ROCKY-4786EVGR

User Manual

Version 1.0

SOCKET 478 PENTIUM 4/4-M with Ethernet & USB 2.0 & SATA RAID

APRIL 14, 2005

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Chapter 1 Introduction

Thank you for choosing ROCKY-4786EVGR SOCKET 478 PENTIUM 4 Single Board Computer. The ROCKY-4786EVGR board is an PICMG form factor board, which comes fully equipped with high performance Processor and advanced high performance multi-mode I/O, designed for the system manufacturers, integrators, or VARs that want to provide all the performance, reliability, and quality at a reasonable price.

In addition, ROCKY-4786EVGR built in a 3D AGP 4X controller (Intel 865GV), which provides up to 2048x1536x16-color clear resolution that shares 1/8/16MB system DDR-SDRAM.

ROCKY-4786EVGR supports one or two 64-bit wide DDR400 data channels. Available bandwidth up to 3.2GB/s in single-channel mode and 6.4GB/s in dual-channel mode.

The CSA interface connects the GMCH with a Gigabit Ethernet controller.

ROCKY-4786EVGR's built-in ICH5R has 10/100 Fast Ethernet LAN capability. It is fully integrated 10BASE-T/100BASE-TX LAN solution with high performance networking functions and low power features.

The ICH5R has an integrated SATA host controller that supports independent DMA operation on two port and supports data transfer rate of up to 1.5Gb/s.The ICH5R Offers data striping for higher performance(RAID Level 0),and offers mirroring for Data security(RAID Level 1).

For applications that needs high speed serial transmission, the ROCKY-4786EVGR provides USB2.0 for your convenience. The high speed USB2.0 host controller implements an ECHI interface that provides bandwidth up to 480Mb/s.

1.1 Specifications

CPU(PGA 478)	Intel Pentium 4(NORTHWOOD,PRESCOTT) /4-M Processor, supports 400/533/800 MHz PSB (SET BY BIOS)
Bus interface	PICMG 1.0 compliant, PCI 2.1
Bus speed	PCI: 33MHz
DMA channels	7
Interrupt levels	15
Chipset	INTEL 865GV / ICH5R
RAM memory	Two 184-pin DIMM sockets support Dual Channel DDR333/400 SDRAM .Support one or two 64-bit wide DDR data channels. The max. memory supported is up to 2GB.
Ultra DMA 100 IDE interface	Up to four PCI Enhanced IDE hard drives. The Ultra DMA 100 IDE can handle data transfer up to 100MB/s. Compatible with existing ATA IDE specifications its best advantage, so there is no need to do any changes for users' current accessories.
Floppy disk drive interface	Supports up to two floppy disk drives, 5.25"(360KB and 1.2MB) and/or 3.5" (720KB, 1.44MB, and 2.88MB)
Serial ports	Two RS-232 ports with 16C550 UART (or compatible) with 16-byte FIFO buffer. Support up to 115.2Kbps. Ports can be individually configured to COM1, COM2 or disabled.
Bi-directional parallel port	Configurable to LPT1, LPT2, LPT3 or disabled. Supports EPP/ECP/SPP
Hardware monitor	Built-in to monitor power supply voltage and fan speed status
IrDA port	Supports Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface
USB 2.0/1.1 port	Supports 8 USB 2.0/1.1 ports for future expansion
Watchdog timer	Software Programmable Reset generated when CPU does not periodically trigger the timer.

Serial ATA	Supports Two independent serial ATA channels. Serial ATA generation 1 transfer rate of 150MB/s.Support (RAID Level 0), (RAID Level 1)
Ethernet	The CSA interface connectors GMCH with a 82547EI Gigabit Ethernet controller. It's to Support full 100/1000-bast-T Ethernet ICH5 integrated fast Ethernet MAC features an IEEE802.3 and 802.3x compliant MAC supporting full duplex 10-base-T,100-bast-T Ethernet.
Keyboard and PS/2 mouse connector	A 6-pin mini DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. For alternative application, a keyboard and a PS/2 mouse pin header connector are also available on board.
Audio	AC'97 Audio CODEC
VGA controller	Built-in AGP 4X 3D graphics engine. Shares system DDR SDRAM 16MB. Onboard DVO chip(SIL164) supports color DVI display(optional).
Compact flash	It can be used with a passive adapter (True IDE Mode) in a Type I/II Socket.
Power consumption	PENTIUM4 NORTHWOOD :3.0GHz, 512MB DDR400 DDR-SDRAM +12V@ 7.52A ,+5V@6.98A ,-12V@0.5A. PENTIUM4 PRESCOTT CPU :3.2GHz, 512MB DDR400 DDR-SDRAM. +12V@ 15A ,+5V@8A ,-12V@0.5A. Recommended : 350-watt power supply or higher
Operating temperature	0° ~ 55° C (*CPU needs Cooler & silicone heat sink paste*)

WARNING : 1. Never run the processor without the heat-sink and (Cooler).
2. Be sure to use ATX-12V power connector (CN2) for the CPU power.

1.2 Package Contents

The ROCKY-4786EVGR package includes the following items:

- One ROCKY-4786EVGR Single Board Computer
- One RS-232 & Printer Cables with bracket
- One FDD cable.
- One ATA IDE cable.
- Two SATA IDE cables.
- One SATA Power cord.
- One ATX-12V cable.
- One keyboard and mouse Y-Adapter cable.
- One Driver CD
- User manual

If any of these items are missing or damaged, please contact the dealer from whom you purchased this product. Save the shipping materials and carton in case you want to ship or store the product in the future.

Chapter 2 Installation

This chapter describes how to install the ROCKY-4786EVGR. First a layout diagram of the ROCKY-4786EVGR is shown, followed by unpacking information that should be carefully followed. The jumpers and switch settings for the ROCKY-4786EVGR configuration, such as CPU type selection, system clock setting, and watchdog timer, are also listed.

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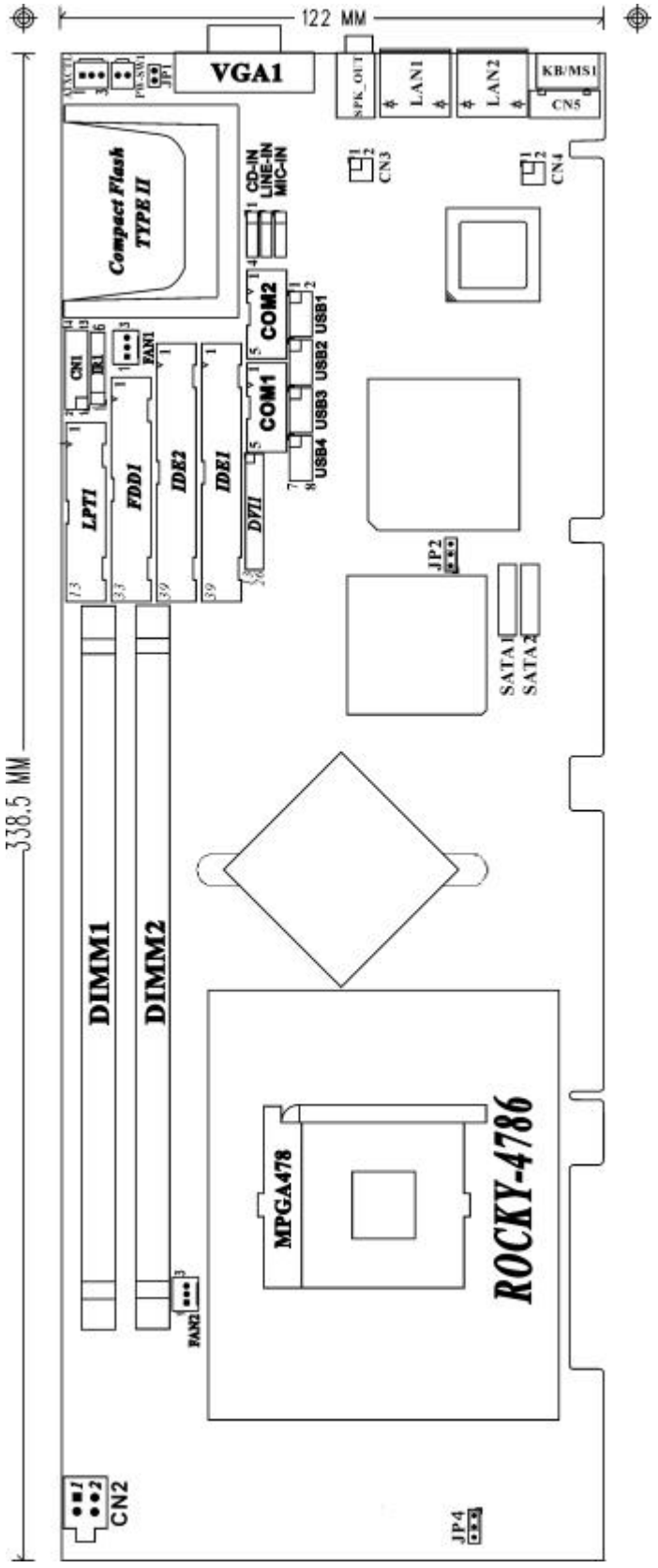
Please refer to the next page.)

