5) which enables you to select your own storage capacity, data availability (redundancy) and I/O transfer performance for any data application

- Supports almost any type of servers or operating system

- Drives can be grouped or managed individually, as a single or multiple drive groups

- Supports any SCSI hard drive platform

2.2.2 Highly Flexible User Interface

- Front panel key controls and LCD screen can be used for all disk array configuration and management functions and is not dependent on the host system

- Monitor port located at the back panel of the subsystem allows array configuration through a terminal or a PC system.

2.2.3 RAID Function Automation

- Automatic detection of failed hard drives

- Automatic array rebuild function using a standby disk after a disk failure

- Automatic rebuild function of failed hard drives

- Automatic error detection and correction of parity errors, bad blocks, etc.

- Automatic remapping of sectors to recover defective media and correct data errors

2.2.4 SCSI Performance Enhancement

- High performance SCSI interface provides faster data transfers up to 40MB/sec (Ultra Wide) per channel

- Tagged-command queing to the host allows up to 64 simultaneous data requests to be processed

- Cache write policy and variable stripe width may be defined by the user

- Enhanced SCSI bus performance

2.2.5 Systems Performance Monitoring

- Built-in controller and drive fault monitoring diagnostics

- Critical condition notification via status messages and alarms

- Backup power supply option in case of power interruption

2.3 Components of the Controller Unit

The important components of the controller unit includes the following:

- 486DX processor

- DRAM cache memory

- SCSI and I/O subsystems

- Memory subsystem

- Modem and monitor I/O subsystem

2.3.1 486DX Processor

The subsystem's CPU is an Intel 486DX microprocessor. Its function is to control all controller functions such as SCSI bus transfers, RAID operation and configuration, data stripping, error recovery, and drive rebuild.

2.3.2 Memory Subsystem and DRAM Cache

The subsystem can support up to a maximum of 128MB cache memory. Its main function is to control the memory and addresses. Unless otherwise requested, the subsystem is supplied with a 8MB DRAM. The memory control unit provides a fast interface between the 486DX CPU and the cache memory DRAM.

Important: Although the subsystem supports cache memory expansion, we do not recommend users to perform this on their own. This is because the subsystem requires further testing after each memory expansion to ensure reliability.

2.4 Controller Firmware

The subsystem's firmware contains various programs executed by the 486DX microprocessor. This firmware, which resides in the onboard flash EPROM, stores information even after power-off. It can be upgraded by simply overwriting the previous information, thus there is no need for any hardware replacement.

2.5 SCSI Bus Interface

The SCSI bus interface allows the controller to communicate with the respective host system, as well as read or write data on several drives. Each SCSI channel can connect up to 7 disk drives (15 drives for Ultra Wide). The subsystem can work with all SCSI platforms.

2.6 User to RAID-800S Interface

The user can communicate with the subsystem via (1) the key controls and LCD screen located at the RAID disk array controller unit's front panel or (2) using a terminal or PC connected to the subsystem via the serial monitor port.

2.7 SCSI Functions

The controller provides two Ultra Wide SCSI bus interfaces (40MB/s, using 68-pin connector) to connect to the host system.

Besides, the controller unit also provides two SCSI disk device channels as shown on page 6.

Each host channel must be assigned a unique SCSI ID ranging from 0 - 15. The default value is ID 0. You can specify a different SCSI ID for each host channel.

2.8 Disk Drive Organization

The subsystem arranges the SCSI drives connected to it as a physical drive group and logical unit (LUN).

2.8.1 Physical Drive Groups

The subsystem has up to a maximum of seven individual disk drives which can be used to form a physical drive group. This drive group will comprise the array's logical unit capacity. Take note - if the capacity of the three hard drives in a drive group are not identical, the capacity of the drive group will be the multiple of the smallest capacity hard drive.

To calculate the total size of a particular drive group, multiply the size of the smallest disk in the drive group by the number of disk in the group.

2.8.2 Logical Unit Number (LUNs)

A logical unit or the system drive is a drive group or a combination of up to four drive groups read by the host system as a single logical device. Each logical unit is given a unique logical number (LUN). A LUN number system begins at 0, 1, 2, 3, and so on. The subsystem supports

up to eight LUNs per drive group. For example, the third logical unit on a drive channel with SCSI ID 1 will be read by the hosts computer as ID 1 LUN 2.

Use the controller's LCD panel or the terminal connected to the serial monitor port to configure the logical units of a drive group.

2.9 RAID Management

The subsystem implements different versions of the RAID (Redundant Array of Independent Disk) technology. Each version is commonly refered to as RAID level and is selected when the logical units are defined and created based on the following:

- disk capacity

- data availability (fault tolerance or redundancy)

- disk performance

The subsystem supports RAID levels 0, 1, 0+1, 3 and 5. RAID implementation and the disk drives' physical configuration is transparent to the host operating system. This means that the host operating system drivers and software utilities are not in any way affected by any RAID level.

To properly configure the subsystem, a proper understanding of the RAID technology is an advantage. This concept is described in detail in Appendix A of this manual.

2.10 Drive Management

2.10.1 Hot-Swap Drive Replacement

The subsystem supports hot-swapping of drives while the system is on. A disk may be disconnected, removed or replaced with a different disk without turning off the system. The SCSI bus termination must be arranged so that a drive can be removed without disrupting the termination scheme.

2.10.2 Disk Failure Detection

The subsystem can automatically detect SCSI disk failures. The controller unit monitors the disk activity like the elapsed time on all commands issued to the disks as well SCSI bus parity error and other potential problems.

A time-out will reset the disk and retry the command. If the command time-out occurs again, the disk will fail. Any disk with too many errors will be destroyed by the controller unit.

2.10.3 Cache Management

The subsystem provides data transfer performance enhancement via its onboard cache memory. It supports up to 128MB cache memory for read cache and write cache. Write cache policy is user selectable for maximum performance of specific applications.

2.10.4 Read Cache

The controller unit's read cache is always enabled. Its operation is transparent and requires no user intervention.

2.10.5 Write Back Cache

Write back cache is a caching strategy wherein write operations result in a completion status being sent to the host operating system as soon as the cache (not the disk drive) receive the data to be written. The target SCSI drive will receive the data in a more appropriate time in order to increase the controller's performance. To use the write back cache function, cache must be enabled.

2.10.6 Write Through Cache

Write through cache refers to a cache writing strategy whereby data is written to the SCSI drive before a completion status is returned to the host operating system. This caching strategy is considered more secure because power failure will be less likely to cause any data loss. However, write through cache results in a slightly lower performance in most environments. To use the write through cache function, cache must be disabled.

Installation Overview

This chapter describes the hardware
component installation and interface of
RAID-800S.

3.1 Powering-on your Subsystem

1. Plug the power cord from the rear of the subsystem into a power outlet.

2. Turn on the power switch.

3. The power supplies installed in your subsystem is able to operate using 115V or 230V. Configure the "Voltage Selector" for the type of power you are using. Failure to do so may cause severe damage to your subsystem.
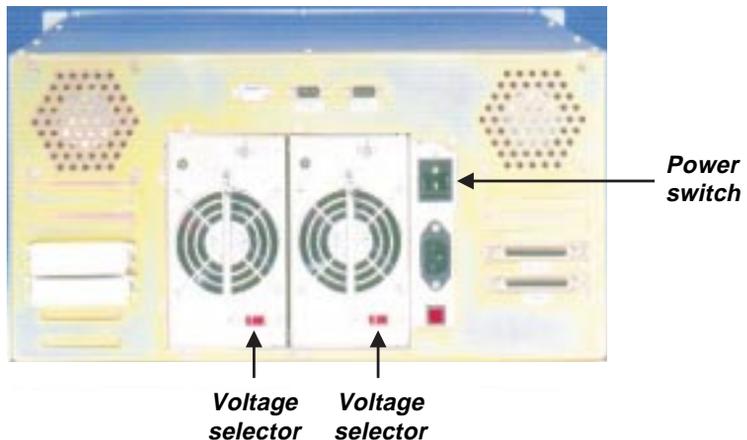
Figure 3-1: Power Supply Voltage Selectors

3.2 Installing Hard Disk Drives

This section describes the locations of the device channels, the number of hard drives supported by your subsystem and instructions on installing a hard drive.

3.2.1 Device Channels

Your subsystem is equipped with two device channels located in the RAID Disk Array Controller. Each device channel is connected to 3 or 4 hard drives, therefore the two device channels are connected to a total of 7 hard drives.

3.2.2 How the Device Channels are Connected

Your subsystem uses 2 device cables, one for each device channel. One end of the device cable is connected to a device channel of the controller unit and the other ends of the cable are connected to 3 or 4 U-shaped frames of the mobile racks.

A U-shaped frame holds a mobile rack that houses a hard drive. Device channel 1 connects to 3 U-shaped frames and device channel 2 connects to 4 U-shaped frames. The last connector of the cable is connected to the active terminator, located at the rear of the subsystem, to terminate the device channel. Refer to the figure below.
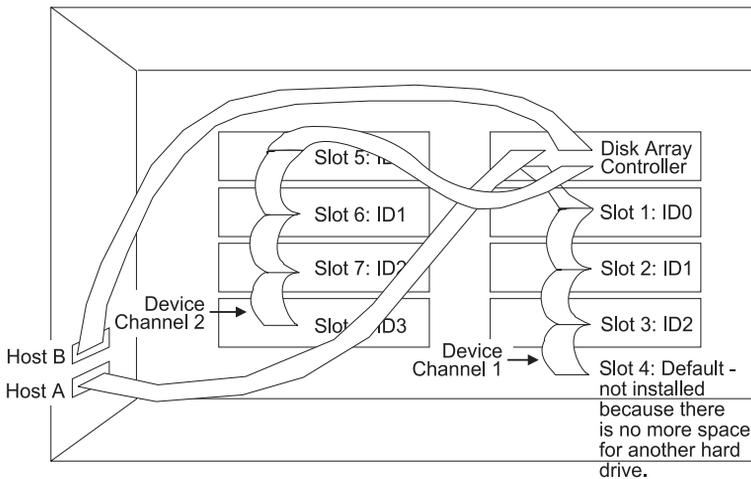
Figure 3-2: Device Channels Connection

3.2.3 Installation

Your subsystem supports hot-swapping allowing you to install or replace your hard drive while the subsystem is running.

1. Pull out an empty mobile rack. (You can install in any available slot.) Refer to section 1.4 for the locations of the mobile racks.

2. Static electrical discharge can damage your drive or other components without causing any signs of physical damage. To provide ESD protection, ground yourself by touching the metal part of the subsystem chassis.

3. Unpack your hard drive. Before installing the drive into the rack, you must first disable the drive's terminator. Refer to your hard drive's manual for instructions on disabling the terminator.

4. Remove the top cover of the cartridge. The cover is snapped securely onto the cartridge. In some cases, you may need to exert slight force to remove the cover. Refer to section 1.4.2 (figure 1-6) for the internal structure of the mobile rack.

5. Connect the Drive Activity (HDD LED) cable. If it is incorrectly installed, the LED will not light.

HDD LED	Cable
+	Orange
-	Black

6. Connect the SCSI ID Selector cable. If there are any jumpers installed in your drive's SCSI ID connector, remove them now. Connect the cable to the hard drive according to the table shown on the next page.

Wires of the SCSI ID Cable	Pins of the Connector
Red	Bit 0
Blue	Bit 1
Yellow	Bit 2
Gray	Bit 3
Black	Ground

Note: *Refer to your hard drive's manual to determine the pins of the SCSI ID connector.*

7. Connect the power cable of the cooling fan.

8. Connect the power cable of the hard drive.

9. Connect the SCSI flat data cable. Align the colored edge of the cable with pin 1 of the connector.

10. Place the hard drive in the cartridge.

11. Install the mounting screws on each side to secure the drive in the cartridge.

12. Replace the cover. The cables must be properly placed inside the cartridge - away from the edge of the cartridge. This is to prevent the cables from being pressed when you replace the cover. Make sure the cover snaps into place, otherwise you will not be able to insert the rack into the slot.

13. Slide the cartridge into a slot until it clicks into place. The mobile rack's power LED (lower LED) will immediately turn red.

14. Insert the key (included in your package) into the keylock located on the right of the mobile rack and turn it counterclockwise. This will lock the mobile rack to the subsystem providing data security. If you are replacing a new hard drive, make sure to unlock it by turning the key clockwise.

15. The Power LED will turn green after it has been detected by the subsystem. If the LED did not turn green, check the following:

    a. Make sure the cables at the rear of the hard drive are connected properly.

    b. Make sure the hard drive is in good condition.

16. If the hard drive is not being accessed, the Access LED will not illuminate. The LED blinks only when being accessed.

3.2.4 LEDs on the Mobile Rack

The 2 LEDs on the mobile rack indicate the status of the hard drive.
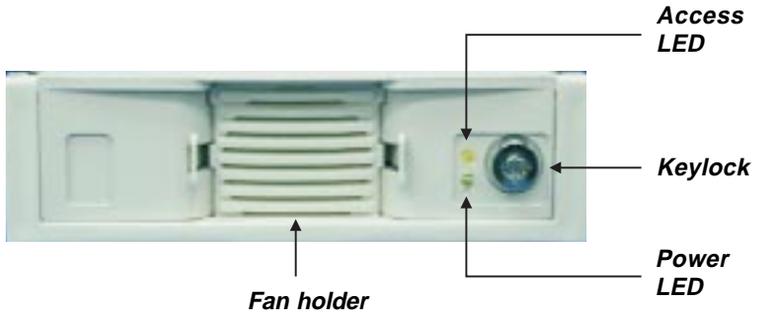

Figure 3-3: LEDs on the Mobile Rack

Access LED

The Access LED is also referred to as the HDD activity LED. This LED blinks red only when the hard drive is being accessed.

Power LED

The Power LED is also referred to as the HDD status LED. This LED indicates the status of the hard drive. The color of the LED changes according to its operating status.

LED Color	Description
Green	Normal operation.
Orange	Drive failure.
Red	Hard drive is powered off or no drive is installed in the slot.

3.3 Connecting External SCSI Devices

Your subsystem supports Ultra Wide SCSI which provides very fast 40 Mbps transfer rate using a 16-bit SCSI bus. It allows you to connect a wide range of SCSI devices such as CD-ROMs, hard drives, tape drives and optical devices. This section describes the location of the host channels and instructions on connecting external SCSI devices.

3.3.1 Host Channels

Your subsystem is equipped with two host channels located in the RAID Disk Array Controller. Refer to section 1.4.1 (figure 1-3) for the locations of the host channels.

3.3.2 How the Host Channels are Connected

Your subsystem uses 2 internal SCSI cables, one for each host channel. One end of the internal SCSI cable is connected to a host channel and the other end mounted at the rear of the subsystem. With 2 internal SCSI cables connected, a total of 2 Centronic connectors are installed at the rear of the subsystem.

3.3.3 Connecting an External SCSI Device

1. Configure the SCSI ID of each device. (Refer to Chapters 4 to 6 for more information.)

2. Connect the external SCSI device between the host and the RAID-800S subsystem, then enable the terminator on the setup menu of the RAID-800S. (The RAID-800S subsystem should always be put farthest away from the host than all the other external SCSI devices.)

Note: *When one or more SCSI devices are connected, the total length of all cables (internal or external) must not exceed 3 meters (9.8 ft.) to ensure reliable operation.*

3.4 Replacing a Power Supply

1. If one of the power supplies becomes defective, an alarm will sound and the Power Status LED of the power supply that needs to be replaced will stop illuminating.

2. Press the Reset button located at the rear panel to stop the alarm. At this stage, the Power Status LED remains unilluminated.
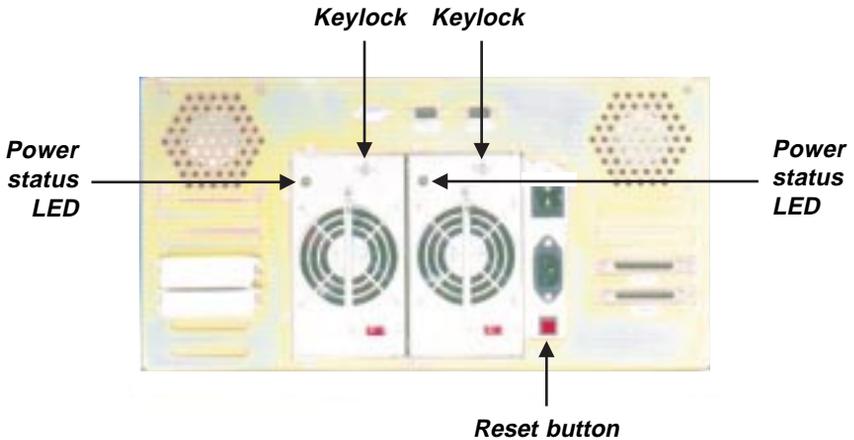
Figure 3-4: Locations of the Reset Button, Power Status LED and Keylock

3. Unlock the defective power supply by inserting the key (included in the subsystem's package) into the keylock. Pull out the power supply.

4. Slide-in the new power supply until it clicks into place. Make sure to replace it with a 300W power supply.

5. Use the key to lock the newly replaced power supply. The Power Status LED will now illuminate.

3.5 Replacing a Fan

1. Remove the screws of the subsystem's top cover. Now open the top cover.

2. Remove the 4 screws of the defective fan. Place the screws on a safe place as you will need them later when you install a new fan.

3. Disconnect the power cable.

4. Replace a new fan by connecting the power cable and replacing the screws you removed in step 2.

5. Replace the top cover and screws you removed in step 1.

3.6 Memory Upgrades

Your subsystem is equipped with two SIMM (Single In-Line Memory Module) sockets located in the RAID Disk Array Controller. By default, it comes with 8MB of memory. It is upgradeable to 128MB by installing 4MB, 8MB, 16MB, 32MB or 64MB 72-pin SIMMs modules.

Important
- *Supports FPM (Fast Page Mode) and EDO (Extended Data Output) SIMMs.*

- *60ns SIMM module is recommended.*

- *You may install parity or non-parity SIMMs.*

- *You may install SIMMs in either banks.*

- *Memory expansion should be performed by Advantech only.*

3.7 Replacing the Fan of the Mobile Rack

1. Lift up the bracket of the mobile rack.

2. Press the sides of the fan holder towards the center and pull it towards you.

3. Disconnect the power cable.

4. Remove the defective fan from the fan holder and replace it with a new one.

5. Reconnect the power cable.

6. Insert the fan holder back to its original position.
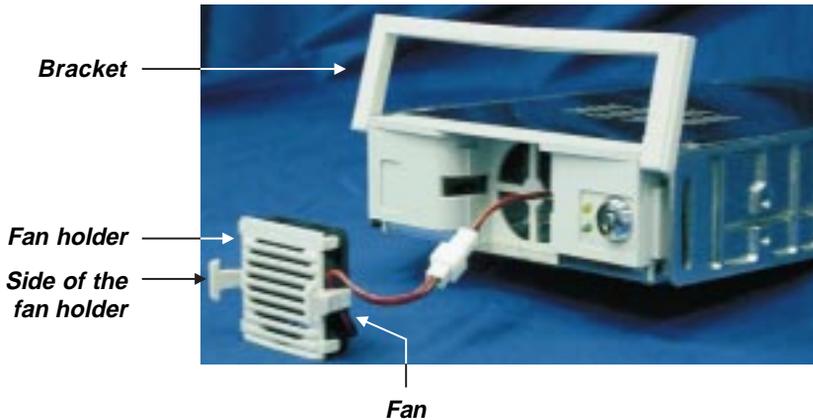
Figure 3-5: Replacing the Fan

Fan

Figure 3-6: Location of the Fan on the Fan Holder

3.8 Connecting a PC or Terminal

The subsystem is equipped with a serial monitor port located at the rear of the system unit. This serves as an alternative display when accessing the setup utility.
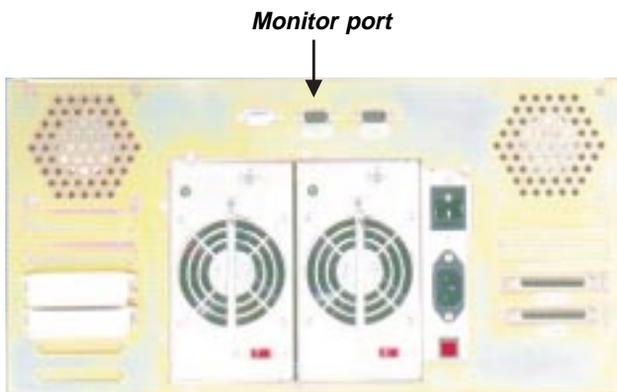
Monitor port

Figure 3-7: Location of the Monitor Port

Pin	Description
1	Data Carrier Detect (DCD)
2	Receive Data (RD)
3	Transmit Data (TD)
4	Data Terminal Ready (DTR)
5	Signal Ground (SG)
6	Data Set Ready (DSR)
7	Ready To Send (RTS)
8	Clear To Send (CTS)
9	Ring Indicator (RI)

Note: *Refer to Chapter 6 for instructions on accessing the setup utility through a PC or terminal, as well as instructions on setting the baud rate, stop bit, data bit and parity of your monitor or terminal.*

3.9 Connecting a Modem

The subsystem is equipped with a serial modem port located at the rear of the system unit.
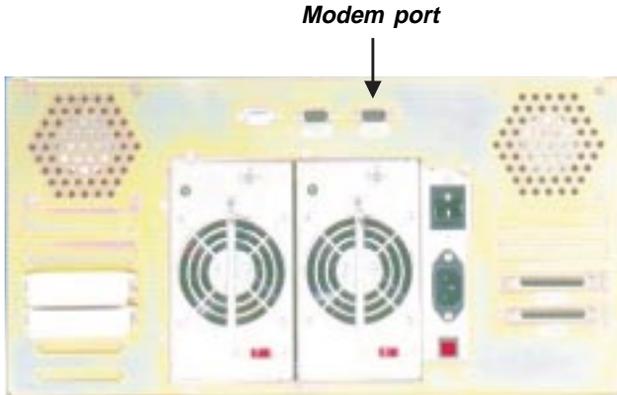
Modem port

Figure 3-8: Location of the Modem Port

Pin	Description
1	Data Carrier Detect (DCD)
2	Receive Data (RD)
3	Transmit Data (TD)
4	Data Terminal Ready (DTR)
5	Signal Ground (SG)
6	Data Set Ready (DSR)
7	Ready To Send (RTS)
8	Clear To Send (CTS)
9	Ring Indicator (RI)

Note: *Refer to Chapter 6 for instructions on setting up your pager or fax, as well as instructions on setting the baud rate, stop bit, data bit and parity of your modem.*

SCSI Configuration Guidelines

- SCSI IDs
- Terminators

Before configuring your subsystem, you must first understand the basic SCSI concepts so that your subsystem and SCSI devices will function properly.

