SUPER●

AOC-SOZCR1

AOC-LPZCR1

AOC-LPZCR1/AOC-SOZCR1

All-In-One ZCR Card

USER'S GUIDE

Rev. 1.0a

Table of Contents

Chapter 1 Introduction

This manual is written for system integrators, PC technicians and knowledgeable PC users who intend to integrate Supermicro's Zero-Channel RAID solution into their RAID system. It provides detailed information for the installation and use of the AOC-LPZCR1/AOC-SOZCR1 All-In-One card that supports SAS/SATA/SCSI configurations in a slim-size card. The Supermicro AOC-LPZCR1/AOC-SOZCR1 offers an innovative, complete and cost effective solution to the ever-increasing demands of disk density and data integrity of today's servers.

1.1 Overview

The AOC-LPZCR1/AOC-SOZCR1 is a highly efficient, highly compatible and easy-to-use SAS/SATA/SCSI RAID Controller that allows the user to configure RAID 0, RAID 1, RAID 5, RAID 10 and JBOD by using Marvell's 88SX6041/-6081 (Hercules II), Adaptec's AIC-7901/-7902 Ultra 320 SCSI Controller or Adaptec's AIC-9410 SAS Controller on the motherboard. With the built-in Intel's Verde 400 MHz I/O Processor and 64 MB ECC DDR memory, the AOC-LPZCR1/AOC-SOZCR1 supports PCI-X speeds up to 100MHz and provides the user with a high-speed, space-saving, scalable and intelligent hardware RAID solution.

1.2 Introduction to SATA (Serial ATA) and SAS (Serial Attached SCSI)

Serial ATA(SATA) is a physical storage interface. It uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link which supports SATA transfer rates from 150MBps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA), SATA systems provide more efficient system cooling, faster data transfer and better functionality than Parallel ATA.

With the functionality provided by the onboard SAS controller, the AOC-LPZCR1/AOC-SOZCR1 offers unprecedented I/O throughput, reliability and scalability to the IT industry. In addition, with a dynamic serial-link transmission infrastructure built-in, the AOC-LPZCR1/AOC-SOZCR1 supports both SATA and SAS without any bridging, providing the user with unparalleled data storage expansion and inter-connectivity capability.

1.3 Product Features

(1) The AOC-SOZCR1 Series: (the Terminator Socket DIMM ZCR CARD):

• Slim design: pocket-size (3.2" H x 3.8" W)
• Intel's Verde I/O Processor @ 400MHz built-in
• 64 MB onboard ECC DDR memory
• 1 amp@ 3.3V

- Supports Marvell's Hercules II 88SX6081 (8-port)/88SX6041 (4-port) Host Controller
- Supports Adaptec's AIC-7901/-7902 Ultra 320 SCSI Controller and AIC-9410 SAS Controller
- RAID 0, RAID 1, RAID 5, RAID 10, RAID 50* and JBOD supported (*See Note 1 Below.)

(2) The AOC-LPZCR1 Series: (-Low Profile Skyhawk ZCR RAID Card)

- Low profile Form Factor (2.5" H x 6.6" W)
- Intel's IOP321 I/O Processor (Verde) @ 400MHz built-in
- 64 MB onboard ECC DDR memory
- 1 amp@ 3.3V
- RAID 0, RAID 1, RAID 5, RAID 10, RAID 50* and JBOD supported (*See Note 1 Below.)

(a) SAS (-based on the Adaptec AIC-9410 Host Controller)

- Supports Adaptec's AIC-9410 SAS Host Controller
- Supports PCI-X up to 100 MHz in the green slot (*See Note 2)

(b) SATA (-based on the Marvell Hercules II Controller)

- Supports Marvell's Hercules II 88SX6081 (8-port) or 88SX6041 (4-port) Host Controller
- Supports PCI-X slot up to 100MHz in the green slot (*See Note 2)

(c) SCSI (-based on the Adaptec AIC-7901 or AIC-7902Ultra 320 SCSI Controller)

- Supports Adaptec's AIC-7901/-7902 Ultra 320 SCSI Controller
- Supports PCI-X up to 100 MHz in the green slot (*See Note 2)

Operating Systems supported
* Windows 2000, Windows XP, and Windows 2003
* Linux: SuSE 9.0, SuSE 9.1, SuSE 9.2, Red Hat 3.0 and Red Hat 4.0
* Upgradable in the future.

Management support
* Adaptec's Storage Manager
* Adaptec Flash Utility
* Adaptec RAID Configuration Utility
* SAF-TE (*SCSI and SATA only)

Key RAID Features
* RAID detection, configuration, deletion, addition, and error detection
* Background initialization
* Hot-spare disk drive support for easy replacement
* Hot-spare disk drive support with automatic rebuild

(***Notes:**   **Note 1: RAID 50 is available for SAS only.**
              Note 2: Please install the ZCR card in the green slot.)

1.4 Contacting Supermicro

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	980 Rock Ave.
	San Jose, CA 95131 U.S.A.
Tel:	+1 (408) 503-8000
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Email:	marketing@supermicro.com (General Information)
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	Het Sterrenbeeld 28, 5215 ML
	's-Hertogenbosch, The Netherlands
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	4F, No. 232-1 Liancheng Road
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Tel:	+886-(2) 8226-3990
Fax:	+886-(2) 8226-3991
Web Site:	www.supermicro.com.tw

Technical Support:
Email: support@supermicro.com.tw

1.5 Product Compliance Information

The AOC-LPZCR1/AOC-SOZCR1 is compliant with the following product standards/requirements:

* USA: FCC 47 CFR, Part 15, subpart B

 * European Union: EN 55022

EN 55024

Chapter 2
Technical Specifications and Software Installation

2.1 AOC-LPZCR1 Card Layout and Jumper Locations

2.1.1 SUPER● AOC-LPZCR1 Card Layout and Jumper Locations

Front view (AOC-LPZCR1)
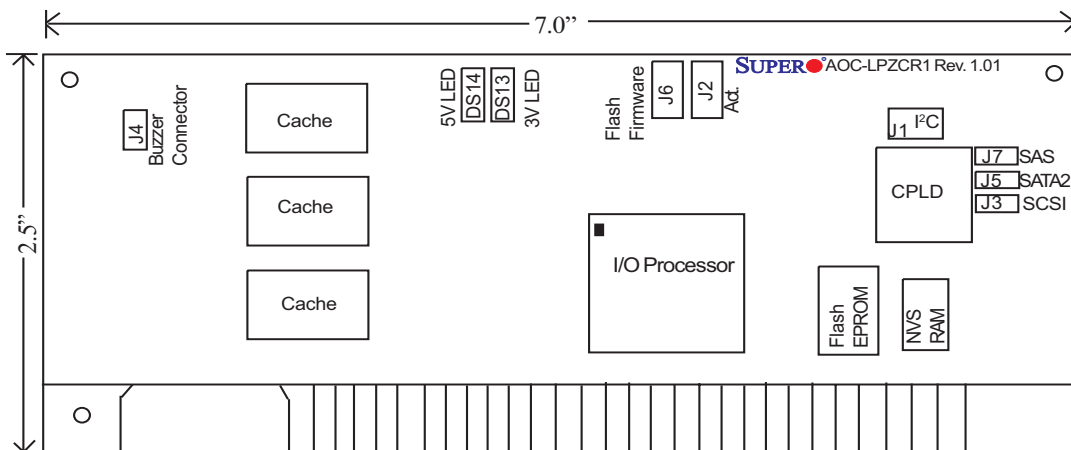
Rear view
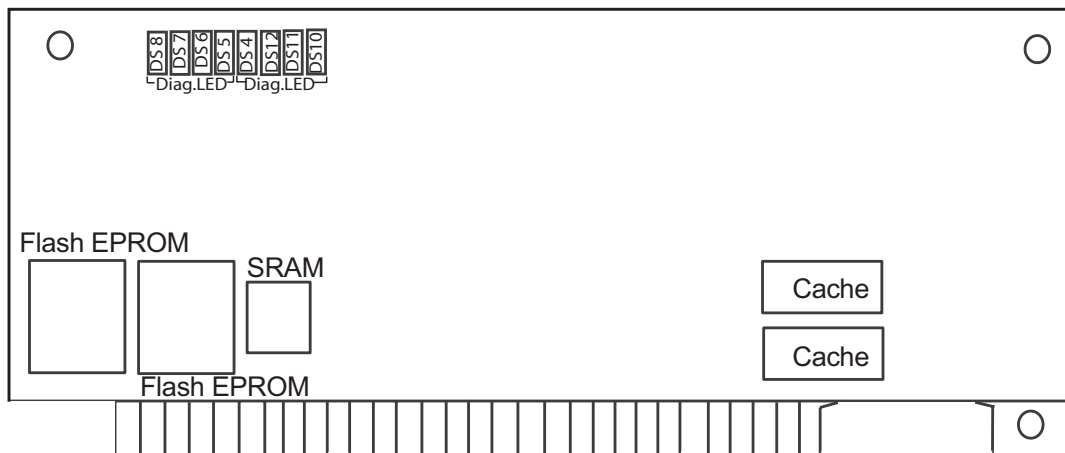
2.1.2 Jumper and Connector Descriptions (*AOC-LPZCR1)

Jumper   Description

J2	Activity LED Connector	(*See 2.1.3 for details)
J4	Buzzer Connector	(*See 2.1.3 for details)

Connector   Description

J1	Systerm Management Bus (I^{2}C) (*See I^{2}C cable connection on the next page.)
J3	SCSI Mode (On: Enable)
J5	Serial ATA Mode (SATA 2) Mode (On: Enable)
J6	Flash Firmware (On: Flashing Firmware)
J7	SAS Mode (On: Enable)
(DS10-12, DS4),(DS5-8)	Diagnostic LED Indicators

2.1.3 Connectors and LED Indicators (*AOC-LPZCR1)

Activity LED Indicator

Activity LED Indicator (J2), located on the front side of the AOC-LPZCR1 card, indicate the activity status of the AOC-LPZCR1 card. See the table on the right for pin definitions.

Activity LED Pin Definitions (J2)	
Pin#	Pin Definitions
Pin1	-(Negtive) or Cathod
Pin2	+(Positive) or Anode

Buzzer Connector

Buzzer Connector (J4), located on the front side of the AOC-LPZCR1 card, provides a connection for the onboard buzzer. See the table on the right for pin definitions.

Buzzer Connector Pin Definitions (J4)	
Pin#	Definitions
Pin1	+(Positive)
Pin2	-(Negtive)

SMB (I^{2}C)

A System Management Bus header is located at J1. Connect the I^{2}C cable here to utilize SMB on your add-on card (*See below). See the table on the right for pin definitions.

SMB (I^{2}C) Pin Definitions (J1)	
Pin Number	Definition
1	Data
2	Ground
3	Clock

I^{2}C Cable Connection

1. The I^{2}C Cable has a 3-pin connector on one end, and a 4-pin connector on the other end.

2. Connect the 3-pin connector of the cable to the 3-pin I^{2}C Connector (J1) on the AOC-LPZCR card as shown on the right.

3. Connect the 4-pin connector of the cable to the 4-pin I^{2}C Connector on the backplane as shown on the right.

3-Pin Connector (J1) on the LPZCR1   3-Pin Connector on the cable
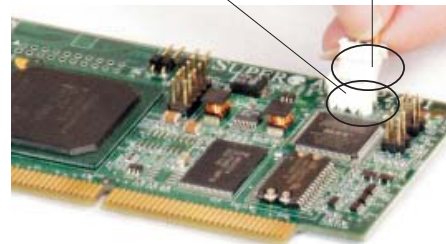
4-Pin I^{2}C Connector on the Backplane   4-Pin Connector on the cable
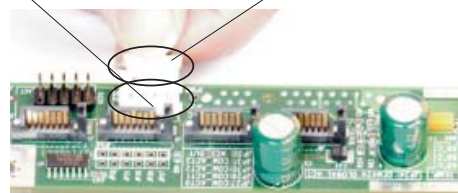
(*Note: Refer to the layout on Page 2-1 for the locations of the Connectors and LED Indicators.