2.1 Layout & Dimensions



2.2 Unpacking Precautions

Some components on ROCKY-4786EVGR are very sensitive to static electric charges and can be damaged by a sudden rush of power. To protect it from unintended damage, be sure to follow these precautions:

- Ground yourself to remove any static charge before touching your ROCKY-4786EVGR. You can do it by using a grounded wrist strap at all times or by frequently touching any conducting materials that is connected to the ground.
- Handle your ROCKY-4786EVGR by its edges. Don't touch IC chips, leads or circuitry if not necessary.
- Do not plug any connector or jumper while the power is on.

Note: All shaded rows in tables of this manual are the default settings for ROCKY-4786EVGR.

2.3 Clear CMOS Setup

To clear the CMOS Setup (for example if you have forgotten the password, you should clear the CMOS and then re-set the password), you should close the JP2 (2-3) for about 3 seconds, then open it once more. This will set back to normal operation mode.

- **JP2 : Clear CMOS Setup**

JP2	DESCRIPTION
1-2 or open (default)*	Keep CMOS Setup (Normal Operation)
2-3	Clear CMOS Setup

2.4 Compact Flash Master/Slave Function Setting

- **JP1 : Compact Flash Master/Slave Function Setting Short 1 - 2 pin , Compact Flash is Master**

JP1	DESCRIPTION
Short	Master
Open	Slave

2.5 CPU type Setting

ROCKY-4786EVGR board can use two different types of CPU. One is Pentium4 CPU model and the other is Pentium4-M CPU.

- **2.5-1:** When using Pentium4 CPU, please short JP4 (1-2). CPU VID will now automatically configure the power of CPU. (Default)
- **2.5-2:** When using Pentium4-M CPU, please short JP4 (2-3). The power of CPU will be set to 1.3V at this time.

JP4	DESCRIPTION
Short (1-2)	Pentium4 CPU
Short (2-3)	Pentium4-M CPU

Chapter 3 CONNECTION

This chapter describes how to connect peripherals, switches and indicators to the ROCKY-4786EVGR board.

Label	Function
IDE1 & IDE2	Ultra ATA100 Primary & Secondary IDE connectors
FDD1	Floppy connector
LPT1	Parallel port connector
COM1 & COM2	Serial port connectors
CF1	Compact Flash Storage Card Type II connector
IR1	IRDA infrared interface port
USB1	USB dual port connector
USB2	USB dual port connector
USB3	USB dual port connector
USB4	USB dual port connector
LAN1 & LAN2	LAN RJ45 connectors
KB/MS1	6-pin Mini-Din Keyboard & Mouse connector
CN5	External 5-pin Header Keyboard Connector
FAN1 & FAN2	FAN connectors
SATA1 & SATA2	Serial ATA connectors
CN1	External switches and indicators
CN2	ATX +12V Power connector
CN3 & CN4	LAN LED connectors
CD-IN	Audio CD in connector
LINE-IN	Audio LINE in connector
MIC-IN	Audio MIC in connector
PW-SW1	ATX Power Button connector
ATXCTL	Backplane to Main board ATX power control Connector

3.1 Audio Connector

The ROCKY-4786EVGR has a built-in AC'97 AUDIO CODEC; connector directly connects to your MIC-IN & CD-IN & LINE-IN.

- **SPK_OUT : AUDIO Headphone Jack (Output)**
- **LINE-IN : AUDIO LINE-IN Connector (Input)**
- **CD-IN : AUDIO CD-IN Connector (Input)**
- **MIC-IN : AUDIO MIC-IN Connector (Input)**

PIN NO.	DESCRIPTION		
	LINE-IN	CD-IN	MIC-IN
1	LEFT	LEFT	MIC-IN
2	GND	GND	GND
3	GND	GND	GND
4	RIGHT	RIGHT	NC

3.2 VGA Connector

- **VGA1: 15-pin Female Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GROUND	6	GROUND
7	GROUND	8	GROUND
9	VCC / NC	10	GROUND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

3.3 PCI E-IDE Disk Drive Connector

You can attach up to four IDE(Integrated Device Electronics) devices.

- **IDE1 : Primary IDE Connector**
- **IDE2 : Secondary IDE Connector**
- **IDE1 & IDE2 : IDE Interface Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	CHRDY	28	REV. PULL LOW
29	DACK	30	GROUND-DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

3.4 Parallel Port Connector

Usually, a printer is connected to the parallel port. The ROCKY-4786EVGR includes an on-board parallel port, accessed via a 26-pin flat-cable connector LPT1.

- **LPT1 : Parallel Port Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	NC

3.5 ATX Power Button Connector

· **PW-SW1: ATX Power Button Connector**

PIN	DESCRIPTION
1	PWRBTN
2	GROUND

3.6 USB Port Connector

The ROCKY-4786EVGR is equipped with Four USB(Version. 2.0) ports for the future new I/O bus expansion.

· **USB1,USB2, USB3,UBS4 : 2 ports USB Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1.	VCC	2.	GROUND
3.	DATA0-	4.	DATA1+
5.	DATA0+	6.	DATA1-
7.	GROUND	8.	VCC

3.7 Serial Port

The ROCKY-4786EVGR offers Two high speed NS16C550 compatible UART's with 16-byte Read/Receive FIFO serial ports.

• **COM1,COM2: 10Pin Serial Port Connector**

PIN	DESCRIPTION
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)
10	GROUND (GND)

3.8 Keyboard / Mouse Connector

The ROCKY-4786EVGR has a 6-pin DIN keyboard/mouse connector & a external

- **KB/MS1 :Mini DIN Keyboard / Mouse Connector**

PIN	DESCRIPTION
1	KEYBOARD DATA
2	MOUSE DATA
3	GROUND
4	+5V
5	KEYBOARD CLOCK
6	MOUSE CLOCK

For alternative application, a keyboard pin header connector are also available on board, located on CN5 respectively.

- **CN5 : 5-pin Header Keyboard Connector**

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND
5	+5V

3.9 IrDA Infrared Interface Port

The ROCKY-4786EVGR comes with an integrated IrDA port which supports either a Serial Infrared(SIR) or an Amplitude Shift Keyed IR(ASKIR) interface.