4.1 SCSI IDs

A SCSI ID is an identifier assigned to SCSI devices that enables them to communicate with a computer when they are attached to a host adapter via the SCSI bus. Each SCSI device, and the host adapter itself, must have a SCSI ID number (Fast SCSI-2 = 0 to 7, Ultra Wide SCSI = 0-15). The ID will define each SCSI device on the SCSI bus. If there are more than one SCSI adapter in the Host subsystem, each adapter forms a separate SCSI bus. SCSI IDs can be reused as long as the ID is assigned to a device on a separate SCSI bus. Refer to the documentation that came with your peripheral device to determine the ID and how to change it.

Note: *SCSI IDs has nothing to do with the order in which devices are cabled to the host adapter.*

4.2 Terminators

Based on SCSI specification, SCSI bus must be terminated at both ends. Meaning, the devices that are connected to the ends of the SCSI bus must have their bus terminators enabled. Devices connected in the middle of the SCSI bus must have their terminators disabled. Proper termination allows data and SCSI commands to be transmitted reliably on the SCSI bus. Your host adapter and the SCSI devices attached to it must be properly terminated, or they will not work reliably.

Termination means that terminators are installed in the devices at each end of the bus. Some SCSI devices would require you to manually insert or remove the terminators. Other devices have built-in terminators that are enabled or disabled via switches or software commands. Refer to your device's documentation on how to enable or disable termination.

Quick Setup Guide

This guide will allow you to setup
RAID-800S in 5 minutes.

This Quick Setup Guide is intended as a shortcut so that experienced users can get their RAID Disk Array subsystem started as quickly as possible. If this is your first time to configure the subsystem, the screen on the Disk Array Controller will show the following message.

```
RAID-800S
NO RAID
                    □
```

Before configuring the subsystem, make sure the controller is able to detect all the hard drives installed in your subsystem. This is to ensure that the mobile racks and hard drives are functioning normally. Press the Down arrow button until you see "S1". "S1" refers to the first slot. If there is a drive installed in slot 1, the following will appear on the screen:

```
S1: (Brand) (Model)
1:0 (Capacity)
                    □
```
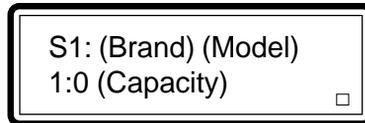
"S1" - "S" refers to slot and "1" refers to the location of the slot where the drive is installed. Your subsystem comes with 8 slots but S4 is default configured as "Not Installed". Please refer to page 5.

"1:0" - "1" denotes the device channel where the drive is connected. (Refer to section 3.2 for more information.) "0" refers to the SCSI ID of the drive. The SCSI ID of each slot has already been preset. DO NOT change the SCSI ID of your drive.

" □ " moving up and down at the lower right corner of the screen indicates that the controller is functioning normally. The " □ " becomes "zZ" if the host is accessing the subsystem. It becomes "wW" when memory is writing cache to your hard drive. If it is not moving, something must be wrong with the controller. Use a paper clip or pin to press the Reset button located above the Up arrow button.

Refer to section 1.4.1 for the locations and functions of the up and down arrow buttons, SEL button and ESC button.

Warning: *We strongly recommend that only experienced user should reset the subsystem.*

For a Quick Setup of the Subsystem:

1. Use the Up or Down arrow button to view the configuration of your subsystem such as the firmware version, memory size, hard drives installed, serial number, etc.

2. Press the "Sel" button to enter the Main Menu. The screen will appear as shown below. (Edit Chasis is the first field in the Main Menu)

```
┌─────────────────────────┐
│  Main Menu              │
│  1   Edit Chasis        │
│                    □    │
└─────────────────────────┘
```

3. Press the Down arrow button once to go to the Quick Setup menu.

```
┌─────────────────────────┐
│  Main Menu              │
│  2   Quick Setup        │
│                    □    │
└─────────────────────────┘
```

4. Press the "Sel" button to enter Quick Setup.

```
┌─────────────────────────┐
│  2   Quick Setup        │
│  21   Level5            │
│                    □    │
└─────────────────────────┘
```

Use the Up or Down arrow button to select a RAID Level – Level 0, Level 1, Level 0+1, Level 3 or Level 5 and press "Sel". We recommend that you select Level 5 which is faster and safer. Refer to Appendix A for descriptions of the RAID levels.

5. Press "SEL" to enter the Disk Num menu. This will allow you to select the number of drives to perform a RAID array.

```
┌─────────────────────────┐
│  21   Level5            │
│  211   Disk Num 3       │
│                    □    │
└─────────────────────────┘
```
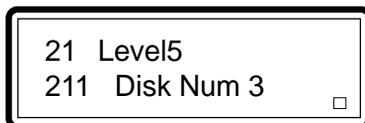
Use the Up or Down arrow button to select the number of drives. If you selected Level 5 in step 4, select "3". Level 5 requires at least 3 drives to perform a RAID array.

Note: *It would be best if you have more than 3 drives installed. This will serve as a backup drive in case a drive becomes defective.*

6. You will be asked to confirm your settings.

```
211   Disk Num 3
NO
                        □
```

Use the arrow key to select "Yes" and press "SEL".

7. The controller will now restart and initialize in order for the settings to become effective.

```
Initial(2)          1%
RAID READY
                        □
```

8. After the subsystem completes initialization, the screen will appear as shown below.

```
INIT OK !
RAID READY
                        □
```

9. The drives that are RAID READY will be mapped to the host channel. Select View Config under the Main Menu to check whether the host channels are detected by the Host system. This is to ensure that the SCSI card in the Host subsystem is able to access the hard drives.

Press ESC to return to the Main Menu.

10. Press the Up arrow button to go to the Edit Chan menu.

```
Main Menu
4   Edit Chan
                        □
```

11. Press the "Sel" button to enter Edit Chan.

```
4   Edit Chan
41   Host Chan 1
                        □
```

12. Use the Up or Down arrow button to select the Host channel where your Host subsystem is connected and press "SEL". Refer to section 3.3 for more information. If you selected Host channel 1, your screen will appear as shown below.

```
41   Host Chan 1
411   SCSI ID
                        □
```

13. Press "SEL" to enter the SCSI ID. The screen will appear as shown below.

```
411   SCSI ID
ID   0
                        □
```
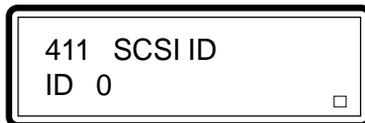
Use the arrow buttons to assign a SCSI ID (0-15) and press "SEL". Make sure you select an ID that has not been used by the SCSI bus. Refer to Chapter 4 for more information.

14. If your subsystem will be the last SCSI device, use the arrow buttons to select Terminator in step 12.

```
41   Host Chan 1
412   Terminator          □
```

Press "SEL" to enter Terminator.

```
412   Terminator
ENABLE                     □
```

The options are Enable and Disable. Since the subsystem is the last SCSI device, press "SEL" to select Enable.

You may also install an active terminator into the Centronic connector located at the rear of the subsystem. Refer to section 3.3.3 for more information.

15. Press "ESC" twice to return to the Main Menu.

16. Use the arrow buttons to move to the Save Config menu.

```
Main Menu
8   Save Config            □
```

17. Press "SEL" to enter Save Config.

```
8   Save Config
NO                         □
```

Use the arrow buttons to select "Yes" and press "SEL" to save the configurations.

Configuring the Subsystem

This chapter describes in detail the various configuration procedures using both the LCD and terminal.

Your RAID-800S subsystem has a setup utility built into the controller's firmware. It contains important information about the configuration and settings for various optional functions in the subsystem. This chapter explains how to use and make changes to the setup utility.

6.1 Configuration Methods

There are two methods of configuring your subsystem. You may configure your subsystem through the LCD panel on the Disk Array Controller or by connecting a terminal on the serial monitor port located at the rear of the subsystem.

Warning: *You cannot access the utility using both methods at the same time. The controller allows you to access the utility using one method at a time.*

6.1.1 Configuring through the Disk Array Controller

If you are configuring your subsystem using the Disk Array Controller, please refer to Chapter 1 for descriptions of the LCD screen and the functional buttons. Refer to Chapter 5 for the quick setup guide to configuring your subsystem using the controller.

6.1.2 Configuring through a Terminal

Configuring through a terminal will allow you to perform the same configuration options and functions that are available from the Disk Array Controller. To start-up:

1. Connect a VT100 compatible terminal or a PC operating in an equivalent terminal emulation mode to the monitor port located at the rear of the subsystem. Refer to section 1.5 and 3.8 for the location of the monitor port.

Note: *You may connect a terminal even while the sub-system's power is on.*

2. Power-on the terminal.

3. Run the VT100 program or an equivalent terminal program.

4. Reset the Disk Array Controller. Refer to section 1.4.1 for the location of the reset button.
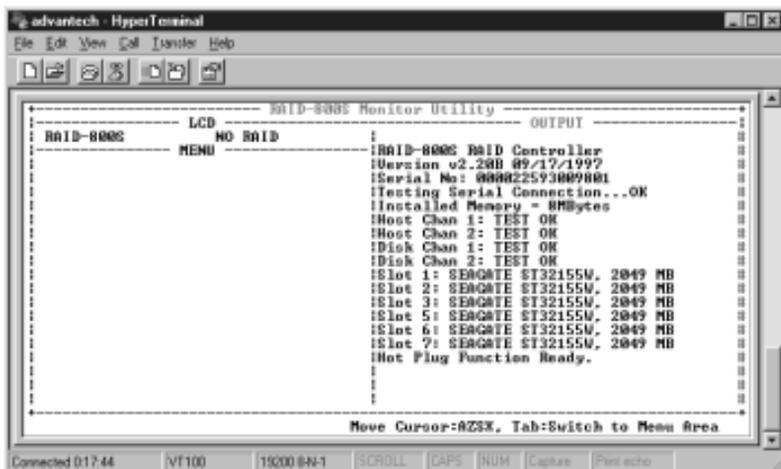
Figure 6-1: Configuring through a terminal

"AZSX": "A" - to move to the line above
"Z" - to move to the next line
"S" - Page Up
"X" - Page Down

"Tab": to move between the left column (Menu) and the right column (Output)

"Menu" on the left column of the screen consists of 10 menus that would allow you to configure your subsystem. "Output" on the right column shows the status and basic information about the subsystem.

6.2 Creating a New RAID

1. In the Main Menu, select Edit Array and press <Enter>.

```
3   Edit Array
31   Array1
                        □
```


Figure 6-2: Selecting Edit Array in the Main Menu

2. In the Edit Array menu, select Array1 and press <Enter>.

```
31   Array1
311   Level 5
```
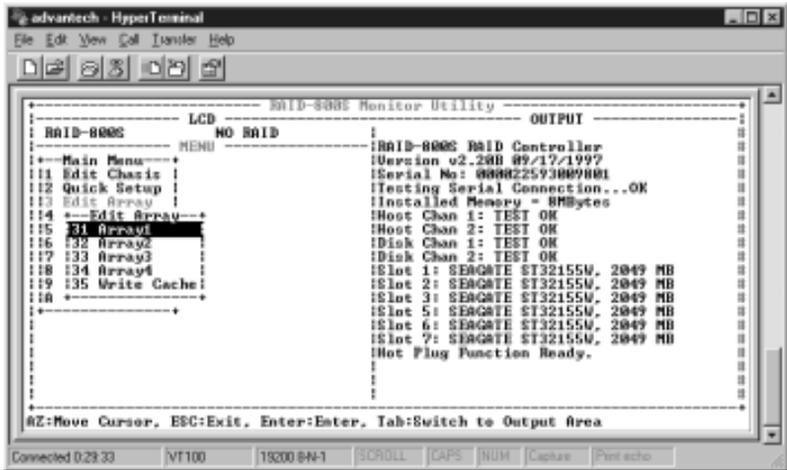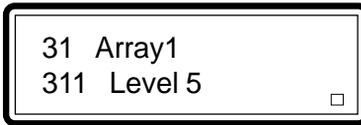

Figure 6-3: Selecting Array1 in the Edit Array menu

3. In the Array1 menu, select Level 5 and press <Enter>.

```
311   Level 5
3111  S1:2049MB
                □
```
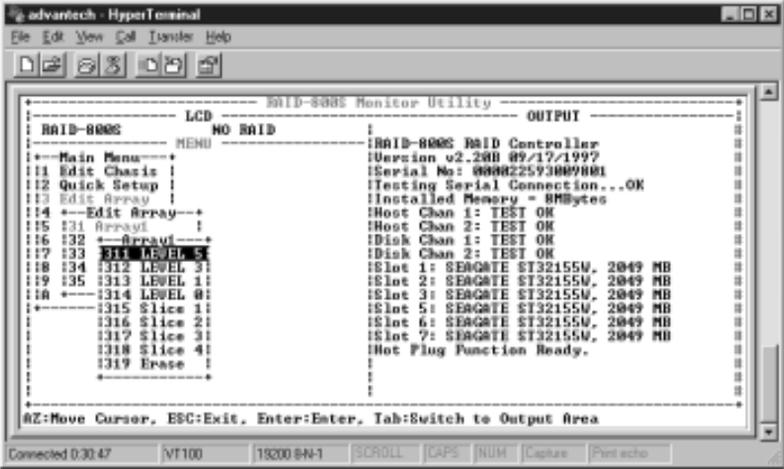

Figure 6-4: Selecting Level 5 in the Array 1 menu

4. In the Level 5 menu, select the slot of the hard drive to be included in Array1. The slot that was selected in the example below is Slot 1.

```
3111  S1:2049MB
NO
                 □
```
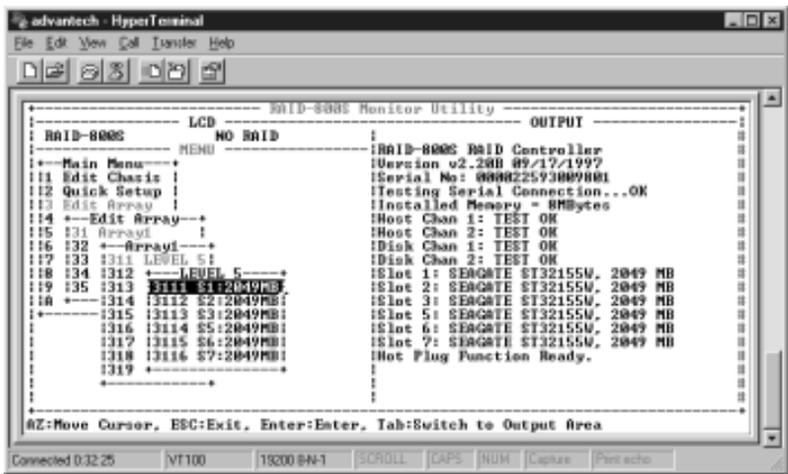

Figure 6-5: Selecting a Slot in the Level 5 menu

5. In the S1 menu, select Yes.

```
3111  S1:2049MB
YES
                    □
```


Figure 6-6: Selecting Yes in the S1 menu

6. You will return to the Level 5 menu. In the Level 5 menu, select the slot of another hard drive to be included in Array1 and select Yes. The slot that was selected in the example below is Slot 2.
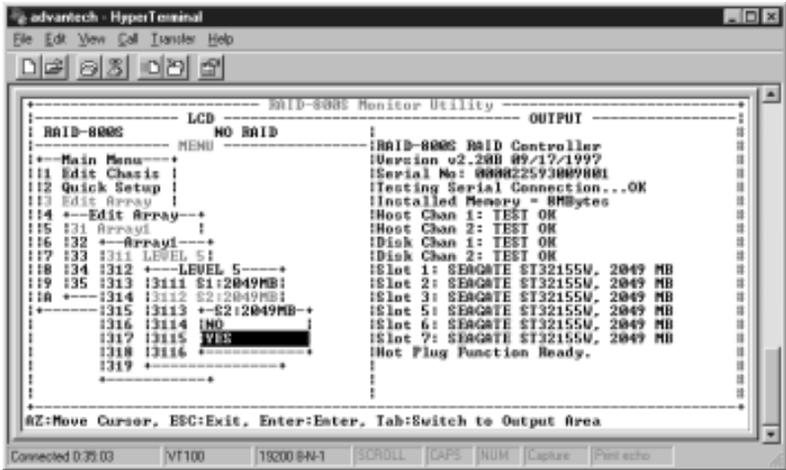
Figure 6-7: Selecting Yes in the S2 menu

7. You will return to the Level 5 menu. In the Level 5 menu, select the slot of another hard drive to be included in Array1 and select Yes. The slot that was selected in the example below is Slot 3.

```
3113  S3:2049MB
YES               □
```


Figure 6-8: Selecting Yes in the S3 menu

8. Press <Esc> to return to the Array1 menu. Select Slice 1. This will allow you to divide the partition size of the RAID group in Array1.

```
315   Slice 1
3151  Size(MB)        □
```


Figure 6-9: Selecting Slice 1 in the Array1 menu

9. In the Slice 1 menu, select Size.

```
+-----------------------------+
|                             |
|  3151   Size(MB)            |
|  0                          |
|                        □    |
|                             |
+-----------------------------+
```
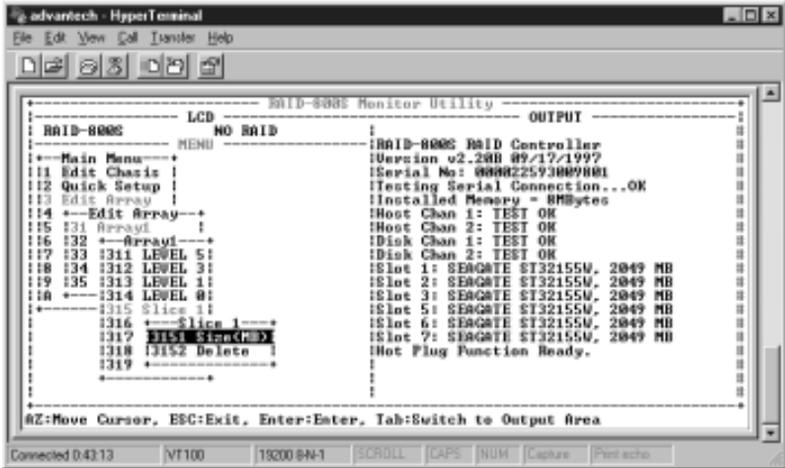