2.2.1 SUPER⚫˚ AOC-SOZCR1 Card Layout and Jumper Locations

2.2 AOC-SOZCR1 Card Layout and Jumper Locations

Front view (AOC-SOZCR1)

Rear view (AOC-SOZCR1)
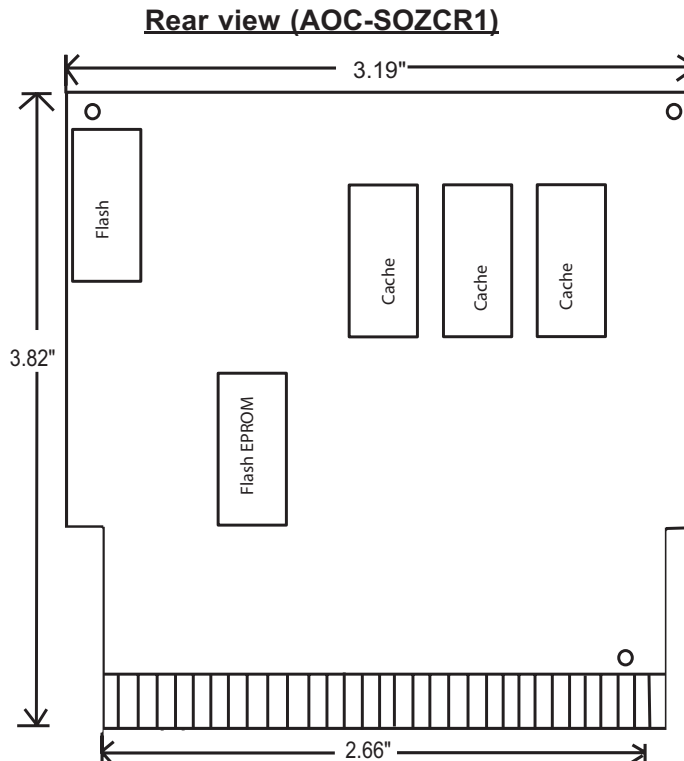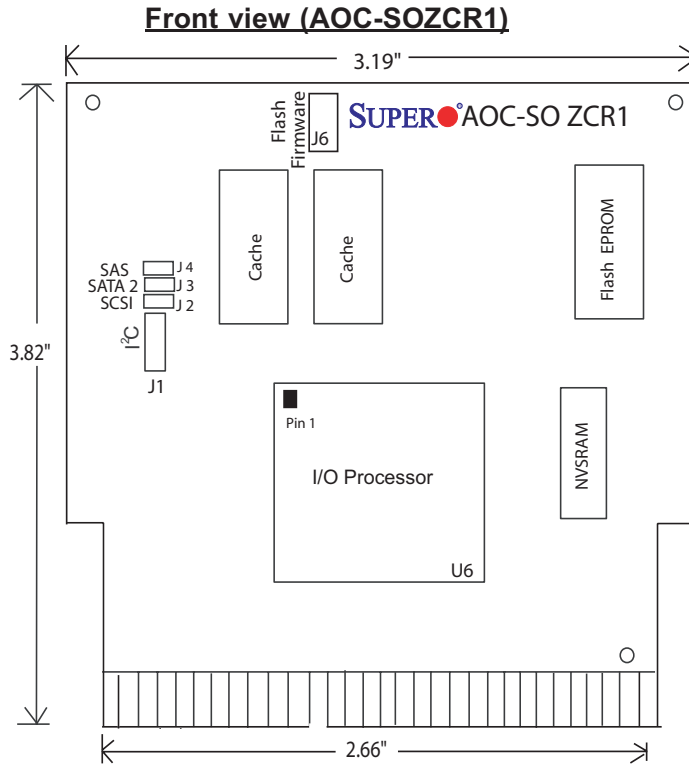
2.2.2 Connector and Header Descriptions (*AOC-SOZCR1)

Connector	Description
J1	Systerm Management Bus (I^{2}C) (*See Page 2-2 for I^{2}C cable connection.)
J2	SCSI Mode (On: Enable)
J3	Serial ATA (SATA2) Mode (On: Enable)
J4	SAS Mode (On: Enable)
J6	Flash Firmware (On: Flashing Firmware.)

2.2.3 SMB Connector and Pin Definitions (*AOC-SOZCR1)

SMB (I^{2}C)

A System Management Bus header is located at J1. Connect the I^{2}C cable here to utilize SMB on your add-on card (*See below). See the table on the right for pin definitions.

SMB (I^{2}C) Pin Definitions (J1)	
Pin Number	Definition
1	Data
2	Ground
3	Clock

I^{2}C cable Connection

1. The I^{2}C Cable has a 3-pin connector on one end, and a 4-pin connector on the other end.

2. Connect the 3-pin connector of the cable to the 3-pin I^{2}C Connector (J1) on the AOC-SOZCR1 card.

3. Connect the 4-pin connector of the cable to the 4-pin I^{2}C Connector on the backplane as shown on the right.

3-Pin Connector (J1) on the SOZCR1   3-PinConnector on the cable

4-Pin I^{2}C Connector on the Backplane   4-Pin Connector on the cable
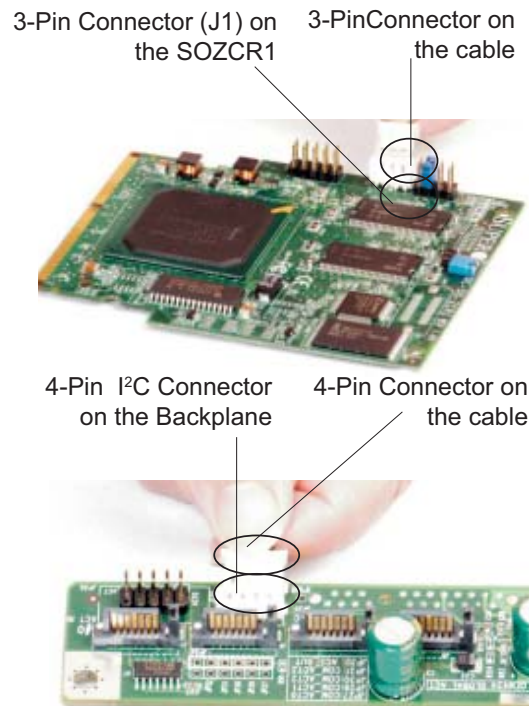
*Note 1: Refer to the layout on Page 2-4 for the locations of the Connectors and LED Indicators.

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2.3 Intelligent Interface Management: SAF-TE

Both AOC-LPZCR1 and AOC-SOZCR1 models offer the feature of SAF-TE. SAF-TE, (-SCSI Accessed Fault-Tolerant Enclosures Interface Specification), is a set of SCSI commands used to monitor hot-swap drives and inform the user of the status of these drives through LED indicators. Refer to the table below for details on SAF-TE LED Indicators.

(*__See Note 1 below__.)

| LED Indicator		Buzzer	Drive Status
Name	Signal		
All SAF-TE (RED) LEDs	On (about 5 seconds)	On (about 5 seconds)	Normal Power-On/bootup
SAF-TE (RED) LED	On (until the disk is rebuilt)	On (until the disk is rebuilt)	Disk Drive Failure
SAF-TE (RED) LED	Constant Blinking	Off	RAID Rebuilding
SAF-TE (RED) LED	Continuous Blinking: 2-long + pause	Off	Hot Spare Drive
SAF-TE Availability	SCSI, Hercules II		

(*__Notes__:

*__Note 1__: SAF-TE in the SATA Mode is available for OEM only. To support SAF-TE, you will need to have a Supermicro's SATA backplane with the Q-Logic GEM-424 Enclosure Management Controller pre-installed. By default, this function is disabled.

*__Note 2__: SES-2 Enclosure Management in the SAS Mode will be provided when available.)

2.4 Safety Guidelines

To avoid personal injury and property damage, please carefully follow all the safety steps listed below when accessing your system or handling the components:

ESD Safety Guidelines

Electric Static Discharge (ESD) can damage electronic components. To prevent damage to your system. it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

- Use a grounded wrist strap designed to prevent static discharge.

- Touch a grounded metal object before removing a component from the antistatic bag.

- Handle the RAID card by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.

- When handling chips or modules, avoid touching their pins.

- Put the card and peripherals back into their antistatic bags when not in use.

General Safety Guidelines

- Always disconnect power cables before installing or removing any components from the computer, including the RAID card.

- Use only the correct type of bracket for the chassis. Please use a full-height bracket for a 1U, 3U, 4U, Tower, or a Pedestal system. Use a low-profile bracket for a 2U or some of the proprietary chassis. Make sure to secure the bracket in the host system cabinet. (*Note: When used in a 1U system, the full-height bracket is mounted into the riser card.)

- Disconnect the power cable before removing the Extended LED cable, data cable or I^2C cable from the riser card.

- Make sure that the riser card is securely seated in the PCI slot to prevent damage to the system due to power shortage.

- Do not force a cable connector onto the controller or a drive.

2.5 Installing the Controller Driver

2.5.1 Creating the Driver Floppy Disk:

A CD-ROM that contains the drivers for the Windows OS, the Linux Red Hat/SuSE OS, and the Controller BIOS is included in the shipping package. Please locate the CD-ROM before installing the driver. (*Note: this CD-ROM does not perform Auto-boot or auto-play.)

For the Windows 32-bit Operating System:

• Copy all files from the folder: \Drive\Windows into a blank, formatted floppy disk. (The folder is saved in the CDROM that came with your shipment.)

For the Red Hat/SuSE Operating System:

• Make the floppy disk by using the diskette image file at \Drive\Linux, which is stored in the CD-ROM.

2.5.2 Adding the Driver into an Existing System

(*Note: An existing system is a system that has an operating system already installed and the AOC-LPZCR1/AOC-SOZCR1 driver is being installed as a Secondary Controller.)

For the Windows Operating System

a. Install the controller and make sure that its BIOS appears in POST.

b. Start the Windows OS. The Windows OS will launch the "Found New Hardware Wizard" and search for the installer driver.

c. Insert the driver floppy disk that you've created into the computer, select the floppy drive as the source, and press the <Enter> key.

d. Continue clicking <Next> until the driver is successfully installed.

e. Remove the driver disk from the FDD drive and restart the system to complete the installation process.

For the Red Hat/SuSE Operating System

a. Start the Red Hat/SuSE OS.

b. Insert and mount the RPM driver Floppy or CD.

c. Type:"rpm -Uvh filename.rpm" at the prompt, and then, follow the instructions given on the screen to install the driver. (*Note: filename=the file name of the RPM driver that appears on your screen.)

d. Run fdisk, mkfs, and create a mount point for the new driver.

2.5.3 Installing the Driver into a New System

(*Note: A new system is a system that has no operating system installed yet, and the AOC-LPZCR1/AOC-SOZCR1 driver installation is a part of the OS installation.)

For the Windows Operating System

a. Install the controller and make sure that its BIOS appears in POST.

b. Insert the Windows Setup CD and boot from it.

c. When prompted at the bottom of the screen to install a third party driver, press the <F6> key. (*Note: You have only 5 seconds to press <F6>. If you miss it, you will need to restart the system and repeat this step again.)

d. Insert the driver disk into the computer, and wait until you are prompted to install a driver. Press <S> to specify that the driver is included in an additional device--the floppy disk, and press <Enter>. (Refer to Page 2-7.)

e. When the Adaptec's driver disk--"Adaptec RAID Controller" is located, press <Enter>.

f. Press <Enter> again to continue with the Windows OS installation.

For the Red Hat Operating System

a. Install the controller and make sure that its BIOS appears in POST.

b. Boot from the Linux CD.

c. Type: "linux dd" at the prompt, and follow the instructions given on the screen to install the driver.

d. Remove the driver disk from the computer, and, then, restart the system to complete the installation.

For the SuSE Operating System

a. Install the controller and make sure that its BIOS appears in POST.

b. Boot from the Linux CD.

c. While the kernel is booting, press <Alt>.

d. When prompted, insert the Driver Floppy Disk to the floppy drive and press <Enter>.

e. Remove the driver disk from the computer, and, then, restart the system to complete the installation.

Notes

Chapter 3
RAID Configuration

After all the hardware has been installed in your system, you must first configure the Adaptec Embedded RAID Driver before you install the Windows operating system. The necessary drivers are all included on the Supermicro bootable CDs that came with your card.

(*Note: For the Adaptec RAID Configuration Utility to function properly, you will need to correctly setup the jumper settings of your add-on card first before using the Utility)

Configuring Jumper Settings

To properly configure the jumper settings, please follow the table listed below before using the Adaptec RAID Configuration Utility. For more detailed information on jumper settings and locations, please refer to Chapter 2.

SATA/SCSI Jumper Settings for the AOC-LPZCR1 (the Low-Profile Card)

AOC-LPZCR1				
Jumper/Function	J6	J5	J3	J7
To flash Firmware	On			
To enable SATA based on Hercules II		On		
To enable SCSI			On	
To Enable SAS				On
Note1: For jumper locations, please refer to Page 2-1 **Note2: For jumper description, please refer to Page 2-2**				

SATA/SCSI Jumper Settings for the AOC-SOZCR1 (the Socket Terminator Card)

AOC-SOZCR1				
Jumper/Function	J6	J3	J2	J4
To flash Firmware	On			
To enable SATA based on Hercules II		On		
To enable SCSI			On	
To Enable SAS				On
Note1: For jumper locations, please refer to Page 2-4 **Note2: For jumper description, please refer to Page 2-5**				

*Note 1: Refer to the layouts on Page 2-1 and Page 2-4 for jumper locations.

Using Adaptec's RAID Configuration Utility

The Adaptec RAID Configuration Utility includes the following major components:

1. Array Configuration Utility: this utility allows the user to create and manage arrays. You can also use this utility to initialize and scan disk drives.

2. SCSISelect Unity (or Serial/SATASelect): this utility allows the user to configure the control settings for disk drives.

3. Disk Utility: this utility allows the user to format and verify disk drives.

To Use the Adaptec RAID Configuration Utility

(*Note: the configuration procedures listed below are applicable to SAS, SATA and SCSI settings.)

To use the Adaptec RAID Configuration Utility, please follow the steps listed below:

1. Properly configure the jumper settings of your add-on card as indicated on page 3-1.

2. Enable the RAID function in the system BIOS. (*Please refer to the User's Guide that came with your system for system BIOS configuration.)

3. Turn on your computer. The BIOS screen as shown below will display during system bootup:


```
Adaptec SATA RAID BIOS V4.2-0 [Build 7341]
(c) 1998-2004 Adaptec, Inc. All Rights Reserved.

◄◄◄ Press <Ctrl><A> for Adaptec RAID Configuration Utility! ►►►

Booting the Controller Kernel......Controller started

Controller #00: Adaptec 2020ZCR at PCI Bus:02, Dev:01, Func:00
Waiting for Controller to Start....Controller started
Controller monitor V4.2-0[7341], Controller kernel V4.2-0[7341]
Controller POST operation successful
Controller Memory Size: 64 MB
```

4. At the prompt, press the <Ctrl> and <A> keys simultaneously to enter the Adaptec RAID Configuration Utility. The RAID Configuration Utility Main Menu (as shown below) will appear:
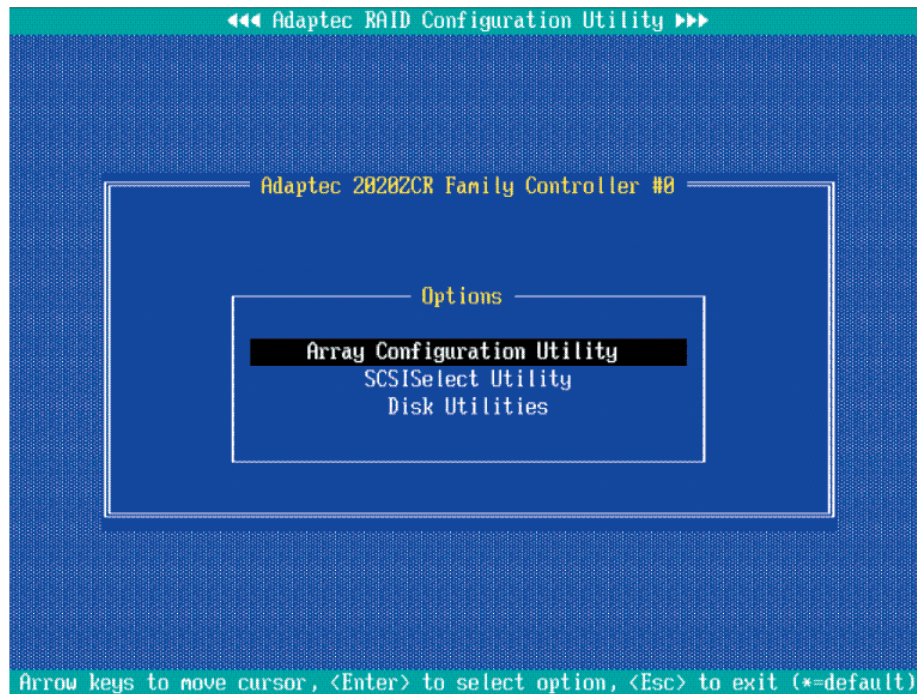
Figure 3.1 The RAID Configuration Utility Main Menu

3.1 Using the Array Configuration Utility

The Array Configuration Utility allows you to create, manage, delete arrays and hot spare disk drives.