- **IR1: IrDA connector**

PIN	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	Ground
5	IR-TX
6	CIRRX

3.10 Fan Connector

The ROCKY-4786EVGR also has a CPU with cooling fan connector and chassis fan connector, which can supply 12V/500mA to the cooling fan. There is a “rotation” pin in the fan connector, which transfers the fan’s rotation signal to the system BIOS in order to recognize the fan speed. Please note that only some specific types of fans offer a rotation signal.

- **FAN1,FAN2 : Fan Connector**

PIN	DESCRIPTION
1	Ground
2	+12V
3	Rotation Signal

3.11 External Switches and Indicators

There are several external switches and indicators for monitoring and controlling your CPU board. All functions are in the CN1 connector.

- **CN1 : External Switches and Indicators**

	PIN	DESCRIPTION	PIN	DESCRIPTION	
Power LED	1	+5V	2	Speaker +	Speaker
	3	N/C	4	N/C	
	5	GND	6	N/C	
	7	NC	8	Speaker -	
	9	NC	10	Reset PIN1	Reset Button
	11	GND	12	Reset PIN2	
HDD LED	13	HDD LED+	14	HDD LED-	HDD LED

3.12 LAN Connector

The ROCKY-4786EVGR is equipped with one built-in 10/100Mbps & one built-in 100/1000Mbps Ethernet controllers. You can connect it to your LAN through RJ45 LAN connectors. There are two LED on the connector indicating the status of LAN. The pin assignments are listed in the following table:

- **LAN1 (10/100-TX)RJ45 Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX+	5.	N/C
2	TX-	6.	RX-
3.	RX+	7.	N/C
4.	N/C	8.	N/C

- **LAN2(100/1000-TX) RJ45 Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TXA+ (TX+)	5.	TXC-(N/C)
2	TXA-(TX-)	6.	TXB-(RX-)
3.	TXB+(RX+)	7.	TXD+(N/C)
4.	TXC+(N/C)	8.	TXD-(N/C)

· **CN3: LAN1 /CN4 LAN2 State LED Connector.**

PIN NO.	DESCRIPTION
1-2	ACT LED(PIN2:+)
3-4	LINK LED(PIN4:+)

3.13 Serial ATA Connector

The ROCKY-4786EVGR provide 2 Serial ATA ports to connect with Serial ATA devices.

- **SATA1, SATA2 : Serial ATA Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	S_TXP	3	S_RXN
2	S_TXN	4	S_RXP

3.14 Floppy Connector

The ROCKY-4786EVGR board is equipped with a 34-pin daisy-chain drive connector cable.

- **FDD1 : Floppy Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	2	RWC0-
3	GROUND	4	NC
5	GROUND	6	RWC1-
7	GROUND	8	INDEX-
9	GROUND	10	MO-A
11	GROUND	12	DS-B
13	GROUND	14	DS-A
15	GROUND	16	MO-B
17	GROUND	18	DIR-
19	GROUND	20	STEP-
21	GROUND	22	WD-
23	GROUND	24	WGATE-
25	GROUND	26	TRK0-
27	GROUND	28	WP-
29	GROUND	30	RDATA-
31	GROUND	32	HEAD-
33	GROUND	34	DSKCHG-

3.15 Compact Flash Storage Card Socket

The ROCKY-4786EVGR configures Compact Flash Storage Card in IDE Mode. This type II Socket is compatible with IBM Micro Drive.

- **CF1 : Compact Flash Storage Card Socket pin assignment**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	PULL DOWN
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS1#	32	CS3#
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC
12	N/C	37	IRQ15
13	VCC	38	VCC
14	N/C	39	MASTER/SLAVE
15	N/C	40	N/C
16	N/C	41	RESET#
17	N/C	42	IORDY
18	A2	43	N/C
19	A1	44	VCC
20	A0	45	ACTIVE#
21	D0	46	PDIAG#
22	D1	47	D8
23	D2	48	D9
24	N/C	49	D10
25	PULL DOWN	50	GROUND

3.16 DVI (Optional)

The ROCKY-4786EVGR provides DVI interface for your DVI display.

- **DVI1 : DVI Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DATA2-	14	Vcc
2	DATA2+	15	NC
3	GND	16	HP_DET
4	NC	17	DATA0-
5	NC	18	DATA0+
6	DDCCLK	19	GND
7	DDCDATA	20	NC
8	NC	21	NC
9	DATA1-	22	GND-
10	DATA1+	23	CLK+
11	GND	24	CLK-
12	NC	25	GND
13	NC		

3.17 ATXCTL Connector

- **ATXCTL : Backplane to Mainboard Connector**

PIN NO.	DESCRIPTION
1	5VSB
2	ATX-ON
3	GND

v **Power source from Backplane with ATX Connector (Through Power Button & +5VSB)**

Chapter 4 AMI BIOS Setup

4.1 Introduction

This manual discusses AMI's Setup program built into the ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

4.2 Starting Setup

The AMI BIOS is immediately activated when you first power on the computer.The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.
While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Del> immediately after switching the system on, or
2. by pressing the <Del>key when the following message appears briefly at the bottom of the screen during the POST.

   Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

4.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

4.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the **F1** key again.

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AMI BIOS supports an override to the CMOS settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both AMI and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

4.5 BIOS menu bar

The **menu bar** on top of the screen has the following main items:

Main For changing the basic system configuration.

Advanced For changing the advanced system settings.

PCI PnP This entry appears if your system supports PnP / PCI.

Boot For changing the system boot configuration.

Security Use this menu to set User and Supervisor Passwords.

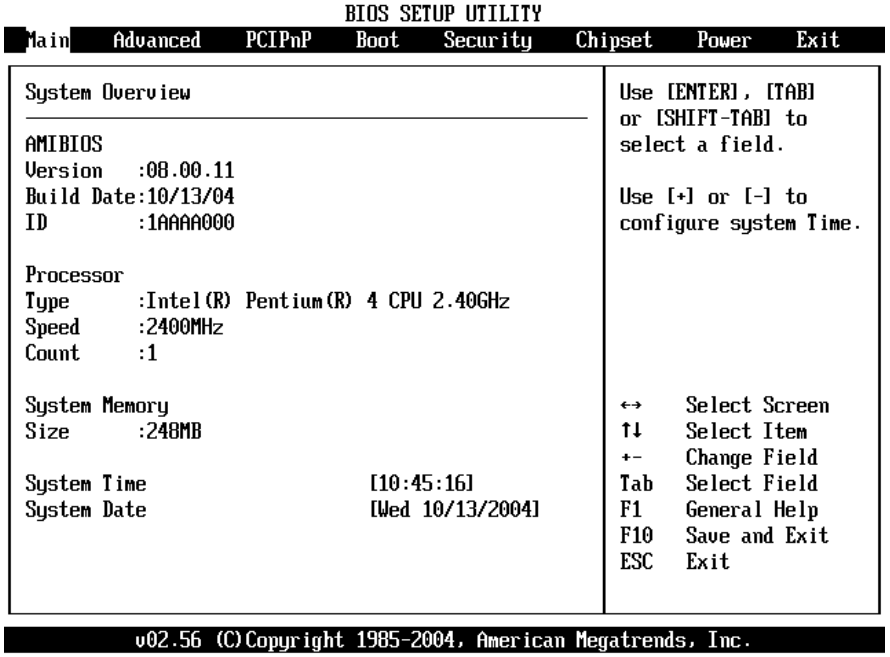
Chipset For changing the chipset setting.

Power For changing the advanced power management configuration.

Exit For selecting the exit options and loading default settings.