Figure 6-10: Selecting Size in the Slice 1 menu

10. In the Size menu, enter the size and press <Enter>.

```
3151   Size (MB)
4098                        □
```


Figure 6-11: Entering the size in the Size menu

Note: *"←" denotes the last "keyed in" digit. If you want to use the functional buttons on the front panel of the controller to key in "2048", you must key-in "2048← □□□" and then press the "SEL" button. (" □" denotes ignore.)*

11. Press <Esc> to return to the Array1 menu. Select Slice 2, then select Size.

```
3161   Size(MB)
0
                        □
```
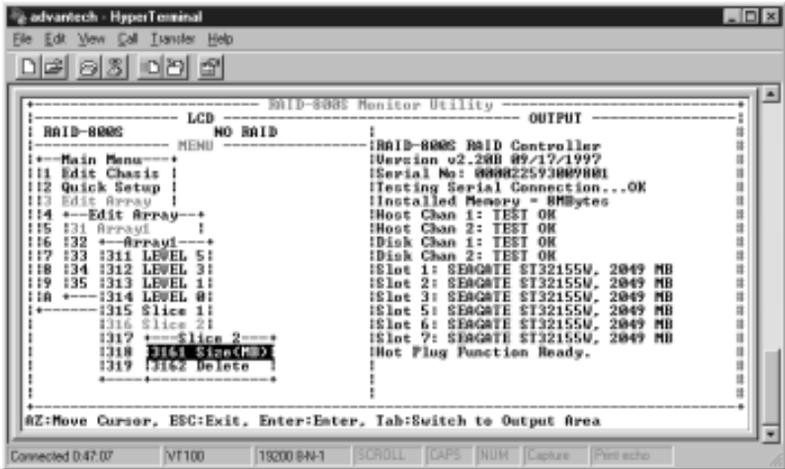

Figure 6-12: Selecting Size in the Slice 2 menu

12. In the Size menu, enter the size and press <Enter>.

```
 3161  Size(MB)
 0
                        □
```
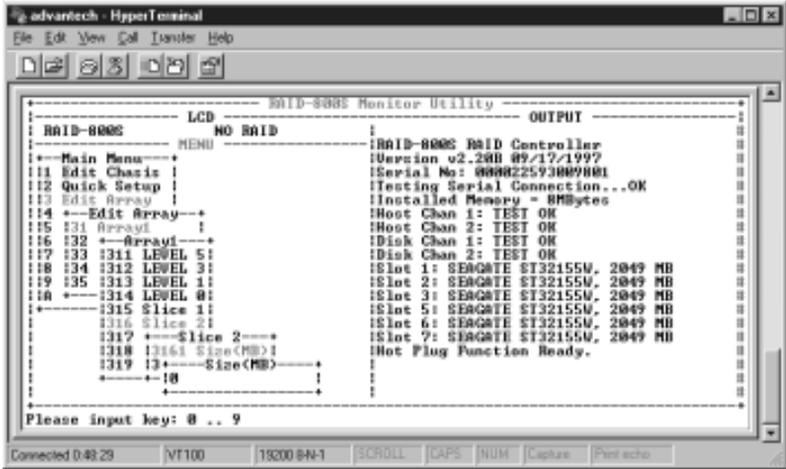

Figure 6-13: Entering the size in the Size menu

13. Press <Esc> until you return to the Main Menu.

Note: *You may skip steps 8 to 12 if you do not want to divide the size of the RAID group.*

14. In the Main Menu, select Edit Chan and press <Enter>.

```
4   Edit Chan
41    Host Chan 1
                        □
```
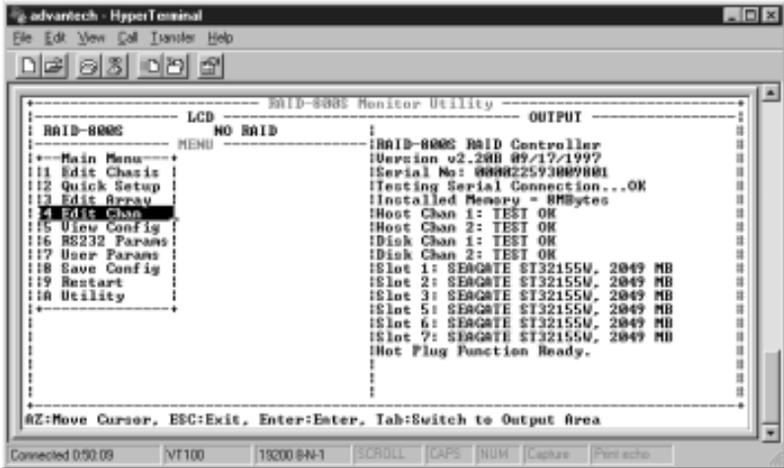

Figure 6-14: Selecting Edit Chan in the Main Menu

15. In the Edit Chan menu, select Host Chan 1.

```
41   Host Chan 1
411   SCSI ID        □
```
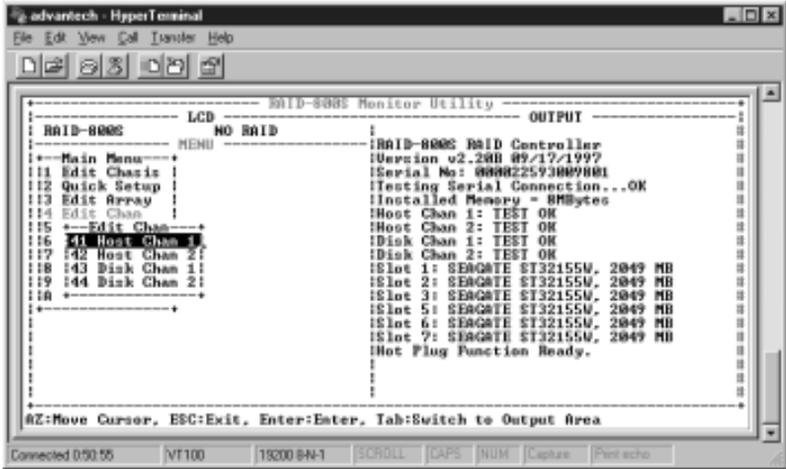

Figure 6-15: Selecting Host Chan 1 in the Edit Chan menu

16. In the Host Chan 1 menu, select a LUN. The LUN that was selected in the example below is LUN 0.

```
416  LUN 0
Array1 Slice1
                    □
```


Figure 6-16: Selecting a LUN in the Host Chan 1 menu

17. In the LUN 0 menu, select Array1 Slice1.

Array1 Slice1

Figure 6-17: Selecting Array1 Slice1 in the LUN 0 menu

18. Press <Esc> until you return to the Edit Chan menu.

19. In the Edit Chan menu, select Host Chan 2.

```
42   Host Chan 2
421   SCSI ID        □
```


Figure 6-18: Selecting Host Chan 2 in the Edit Chan menu

20. In the Host Chan 2 menu, select a LUN. The LUN that was selected in the example below is LUN 0.
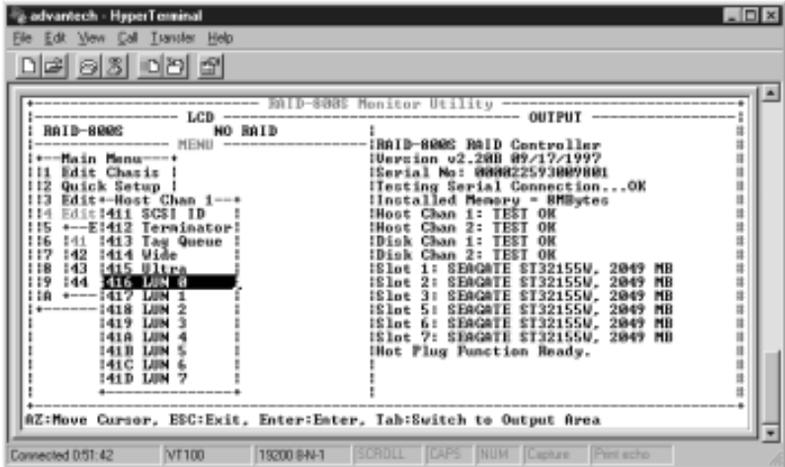
```
426  LUN 0
Array1 Slice1          □
```
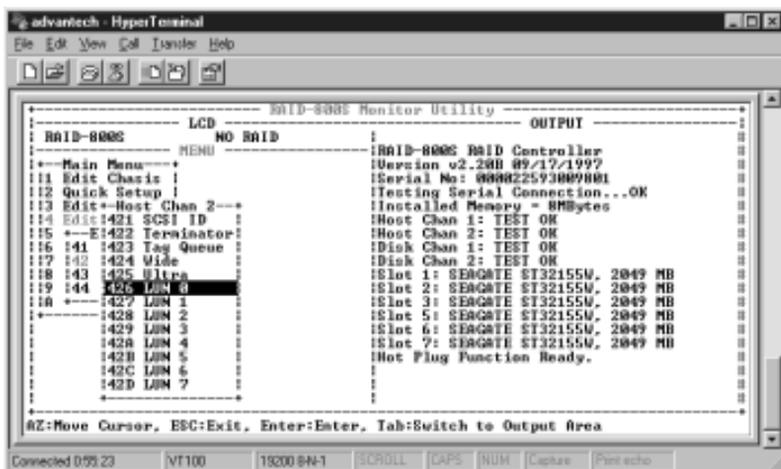

Figure 6-19: Selecting a LUN in the Host Chan 2 menu
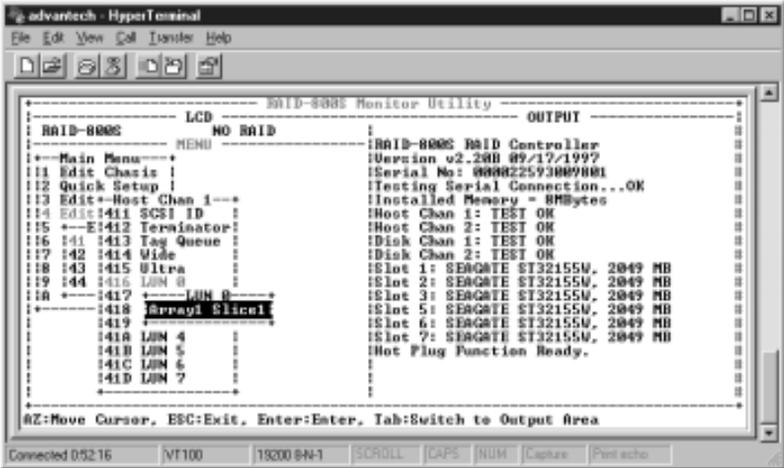
21. In the LUN 0 menu, select Array1 Slice1.

```
┌─────────────────────────────┐
│                             │
│   Array1 Slice1             │
│                             │
│                        □    │
└─────────────────────────────┘
```
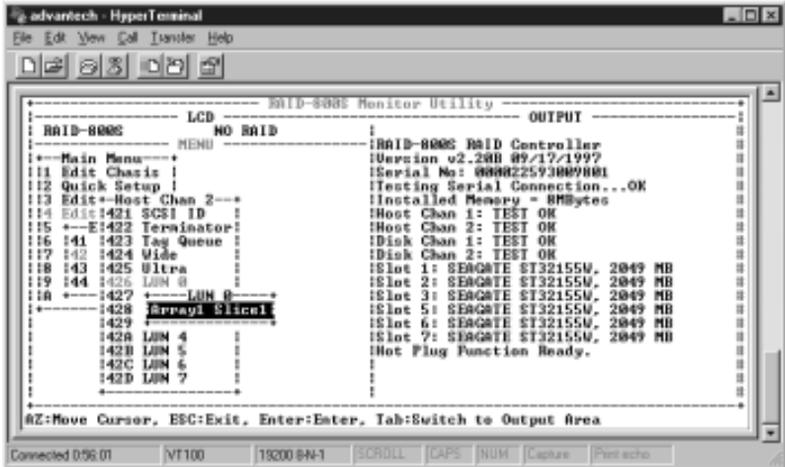

Figure 6-20: Selecting Array1 Slice1 in the LUN 0 menu

22. Press <Esc> to return to the Main Menu.

23. In the Main Menu, select Save Config and press <Enter>.

```
8   Save Config
NO
                        □
```
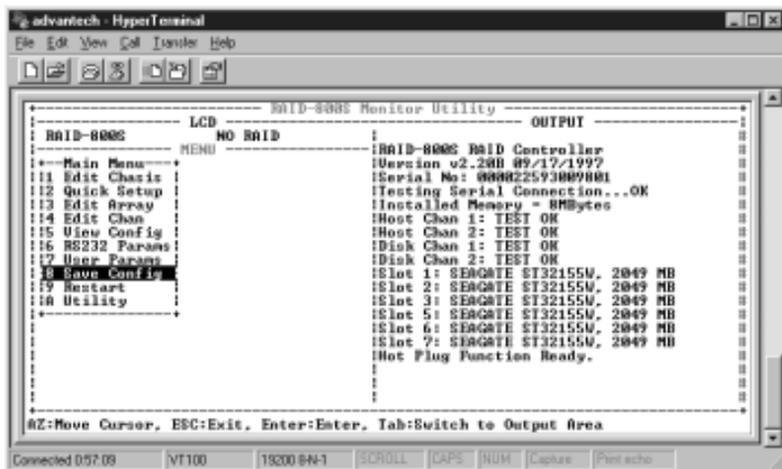

Figure 6-21: Selecting Save Config in the Main Menu

24. In the Save Config menu, select Yes.

```
┌─────────────────────────────────────┐
│ YES                                 │
│                                     │
│                                  □  │
└─────────────────────────────────────┘
```


Figure 6-22: Selecting Yes in the Save Config Menu

25. In the Main Menu, select Restart, then select Yes.

```
9   Restart
YES
                    □
```
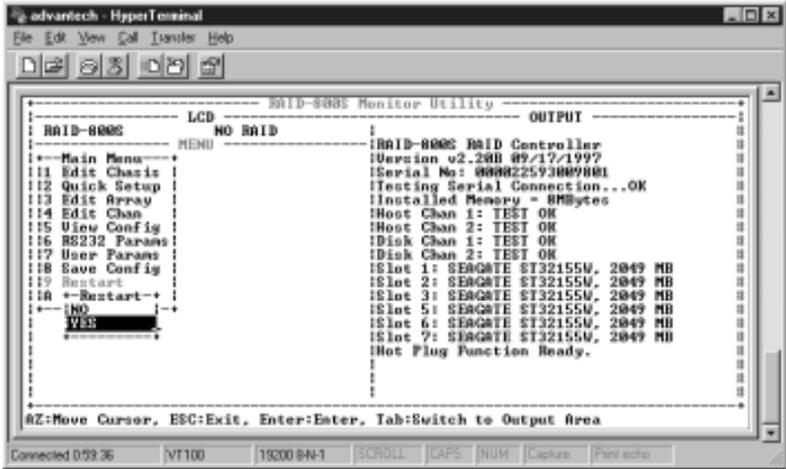

Figure 6-23: Selecting Yes in the Restart Menu

6.3 Deleting an Existing RAID

Warning: *The steps below will guide you into deleting an existing RAID. All previously configured RAID will be deleted.*

1. In the Main Menu, select Edit Chan and press <Enter>.

```
4   Edit Chan
41   Host Chan 1
                          □
```
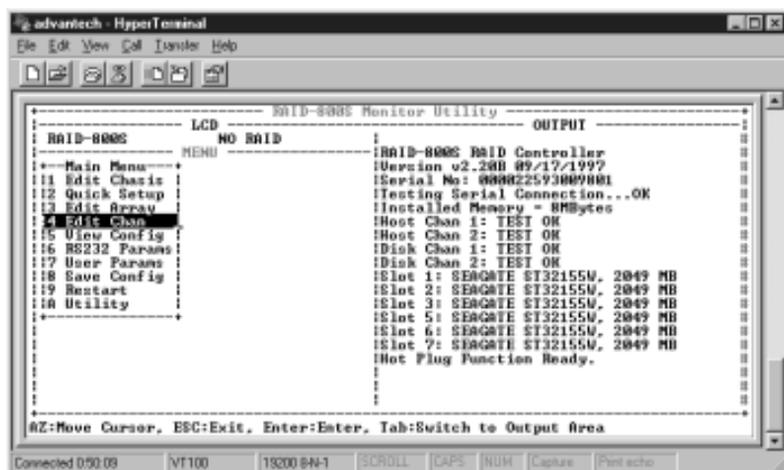

Figure 6-24: Selecting Edit Chan in the Main Menu

2. In the Edit Chan menu, select Host Chan 1.

```
41   Host Chan 1
411   SCSI ID          □
```
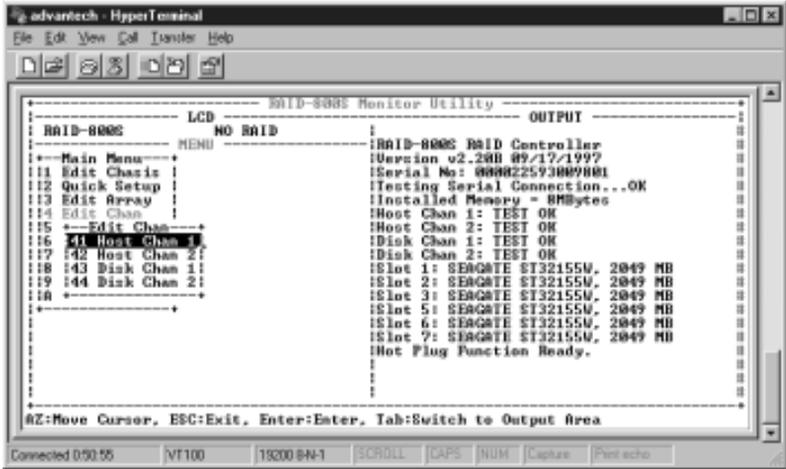

Figure 6-25: Selecting Host Chan 1 in the Edit Chan Menu

3. In the Host Chan 1 menu, select the LUN to be deleted. The LUN that was selected in the example below is LUN 0.

```
416  LUN 0
Array1 Slice1
```


Figure 6-26: Selecting a LUN in the Host Chan 1 Menu

4. In the LUN 0 menu, select Erase.

```
416  LUN 0
Erase
                  □
```
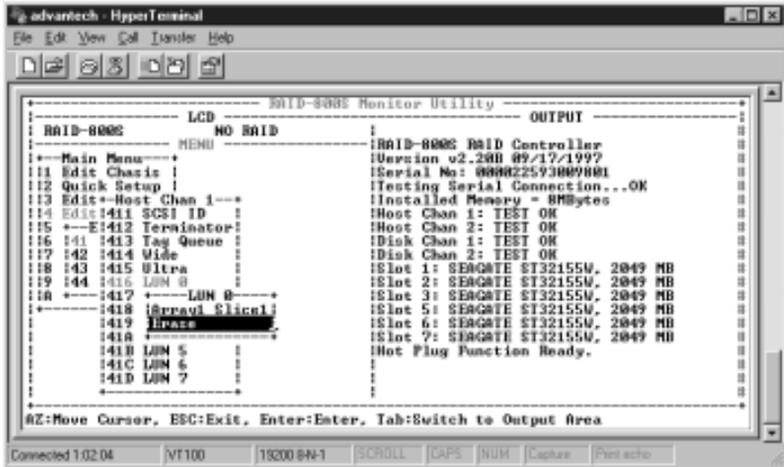

Figure 6-27: Selecting Erase in the LUN 0 Menu

5. Press <Esc> to return to the Edit Chan menu. Select Host Chan 2.

```
42   Host Chan 2
421   SCSI ID          □
```
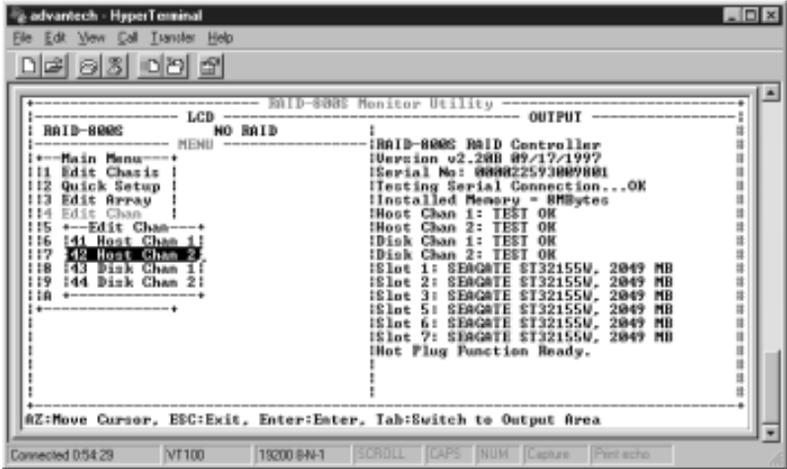