1. Select "Array Configuration Utility" from the RAID Configuration Main Menu (Figure 3.1), and press <Enter>. The Array Configuration Main Menu will display as shown on the next page:

(*Note: You can use the arrow keys to highlight an item and then press the <Enter> key to select it. To return to the previous menu, press the <ESC> key.)
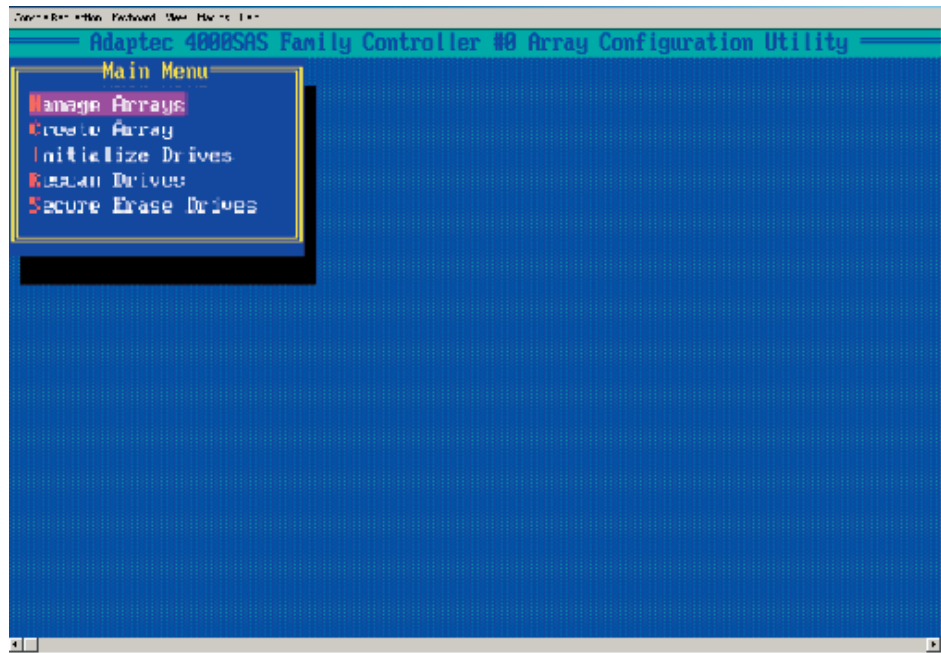
Figure 3.2 The Array Configuration Utility Main Menu

To Create Arrays

(*__Note:__ Make sure that the disks you want to use for the arrays are connected to your system and are initialized. A disk shown in the gray area is not initialized and cannot be used for an array. Please refer to the section "Initializing Disk Drives" for disk initialization.)

1. Turn on your computer. When prompted, press <Ctrl> and <A> to access the Adaptec RAID Utility.

2. From the RAID Configuration menu (Figure 3.1), select "Array Configuration Utility" and press <Enter>. The Array Configuration Utility Main Menu (Figure 3.2) will display.

3. Select "Create Array" and hit <Enter> as shown above. The Create Array submenu will display as shown on the next page:
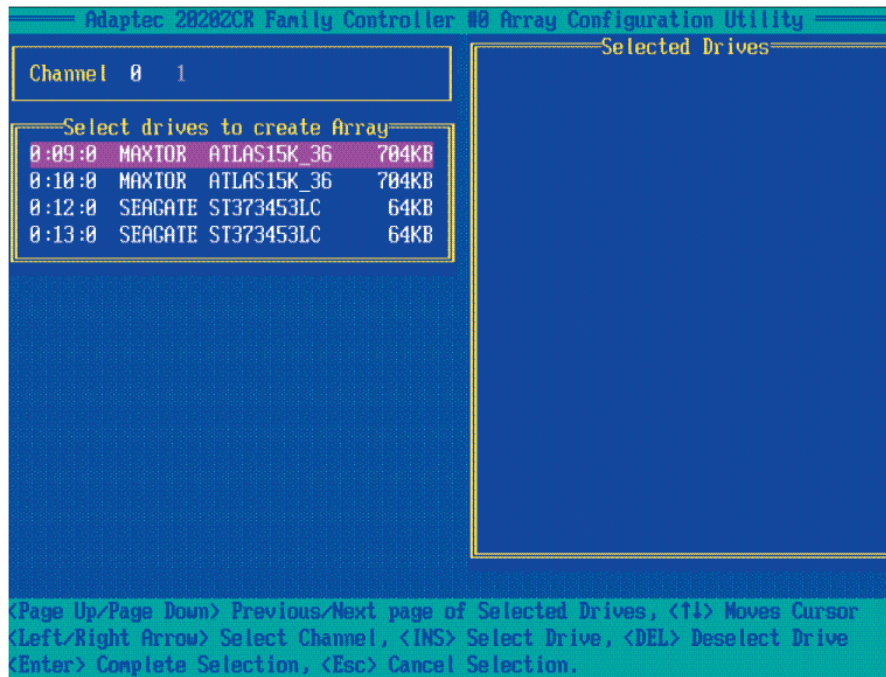
4. Use the arrow keys to highlight the channel(-the disk drive) you wish to create a new array, and press <Insert>.

 (*__Note__: To de-select any disk, highlight the disk and press __<Del>__.)

5. The disk drive that you've selected to create a new array will appear in the "Selected Drives" dialogue box as shown below:
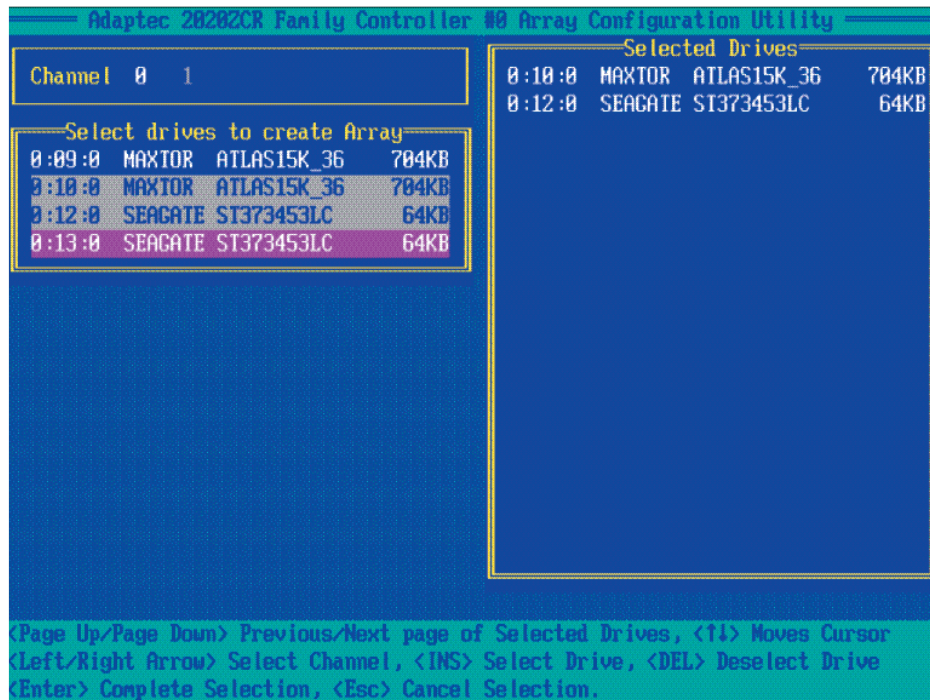
6. Once you've selected all the disk drives for new arrays, and all the drives selected have appeared in the "Selected Drives" dialogue box, press <Enter>. Then, a dialogue box showing array properties will display.

To assign properties to the new array

7. In the "Array Properties" dialogue box, select the item you want to configure and follow the instructions given on the screen to configure the settings for the selected item.

(For the RAID type--you can select Volume, RAID 0 or RAID 1. To configure RAID 0 or RAID 1, you will need to have at least two drive disks. Select "Volume" to configure a disk drive as an independent unit.)

8. Under "Arrays Label," you type in the name you wish to identify a disk drive, and press <Enter>.

9. For RAID 0, select the desired stripe size. (You can select: 16, 32, or 64 KB - default. Please do not change the default setting.)

10. You can also use the item "Create RAID via" to select the different methods under RAID 0 and RAID 1.

11. Press <Esc> to return to the previous menu.

(*Note: Once the array is created and its properties are assigned, you cannot change the properties by using Array Configuration Utility.)

To Manage Arrays

The item "Manage Arrays" allows you to view, delete, set a boot array and create hot spare drives.

1. Turn on your computer. When prompted, press <Ctrl> and <A> to access the Adaptec RAID Utility.

2. From the RAID Configuration menu (Figure 3.1), select "Array Configuration Utility" and press <Enter>. The Array Configuration Utility Main Menu displays as shown below:
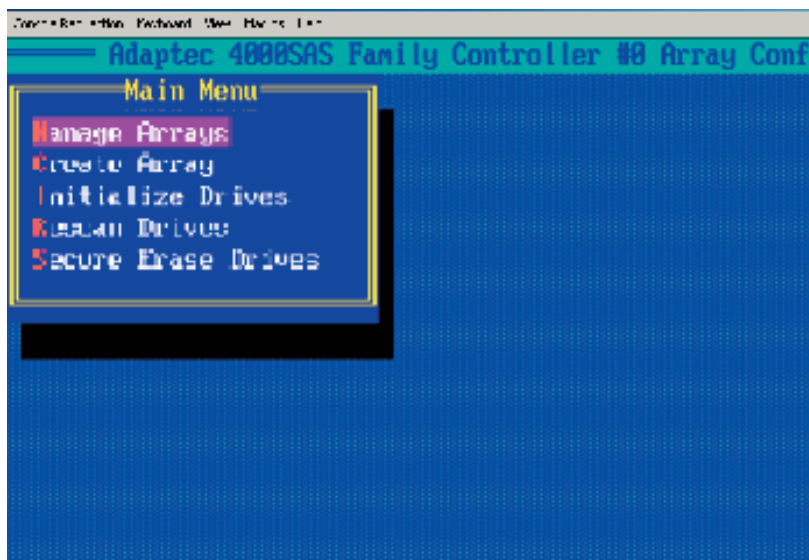
3. From the main menu, select "Manage Arrays" and press <Enter> to access the Manage Arrays submenu as shown below:

To View the properties of Existing Arrays

4. A dialogue box showing a List of Arrays will display on the right. Select the array you want to view as shown below:
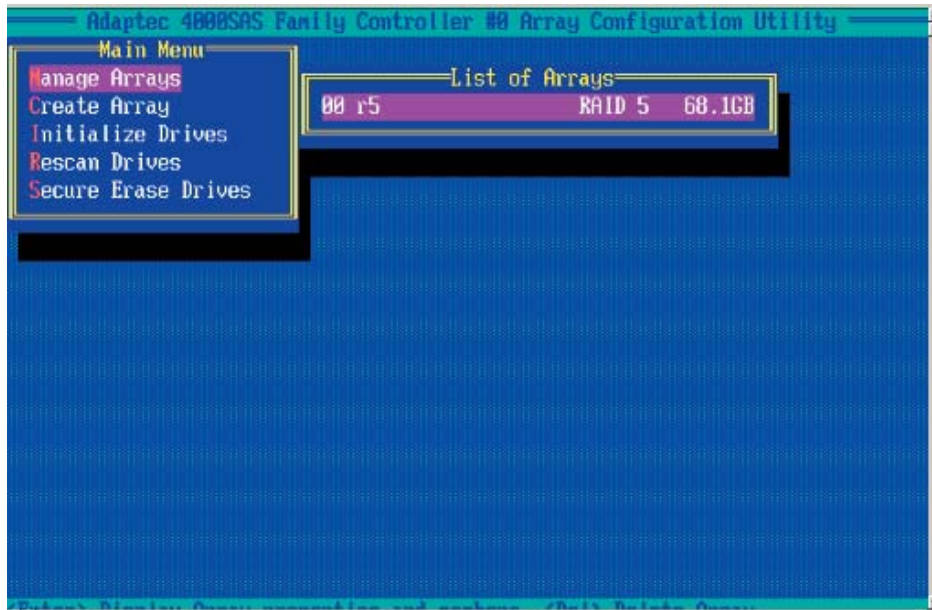
5. Press <Enter>, and the "Array Properties" dialogue box will display, showing detailed information. The physical disks associated with the array will also be displayed as shown in the screen below:

6. Press <Esc> to return to the previous menu.
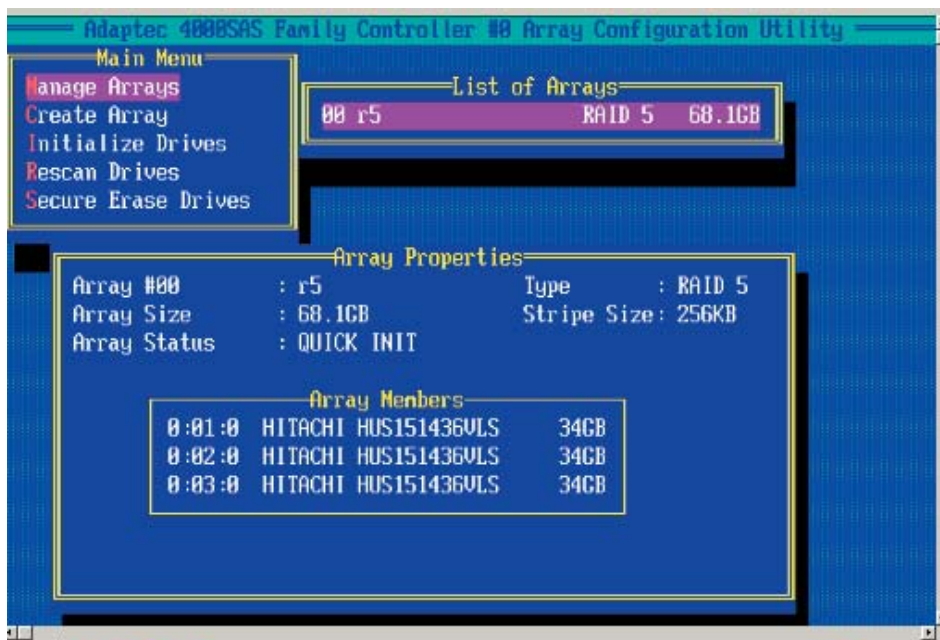
Deleting Arrays

⚠️ <u>Warning: To prevent data loss, please back-up your data before deleting arrays. You cannot restore a deleted array.</u>

1. On the Array Configuration main menu, select "Manage Arrays" and press <Enter> to access the submenu as shown below:
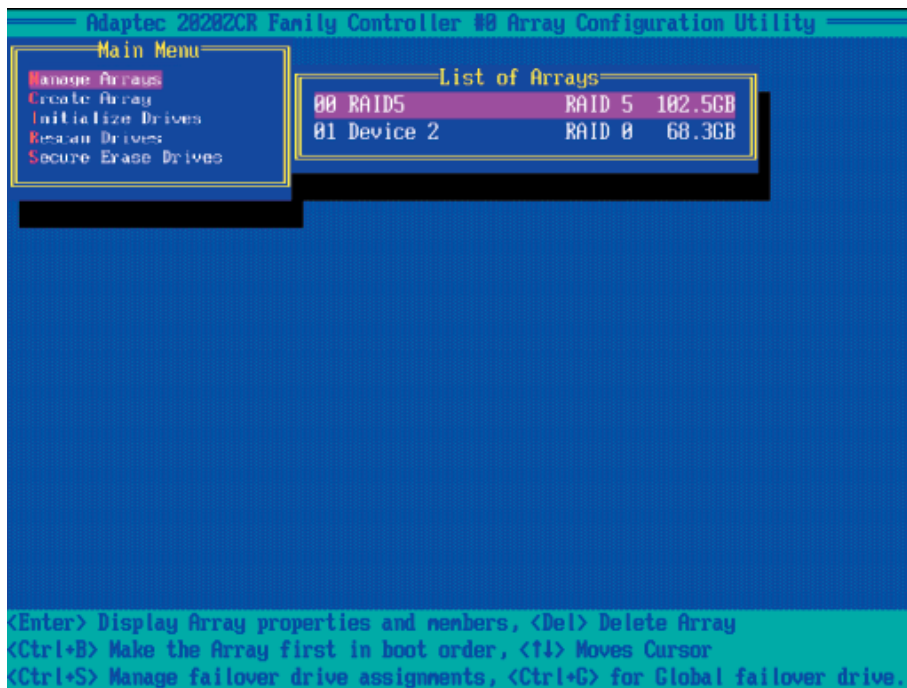
2. From the "List of Arrays" dialogue box (on the right), select the array you wish to delete and press <Del>.

3. The "Array Properties" dialogue box displays. In the "Properties" dialogue box, select <Delete> and press <Enter>. The following warning message will display:

Warning!! Deleting the array will erase all data from the Array. Do you want to continue? (Yes/No):

4. Press <Yes> to delete the array, or press <No> to cancel the selection.

5. Press <Esc> to return to the previous menu.

Setting a Bootable Array

1. From the Array Configuration Main menu, select "Manage Arrays" and press <Enter> to access the submenu as shown below:
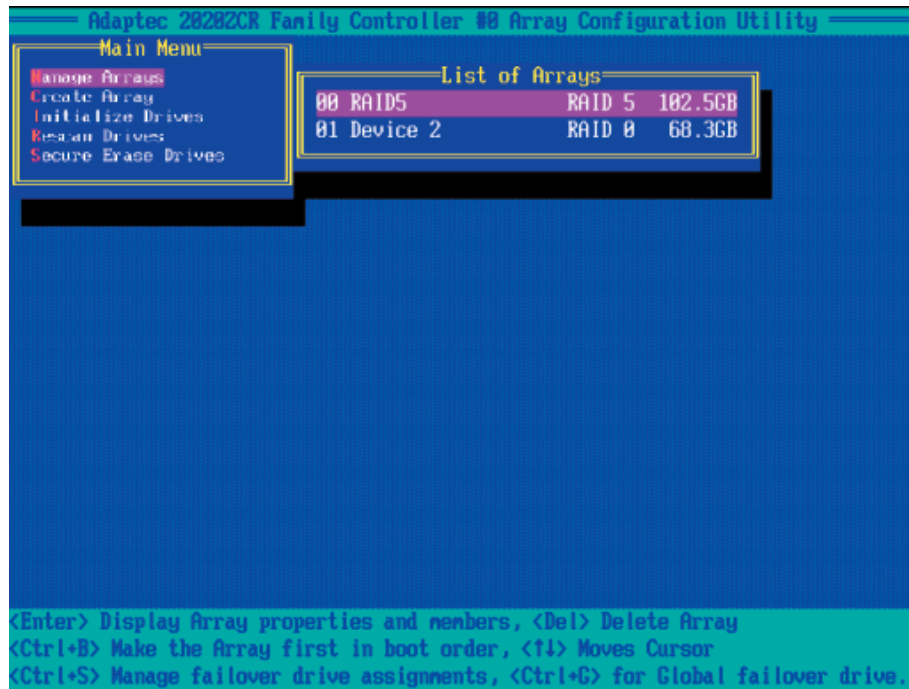
2. From the List of Arrays dialogue box (on the right), highlight and select the array you want to make as the first bootable, and press <Ctrl> and <B> simultaneously.

3. The array selected as the 1st bootable array will appear on the top (-the first) of the List.

4. To re-assign the 1st boot array to another disk drive, select the array you wish to configure, and press <Ctrl> and <B> simultaneously. The new 1st bootable array will appear on the top of the list.

5. Press <Esc> to return to the previous menu.

Adding a Hotspare Disk Drive

1. From the Array Configuration Utility Main menu, select "Manage Arrays" and press <Enter> to access the submenu as shown:
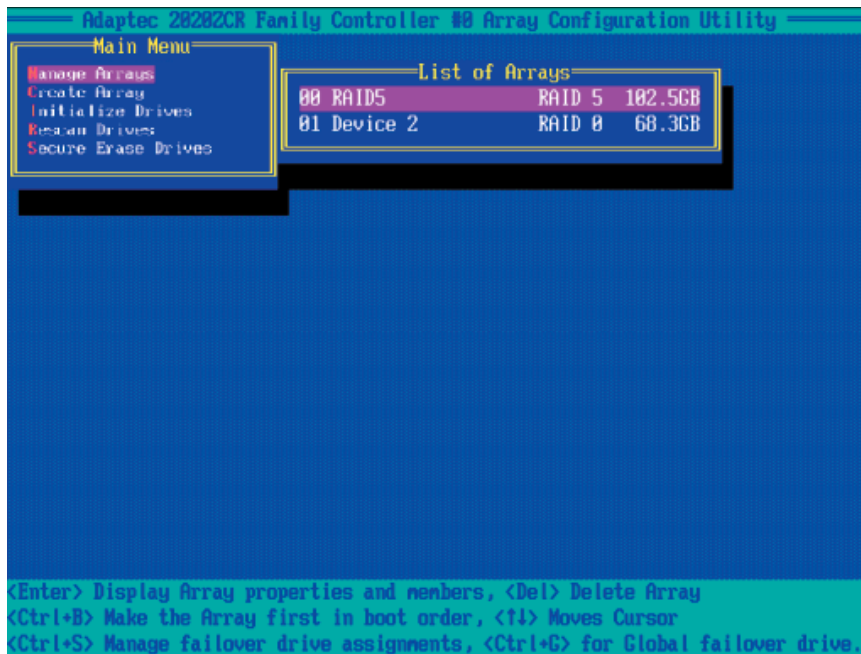
2. In the "List of Arrays" dialogue box (on the right), select the array you wish to configure as a hot spare and press <Ctrl> and <S> simultaneously.

3. A "Hotspares" dialogue box displays, showing the drives that can be config-ured as Hotspares.

4. Select the drive you wish to configure as a hotspare and press <Insert>. The drive selected will appear in the Assigned Hotspares List. Then, press <Enter>.

5. When prompted by a message, asking you if you want to confirm the selection, press <Yes> and <Enter> to configure the selected drive as a hotspare.

Deleting a Hotspare Disk Drive

1. From the Array Configuration Utility Main menu, select "Manage Arrays" and press <Enter>.

2. In the "List of Arrays" dialogue box (on the right), select the Hotspare array you wish to delete and press <Ctrl> and <S> simultaneously.

3. The "Hotspares" dialogue box displays, showing the drives that have been configured as Hotspares.

4. From the Assigned Hotspare List, select the drive you want to remove and press <Delete>.

5. The drive selected will appear in the Assigned Hotspares List. Then, press <Enter>.

6. When prompted by a message, asking you if you to confirm the selection, press <Yes> to delete the hotspare drive.

Initializing Disk Drives

Please be sure to initialize a disk drive before creating an array.

Caution: Initializing a disk will overwrite the partition table on the disk, making any data on the disk inaccessible. If the drive is used in an array, you may not be able to use the array again. You will also need to initialize a disk drive that is attached to a controller before using the disk drive in an array.
Do not initialize a disk that is part of a boot array since disk initialization will overwrite the data stored inside the disk. Refer to the item "*Viewing Array Properties" to* determine which disks are associated with a particular array.