4.6 Main

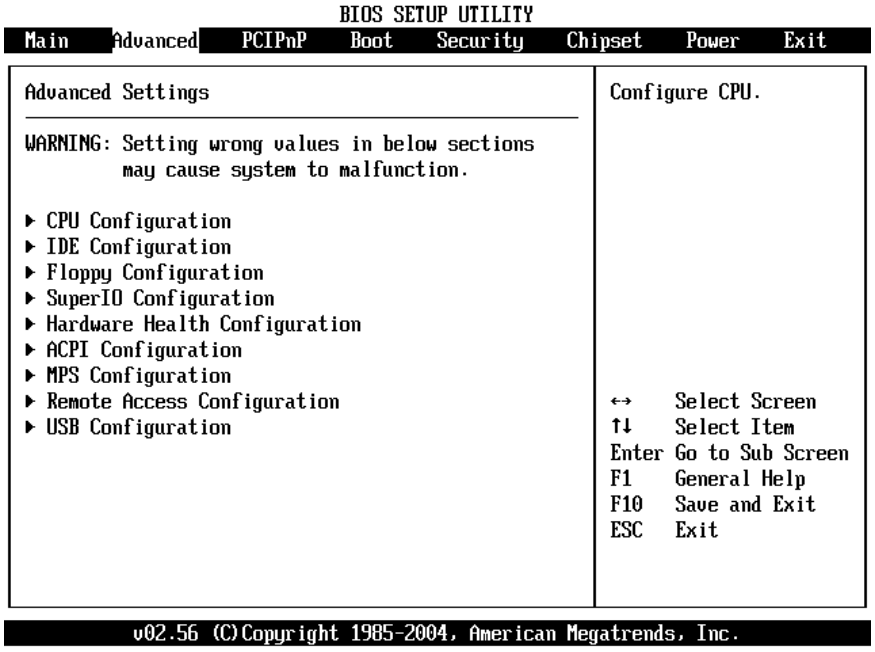
When you enter the BIOS Setup program, the Main menu screen appears giving you an overview of the basic system information.



AMI BIOS This item displays the auto-detected BIOS information.
Processor This item displays the auto-detected CPU specification.
System Memory This item displays the auto-detected system memory.
System Time [xx:xx:xx] This item allows you to set the system time.
System Date [Day xx/xx/xxxx] This item allows you to set the system date.

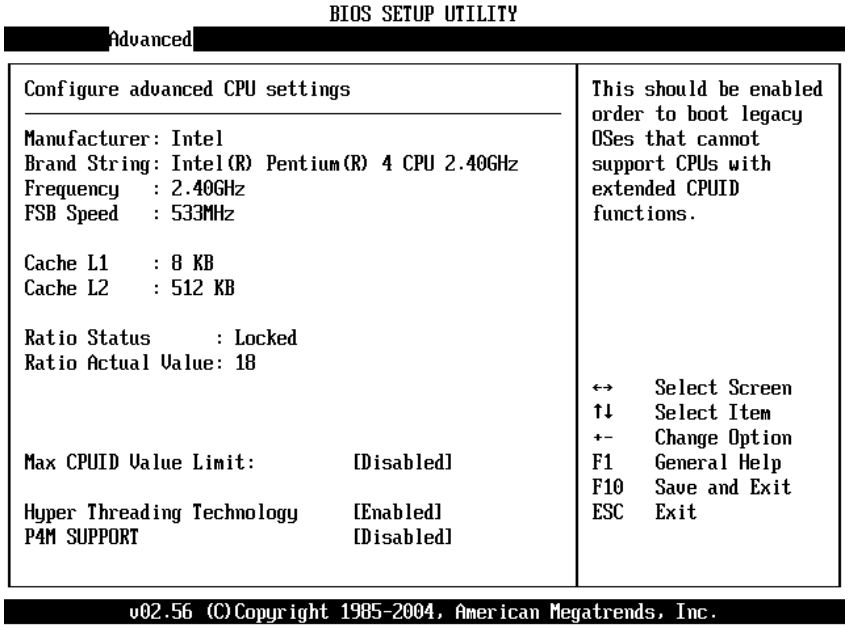
4.7 Advanced

The Advanced menu items allow you to change the settings for the CPU and other system devices.



4.7.1 CPU Configuration

The items in this menu show the CPU-related information auto-detected by BIOS.



Hyper-Threading Technology [Enabled]

This item allows you to enable or disable the processor Hyper-Threading Technology.

Configuration options: [Disabled] [Enabled]

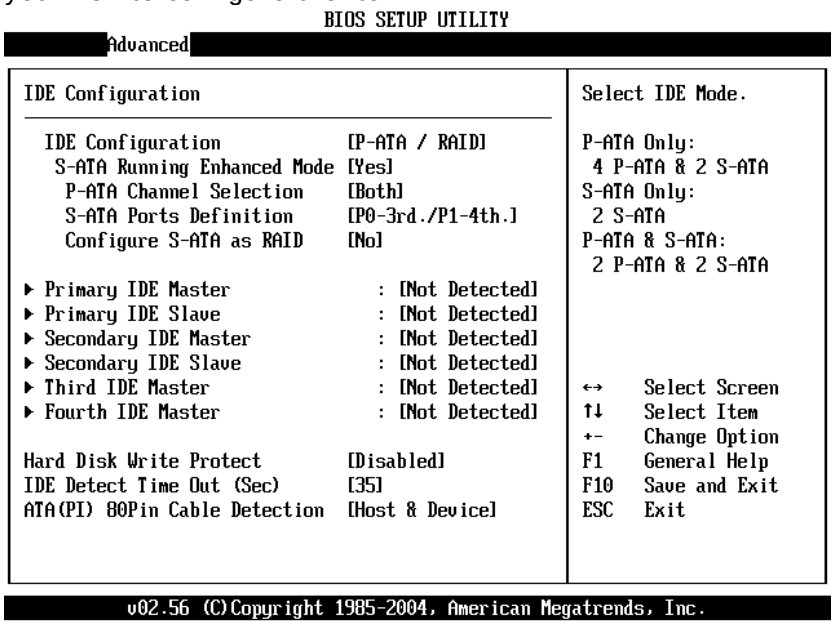
P4M SUPPORT [Disable]

This item allows you to enable or disable the P4-M CPU support.

Configuration options: [Disabled] [Enabled]

4.7.2 IDE Configuration

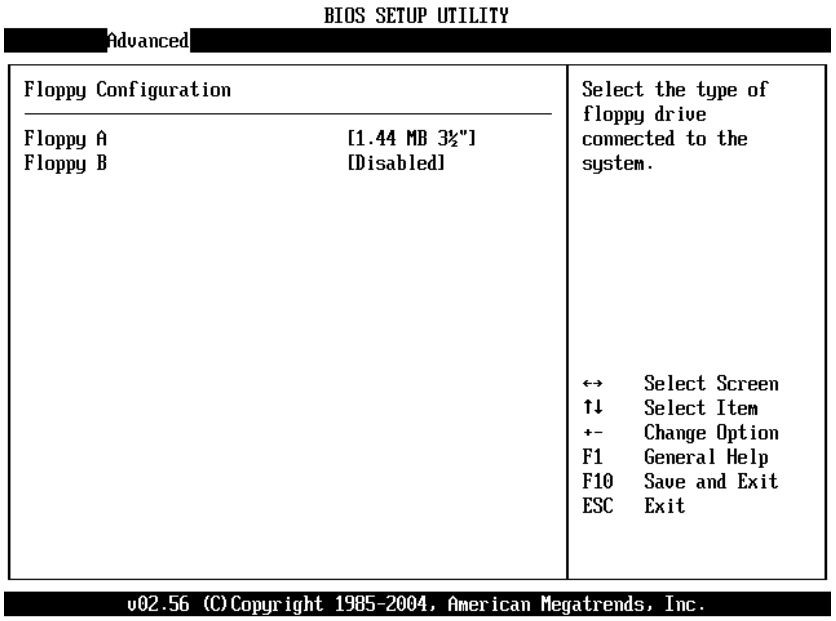
The items in this menu allow you to set or change the configurations for the IDE devices installed in the system. Select an item then press Enter if you wish to configure the item.