Figure 6-28: Selecting Host Chan 2 in the Edit Chan Menu

6. In the Host Chan 2 menu, select the LUN to be deleted. The LUN that was selected in the example below is LUN 0.

```
426  LUN 0
Array1 Slice1
```
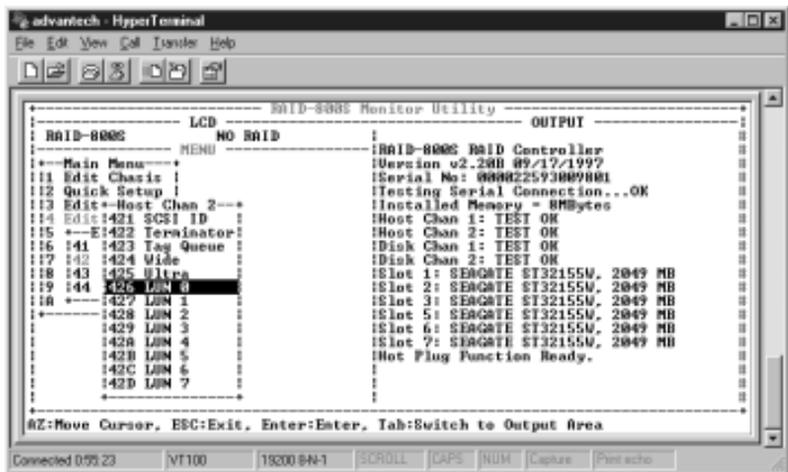

Figure 6-29: Selecting a LUN in the Host Chan 2 Menu

7. In the LUN 0 menu, select Erase.

```
426   LUN 0
Erase              □
```


Figure 6-30: Selecting Erase in the LUN 0 Menu

8. Press <Esc> until you return to the Main Menu.

9. In the Main Menu, select Save Config and press <Enter>.

```
8   Save Config
NO
                      □
```
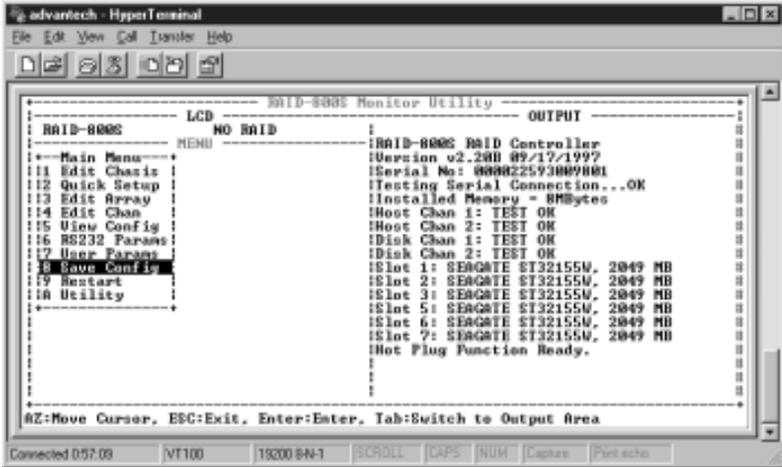

Figure 6-31: Selecting Save Config in the Main Menu

10. In the Save Config menu, select Yes.

YES

Figure 6-32: Selecting Yes in the Save Config Menu

11. You will return to the Main Menu. In the Main Menu, select Edit
    Array.

```
┌─────────────────────────────────┐
│  3   Edit Array                 │
│  31    Array1                   │
│                            □    │
└─────────────────────────────────┘
```
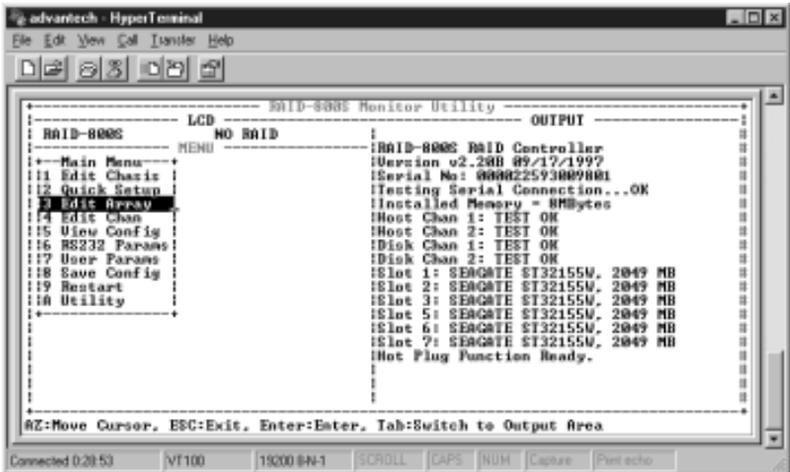

Figure 6-33: Selecting Edit Array in the Main Menu

12. In the Edit Array menu, select Array1 and press <Enter>.

```
 31   Array1
 311   Level 5
                   □
```


Figure 6-34: Selecting Array1 in the Edit Array Menu

13. In the Array1 menu, select Erase.

```
319   Erase
NO                    □
```
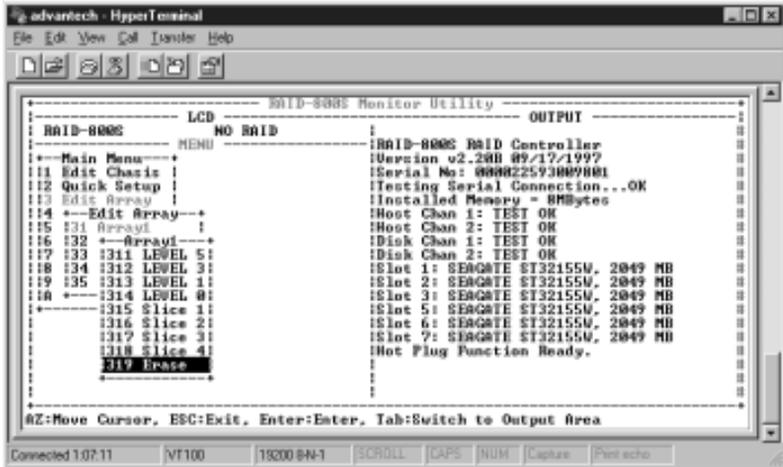

Figure 6-35: Selecting Erase in the Array1 Menu

14. In the Erase menu, select Yes.

```
YES

                    □
```


Figure 6-36: Selecting Yes in the Erase Menu

15. Press <Esc> until you return to the Main Menu.

16. In the Main Menu, select Save Config.


```
8   Save Config
NO                    □
```
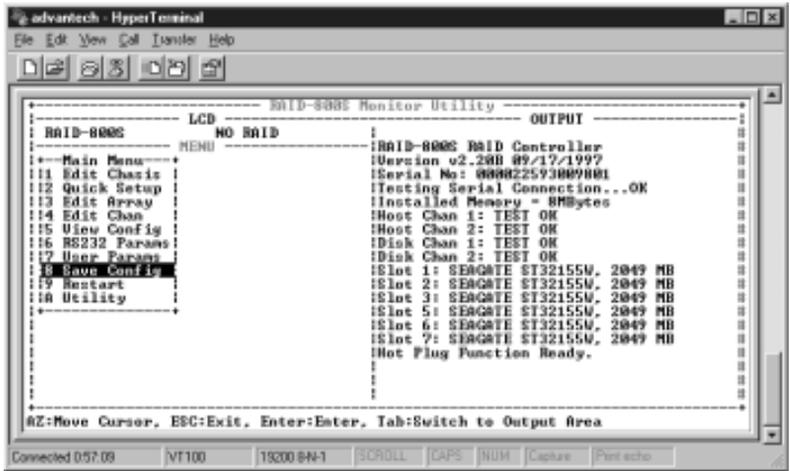

Figure 6-37: Selecting Save Config in the Main Menu

17. In the Save Config menu, select Yes.

Warning: All previously configured RAID will be deleted.

Figure 6-38: Selecting Yes in the Save Config Menu

6.4 Rebuilding an Existing RAID

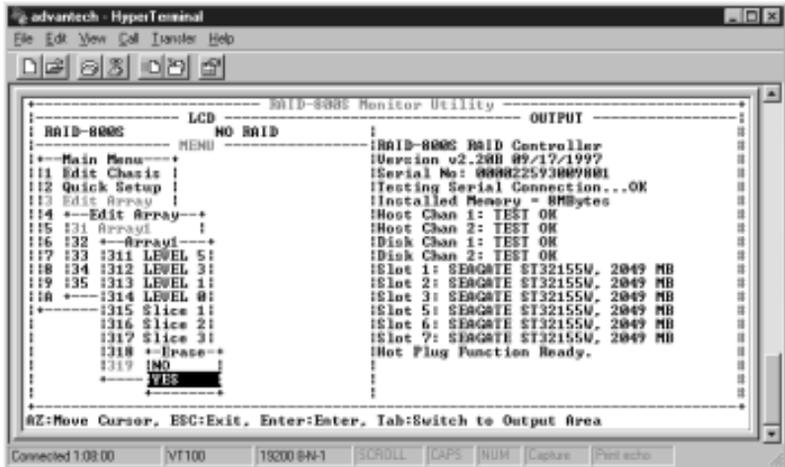If a hard drive in one of the RAID arrays failed to function, the front panel of the controller will show the slot number of the failed drive. Replace the defective drive and "rebuild" RAID. Refer to section 3.2 for instructions on replacing a hard drive.

1. In the Main Menu, select Utility and press <Enter>.

```
A  Utility
A1  Beeper          □
```
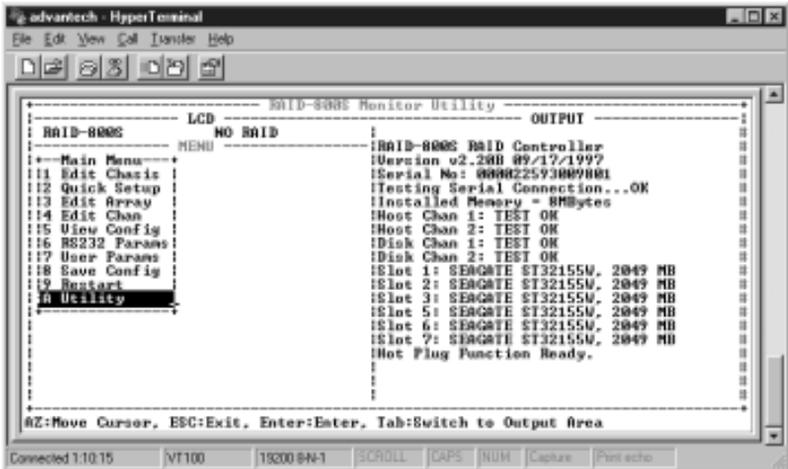

Figure 6-39: Selecting Utility in the Main Menu

2. In the Utility menu, select Rebuild.

```
A5  Rebuild
NO
                        □
```
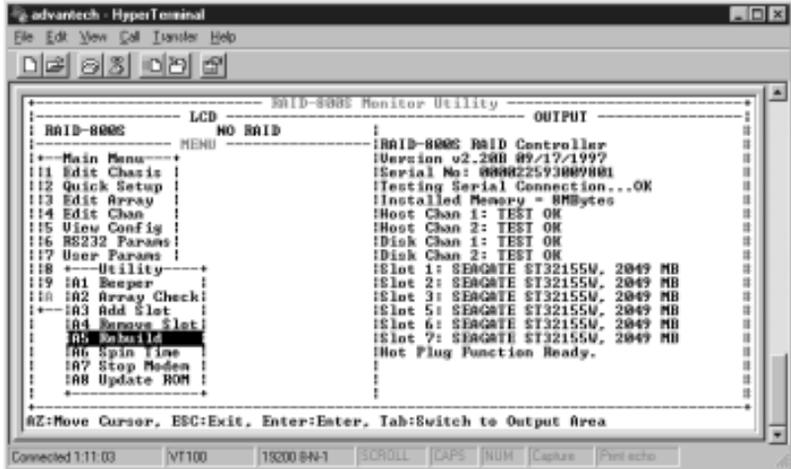

Figure 6-40: Selecting Rebuild in the Utility Menu

3. In the Rebuild menu, select Yes.

6.5 Changing the Host Channel's SCSI ID

1. In the Main Menu, select Edit Chan and press <Enter>.

```
4   Edit Chan
41   Host Chan 1        □
```
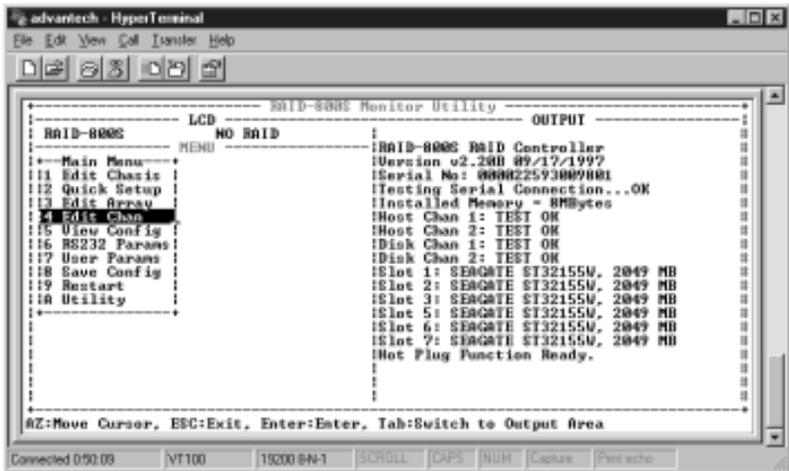

Figure 6-41: Selecting Edit Chan in the Main Menu

2. In the Edit Chan menu, select Host Chan 1.

```
41   Host Chan 1
411   SCSI ID
```
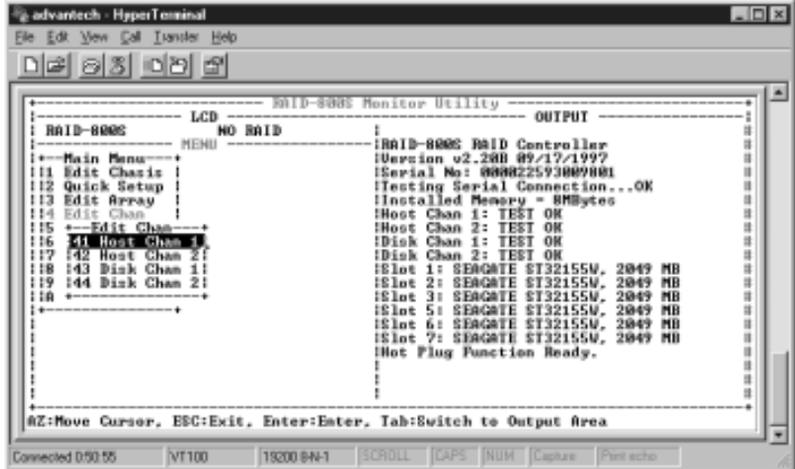

Figure 6-42: Selecting Host Chan 1 in the Edit Chan Menu

3. In the Host Chan 1 menu, select SCSI ID.

```
411  SCSI ID
ID   0          □
```


Figure 6-43: Selecting SCSI ID in the Host Chan 1 Menu

4. In the SCSI ID menu, select ID 1.
5. Press <Esc> until you return to the Main Menu.

6. In the Main Menu, select Save Config and press <Enter>.

```
8   Save Config
NO                    □
```
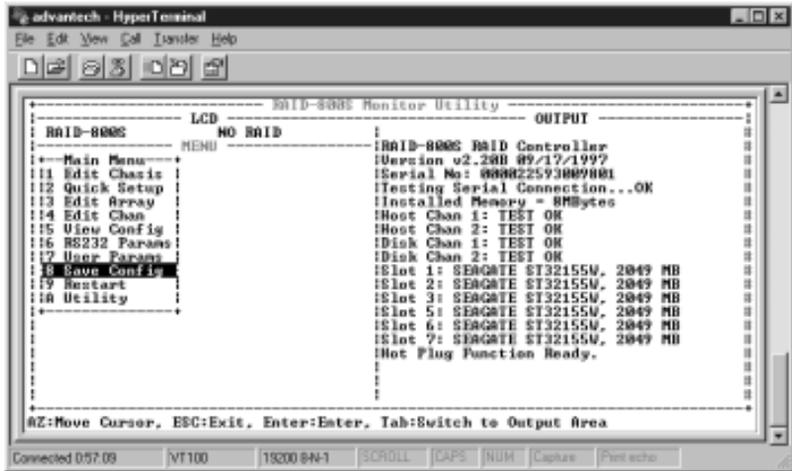

Figure 6-44: Selecting Save Config in the Main Menu

7. In the Save Config menu, select Yes.


```
YES

                                    □
```


Figure 6-45: Selecting Yes in the Save Config Menu

6.6 Configuring Your Terminal

1. In the Main Menu, select RS232 Params and press <Enter>.

```
6    RS232 Params
61    MODEM Port
```
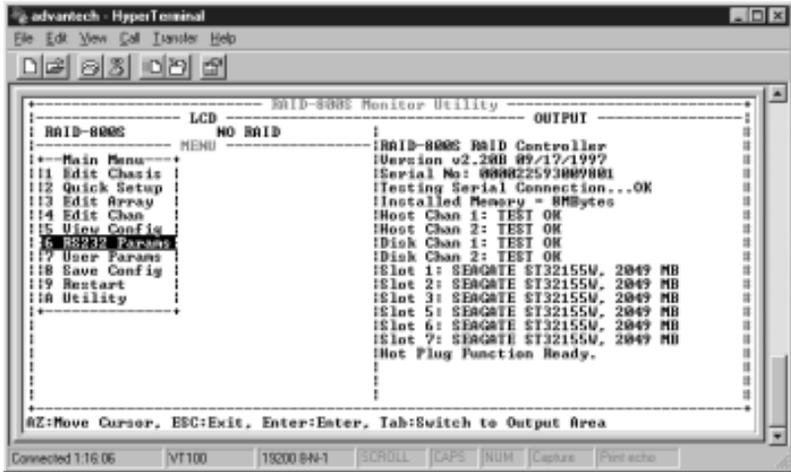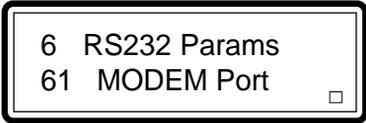

Figure 6-46: Selecting RS232 Params in the Main Menu

2. In the RS232 Params menu, select Terminal Port and press <Enter>.
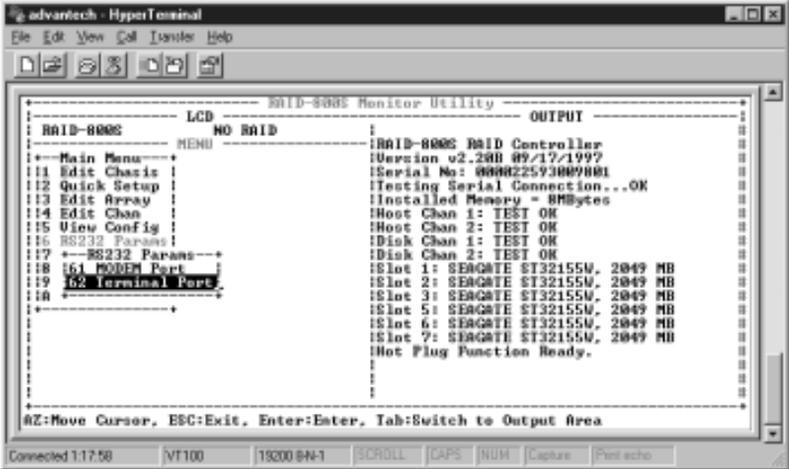
Figure 6-47: Selecting Terminal Port in the RS232 Params Menu