To initialize Disk drives

1. Turn on your computer. When prompted, press <Ctrl> and <A> to access the Adaptec RAID Utility.
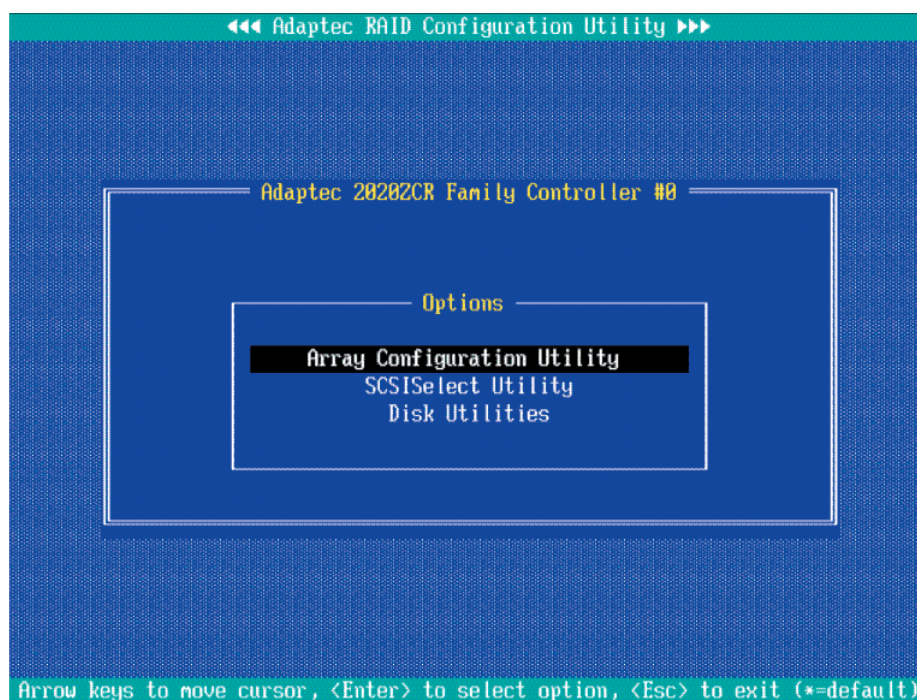
2. From the RAID Configuration menu (Figure 3.1), select "Array Configuration Utility" and press <Enter>. The Array Configuration Utility Main Menu (as shown above) will display.

```
===== Adaptec 20202CR Family Controller #0 Array Configuration Utility =====
     ┌─────Main Menu─────┐
     │ Manage Arrays     │
     │ Create Array      │
     │ Initialize Drives │
     │ Rescan Drives     │
     │ Secure Erase Drives│
     └───────────────────┘


Display, Delete the Arrays. Set the Boot Array. Assign Failover Drives.
```
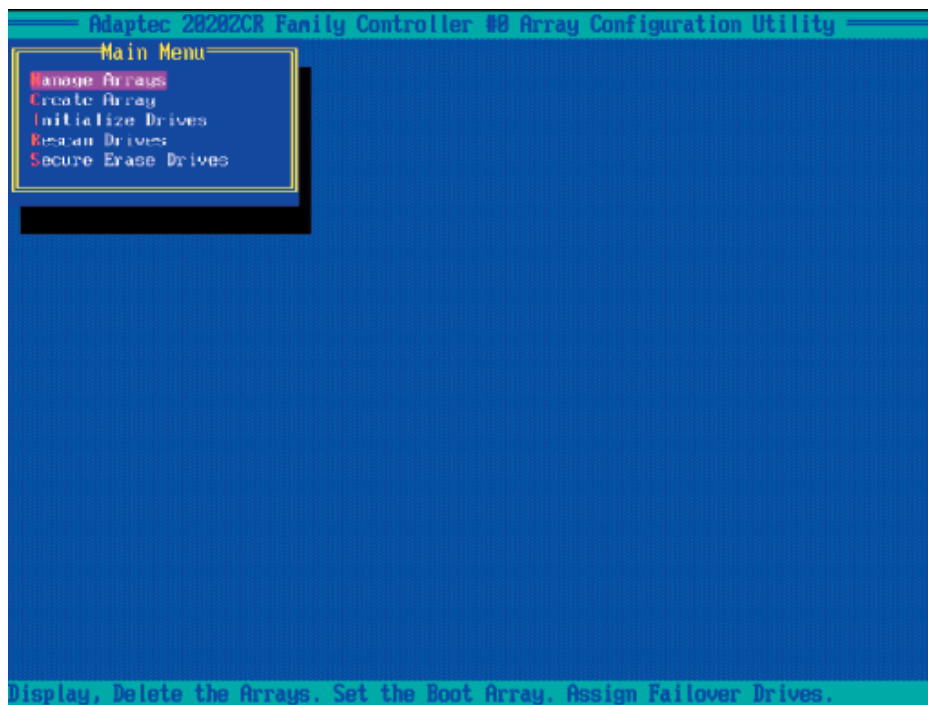
3. From the Array Configuration Utility Main Menu, select: "Initialize Drives" (as shown above) and press <Enter>. The following screen will display:


```
===== Adaptec 20202CR Family Controller #0 Array Configuration Utility =====
                                          ═Selected Drives═
┌─────────────────────────┐  ┌──────────────────────────────┐
│ Channel  0   1          │  │                              │
└─────────────────────────┘  │                              │
┌══Select drives for initialization══┐                      │
│ 0:09:0  MAXTOR  ATLAS15K_36   34.1GB │                    │
│ 0:10:0  MAXTOR  ATLAS15K_36   34.1GB │                    │
│ 0:12:0  SEAGATE ST373453LC    68.3GB │                    │
│ 0:13:0  SEAGATE ST373453LC    68.3GB │                    │
└─────────────────────────────────────┘



<Page Up/Page Down> Previous/Next page of Selected Drives, <↑↓> Moves Cursor
<Left/Right Arrow> Select Channel, <INS> Select Drive, <DEL> Deselect Drive
<Enter> Complete Selection, <Esc> Cancel Selection.
```
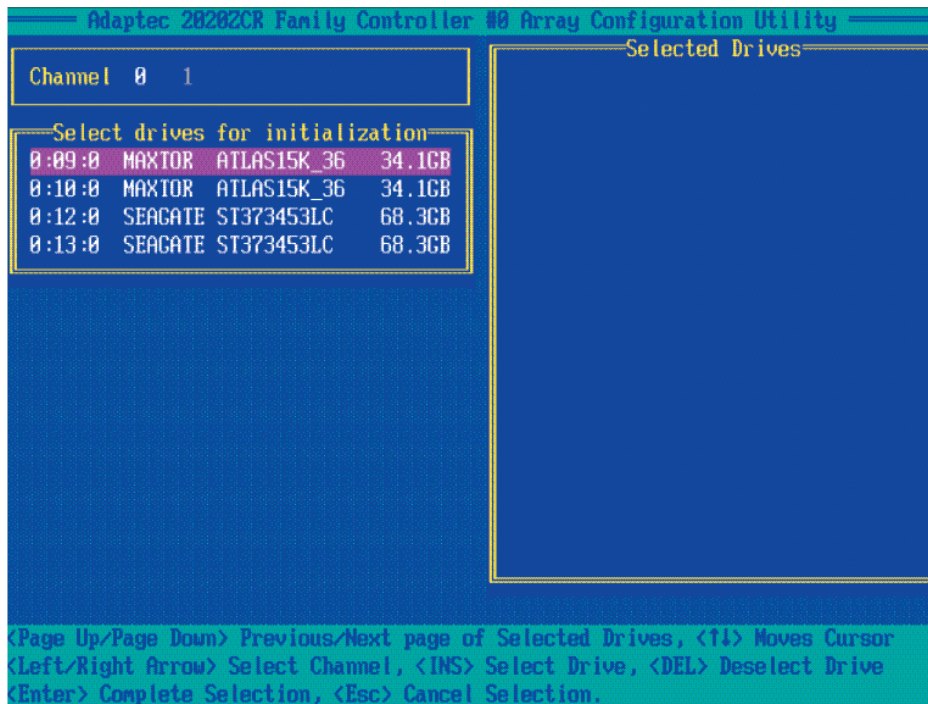
4. From the list of drives (on the left), select the disk drive you wish to initialize and press <Insert>. The drive will appear in the "Selected Drives" dialogue box as show on the next page:

```
═══ Adaptec 20202CR Family Controller #0 Array Configuration Utility ═══
                                              ═══Selected Drives═══
 ┌─────────────────────────────────┐         0:09:0  MAXTOR  ATLAS15K_36   34.1GB
 │ Channel  0   1                  │
 └─────────────────────────────────┘
 ┌═Select drives for initialization═┐
 │ 0:09:0  MAXTOR  ATLAS15K_36  34.1GB│
 │ 0:10:0  MAXTOR  ATLAS15K_36  34.1GB│
 │ 0:12:0  SEAGATE ST373453LC   68.3GB│
 │ 0:13:0  SEAGATE ST373453LC   68.3GB│
 └──────────────────────────────────┘



 <Page Up/Page Down> Previous/Next page of Selected Drives, <↑↓> Moves Cursor
 <Left/Right Arrow> Select Channel, <INS> Select Drive, <DEL> Deselect Drive
 <Enter> Complete Selection, <Esc> Cancel Selection.
```

5. Repeat the step above to select all the drives you wish to initialize. When all the drives to be initialized are selected, press <Enter>, and a warning message will display as shown below:


```
═══ Adaptec 20202CR Family Controller #0 Array Configuration Utility ═══



           ┌────────────────────────────────────────────────────┐
           │ Warning!! Initialization will erase all Array information │
           │ from the selected drives. Any Array using any of these drives │
           │ as members will be affected. Do you want to continue?(Yes/No):_ │
           └────────────────────────────────────────────────────┘
```
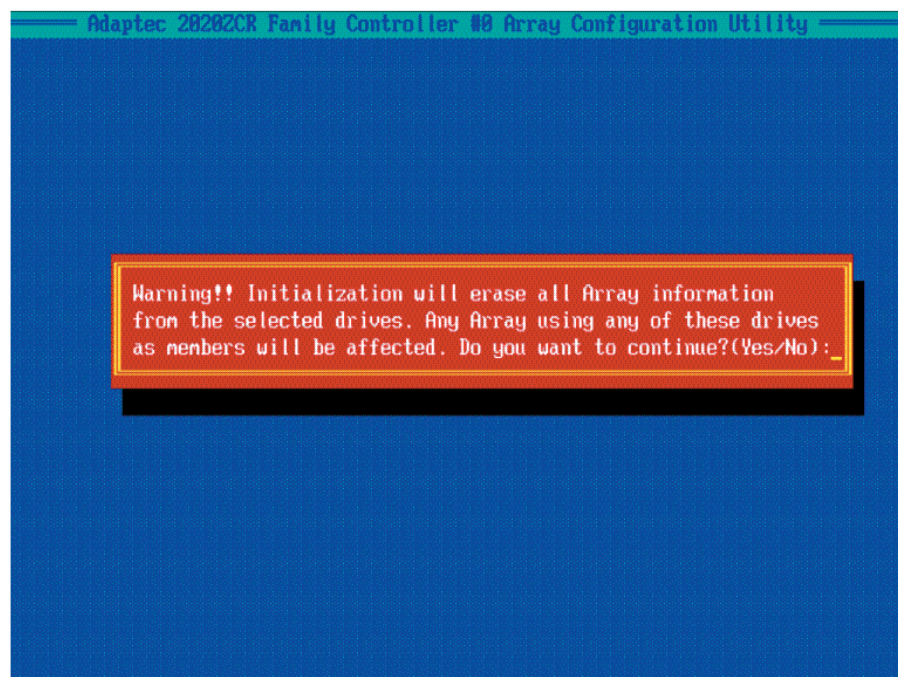
6. Make sure that you have selected the correct disk drives to initialize. If correct, type <Y> to proceed with the disk drive initialization. Type <N> to return to the previous menu.

Rebuilding Arrays

Note: If there is an interruption during array building or disk initialization, you can rebuild an array. You can only configure RAID 1 for array rebuild. If a hard disk fails and there is no hot spare array available, you will need to create a hot spare drive first before creating an array. (Refer to "Creating HotSpare Drives" for more information.)
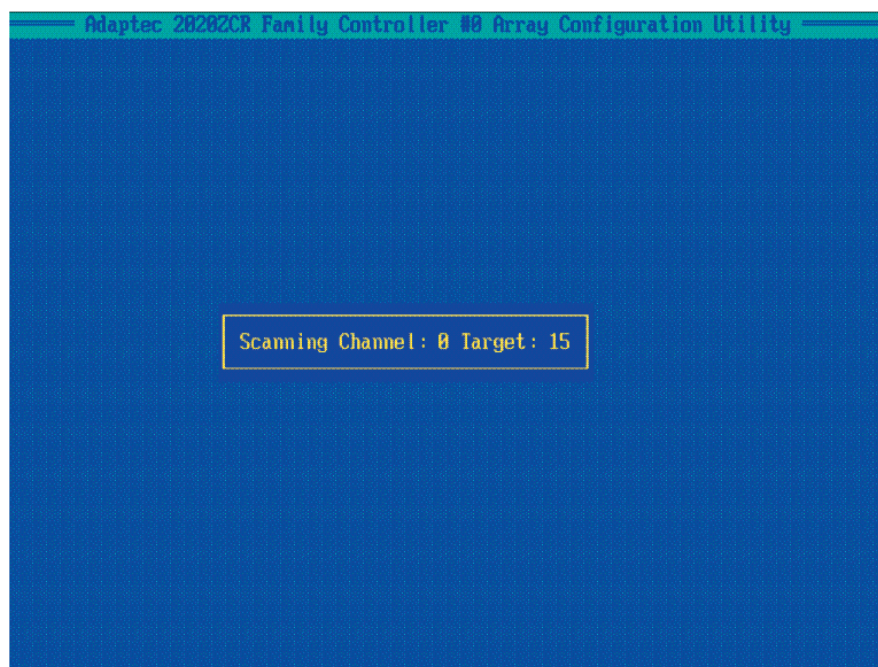
To Rebuild an array:

1. From the main menu, select Manage Arrays. From the list of arrays, select the array you want to rebuild.

2. Press **<**Ctrl> and <R> simultaneously to rebuild an array.

To Rescan Disk drives

1. Power on your system. When prompted, press <Ctrl> and <A> simultaneously to access the Array Configuration Utility.

2. When the Array Configuration Utility Main Menu appears, select "Array Configuration Utility" and press <Enter>. The following screen will display:
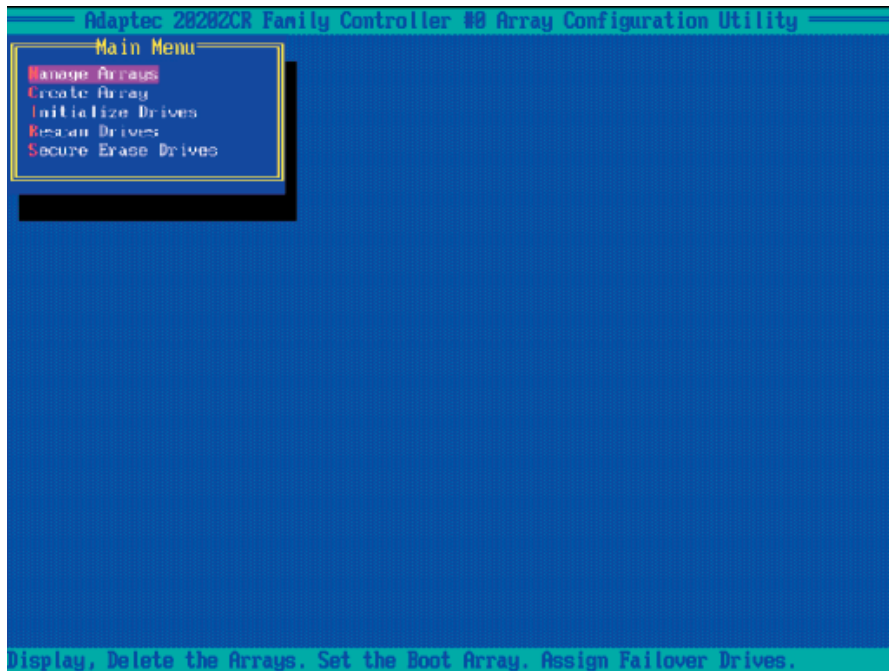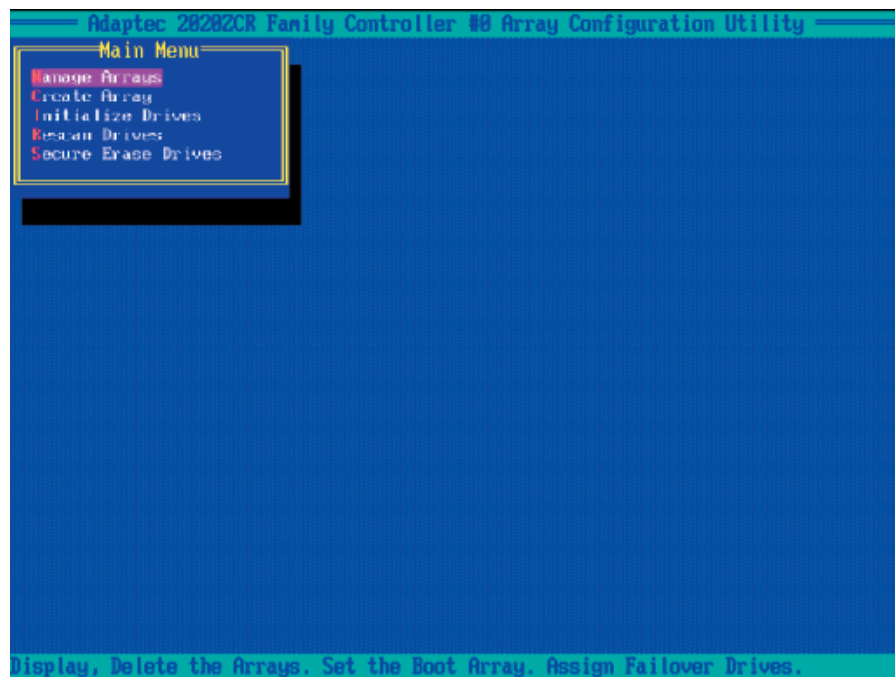