IDE Configuration [P-ATA/RAID]
This item allows you to select the IDE mode
Configuration options: [Disabled] [P-ATA/RAID] [S-ATA Only] [P-ATA/S-ATA]
Primary and Secondary IDE Master/Slave
Third and Fourth IDE Master
The values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring) are auto-detected by BIOS and are not user-configurable. These items show N/A if no IDE device is installed in the system.
Type [Auto]
Selects the type of IDE drive. Setting to Auto allows automatic selection of the appropriate IDE device type. Select CDROM if you are specifically configuring a CD-ROM drive. Select ARMD (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.
Configuration options: [Not Installed] [Auto] [CDROM] [ARMD].
LBA/Large Mode [Auto]
Enables or disables the LBA mode. Setting to Auto enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled.
Configuration options: [Disabled] [Auto]
Block (Multi-sector Transfer) [Auto]
Enables or disables data multi-sectors transfers. When set to Auto, the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to Disabled, the data transfer from and to the device occurs one sector at a time.
Configuration options: [Disabled] [Auto]
PIO Mode [Auto]
Selects the PIO mode.
Configuration options: [Auto] [0] [1] [2] [3] [4]
DMA Mode [Auto]
Selects the DMA mode.
Configuration options: [Auto] [SWDMA0] [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5]
SMART Monitoring [Auto]
Sets the Smart Monitoring, Analysis, and Reporting Technology.
Configuration options: [Auto] [Disabled] [Enabled]
32Bit Data Transfer [Disabled]
Enables or disables 32-bit data transfer.
Configuration options:[Disabled] [Enabled]
Hard Disk Write protect [Disabled]
This item allows you to enable or disable the hard disk write protect
Configuration options: [Disabled] [Enabled]
IDE Detect Time Out (Sec) [35]
Selects the time out value for detecting ATA/ATAPI devices.
Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]
ATA(PI) 80Pin Cable Detection [Host & Device]
Configuration options: [Host & Device] [Host] [Device]

4.7.3 Floppy Configuration

Sets the type of floppy drive installed.
Configuration options: [Disabled][360K, 5.25 in.][1.2M , 5.25 in.][720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M,3.5in.]



4.7.4 Super IO Configuration

On Board Floppy Controller [Enabled]

Allows you to enable or disable the floppy disk controller.

Configuration options: [Disabled] [Enabled]

S**erial Port1 Address [3F8 / IRQ4]**

Allows you to select the Serial Port1 base address.

Configuration options: [Disabled] [3F8/IRQ4] [3E8/IRQ4] [2E8/IRQ3]

Serial Port2 Address [2F8 / IRQ3]

Allows you to select the Serial Port2 base address.

Configuration options: [Disabled] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

Parallel Port Address [378]

Allows you to select the Parallel Port base addresses.

Configuration options: [Disabled] [378] [278] [3BC]

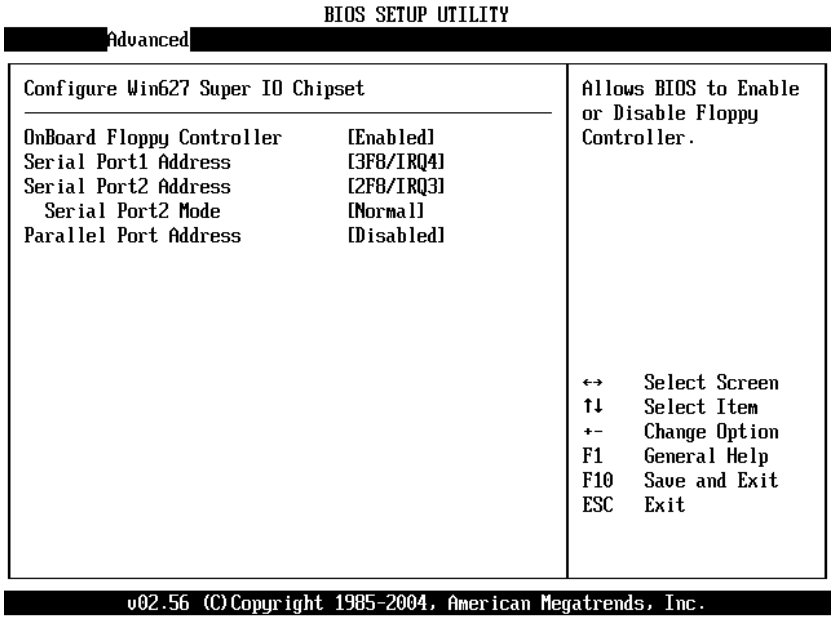
Parallel Port Mode [Normal]

Allows you to select the Parallel Port mode.

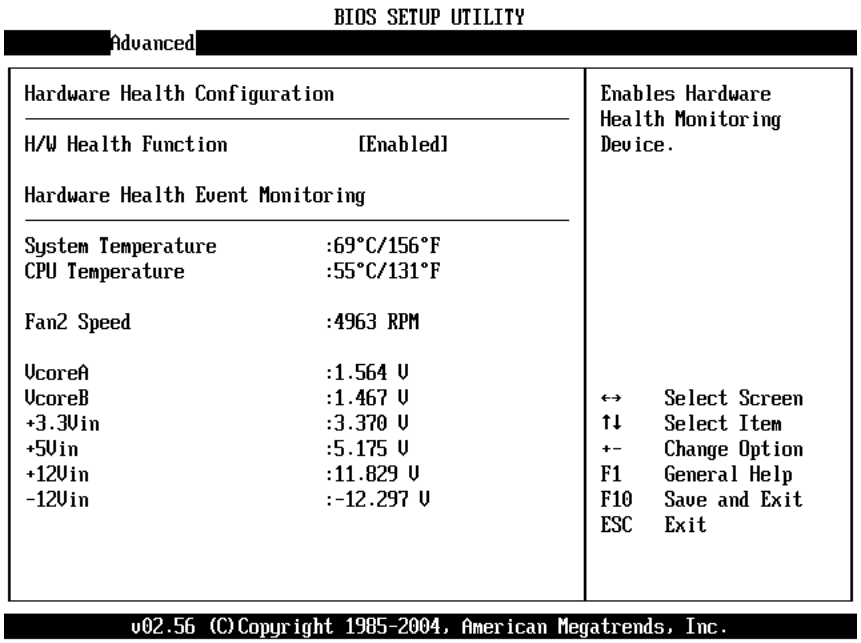
Configuration options: [Normal] [Bi-directional] [EPP] [ECP]

Parallel Port IRQ [IRQ7]

Configuration options: [IRQ5] [IRQ7]

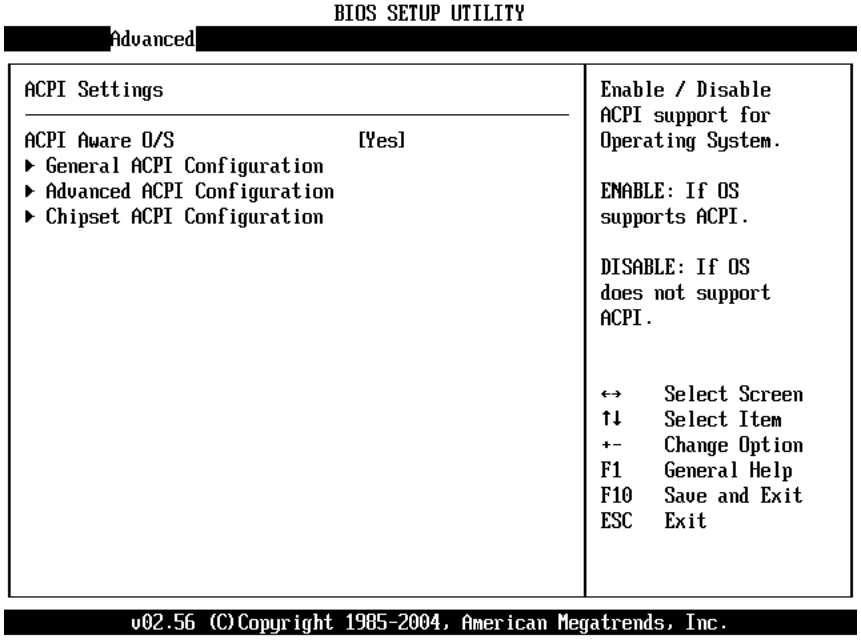


4.7.5 Hardware Health Configuration



4.7.6 ACPI Configuration

Allows you to change the settings for the Advanced Power Management (APM). Select an item then press Enter to display the configuration options.