3. In the Terminal Port menu, select Baud Rate and press <Enter>.

```
621  Baud Rate
2400
                      □
```


Figure 6-48: Selecting Baud Rate in the Terminal Port Menu

4. In the Baud Rate menu, select the baud rate of your terminal and press <Enter>.
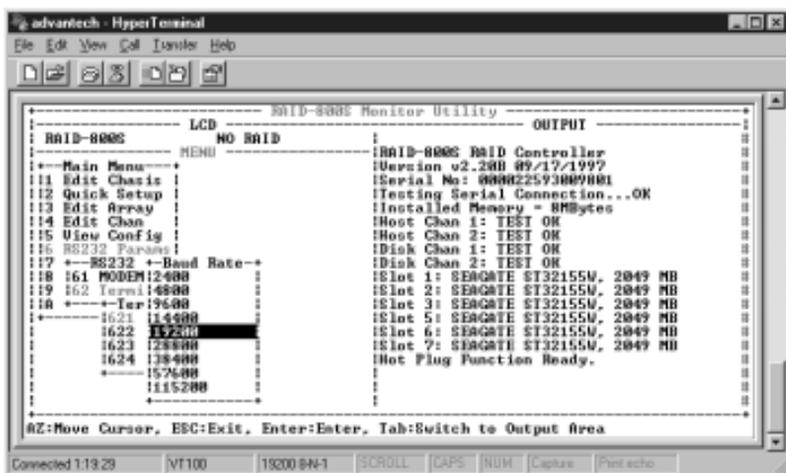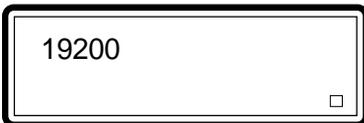
Figure 6-49: Selecting the Baud Rate in the Baud Rate Menu

5. You will return to the Terminal Port menu. Select Stop Bit and press <Enter>.

6. In the Stop Bit menu, select 1 or 2 and press <Enter>.

```
622   Stop Bit
1
                    □
```


Figure 6-50: Selecting the Stop Bit in the Stop Bit Menu

7. You will return to the Terminal Port menu. Select Data Bit and press <Enter>.

8. In the Data Bit menu, select the appropriate data bit and press <Enter>.

Figure 6-51: Selecting the Data Bit in the Data Bit Menu

9. You will return to the Terminal Port menu. Select Parity and press <Enter>.

10. In the Parity menu, select Odd, Even or None. Press <Enter>.

```
624   Parity
None
```
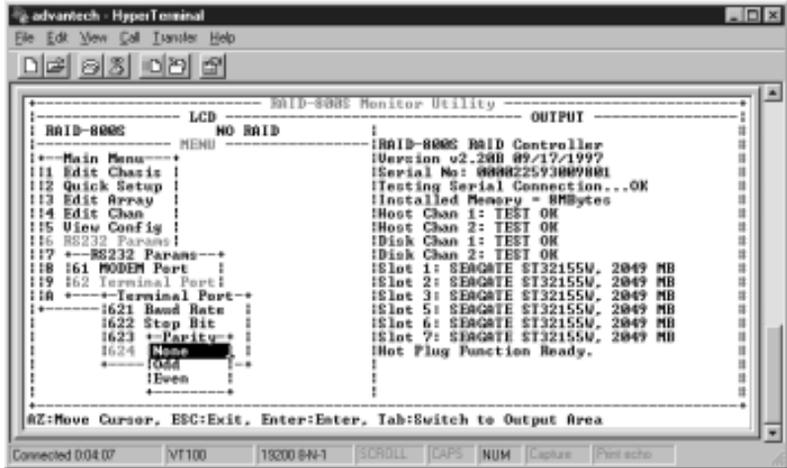

Figure 6-52: Selecting Odd, Even or None in the Parity Menu

6.7 Setting Your Password

1. In the Main Menu, select User Params and press <Enter>.

```
7   User Params
71  Passwd Info
```
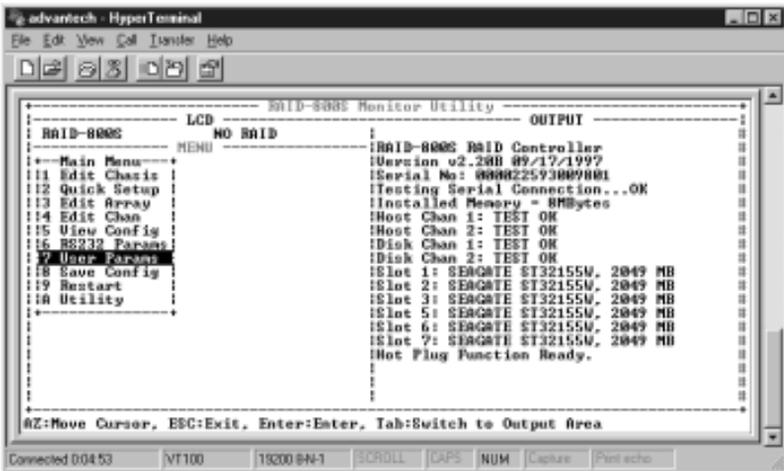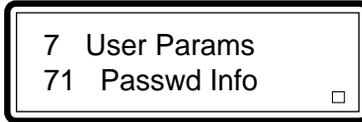

Figure 6-53: Selecting User Params in the Main Menu

2. In the User Params menu, select Passwd Info and press <Enter>.

```
71    Passwd Info
711    Passwd Check  □
```
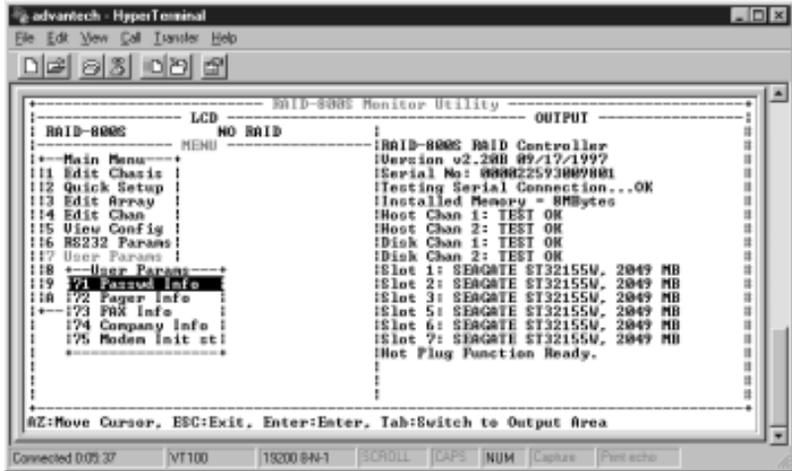

Figure 6-54: Selecting Passwd Info in the User Params Menu

3. In the Passwd Info menu, select Passwd Check.

```
711   Passwd Check
ENABLE
```
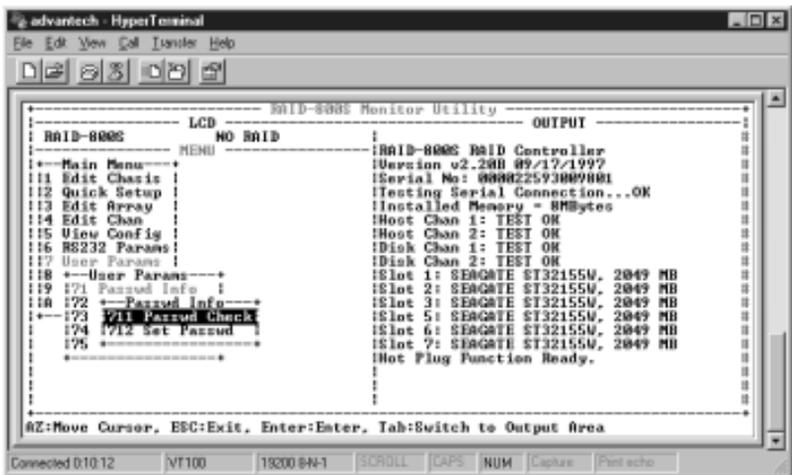

Figure 6-55: Selecting Passwd Check in the Passwd Info Menu

4. In the Passwd Check menu, select Enable and press <Enter>.

```
+-------------------------------------------------+
|  ENABLE                                          |
|                                                  |
|                                          □       |
+-------------------------------------------------+
```
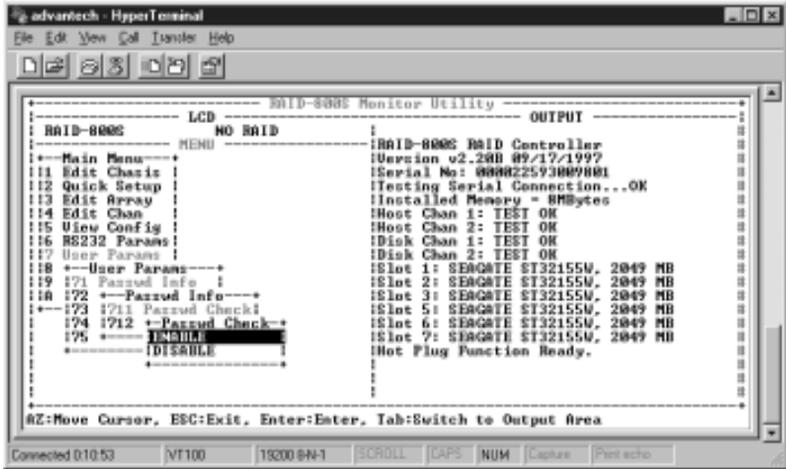

Figure 6-56: Selecting Enable in the Passwd Check Menu

5. You will return to the Passwd Info menu. Select Set Passwd and press <Enter>.

```
712   Set Passwd
0
```


Figure 6-57: Entering the Password in the Set Passwd Menu

6. In the Set Passwd menu, enter your password and press <Enter>. You may also choose not to enter a password. The default password is 8 zeros ("0").

6.8 RAID Array Consistency Check

1. In the Main Menu, select Utility and press <Enter>.

```
A   Utility
A1  Beeper
                        □
```


Figure 6-58: Selecting Utility in the Main Menu

2. In the Utility menu, select Array Check and press <Enter>.

```
A2   Array Check
A21   Array 1
                    □
```
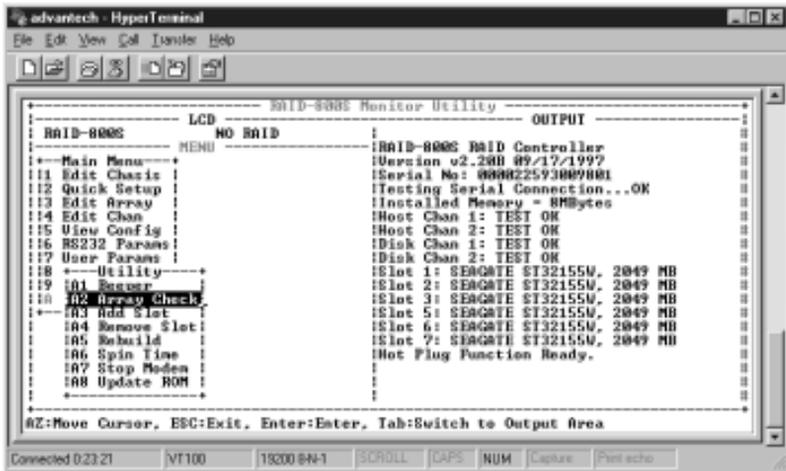

Figure 6-59: Selecting Array Check in the Utility Menu

3. In the Array Check menu, select the array you would like to check then press <Enter>. The array that was selected in the example below is Array 1.

```
A21   Array 1
STOP                    □
```
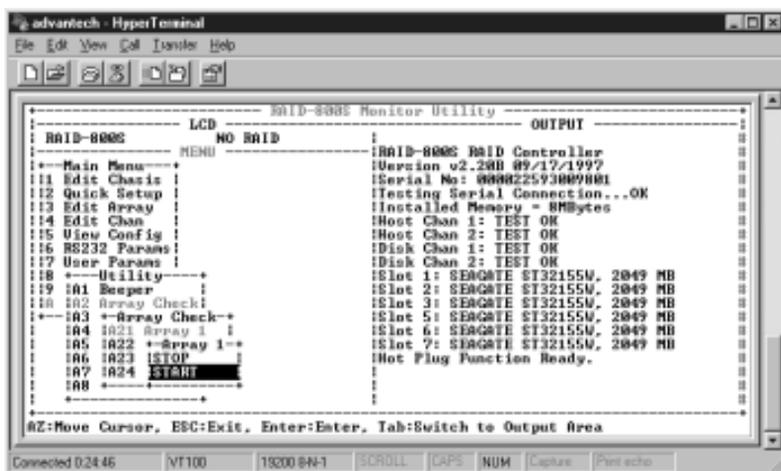

Figure 6-60: Selecting Start in the Array 1 Menu

4. In the Array 1 menu, select Start.

6.9 Viewing the RAID Controller's Configuration

1. In the Main Menu, select View Config and press <Enter>.

```
5   View Config
51    Slot Num
```
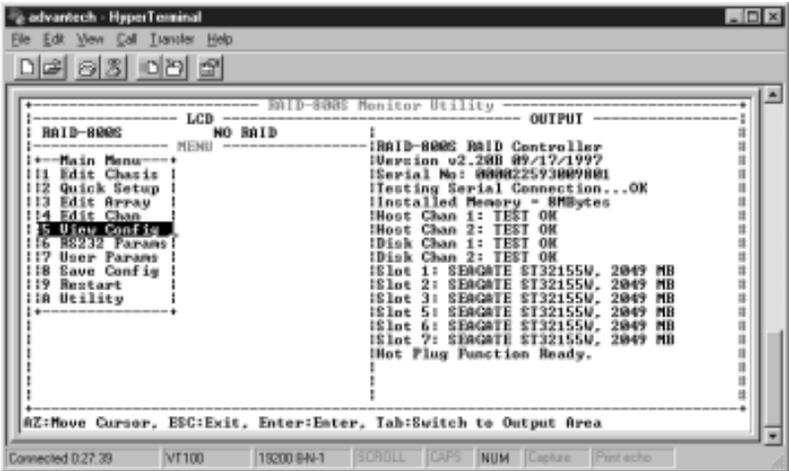

Figure 6-61: Selecting View Config in the Main Menu

2. In the View Config menu, select Slot Num and press <Enter>.

```
51 Slot Num
8
```


Figure 6-62: Entering the Slot Number in the Slot Num Menu

3. In the Slot Num menu, enter the slot number of the drive and press <Enter>.

4. You will return to the View Config menu. Choose Select Slot and press <Enter>.


```
52  Select Slot
1
```


Figure 6-63: Entering the Slot Number in the Select Slot Menu

5. In the Select Slot menu, enter the slot number and press <Enter>. The Select Slot menu shows the device channel where the drive is connected, the ID of the drive, vendor ID and capacity of the drive. After viewing these configurations, press <Esc>.

```
┌─────────────────────────────┐
│ 52  Select Slot             │
│ Chan 1 ID 0                 │
│                         □   │
└─────────────────────────────┘
```
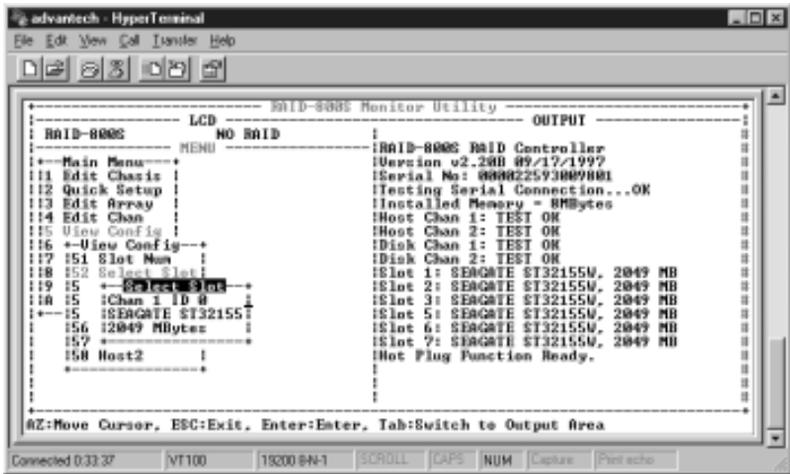

Figure 6-64: Viewing Configurations in the Select Slot Menu

6. You will return to the View Config menu. Select an array and press
   <Enter>. This menu will allow you to view the RAID level, slice
   number and other information of the drives in the array.
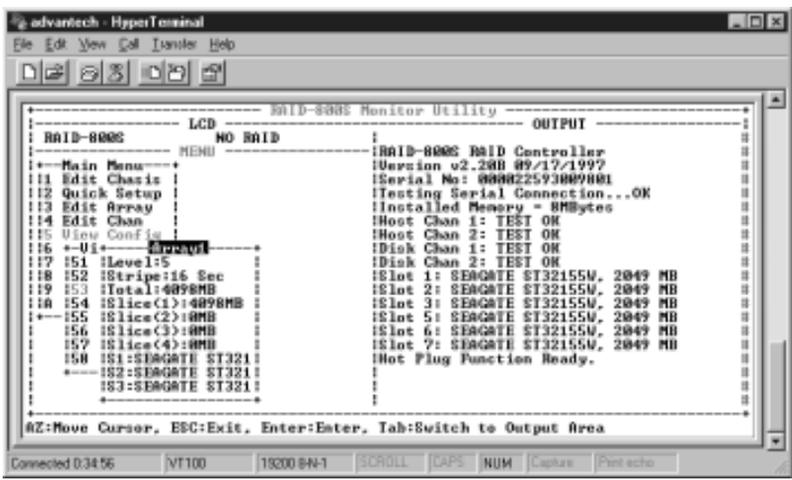
Figure 6-65: Viewing Configurations in the Array1 Menu

7. Press <Esc> to return to the View Config menu. Select Host1 and press <Enter>.

```
57  Host1
SCSI ID: 0
                    □
```
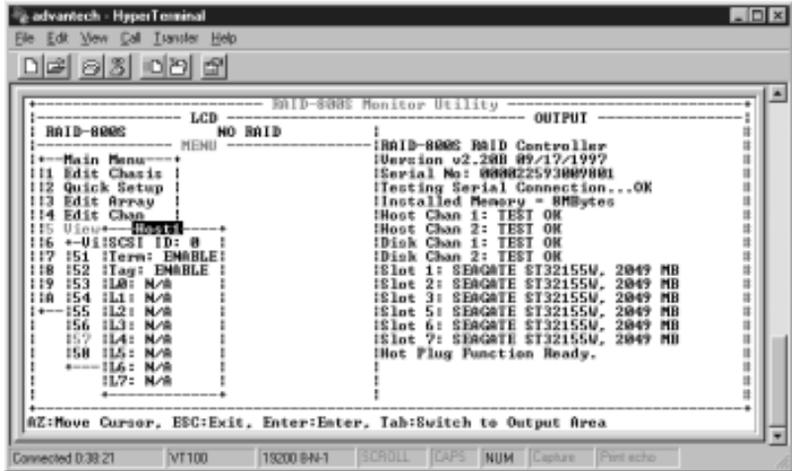

Figure 6-66: Viewing Configurations in the Host1 Menu

6.10 Configuring an Ultra Wide SCSI Subsystem

This section describes the steps on enabling/disabling the Ultra and Wide functions of the Host channels and Disk channels.