3. From the Array Configuration Main Menu appears, select "Rescan Drives" and press <Enter>. The Array Configuration Utility starts to rescan the selected disk drives as shown in the screen on the next page:

```
━━ Adaptec 2020ZCR Family Controller #0 Array Configuration Utility ━━
```

```
         ┌─────────────────────────────┐
         │ Scanning Channel: 0 Target: 15 │
         └─────────────────────────────┘
```

4. When finished, press <Esc> to return to the previous menu.

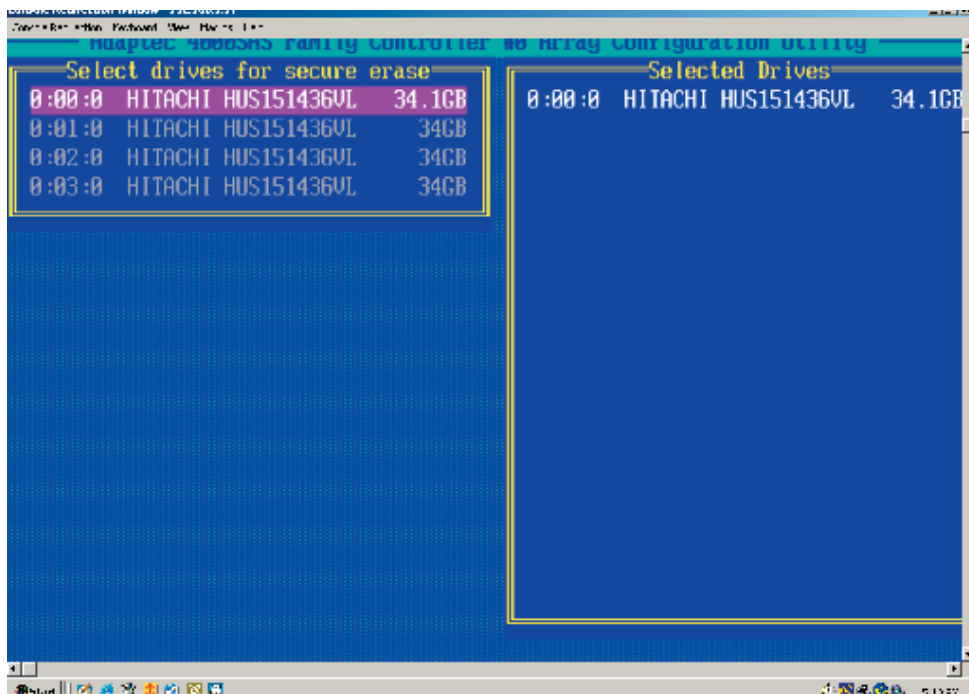### To Secure Erase Drives

1. Power on your system. When prompted, press <Ctrl> and <A> simultaneously to access the Array Configuration Utility.

2. When the Array Configuration Utility Main Menu appears, select "Array Configuration Utility" and press <Enter>. The following screen will display:


```
━━ Adaptec 2020ZCR Family Controller #0 Array Configuration Utility ━━
    ┌───Main Menu───────┐
    │ Manage Arrays     │
    │ Create Array      │
    │ Initialize Drives │
    │ Rescan Drives     │
    │ Secure Erase Drives │
    └───────────────────┘
```

```
Display, Delete the Arrays. Set the Boot Array. Assign Failover Drives.
```

3. From the Main Menu appears, select "Secure Erase Drives" and press <Enter>. The following screen will appear:
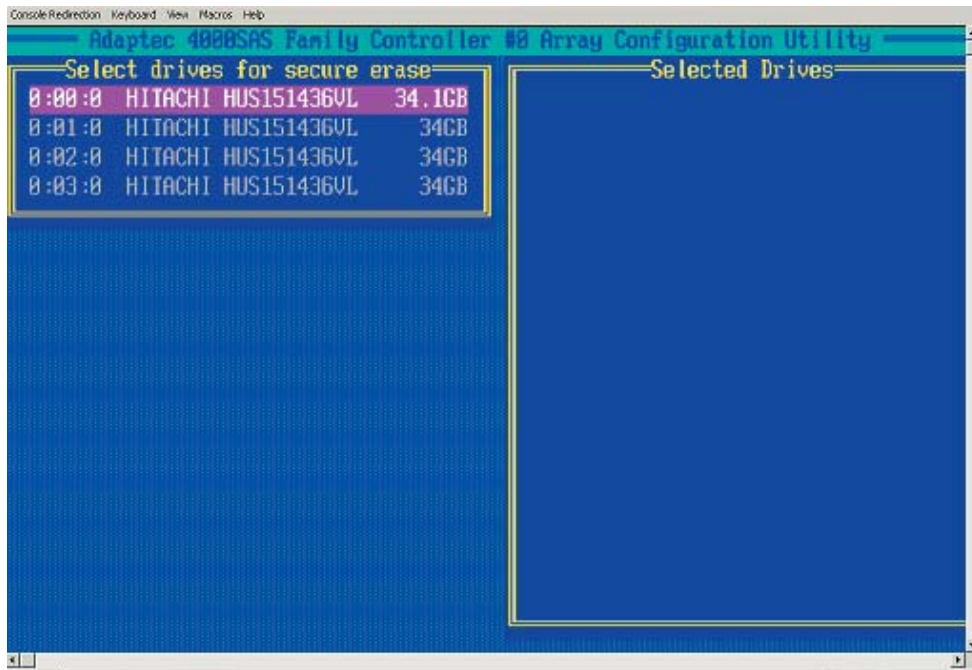
4. Use the up and down arrows to select the drive you wish to erase and press <Insert>. The following screen displays:


5. Make sure that the drive selected is the correct one; then, press <Enter>.

6. The following message displays: "Warning! Secure Erase will erase all information from the selected drive. Do you really want to continue?" Press <Y> to erase the drive. Press <N> to abort the procedure and return to the main menu.

3.2.1 Using Adaptec's SCSISelect Utility

(*<u>Please refer to Page 3-1 for SCSI Jumper Configuration before using the SCSISelect Utility</u>. Please refer to Section 3.2.2 for SATA, and Section 3.23 for SAS Utility Configuration settings.)

1. Turn on your computer. When prompted, press <Ctrl> and <A> to access the Adaptec RAID Utility.

2. From the RAID Configuration menu, select "SCSISelect Utility" and press <Enter> as shown below.
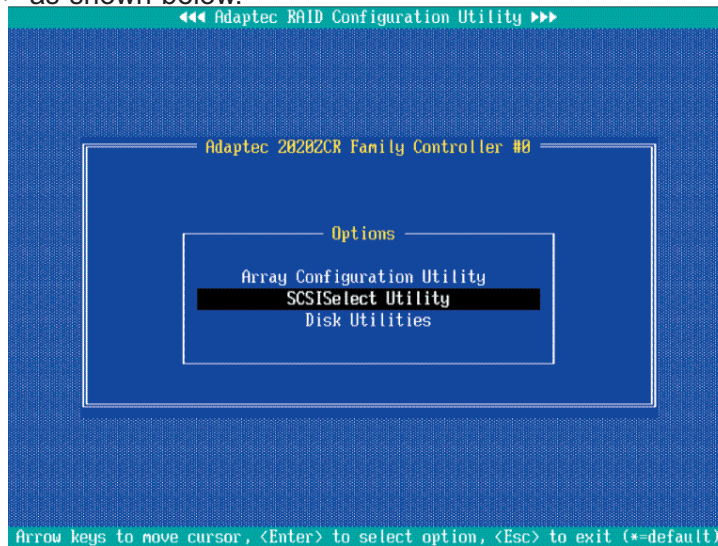
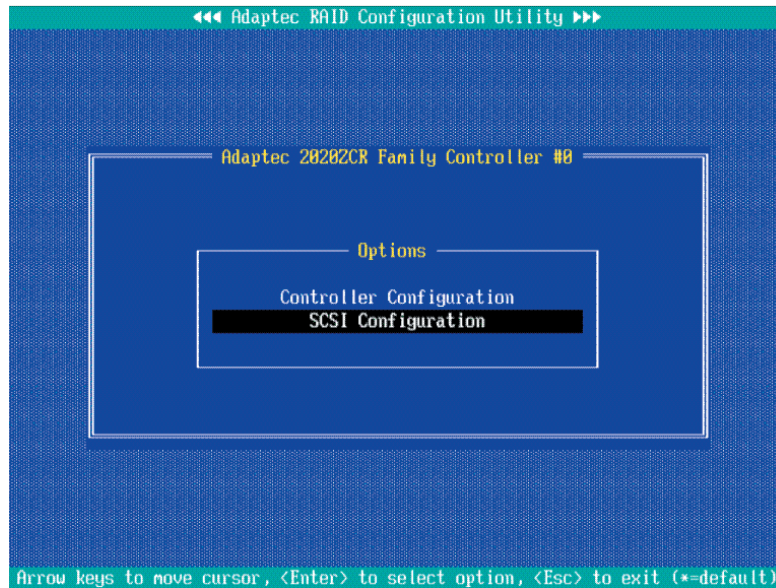**<u>Using the Controller Configuration Utility</u>**

3. To configure the RAID Controller or view Controller settings, select "Controller Configuration" from the SCSISelect sub-menu and press <Enter>. The Controller Configuration will be displayed as shown below:
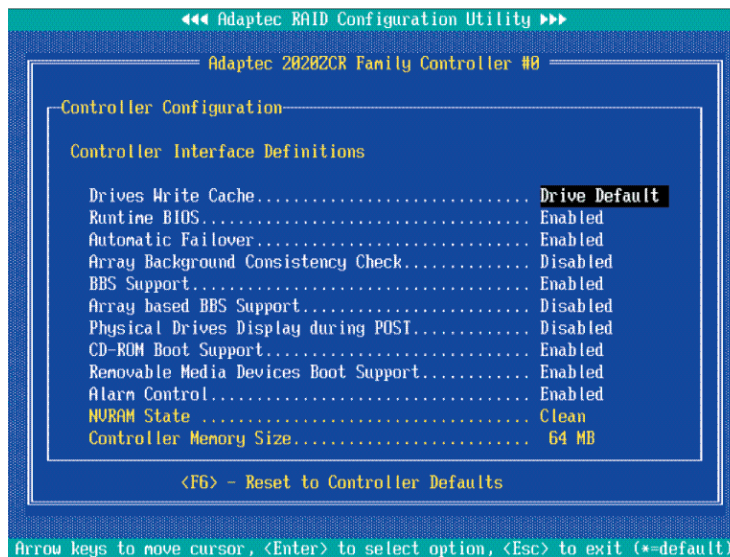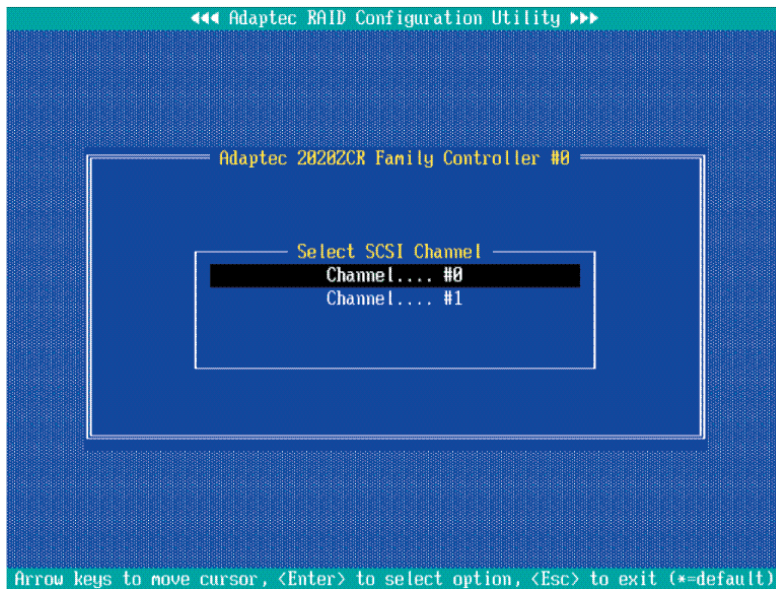

4. Use the arrow keys to select the item to configure and press <Enter>. A dialogue box showing the controller interface definition appears.