General ACPI Configuration

Allows you to select the ACPI state to be used for system suspend. Configuration options: [S1 (POS) Only]

Advanced ACPI Configuration

Use this section to configure additional ACPI options.

ACPI 2.0 Features [No]

Allows you to add more tables for ACPI 2.0 specifications. Configuration options: [No] [Yes]

ACPI APIC support [Enabled]

Allows you to enable or disable the ACPI support in the ASIC. When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]

AMI OEMB table [Enabled]
Allows you to enable or disable the inclusion of the BIOS ->AML exchange pointer to (X)RSDT pointer list.
Configuration options: [Disabled] [Enabled]
Headless mode [Disabled]
Enable/Disable headless operation mode through ACPI.

4.7.7 MPS Configuration

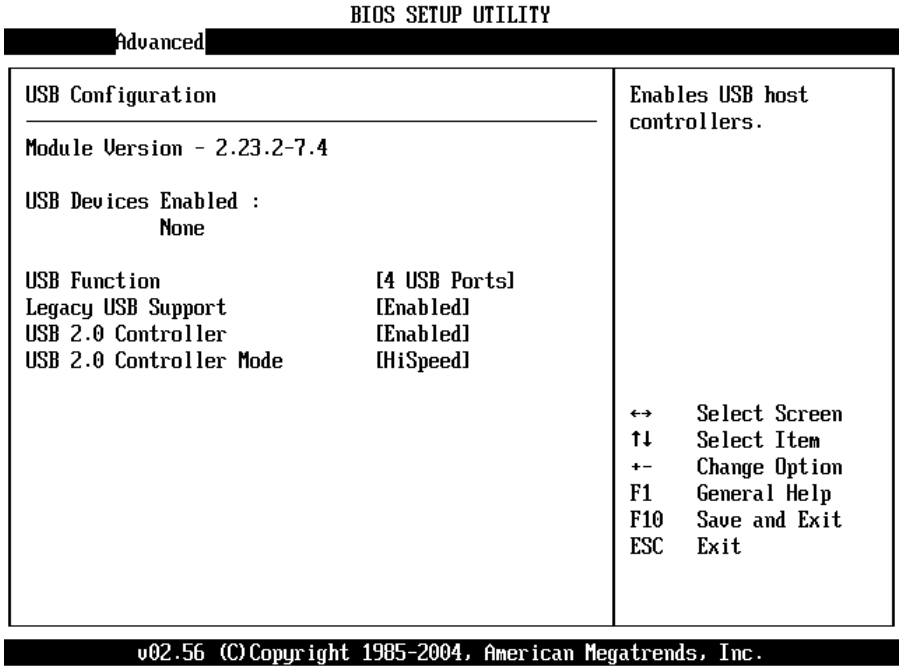
Configure the Multi-Processor table
MPS Revision [1.4]
Configuration options: [1.1] [1.4]

4.7.8 Remote Access Configuration

Configure Remote Access.
Remote Access [Disabled]
Configuration options: [Disabled] [Enabled]

4.7.9 USB Configuration

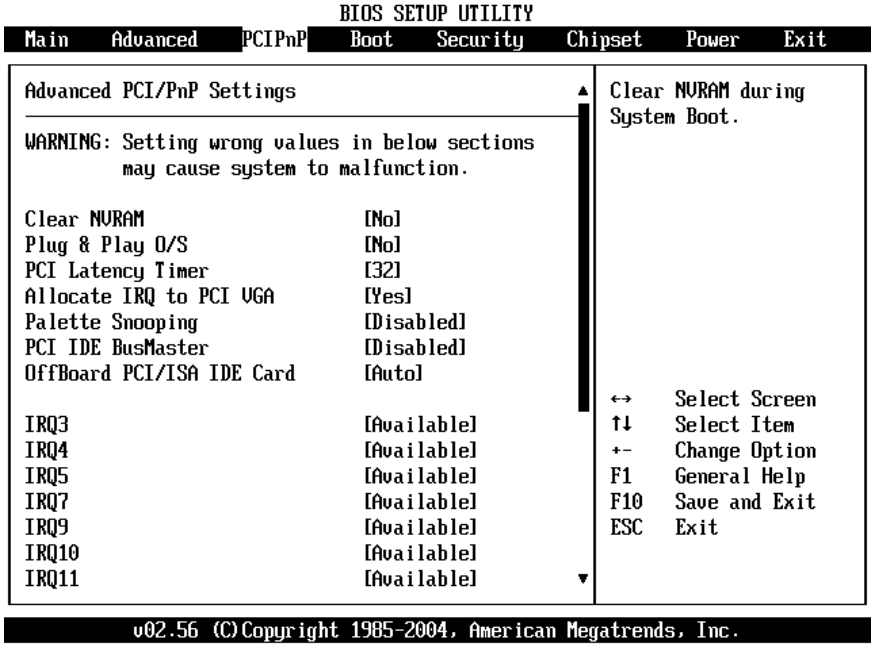
The items in this menu allows you to change the USB-related features.
Select an item then press Enter to display the configuration options.



USB Function [8 USB Ports]
Allows you to set the number of USB ports to activate.
Configuration options: [Disabled] [2 USB Ports] [4 USB Ports] [6 USB Ports] [8 USB Ports]
Legacy USB Support [Enable]
Enable support for legacy USB.
Configuration options: [Disabled] [Enabled]
USB 2.0 Controller [Enabled]
Allows you to enable or disable the USB 2.0 controller.
Configuration options: [Disabled] [Enabled]
USB 2.0 Controller Mode [HiSpeed]
Allows you to configure the USB 2.0 controller in HiSpeed (480 Mbps) or Full Speed (12 Mbps).
Configuration options: [HiSpeed] [Full Speed]

4.8 PCI PnP

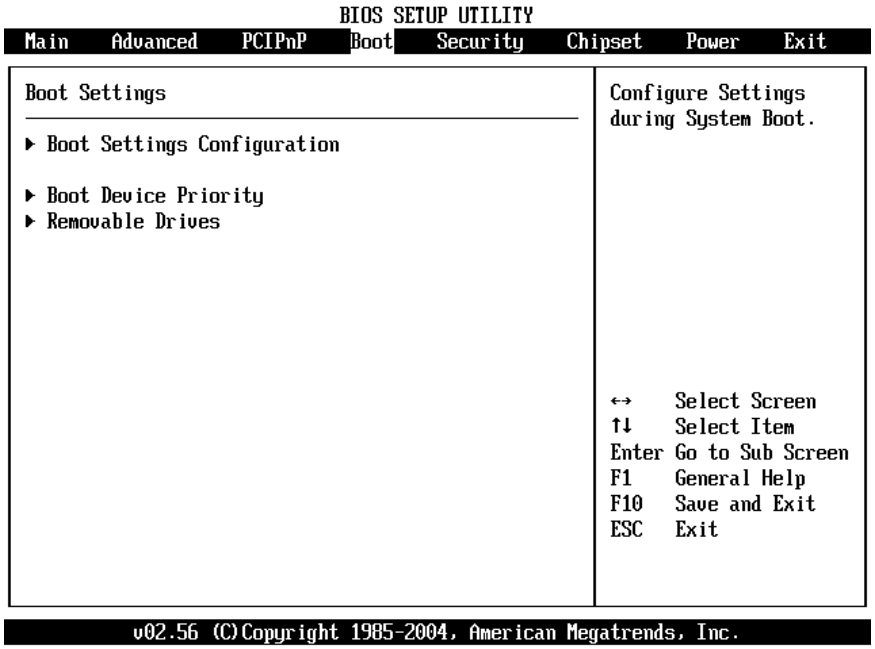
The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel memory size block for legacy ISA devices.