1. In the Main Menu, select Edit Chan and press <Enter>.

```
4  Edit Chan
41   Host Chan 1          □
```


Figure 6-67: Selecting Edit Chan in the Main Menu

2. In the Edit Chan menu, select Host Chan 1.

```
41    Host Chan 1
411    SCSI ID        □
```


Figure 6-68: Selecting Host Chan 1 in the Edit Chan Menu

3. In the Host Chan 1 menu, select SCSI ID.


```
411   SCSI ID
ID 0
                    □
```
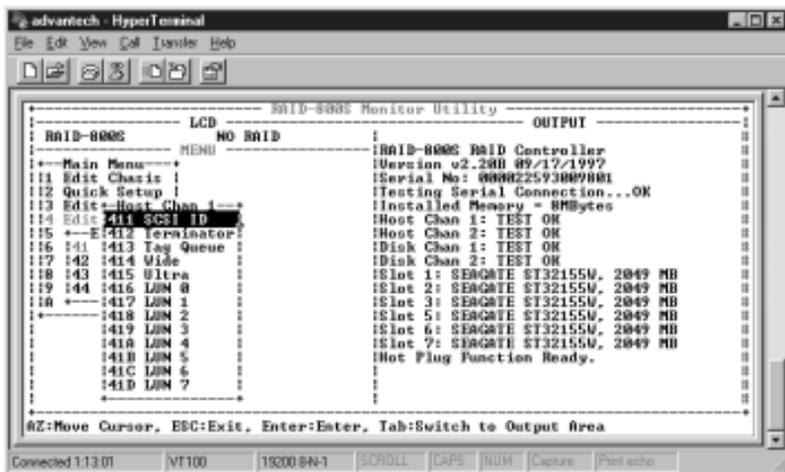

Figure 6-69: Selecting SCSI ID in the Host Chan 1 Menu

4. In the SCSI ID menu, select ID 0. You will return to the Host Chan 1 menu.

5. Select Wide and press <Enter>. In the Wide menu, select Enable.

```
┌──────────────────────────────┐
│  414   Wide                  │
│  ENABLE                      │
│                         □    │
└──────────────────────────────┘
```


Figure 6-70: Selecting Enable in the Wide Menu

6. You will return to the Host Chan 1 menu. Select Ultra and press
    <Enter>. In the Ultra menu, select Enable.

```
415   Ultra
ENABLE
                    □
```
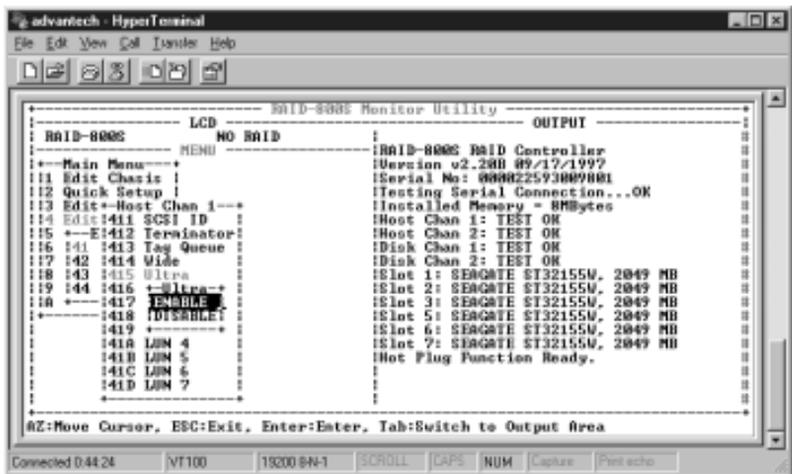

Figure 6-71: Selecting Enable in the Ultra Menu

7. Press <Esc> to return to the Edit Chan menu. Select Disk Chan 1 and
    press <Enter>.

8. In the Disk Chan 1 menu, select Wide and press <Enter>.

```
431  Wide
ENABLE
                    □
```


Figure 6-72: Selecting Enable in the Wide Menu

9. In the Wide menu, select Enable. You will return to the Disk Chan 1 menu.

10. In the Disk Chan 1 menu, select Ultra and press <Enter>.

```
432 Ultra
ENABLE                    □
```
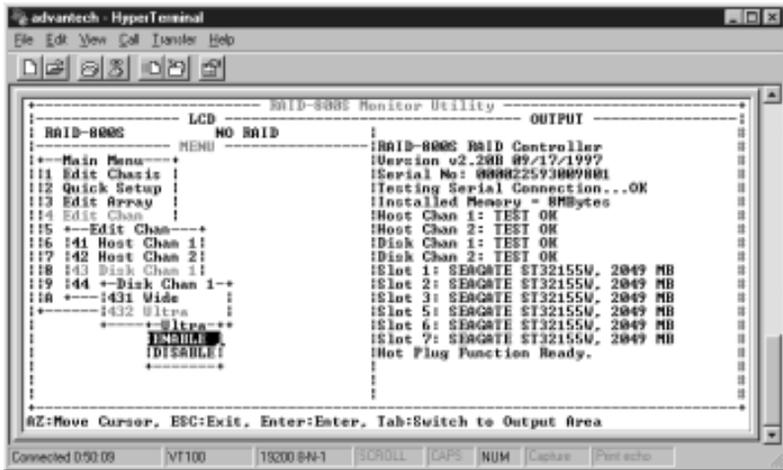

Figure 6-73: Selecting Enable in the Ultra Menu

11. In the Ultra menu, select Enable.

6.11 Main Menu

The Main Menu consists of the following menus: Edit Chasis, Quick
Setup, Edit Array, Edit Chan, View Config, RS232 Params, User Params,
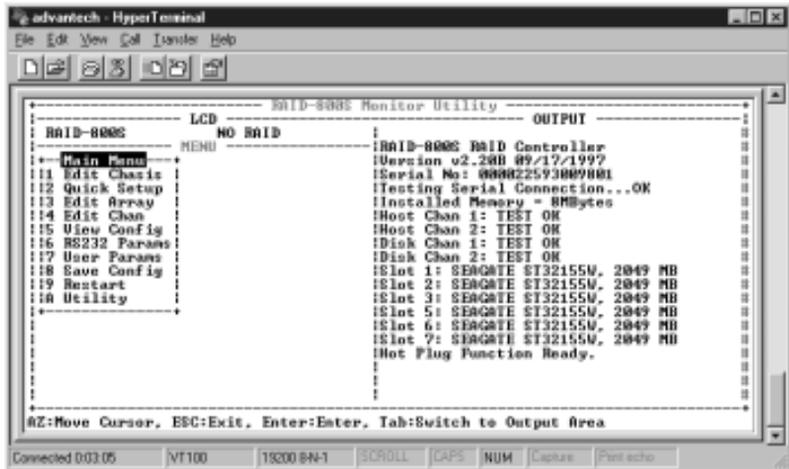Save Config, Restart, and Utility.

Figure 6-74: Main Menu

The following tables list the selectable options that are available under each menu.

1 Edit Chassis	2 Quick Setup
11 Host Num (1, 2)	21 Level 5
12 Slot Num (6 - 42)	211 Disk Number (1 - 8)
13 Edit Slot	212 YES/NO
131 Chan 1 ID (0 - 15)	22 Level 3
132 Chan 2 ID (0 - 15)	221 Disk Number (1 - 8)
133 Chan 3 ID (0 - 15)	222 YES/NO
14 Stripe Size (4, 8, 16, 32, 64, 128 sectors)	23 Level 1
	231 Disk Number (1 - 8)
	232 YES/NO
	24 Level 0
	241 Disk Number (1 - 8)
	242 YES/NO
	25 Level 0+1
	251 Disk Number (1-8)
	252 YES/NO

3 Edit Array	4 Edit Chan
31 Array1	41 Host Chan 1
311 LEVEL 5	411 SCSI ID (0 - 15)
3111 S1:4340MB	412 Terminator (ENABLE, DISABLE)
3112 S2:4340MB	413 Tag Queue (ENABLE, DISABLE)
3113 S3:4340MB	414 Wide (ENABLE, DISABLE)
312 LEVEL 3	415 Ultra (ENABLE, DISABLE)
313 LEVEL 1	416 LUN 0 Array1 Slice1 Array1 Slice2 Erase
314 LEVEL 0	417 LUN 1
315 LEVEL 0+1	418 LUN 2
316 SLICE 1	419 LUN 3
317 SLICE 2	41A LUN 4
3171 Size (MB)	41B LUN 5
3172 Delete	41C LUN 6
318 SLICE 3	41D LUN 7
319 SLICE 4	42 Host Chan 2
31A ERASE (NO, YES)	43 Disk Chan 1
32 Array2	431 Wide (ENABLE, DISABLE)
33 Array3	432 Ultra (ENABLE, DISABLE)
34 Array4	44 Disk Chan 2
35 Write Cache (ENABLE, DISABLE)	441 Wide (ENABLE, DISABLE)
	442 Ultra (ENABLE, DISABLE)

5 View Config

  51 Slot Num

  52 Select Slot

  53 Array1
     Level5
     Stripe:16 sec
     Total:2020MB
     Slice(1):2020MB
     Slice(2):0MB
     Slice(3):0MB
     Slice(4):0MB
     S1:SEAGATE ST310
     S2:SEAGATE ST310
     S3:SEAGATE ST310

  54 Array2

  55 Array3

  56 Array4

  57 Host1
     SCSI ID 0
     Term: DISABLE
     Tag: ENABLE
     L0:Array1 Slice1
     L1:N/A
     L2:-7:N/A

  58 Host2

6 RS232 Params

  61 MODEM Port

    611 Baud Rate (2400 - 115200)

    612 Stop Bit (1-2)

    613 Data Bit (7-8)

    614 Parity (None, Odd, Even)

  62 Terminal Port

    621 Baud Rate (2400 - 115200)

    622 Stop Bit (1 - 2)

    623 Data Bit (7 - 8)

    624 Parity (None, Odd, Even)

7 User Params

  71 Passwd Info

    711 Passwd Check (ENABLE, DISABLE)

    712 Set Passwd

  72 Pager Info

    721 Paging (ENABLE, DISABLE)

    722 Pager1 No.

    723 Pager2 No.

    724 Code

    725 Repeat # (5, 10, 15, 20)

    726 Interval (min) (5, 10, 15, 20)

    727 Page Now (YES, NO)

  73 FAX Info

    731 FAX (ENABLE, DISABLE)

    732 FAX Class (1, 2)

    733 FAX1 No.

    734 FAX2 No.

    735 Retry # (5, 10, 15, 20)

    736 FAX Now (YES, NO)

  74 Company Info

    741 String 1

    742 String 2

  75 Modem Init st (AT&FE0)

8 Save Config

NO

YES

9 Restart

NO

YES

```
+----------------------------------------------+
| A  Utility                                   |
|    A1  Beeper                                |
|        ENABLE                               |
|        DISABLE                              |
|                                              |
|    A2  Array Check                           |
|        A21 Array1 (Start, Stop)             |
|        A22 Array2 (Start, Stop)             |
|        A23 Array3 (Start, Stop)             |
|        A24 Array4 (Start, Stop)             |
|    A3  Add Slot (1 - 42)                     |
|    A4  Remove Slot (1 - 42)                  |
|    A5  Rebuild (NO, YES)                     |
|    A6  Spin Time (20, 40, 60 sec)           |
|    A7  Stop Modem (NO, YES)                  |
|    A8  Update ROM                            |
+----------------------------------------------+
```

6.11.1 Edit Chasis

Figure 6-75: Edit Chasis Menu

Host Num

This is used to define the number of host and device channels used by the subsystem. The options are "1" and "2". If you selected "1", the other 3 channels become device channels. Refer to Chapter 3 for more information on host channels and device channels.

Slot Num

This is used to define the total number of hard drives (in the slots) used. This includes the hard drives after they have been chained. The default is "8".

Edit Slot

This is used to define the device channel and ID of a hard drive in a particular slot.

Stripe Size

The options are 4, 8, 16, 32 and 64. The default is 16.

Warning: *The settings in the Edit Chasis menu have been predefined. These settings should not be altered unless necessary. It is recommended that only experienced users make changes to the default settings.*
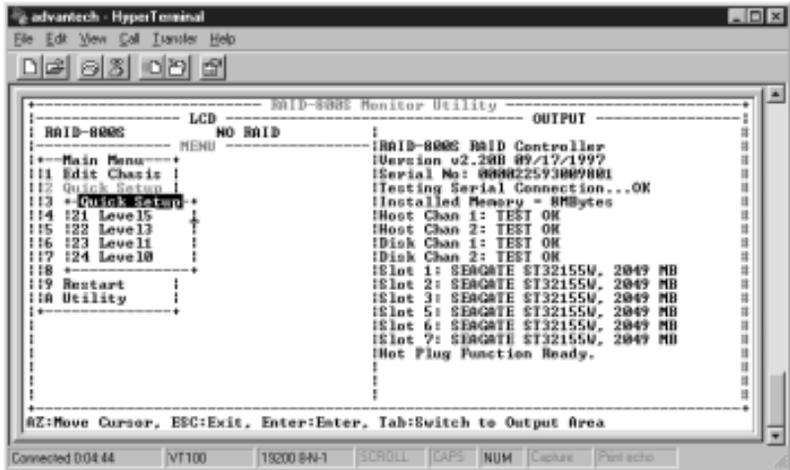
6.11.2 Quick Setup

Figure 6-76: Quick Setup Menu

Quick Setup is used to define the RAID Level to be assigned to an array being created and the number of drives that comprise the array. Refer to Chapter 5 for more information.
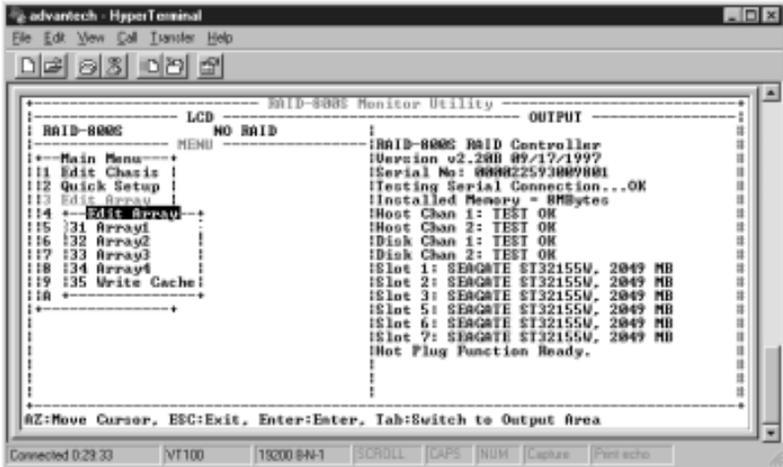
6.11.3 Edit Array

Figure 6-77: Edit Array Menu

This menu is used to create or delete an array. You must define the RAID level of the array you are about to create and select the hard drives that would comprise the array.

Note: *The Write Cache function must be enabled. This provides faster data transmission because data are transmitted to the cache memory first before being transmitted to the hard drives. If this function is disabled, data will be transmitted directly to the hard drives which is slower.*
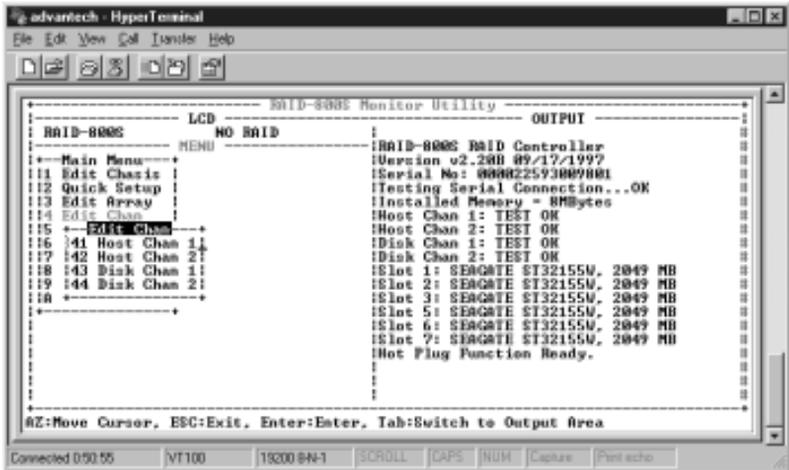
6.11.4 Edit Chan

Figure 6-78: Edit Chan Menu

Host Channel
In order for the Host controller to detect the hard drives in each RAID array, you must define the host channel where your Host is connected.

SCSI ID
This is used to assign a SCSI ID.

Terminator
If the Host controller will be the last SCSI device, enable this function.

Tag Queue
When Enabled, the SCSI channel is able to queue SCSI connect.

Wide and Ultra
These functions must always be enabled.

LUN

A RAID array may be divided into multiple logical units. A logical unit is that portion of a disk array seen by the host system as a single logical device. Each logical unit is identified to the host by its logical unit number (LUN). LUN sets the usable capacity for the logical unit being created.

Note: You must assign a SCSI ID for every Host channel.
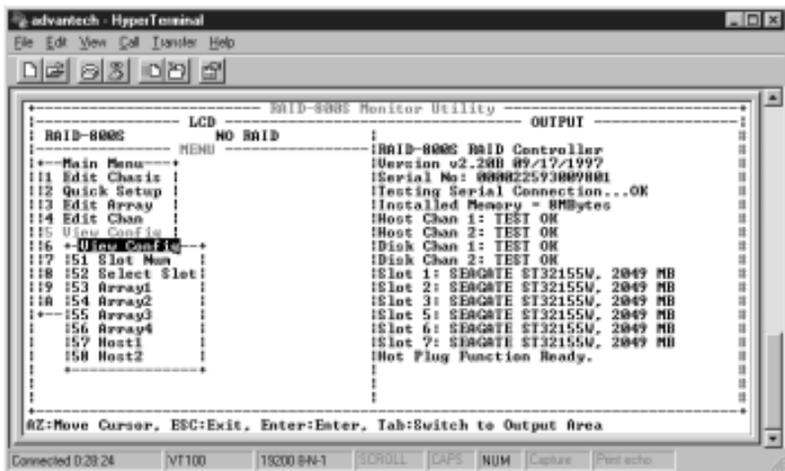
6.11.5 View Config

Figure 6-79: View Config Menu

This menu allows you to view the settings you have defined earlier such as the number of slots used, the vendor ID and capacity of your hard drives, the drives that have been grouped into a RAID array, configuration of the host channels, etc.

6.11.6 RS232 Params

Figure 6-80: RS232 Params Menu

This menu is used to define the baud rate, stop bit, data bit and parity of the modem and terminal attached to your subsystem.
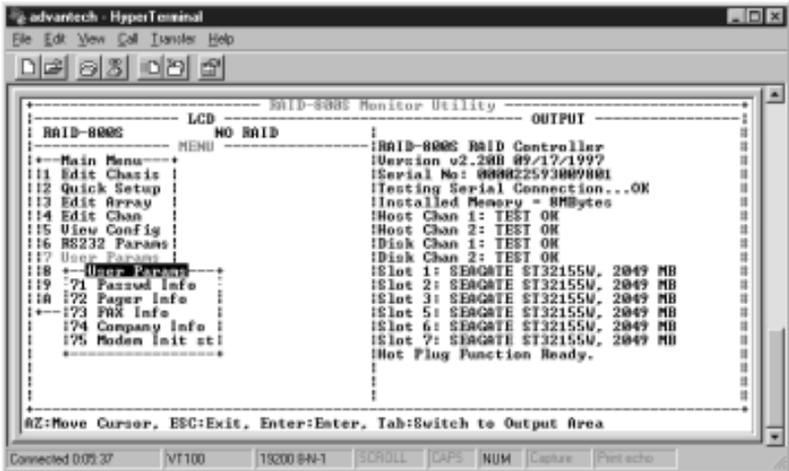
6.11.7 User Params

Figure 6-81: User Params Menu

Password Info
If you wish to secure the settings you have done, enable this function
in the Passwd Check field, then set a password in the Set Passwd field.

Pager Info
This function allows you to set two pager numbers. In case a hard drive
fails to function, your pager will "beep" you informing that a problem
has arised. You can set the number of times your pager will page you
and the time interval between each page.

FAX Info
This function allows you to set two fax numbers. In case a hard drive
fails to function, a message will be transmitted to your fax machine
informing you that a problem has arised. You can set the number of
times it will retry, in case the line is busy.