5. Select the desired option in the dialogue box and press <Enter>.

6. Press <F6> to restore the default setting. Press <Esc> to return to the previous menu.

Using the SCSI Configuration Utility

1. From the Array Configuration Utility Main Menu, select "SCSISelect Utility" and press <Enter>.

```
◄◄◄ Adaptec RAID Configuration Utility ▶▶▶
```
```
┌─ Adaptec 2020ZCR Family Controller #0 ─┐



         ┌──── Options ────┐
           Controller Configuration
           SCSI Configuration



```
```
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)
```

2. From the SCSISelect Sub Menu, select SCSI Configuration (as shown above) and press <Enter> to access the submenu as shown below:

```
◄◄◄ Adaptec RAID Configuration Utility ▶▶▶
```
```
┌─ Adaptec 2020ZCR Family Controller #0 ─┐



         ┌── Select SCSI Channel ──┐
            Channel.... #0
            Channel.... #1



```
```
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)
```
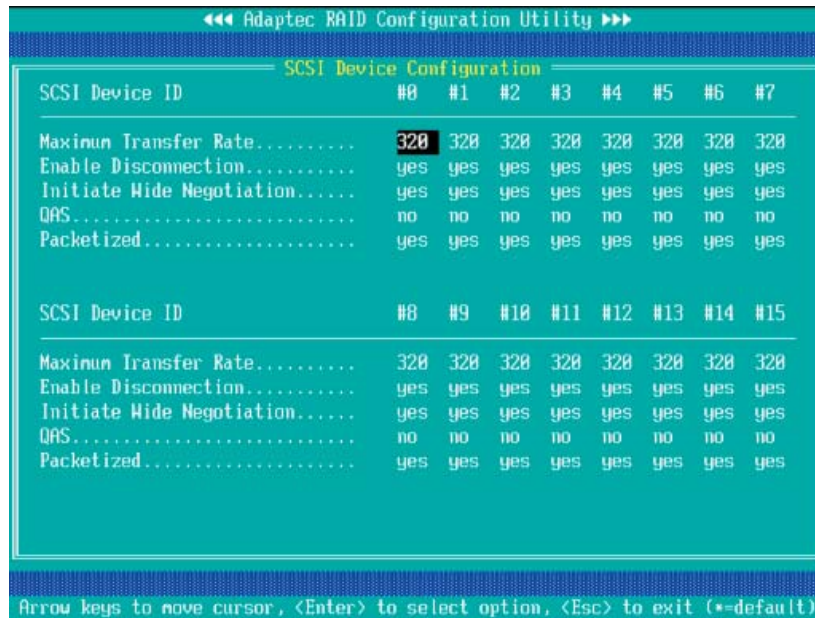
3. Use the arrow keys to select the item and press <Enter>. The status of the selected channel displays as shown on the next page:
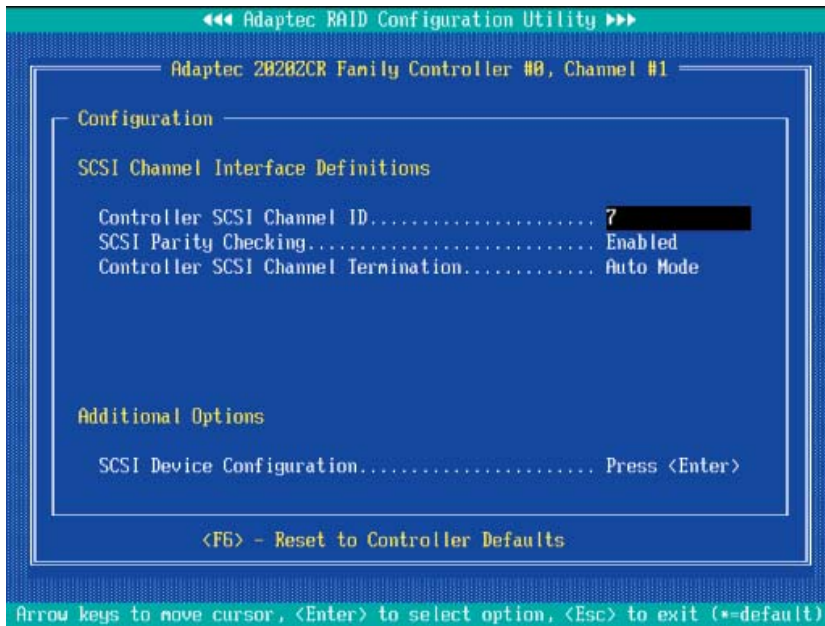
4. To configure an item, use the arrow keys to select the item and press <Enter>. A dialogue box will appear, showing the status of the item.

5. Use the arrow keys to select the desired option and press <Enter> to change the setting of an item. The following screen serves as an example:
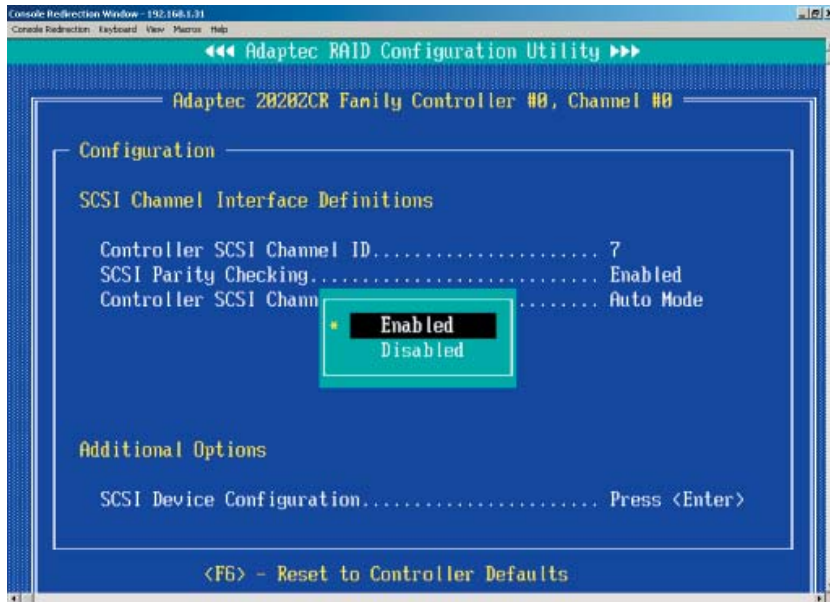
6. To view the status of the SCSI drives or to configure SCSI drives, use the arrow keys to select SCSI Device Configuration (under "Additional Options"), and press <Enter>. The current settings of the selected drive will be displayed as shown on the next page:

7. To change the setting of an item, use the arrow keys to select the item and press <Enter> in the menu as shown above. (*Please refer to the table below for detailed information.)

Setting	Description	Default
Maximum Transfer Rate	Defines the maximum. transfer rate for the SCSI channel	N/A
Enable Disconnection	Determines if the SCSI device can be disconnected from the SCSI Channel	Yes
Initial Wide Negotiation	Determines if the data transfer rate for the SCSI channel shall be 16-bit instead of 8-bit	Yes
QAS (Quick Arbitration & Selection)	Determines if QAS shall be used to minimize overhead and to speed up data transfers on the SCSI bus.	No
Packetized (Encapsulation)	Determines if SCSI Packetized shall be used to minimize overhead and speed up data transfer. If so, SCSI Packetized will allow command and status information will be transferred at the maximum rate.	Yes

8. To restore the default setting, press <F6>. Press <Esc> to return to the previous menu.

3.2.2 Using Adaptec's SATASelect Utility

(*Please refer to Page 3-1 for SATA Jumper Configuration before using the SATASelect Utility. Please refer to Section 3..2.1 for SCSI and Section 3.2.3 for SAS Utility Configuration settings.)

To Use the SATASelect Utility

1. Turn on your computer. When prompted, press <Ctrl> and <A> to access the Adaptec RAID Configuration Utility.

2. From the RAID Configuration main menu (Figure 3.1), select "SATASelect Utility" and press <Enter>.

Using the Controller Configuration Utility

3. To configure the SATA RAID Controller or view the settings, select "Controller Configuration" from the sub-menu and press <Enter>.

5. To configure an item on the submenu, use the arrow keys to select the item and press <Enter>. A dialogue box will appear.

5. Select the desired setting in the dialogue box and press <Enter> to select the option.

6. Press <F6> to restore the default setting. Press <Esc> to return to the previous menu.

Using the SATA Configuration Utility

1. Turn on your computer. When prompted, press <Ctrl> and <A> to access the Adaptec RAID Configuration Utility.

2. From the RAID Configuration main menu (Figure 3.1), select "SATASelect Utility" and press <Enter>.

Using the Controller Configuration Utility

3. From the SATASelect Sub Menu, select SATA Configuration and press <Enter>. The status of SATA Device Configuration will display.

4. Use the arrow keys to select the item you wish to configure and press <Enter>. A option dialogue box will display.

5. Use the arrow keys to select the desired setting and press <Enter>.

6. Press <F6> to load the default setting. To return to the previous menu, press <Esc>.

(***Note**: Refer to Section 3.2.4 on Page 3-24 for Physical Configuration Settings.)

3.2.3 Using Adaptec's Serial Select Utility

(*Please refer to Page 3-1 for SAS Jumper Configuration before using the Serial_Select Utility. Please refer to Section 3..2.1 for SCSI and Section 3.2.3 for SAS Utility Configuration settings.)

To Use the Serial_Select Utility

1. Turn on your computer. When prompted, press <Ctrl> and <A> to access the Adaptec RAID Configuration Utility.

2. From the RAID Configuration main menu (Figure 3.1), select "Serial_Select Utility" and press <Enter>.

Using the Controller Configuration Utility

3. To configure the SAS RAID Controller or view the settings, select "Controller Configuration" from the sub-menu and press <Enter>.

5. To configure an item on the submenu, use the arrow keys to select the item and press <Enter>. A dialogue box will appear.

5. Select the desired setting in the dialogue box and press <Enter> to select the option.

6. Press <F6> to restore the default setting. Press <Esc> to return to the previous menu.

Using the Serial_Select Configuration Utility to Configure SAS Settings

1. Turn on your computer. When prompted, press <Ctrl> and <A> to access the Adaptec RAID Configuration Utility.

2. From the RAID Configuration main menu (Figure 3.1), select "Serial_Select Utility" and press <Enter>.

**Using the Controller Configuration Utility**

3. From the Serial_Select Sub Menu, select SAS Configuration and press <Enter>. The status of SAS Device Configuration will display.

4. Use the arrow keys to select the item you wish to configure and press <Enter>. A option dialogue box will display.

5. Use the arrow keys to select the desired setting and press <Enter>.

6. Press <F6> to load the default setting. To return to the previous menu, press <Esc>.

(***Note**: Refer to Section 3.2.4 on Page 3-24 for Physical Configuration Settings.)

3.2.4 Using Physical Configuration Utility

1. Power on your computer. When prompted, press the <Ctrl> and <A> keys simultaneously to enter the RAID Configuration Utility.

From the RAID Configuration Main Menu, select "SerialSelect Utility" and press <Enter> to access the Physical Configuration submenu as shown below:
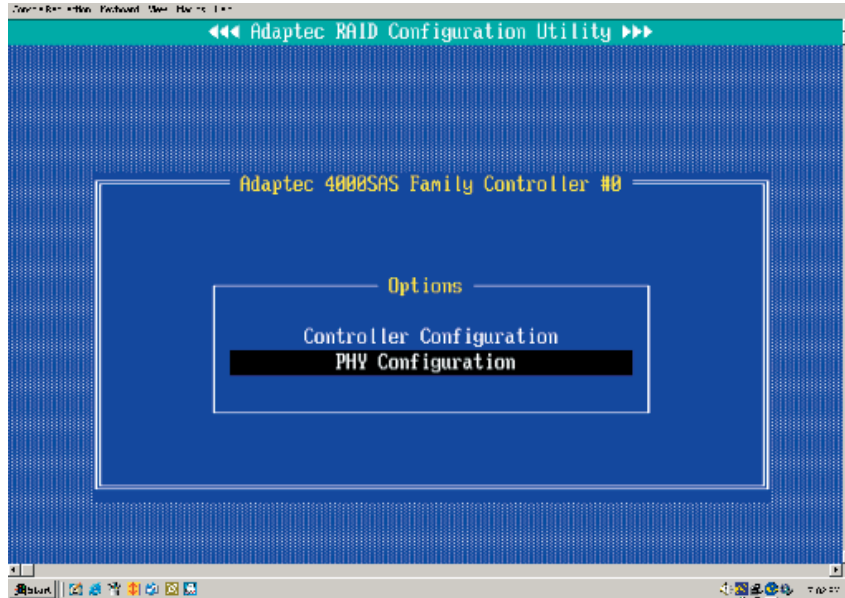
2. Select "Physical Configuration" and press <Enter> to access SAS/SATA Device Configuration submenu.
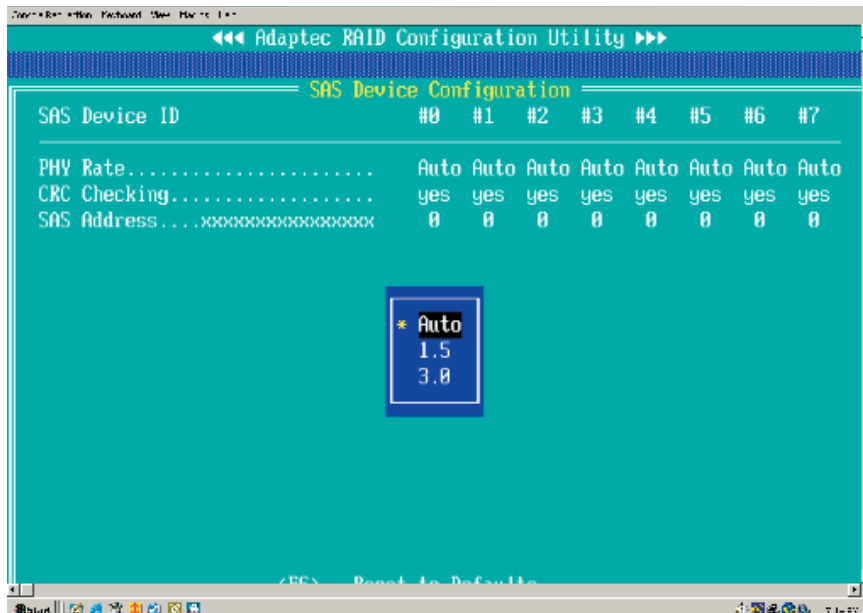
3. Use the arrow keys to select an item. Press <Enter> to see the configuration settings of the item selected as shown in the screen above.

4. Use the up/down arrow keys to highlight the setting you wish to configure and press <Enter>. (*Note: To load default settings, press <F6>.)