Clear NVRAM [NO]
Clear NVRAM during system boot.
Plug & Play O/S [NO]
When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you installed a Plug & Play operating system, the operating system configures the Plug & Play devices not required for boot.
Configuration options: [No] [Yes]
PCI Latency Timer [32]
Allows you to select the value in units of PCI clocks for the PCI device latency timer register.
Configuration options: [32] [64] [96] [128] [160] [192] [224] [248].
Allocate IRQ to PCI VGA [Yes]
When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested.
Configuration options: [No] [Yes]
Palette Snooping [Disabled]
When set to [Enabled], the palette snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Setting to [Disabled] deactivates this feature.
Configuration options: [Disabled] [Enabled]
PCI IDE Bus Master [Disabled]
Allows BIOS to use PCI bus mastering when reading/writing to IDE devices. Configuration options: [Disabled] [Enabled]
Off Board PCI / ISA IDE Card [Auto]
Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card.
IRQ xx [Available]
When set to [Available], the specific IRQ is free for use of PCI/PnP devices. When set to [Reserved], the IRQ is reserved for legacy ISA devices.
Configuration options: [Available] [Reserved]

4.9 Boot

The Boot menu items allow you to change the system boot options. Select an item then press Enter to display the sub-menu.



4.9.1 Boot Settings Configuration

configure settings during system boot.

Quick Boot [Enabled]

Enabling this item allows BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.

Configuration options: [Disabled] [Enabled]

Quiet Boot [Disabled]

This allows you to enable or disable the full screen logo display feature.

Configuration options: [Disabled] [Enabled]

Add On ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.

Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.

Configuration options: [Off] [On]

PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse.

Configuration options: [Disabled] [Enabled] [Auto]

Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for F1 key to be pressed when error occurs.

Configuration options: [Disabled] [Enabled]

Hit 'DEL' Message Display [Enabled]

When set to Enabled, the system displays the message 'Press DEL to run Setup' during POST.

Configuration options: [Disabled] [Enabled]

Interrupt 19 Capture [Disabled]

When set to [Enabled], this function allows the option ROMs to trap Interrupt 19.

Configuration options: [Disabled] [Enabled]

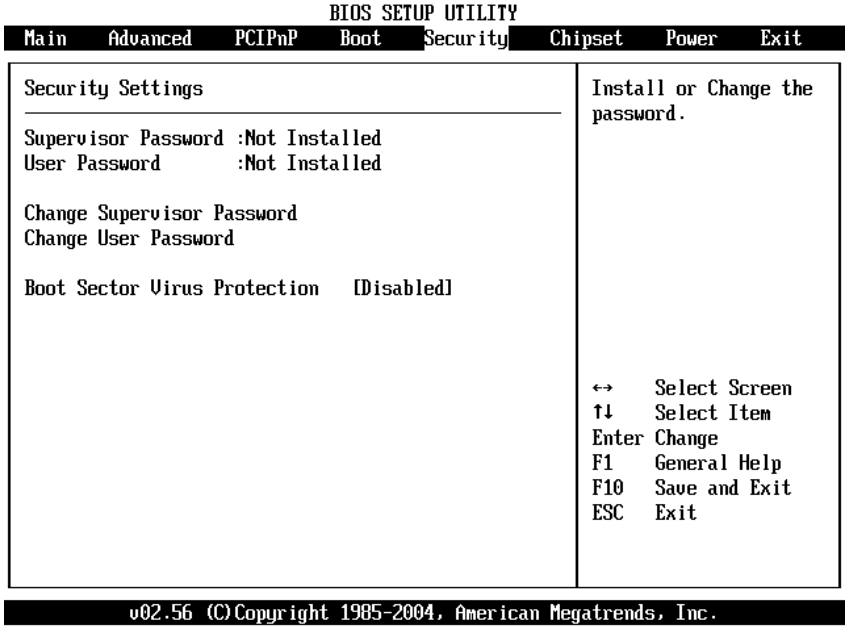
4.9.2 Boot Device Priority

Specifies the boot device priority sequence.

1st ~ xxth Boot Device
These items specify the boot device priority sequence from the available hard disk drives. The number of items that appear on the screen depends on the number of hard disk drives installed in the system.
Configuration options: [xxxxx Drive] [Disabled]
Removable Drives
Specifies the boot device priority sequence from available removable drives.

4.10 Security

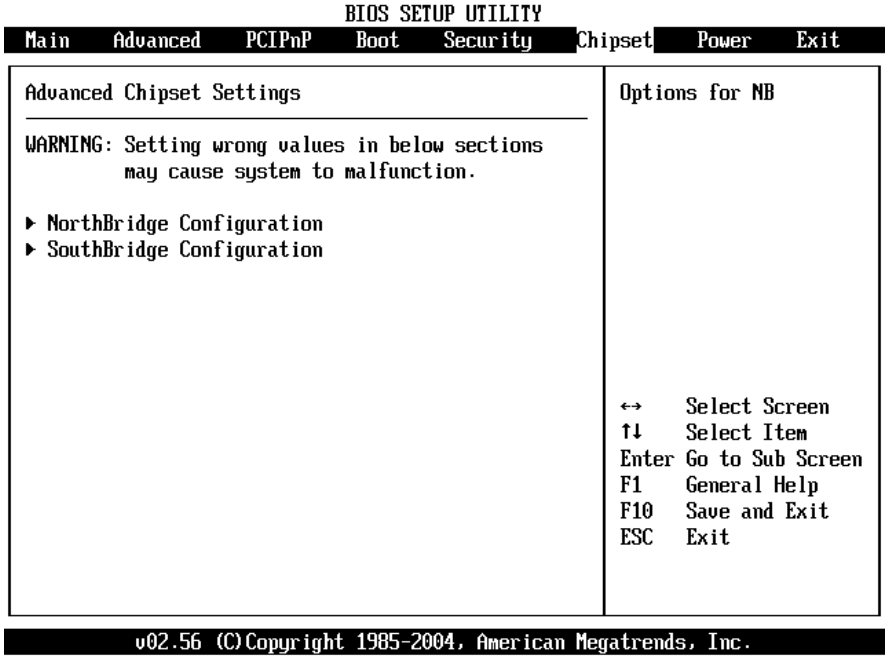
The Security menu items allow you to change the system security settings. Select an item then press Enter to display the configuration options.



Change Supervisor Password
Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen shows the default Not Installed. After you have set a password, this item shows Installed.
Change User Password
Select this item to set or change the user password. The User Password item on top of the screen shows the default Not Installed. After you have set a password, this item shows Installed.
Boot Sector Virus Protection [Disabled]
Allows you to enable or disable the boot sector virus protection.
Configuration options: [Disabled] [Enabled]

4.11 Chipset

The Chipset menu items allow you to change the advanced chipset settings. Select an item then press Enter to display the sub-menu.