6.11.8 Save Config

When you have made changes to the setup utility, remember to always save the new or modified configuration before you exit the utility.
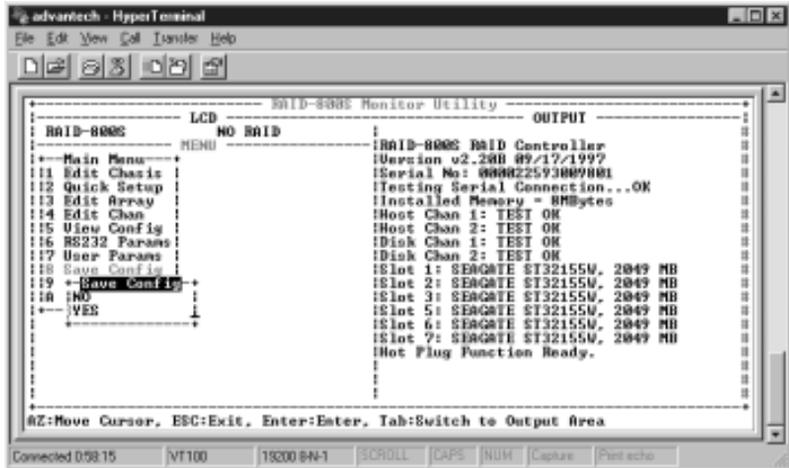

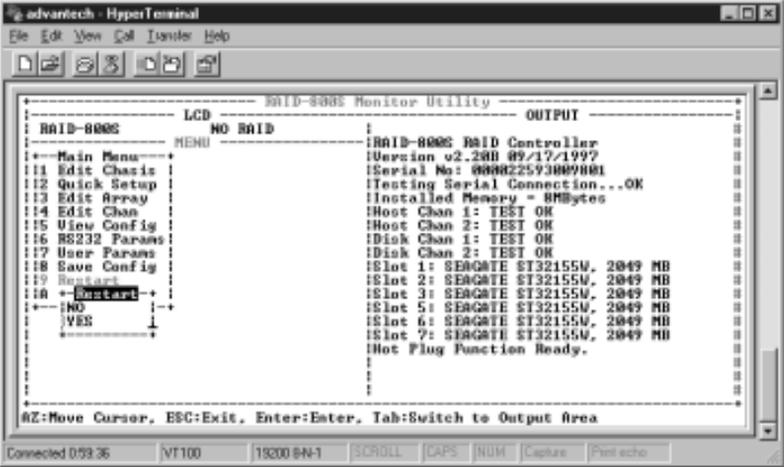*Figure 6-82: Save Config Menu*

6.11.9 Restart

Figure 6-83: Restart Menu

Restart the controller to activate the settings.
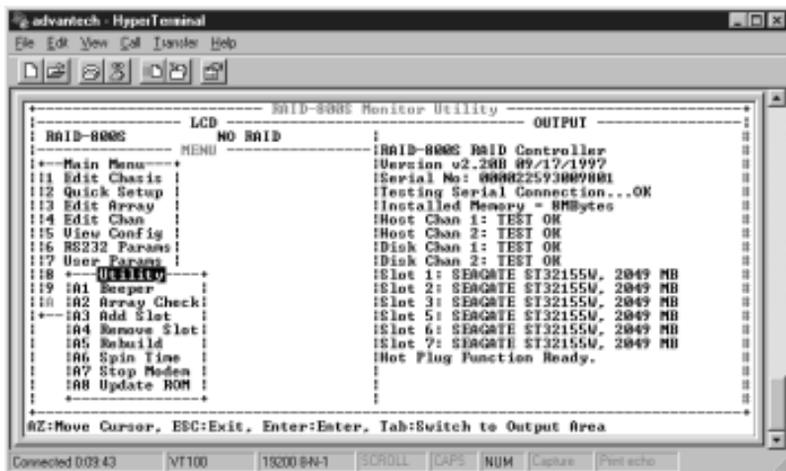
6.11.10 Utility

Figure 6-84: Utility Menu

Array Check
If the RAID level you selected is Level 5, which supports parity check, you can select the RAID array you would like to check.

Add Slot, Remove Slot and Rebuild
Since your subsystem is able to auto-detect the slot that has been added, removed or rebuilt, you may ignore these three categories.

Spin Time
This is used to define the spin-up time of the hard drives. For hard drives with larger capacity, you must select a longer spin-up time.

Update ROM
This is used to update the firmware residing in the controller.

Configuring Faxes and Pagers

Before going on, make sure your modem is properly connected to the serial modem port at the rear of the system unit.

7.1 Configuring the Modem Port

1. In the Main Menu, select RS232 Params and press <Enter>.

```
 6   RS232 Params
 61    MODEM Port        □
```


Figure 7-1: Selecting RS232 Params in the Main Menu

2. In the RS232 Params menu, select Modem Port and press <Enter>.

```
61   MODEM Port
611   Baud Rate
```


Figure 7-2: Selecting Modem Port in the RS232 Params Menu

3. In the Modem Port menu, select Baud Rate and press <Enter>.

```
611   Baud Rate
19200
              □
```
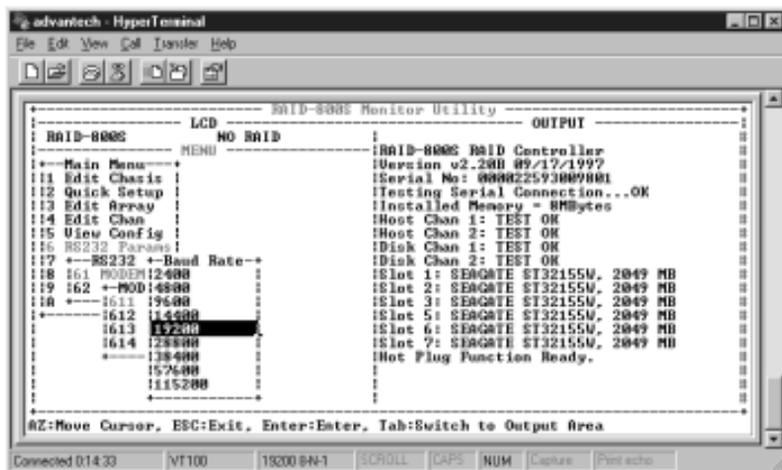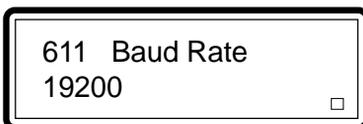

Figure 7-3: Selecting the Baud Rate in the Baud Rate Menu

4. In the Baud Rate menu, select the baud rate of your modem and press <Enter>.

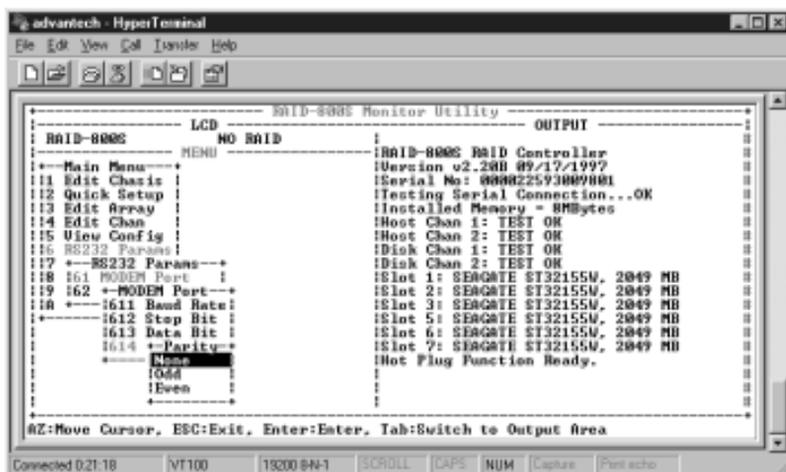5. You will return to the Modem Port menu. Select Stop Bit and press
   <Enter>.

```
┌─────────────────────────────┐
│                             │
│  612   Stop Bit             │
│  1                          │
│                         □   │
└─────────────────────────────┘
```


Figure 7-4: Selecting the Stop Bit in the Stop Bit Menu

6. In the Stop Bit menu, select 1 or 2 and press <Enter>.

7. You will return to the Modem Port menu. Select Data Bit and press
   <Enter>.

```
613   Data Bit
8
```


Figure 7-5: Selecting the Data Bit in the Data Bit Menu

8. In the Data Bit menu, select the appropriate data bit and press
   <Enter>.

9. You will return to the Modem Port menu. Select Parity and press
    <Enter>.

```
┌─────────────────────────────────┐
│  614   Parity                   │
│  None                           │
│                            □    │
└─────────────────────────────────┘
```


Figure 7-6: Selecting Odd, Even or None in the Parity Menu

10. In the Parity menu, select Odd, Even or None. Press <Enter>.

11. Press <Esc> until you return to the Main Menu.

7.2 Configuring Your Pager

Your subsystem supports two pager numbers. In case a hard drive fails to function, your pager will "beep" you informing that a problem has arised. You can set the number of times your pager will page you and the time interval between each page.

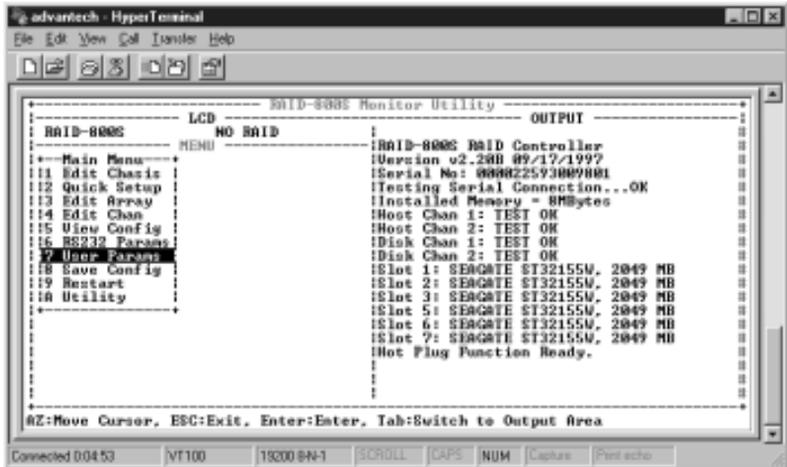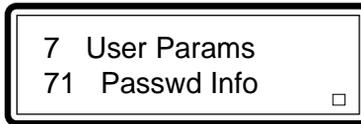1. In the Main Menu, select User Params and press <Enter>.

```
7    User Params
71   Passwd Info
```


Figure 7-7: Selecting User Params in the Main Menu

2. In the User Params menu, select Pager Info and press <Enter>.

```
72   Pager Info
721   Paging
                        □
```
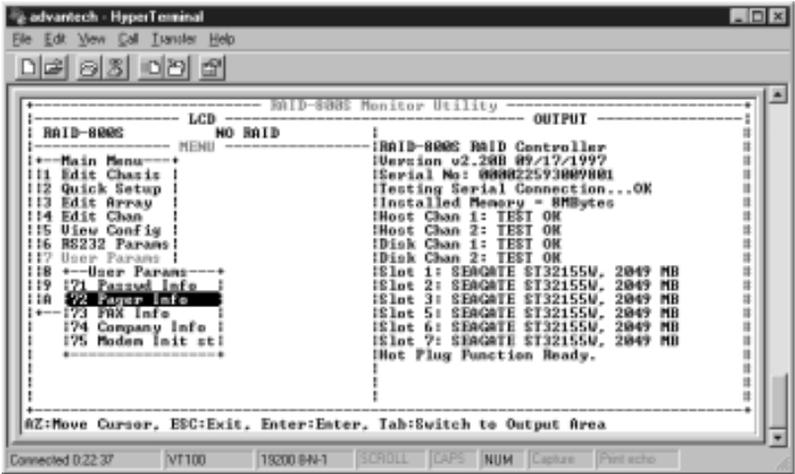

Figure 7-8: Selecting Pager Info in the User Params Menu

3. In the Pager Info menu, select Paging and press <Enter>.


```
721  Paging
DISABLE              □
```


Figure 7-9: Selecting Enable in the Paging Menu

4. In the Paging menu, select Enable and press <Enter>.

5. You will return to the Pager Info menu. Select Pager1 No. and press
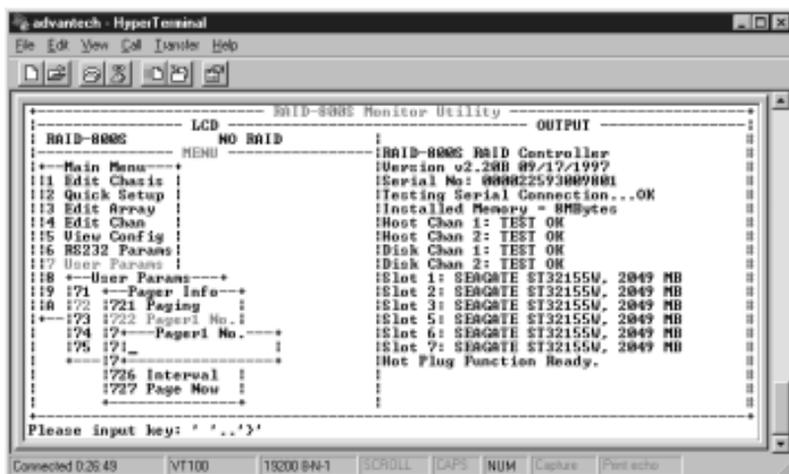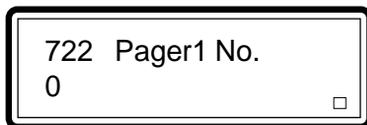   <Enter>.

722 Pager1 No.
0

Figure 7-10: Entering the Pager Number in the Pager1 No. Menu

6. In the Pager1 No. menu, type in the Pager number and press <Enter>.
   You can enter a maximum of 16 characters.

7. You will return to the Pager Info menu. If you wish to enter another pager number, select Pager2 No. and press <Enter>.
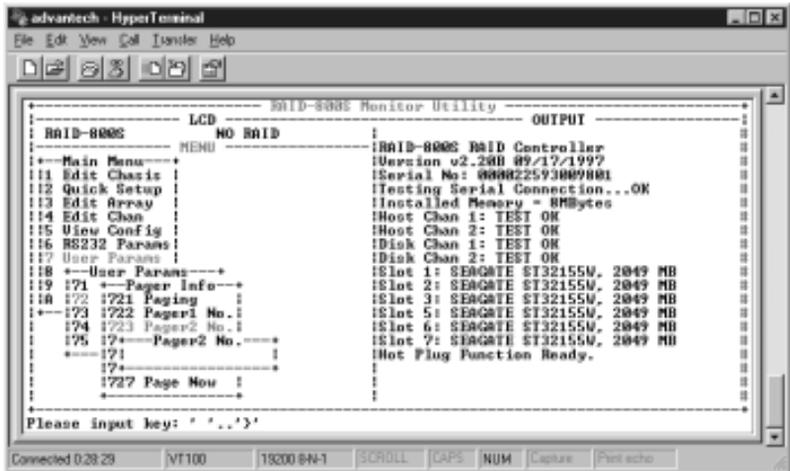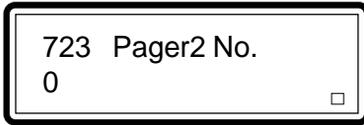
```
723   Pager2 No.
0                    □
```


Figure 7-11: Entering the Pager Number in the Pager2 No. Menu

8. In the Pager2 No. menu, type in the Pager number and press <Enter>. You can enter a maximum of 16 characters.

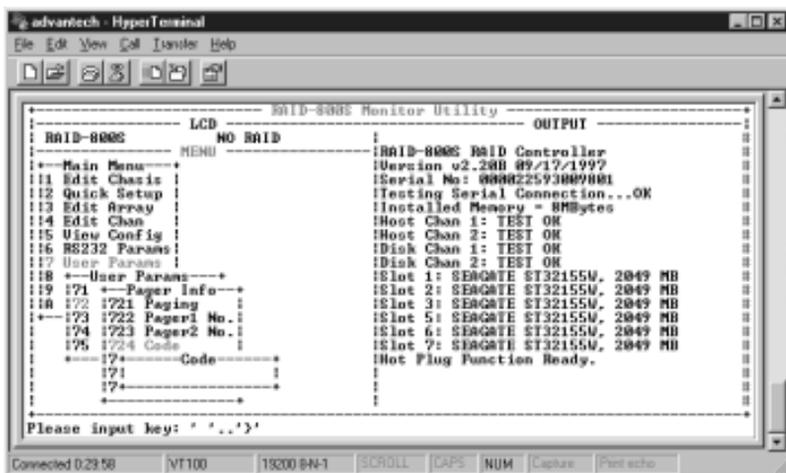9. You will return to the Pager Info menu. Select Code and press
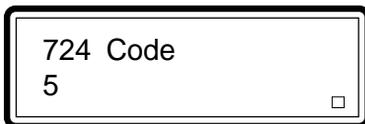   <Enter>.

Figure 7-12: Entering the Code in the Code Menu

10. In the Code menu, you can type your message (code) by entering a
    maximum of 16 alphanumeric characters. After entering your code,
    press <Enter>.

11. You will return to the Pager Info menu. Select Repeat # and press
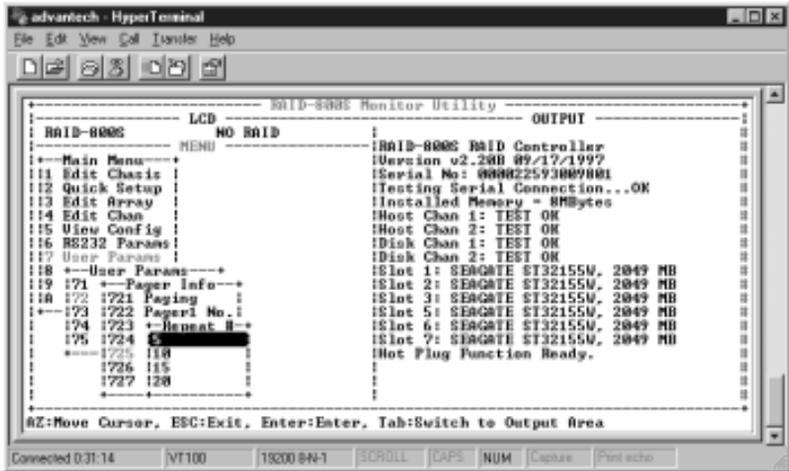   <Enter>.

```
725   Repeat #
5                 □
```


Figure 7-13: Selecting a Number in the Repeat # Menu

12. In the Repeat # menu, select the number of times you would like to
    "page" the number. Press <Enter>.

13. You will return to the Pager Info menu. Select Interval and press
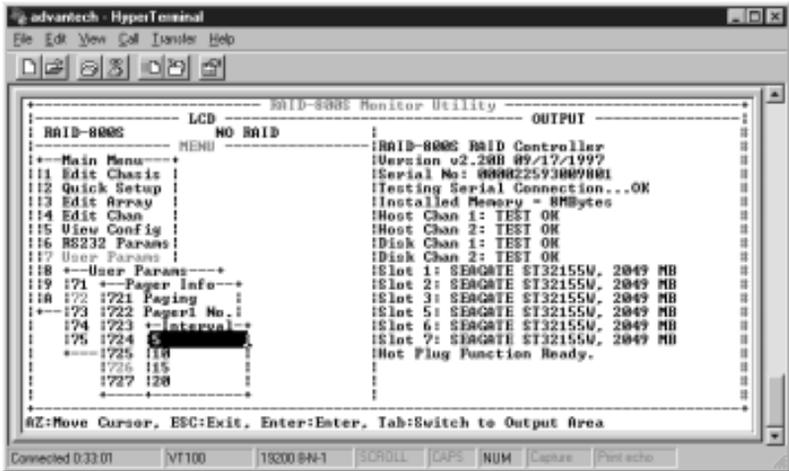   <Enter>.

Figure 7-14: Selecting the Time Interval in the Interval Menu

14. In the Interval menu, select the time interval (in minutes) between
    each page and press <Enter>.

15. You will return to the Pager Info menu. Select Page Now and press <Enter>. This is used to check whether your page number is correct and that your pager is working normally.

```
┌──────────────────────────────────┐
│                                  │
│    727   Page Now                │
│                                 □│
│                                  │
└──────────────────────────────────┘
```
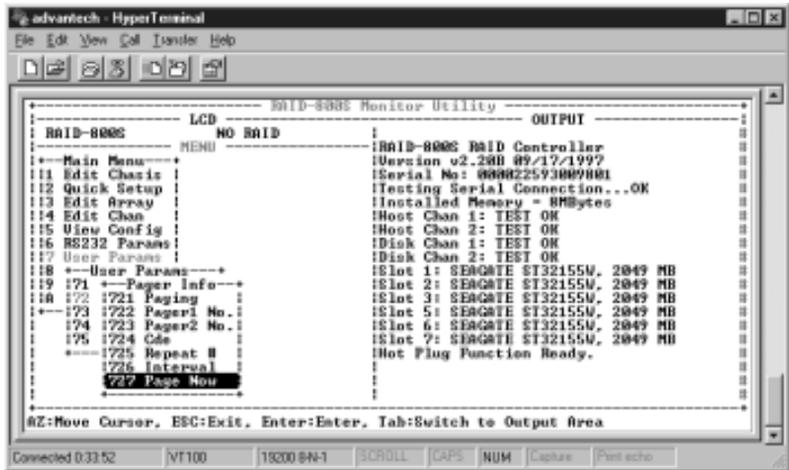

Figure 7-15: Selecting Page Now in the Pager Info Menu

7.3 Configuring Your FAX

Your subsystem supports two fax numbers. In case a hard drive fails to function, a message will be transmitted to your fax machine informing you that a problem has arised. You can set the number of times it will retry, in case the line is busy.