5. Press <Esc> to return to the previous menu and to exit the utility.

3.3 Using Disk Utilities

The Disk Utilities enable you to format or to verify the integrity of your Hard Drive Disks and to determine if there is any defect. (*Note: Formatting a disk will overwrite data stored in the disk. Please backup your data before formatting a disk.)
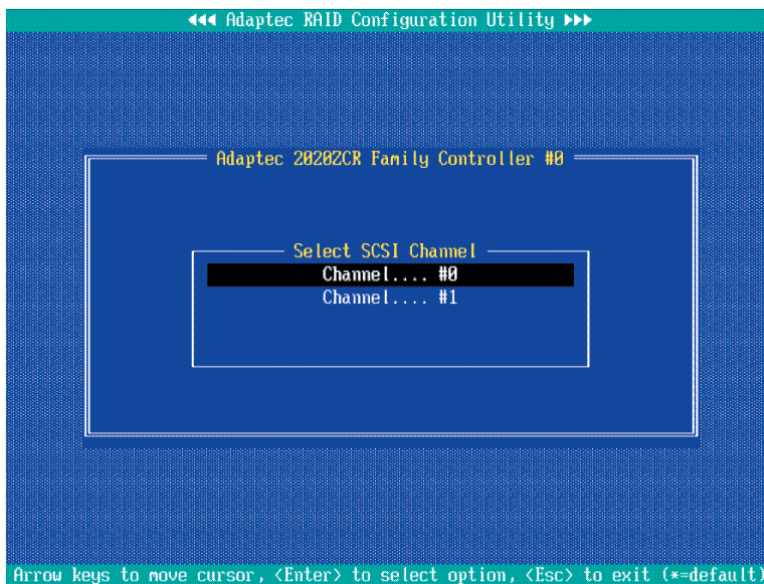
3.3.1 To Use Disk Utilities (*for SCSI only)

(*Note: Please refer to Page 3-1 for SCSI Jumper configuration before using "Disk Utilities". Please refer to Section 3.3.2 for SAS and SATA Disk Utilities.)
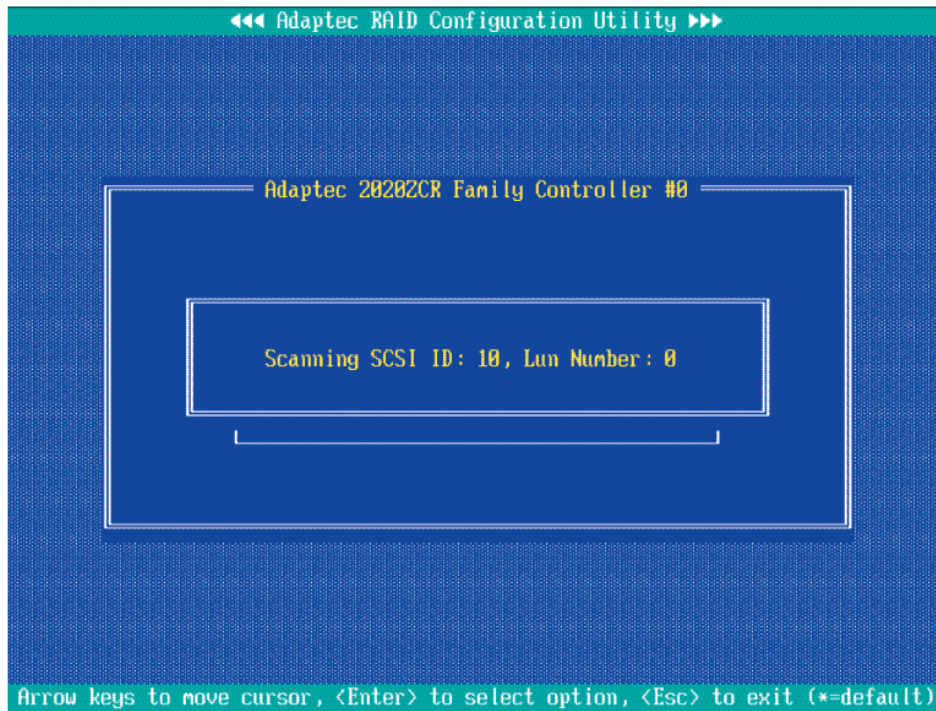
1. Power on your computer. When prompted, press the <Ctrl> and <A> keys simultaneously to enter the RAID Configuration Utility. From the RAID Configuration Main Menu, select "Disk Utilities" as shown below:
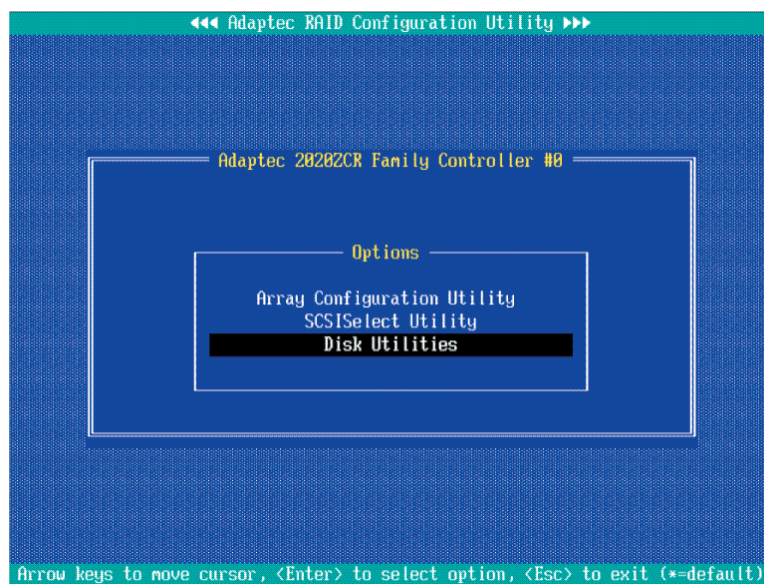
2. Select "Disk Utilities" and press <Enter>. The Disk Utilities Sub-Menu appears. From the submenu select the Channel (-the disk drive) you wish to format or to scan.

3. Once the disk drive is selected, press <Enter>. The Adaptec RAID Utility starts re-scanning the selected drive, and a screen will display as below:


(*Note: Please refer to the following section for SAS and SATA Disk Utilities.)

3.3.2 To Use Disk Utilities (*for SATA and SAS only)

(*Note: Please refer to Page 3-1 for SATA and SAS Jumper Settings before using "Disk Utilities". Please refer to the previous section for SCSI Disk Utilities.)

3.3.2.1 To Format a Disk Drive

1. Power on your computer. When prompted, press the <Ctrl> and <A> keys simultaneously to enter the Adaptec RAID Configuration Utility. From the RAID Configuration Main Menu, select "Disk Utilities" and press <Enter>. After disk scan, the following screen displays:
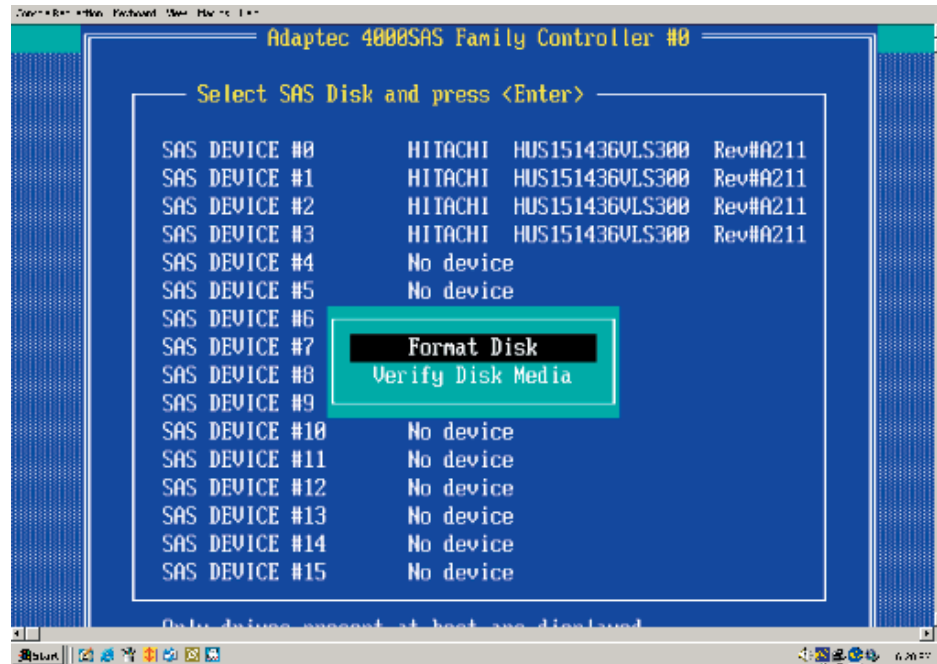
2. When a dialogue box as shown above displays, prompting you to make a selection, select the disk you wish to format and press <Enter>.

3. Then, select "Format Disk" from the displayed dialogue box and press <Enter>.

4. A warning message will display, warning you that the drive is about to be formatted and all data in the drive will be erased.

5. Press <Yes> to continue with disk formatting. Press <No> to return to the previous menu.

3.3.2.2 To Verify Disk Media

1. Power on your computer. When prompted, press the <Ctrl> and <A> keys simultaneously to access the Adaptec RAID Configuration Utility. From the RAID Configuration Main Menu, select "Disk Utilities" and press <Enter>. After disk scan, the following screen displays:
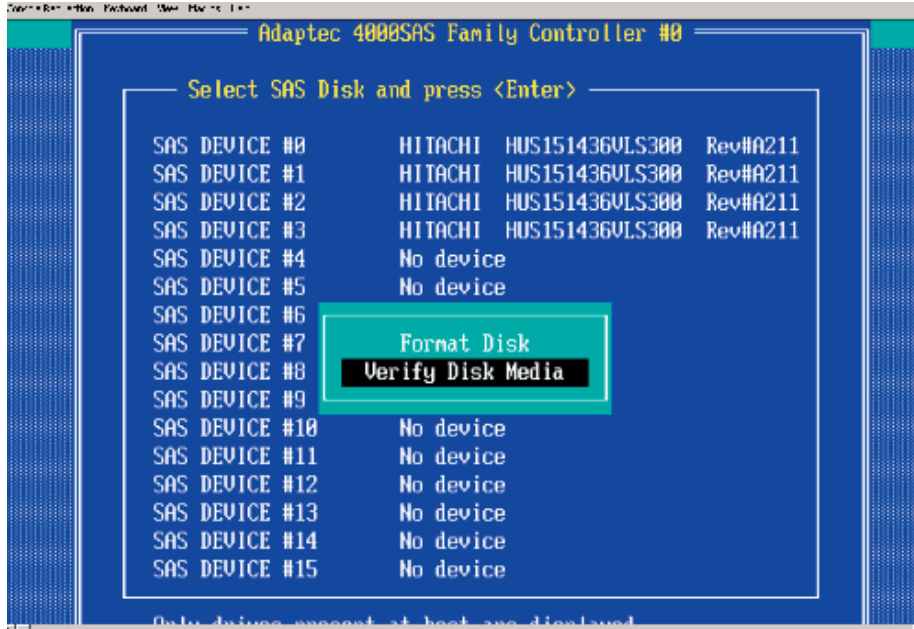
2. Whe a dialogue box as shown above displays, prompting you to make a selection, select the disk you wish to verify and press <Enter>.

3. Then, select "Verify Disk Media" from the displayed dialogue box and press <Enter>.

4. A dialogue box appears, showing you the status of the disk drive, and warning you that the disk drive selected will be scanned for media defects, and all recoverable defects will be remapped.

5. Press <Yes> to continue with disk drive verification. Press <No> to return to the previous menu.

3.4 To Exit the Adaptec RAID Configuration Utility

Once you have finished configuring RAID array disk drives, press <Esc> to return to the Exit Menu. Select Yes and press <Enter> to exit the Adaptec RAID Configuration Utility.

Chapter 4
Troubleshooting

1. Problem: The AOC-LPZCR1/AOC-SOZCR1 BIOS does not show up in POST.

Recommended Solutions:

• Make sure that the system has enough expansion ROM to initialize the card. Remove other add-in cards if possible.

• Make sure that the card is properly and fully seated in the PCI green slot.

• Check if the motherboard's BIOS is updated. (You can download a updated BIOS from our web site at: www.supermicro.com.)

2. Problem: I cannot see the card in the operating system.

Recommended Solutions:

• Make sure that the card is shown in POST. If the card is shown in POST, a screen shown below will display. If it is not shown in POST, please find out the root cause of the problem by following the steps listed above.

• Make sure that the driver for the card is installed in the system.

```
Adaptec SATA RAID BIOS V4.2-0 [Build 7341]
(c) 1998-2004 Adaptec, Inc. All Rights Reserved.

◄◄◄ Press <Ctrl><A> for Adaptec RAID Configuration Utility! ►►►

Booting the Controller Kernel......Controller started

Controller #00: Adaptec 2020ZCR at PCI Bus:02, Dev:01, Func:00
Waiting for Controller to Start....Controller started
Controller monitor V4.2-0[7341], Controller kernel V4.2-0[7341]
Controller POST operation successful
Controller Memory Size: 64 MB
```

3. Problem: I cannot see the hard drives that are connected to the controller.

Recommended Solutions:

• Make sure that there is power supply to the hard drives.

• Check the SAS, SATA or SCSI cable to make sure that there are no loose connections between the card and the hard drives.

• If the hard drives are connected through a SAS, SATA or SCSI back panel, make sure that there is power supply to the back panel, and there are no loose connections between the back panel and the controller. Also make sure that the hard drives are properly seated in the drive bay.

• If possible, swap the drives around to determine if the drive connections or the controller is bad.

4. I cannot create software RAID in the operating system.

Recommended Solutions:

• Make sure that the operating system supports software RAID. If not sure, please check with the software company that produces the OS.

• Make sure that more than one drives are seen by the OS.

Contacting Supermicro's Technical Support:

If you still have problems after trying out all the recommended solutions, please contact our Tech. Support @ (408)503-8000 or visit our web site @ www. supermicro.com/support/.