1. In the Main Menu, select User Params and press <Enter>.

```
7    User Params
71   Passwd Info
```


Figure 7-16: Selecting User Params in the Main Menu

2. In the User Params menu, select FAX Info and press <Enter>.

```
73   FAX Info
731  FAX            □
```
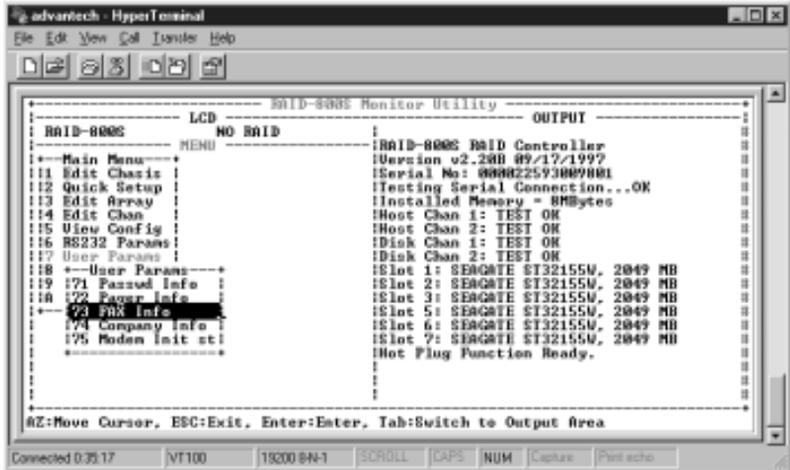

Figure 7-17: Selecting FAX Info in the User Params Menu

3. In the FAX Info menu, select FAX and press <Enter>.

```
731  FAX
ENABLE
              □
```


Figure 7-18: Selecting Enable in the FAX Menu

4. In the FAX menu, select Enable and press <Enter>.

5. You will return to the FAX Info menu. Select FAX1 No. and press
    <Enter>.

```
┌─────────────────────────────────┐
│  733   FAX1 No.                 │
│  0                           □  │
└─────────────────────────────────┘
```


Figure 7-19: Entering the Fax Number in the FAX1 No. Menu

6. In the FAX1 No. menu, type in the FAX number and press <Enter>.

7. You will return to the FAX Info menu. If you wish to enter another FAX number, select FAX2 No. and press <Enter>.

```
734   FAX2 No.
0                          □
```
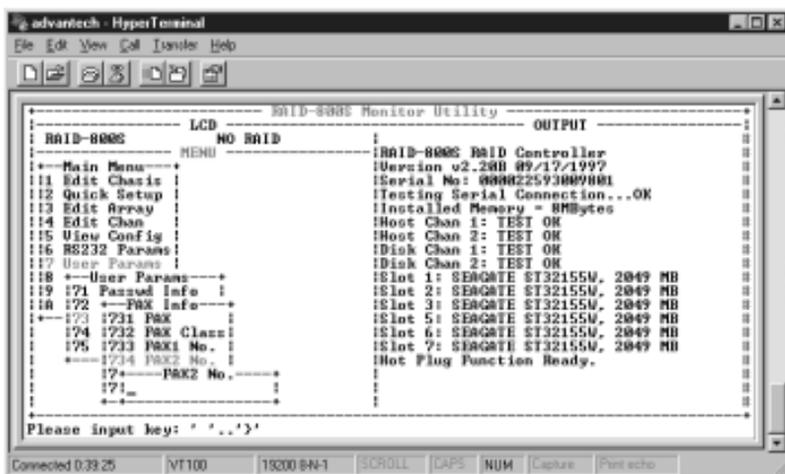

Figure 7-20: Entering the Fax Number in the FAX2 No. Menu

8. In the FAX2 No. menu, type in the FAX number and press <Enter>.

9. You will return to the FAX Info menu. Select Retry # and press
   <Enter>.

```
735   Retry #
5                    □
```
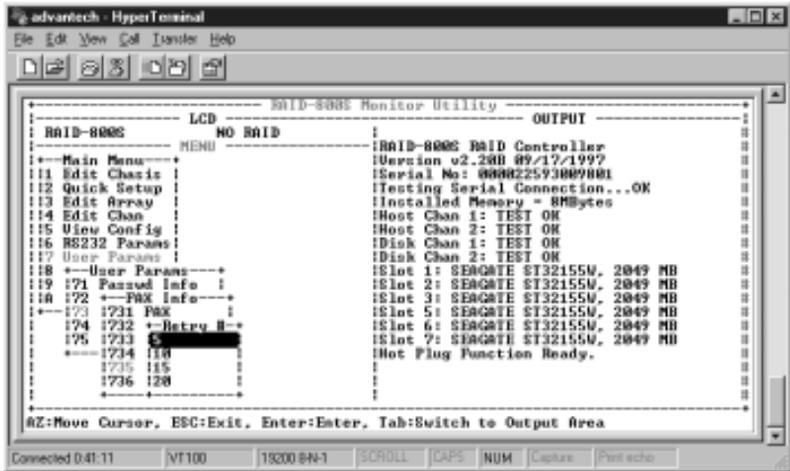

Figure 7-21: Selecting a Number in the Retry # Menu

10. In the Retry # menu, select the number of times you would like to
    retry transmitting the fax. Press <Enter>.

11. You will return to the FAX Info menu. Select FAX Now and press
    <Enter>. This is used to check whether the FAX numbers are correct
    and that the faxes are working normally.

12. You will return to the User Params menu. Select Company Info and press <Enter>.
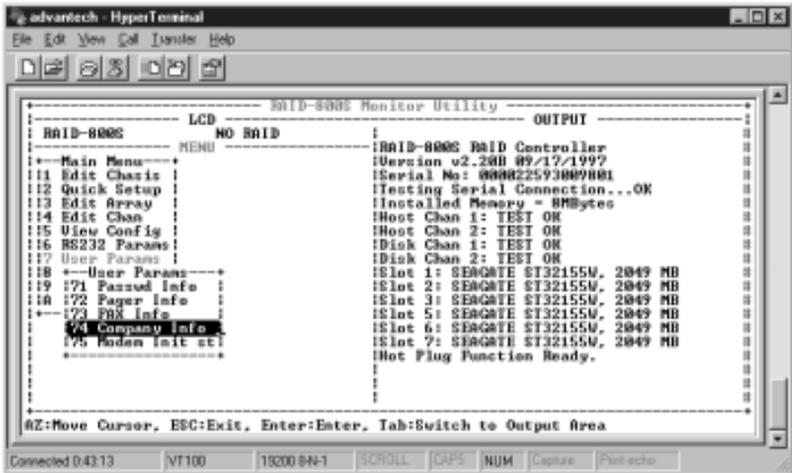
```
74   Company Info
741   String 1
```


Figure 7-22: Selecting Company Info in the User Params Menu

13. In the Company Info menu, select String 1 and press <Enter>. Enter the company information. You can enter a maximum of 16 characters.

```
741   String 1
0
                    □
```
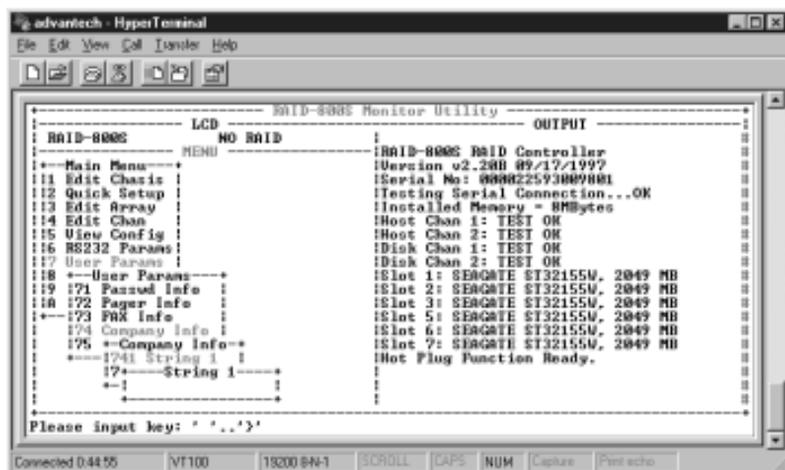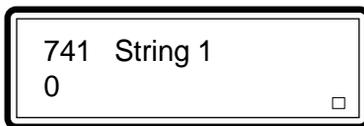

Figure 7-23: Entering Information in the String 1 Menu

14. If the information entered in String 1 is not enough, you may enter some more information by selecting String 2. You can also enter a maximum of 16 characters.

15. You will return to the User Params menu. Select Modem Init st. This is used to configure the AT command of the modem.

Upgrading Your Firmware

This chapter describes the procedure in downloading the firmware from the WEB site to upgrade RAID-800S.

The RAID-800S subsystem allows you to upgrade your firmware. You may download the latest firmware from Advantech's web site. The address is http:\www.advantech.com.

To upgrade your firmware, follow the steps below.

1. In the Main Menu, select Utility and press <Enter>.

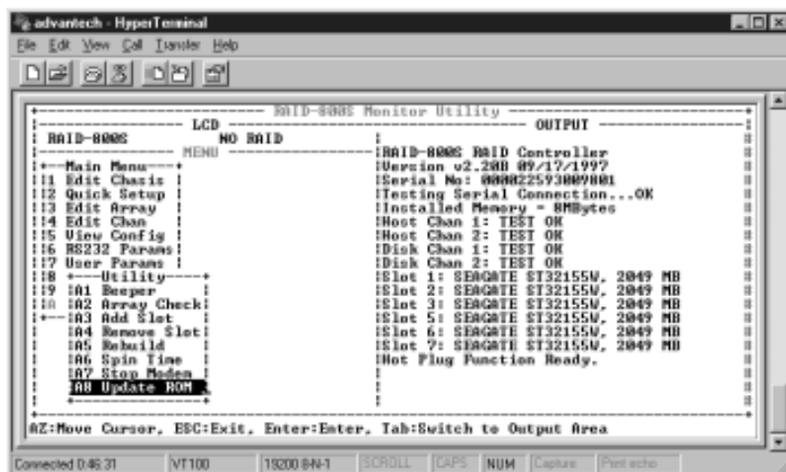2. In the Utility menu, select Update ROM and press <Enter>.

Figure 8-1: Selecting Update ROM in the Utility Menu

3. The screen below will appear. Type <Y>.

Before downloading the new firmware,
shutdown the host computer system.
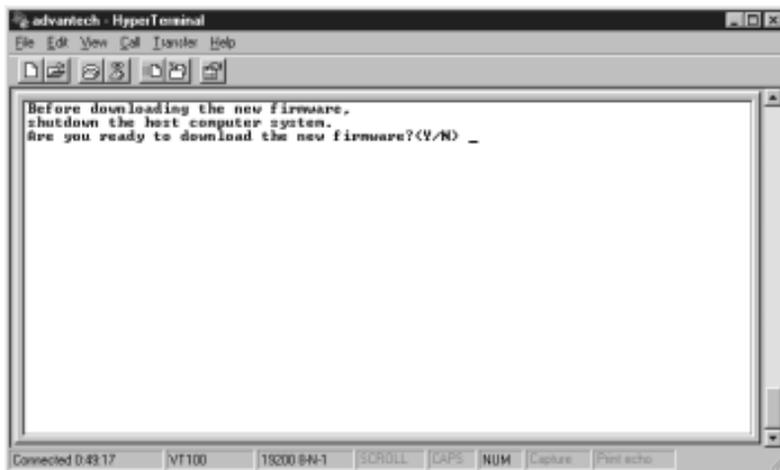Are you ready to download the new firmware?(Y/N) _

Figure 8-2: Typing <Y> to Download the New Firmware

The following message will appear.

Are you sure? (Y/N)

4. Type <Y>.

5. In the menu bar, select Transfer menu.

6. The Transfer scroll-down menu will appear. Select Send Text File.

7. The Send Text File dialog box will appear. Select the drive and file where the new firmware is located and click Open.

8. After the file has been completely transmitted, type <Go>.

```
Before downloading the new firmware,
shutdown the host computer system.
Are you ready to download the new firmware?(Y/N) Y
Are you sure? (Y/N) Y
Begin firmware file transfer now.
To abort download restart the RAID system.
0004B200
File transfer complete.
Checksum = 0x8E78 : OK.
New firmware transfer complete.
Enter 'Go' to update the firmware. Go
Enter 'Go' to reconfirm.
```

Figure 8-3: Typing <Go> After the File has been Transmitted

9. You will be asked to reconfirm. Type <Go> again.

```
Before downloading the new firmware,
shutdown the host computer system.
Are you ready to download the new firmware?(Y/N) Y
Are you sure? (Y/N) Y
Begin firmware file transfer now.
To abort download restart the RAID system.
0004B200
File transfer complete.
Checksum = 0x8E78 : OK.
New firmware transfer complete.
Enter 'Go' to update the firmware. Go
Enter 'Go' to reconfirm. Go
Programming...
count = 0000
Done!
Verifying..._
```

Figure 8-4: Typing <Go> Again

10. The controller will restart.

A

RAID Levels

This appendix describes the various RAID levels supported by RAID-800S.

The RAID-800S subsystem supports RAID level 0, 1, 0+1, 3 and 5. The following describes each of these levels.

A.1 RAID 0 (Striping)

Striping refers to the storing of a sequential block of incoming data across multiple drives in a drive group. This is the striping technique. If there are three drives in a drive group, the data will be separated into blocks. Block one of the data will be stored on drive one, block two on drive two and block three on drive three. Drive one will again be the location of the next block (block four), then block five is stored on drive two, block six on drive three, and so on. This method can significantly increase disk system throughput, particularly for transferring large, sequential data blocks.

A.2 RAID 1 (Mirroring)

Mirroring refers to the 100% duplication of data from one disk drive onto another. Each disk contains the mirror image of the data on the other drive.

A.3 RAID 0+1 (Striping and Mirroring)

Hard drives will be striped first, then mirrored. It requires at least 4 hard drives and the total number of hard drives must always be even.

A.4 RAID 3 (Striping with One Parity Hard Drive)

RAID level 3 requires at least three SCSI drives, one of which is solely used for storing parity information. It provides high transfer rate and high availability at a lower cost than mirroring but its transaction performance is poorer because all member disks operate in lockstep.

A.5 RAID 5 (Striping with Parity Information Distributed in All Hard Drives)

Striping with parity is a method of providing complete data redundancy that requires only a fraction of the storage capacity than mirroring for storing redundant information.

In a system configured under RAID 5 (which requires at least three SCSI drives), all data and parity blocks are divided between the drives in such a way that if any single drive is removed (or fails), the data on the missing drive can be reconstructed using the data on the remaining drives.

Technical Specifications

- Array Controller
- Configuration

B.1 Array Controller

Form factor	5 1/4" half-height
RAID processor	486DX
RAID level	0, 1, 0+1, 3 and 5
Cache memory	8MB-128MB
No. of channels (host+disk)	2+2 SCSI channels
No. of disks	7
Maximum storage	30GB-120GB
Host bus interface	Fast/Wide/Ultra
Disk bus interface	Fast/Wide/Ultra
Data transfer	Up to 40MB
MTBF (hrs)	>100,000

B.2 Configuration

Hot swap disk bays	7
Hot swap power supplies	2
Hot swap cooling fans	2
DB-9 type RS-232 ports	2 (modem and monitor port)
Security lock	Yes
Audible alarm	Yes
Fax notification	Yes (2 fax numbers)
Pager notification	Yes (2 pager numbers)

APPENDIX

C

RAID Controller's Error Messages

C.1 RAID Controller's Error Messages

Error Messages	Description
FAIL n	Disk failed. Number indicates the slot of the hard disk that failed to function.
FAIL Fan	The subsystem's Fan 1 or Fan 2 failed.
FAIL Power	The subsystem's Power 1 or Power 2 failed.
HOST CHAN FAIL	The RAID controller's Host channel failed.
DISK CHAN FAIL	The RAID controller's Device channel failed.
LOST DISKS	The controller is unable to detect previous RAID configuration in group, two or more disks (Level 0's one or more disks).

C.2 RAID Controller's Warning Messages

Warning Messages	Description
WARN n	Number indicates the slot of the hard disk that has too many bad sectors.

C.3 RAID Controller's Messages

Messages	Description
RAID READY	The RAID controller has at least one array group created and mapped to the LUN number of the Host channel.
NO HOST LUN	An array group has been created but not yet mapped to the Host channel.
NO RAID	The RAID controller has not been configured.

Mapping the LUN of the Host Channel to the Slices of an Array

This appendix shows an example of mapping LUN to Slices (D1/D2).

Mapping Principle

1. There are 2 Host channels connected to the RAID disk array subsystem, each channel can be connected with an external Host computer via the ULTRA WIDE SCSI interface.

2. Each host channel can be assigned with eight LUNs (Logical Unit Numbers - LUN 0 to LUN 7). Each LUN represents different application programs on the same Host.

3. There are a total of four arrays (Array 1 to Array 4), all allowed to be set up in one RAID-800S subsystem. Each array can be assigned the same or different RAID level (RAID 0, 1, 0+1, 3 or 5) .

4. Each array can then be partitioned into four Slices (Slice 1 to Slice 4). The concept of "Slice" is the same as partitioning a hard disk drive. Therefore each LUN on the host channel will be mapped to some of the Slices in an array.

5. In the example on the next page, 4 x 4GB HDDs are installed in the RAID-800S subsystem and are configured as Array 1 of Level 5. The total available disk capacity will be 12GB (4-1) x 4GB. That is distributing 4GB to Slice 1 and 8GB to Slice 2; then LUN 0 (AP1) on host channel 1 mapped to Slice 2 of Array 1 and LUN 1 (AP2) on host channel 1 mapped to Slice 1 of Array 1. Therefore the two APs on the same host use different Slices on the same RAID array (level). It's just like the host owning two complete independent hard disk drives (C and D drives).
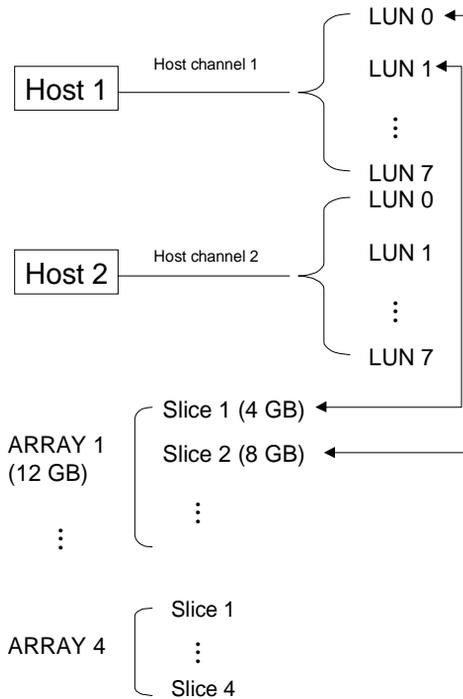
Figure D-1: An Example of the Mapping Principle

Frequently Asked Questions

Frequently Asked Questions

Q: Can an end user expand the cache memory?

A: We recommend that the memory expansion be done by Advantech because post-testing procedure is necessary after cache memory expansion.

Q: If a fan or power failure occurs, will the pager "beep" me or send me a fax to inform me of the problem?

A: NO! The system will page/fax alarm messages only if the hard disk drive fails. This function is enabled in the setup utility.

Q: Is it possible to have different capacities of hard disk drives?

A: YES! But the total capacity will be the smallest size of all hard disk drives multiplied by the number of hard disk drives in the RAID subsystem.

Q: Is it possible to on-line add a new hard disk drive into an empty slot or on-line change the RAID level?

A: You can on-line add a spare hard disk drive into an empty slot but it will not expand the total capacity of the RAID subsystem; this function will be available in the near future. On the other hand, on-line changing the RAID level is definitely not allowed.

Q: While dialing the pager through a modem, is it possible to use "," between digits to stop for a second?

A: YES! Especially when dialing out through PABX, it is necessary to use "," to wait for the PABX to catch the trunk. We also suggest that you fill the code field of the pager with "#,,,xxxxxxxx#". This will allow the RAID subsystem to wait for 3 seconds after the pager number is dialed out, then send out the "xxxxxxxx" eight digits that will be shown on the pager.

Q: Can RAID-800S support multi-host and multi-array - for example host1 deploys RAID level 1, and host2 deploys RAID level 5?

A: YES, RAID-800S supports these functions because it has two host channels and at most can create four arrays (levels).

Q: Can different LUNs (application programs) be mapped to the same slice of the same array?

A: NO! RAID-800S does not provide the database lock/unlock function therefore it is not recommended to map different LUNs to the same slice of the same array. (This kind of mapping is just like two different application programs accessing the same database without any control.)