4.11.1 North Bridge Configuration

Configure DRAM Timing by SPD [Enabled]
When this item is enabled, the DRAM timing parameters are set according to the DRAM SPD (Serial Presence Detect). When disabled, you can manually set the DRAM timing parameters through the DRAM sub-items.
Configuration options: [Disabled] [Enabled]

Memory Hole [Disabled]
Configuration options: [Disabled] [15MB-16MB]

Init. Graphic Adapter Priority [Internal VGA]
Allows selection of the graphics controller to use as primary boot device.
Configuration options: [Internal VGA] [PCI/Int-VGA]

Internal Graphics Mode Select [Enable, 8MB]
Select the amount of system memory used by the internal graphics device.
Configuration options: [Enable, 1MB] [Enable, 4MB] [Enable, 8MB] [Enable, 16MB] [Enable, 32MB]

Graphics Aperture Size [64MB]
Allows you to select the size of mapped memory for AGP graphic data.
Configuration options: [4MB] [8MB] [16MB] [32MB] [64MB] [128MB] [256MB]

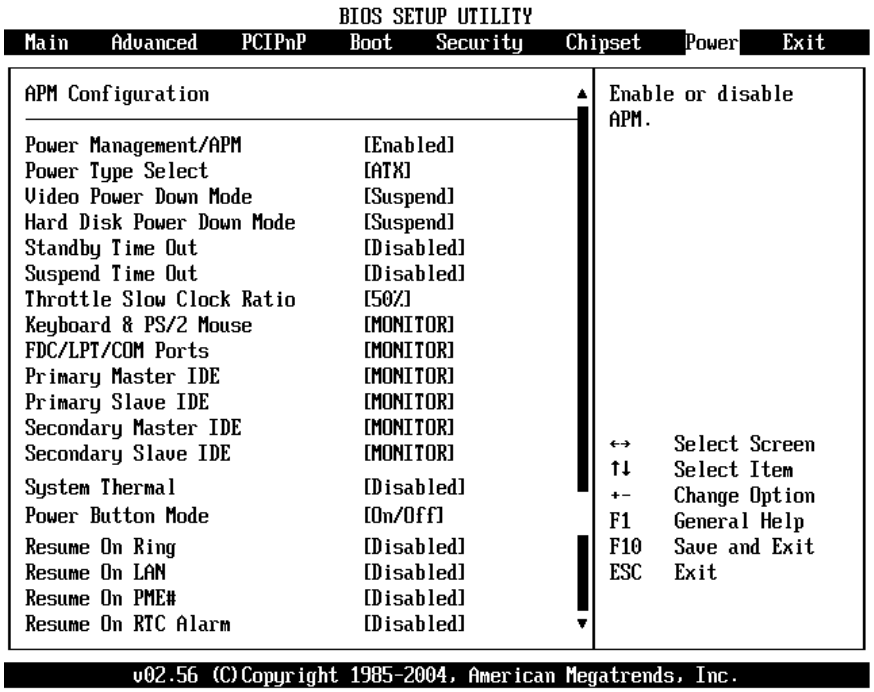
C.S.A Gigabit Ethernet [Auto]
Allows you to enable or disable the C.S.A Gigabit Ethernet.

4.11.2 South Bridge Configuration

On Board AC'97 Audio [Auto]
Allows you to enable or disable the AC'97 Audio.
Configuration options: [Auto] [Disabled]

Restore on AC Power Loss [Last State]
When set to Power Off, the system goes into off state after an AC power loss.
When set to Power On, the system goes on after an AC power loss.
When set to Last State, the system goes into either off or on state
Whatever was the system state before the AC power loss.
Configuration options: [Power Off] [Power On] [Last State]

4.12 Power



Power Management/APM [Enabled]
Allows you to enable or disable the Advanced Power Management (APM) feature.
Configuration options: [Disabled] [Enabled]

Power Type Select [ATX]
Allows you to select the power type mode.
Configuration options: [ATX] [AT]

Video Power Down Mode [Suspend]
Allows you to select the video power down mode.
Configuration options: [Disabled] [Standby] [Suspend]

Hard Disk Power Down Mode [Suspend]
Allows you to select the hard disk power down mode.
Configuration options: [Disabled] [Standby] [Suspend]

Standby Time Out [Disabled]
Allows you to select the specified time at which the system goes on standby.
Configuration options:[Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [10 Min] [20 Min] [30 Min] [40 Min] [50 Min] [60 Min]

Suspend Time Out [Disabled]
Allows you to select the specified time at which the system goes on suspend.
Configuration options:[Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [10 Min] [20 Min] [30 Min] [40 Min] [50 Min] [60 Min]

Throttle Slow Clock Ratio [50%]
Allows you to select the duty cycle in throttle mode.
Configuration options: [87.5%] [75.0%] [62.5%] [50%] [37.5%] [25%] [12.5%]

System Thermal [Disabled]
power management event.
Configuration options: [Disabled] [Enabled]

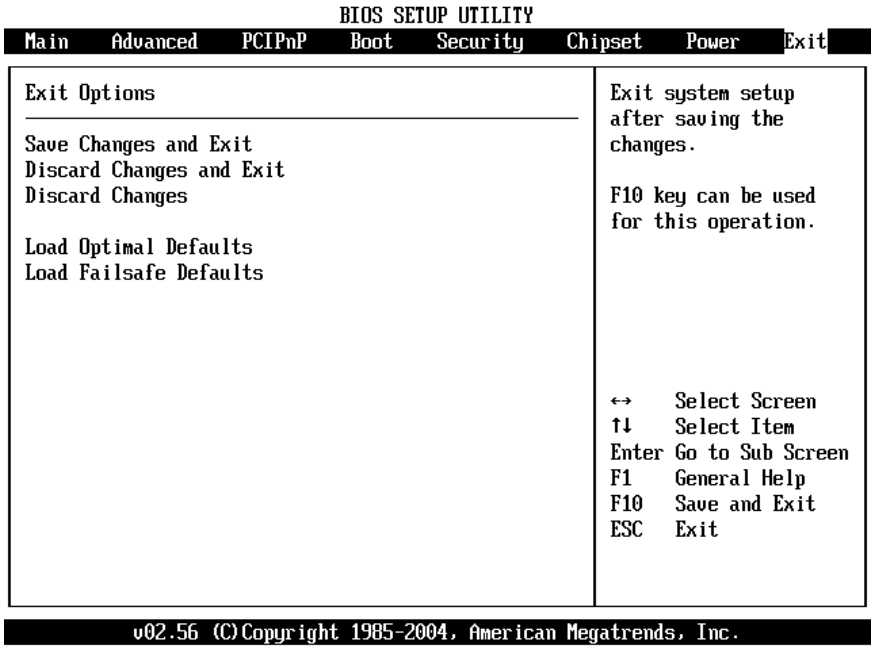
Power Button Mode [On/Off]
Allows the system to go into On/Off mode or suspend mode when the power button is pressed.
Configuration options: [On/Off] [Suspend]

Resume On Ring [Disabled]
Allows you to enable or disable RI to generate a wake event.
Configuration options: [Disabled] [Enabled]

Resume On LAN [Disabled]
Allows you to enable or disable LAN GPI to generate a wake event.
Configuration options: [Disabled] [Enabled]
Resume On PME# [Disabled]
Allows you to enable or disable PCI PME# to generate a wake event.
Configuration options: [Disabled] [Enabled]
Resume On RTC Alarm [Disabled]
Allows you to enable or disable RTC to generate a wake event. When this item is set to Enabled, the items RTC Alarm Date, RTC Alarm Hour, RTC Alarm Minute, and RTC Alarm Second appear with set values.
Configuration options: [Disabled] [Enabled]

4.13 Exit

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



Save Changes and Exit
Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears.
Select [Yes] to save changes and exit.
Discard Changes and Exit
Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.
Discard Changes
This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.
Load Optimal Defaults
This option allows you to load optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**
Load Failsafe Defaults
This option allows you to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Appendix A Watchdog Timer

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, hardware on the board will either perform a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH
Sub-function: **AL – 2** : Set the Watchdog Timer's period **BL** : Time-out value(Its unit--second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

You have to call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer will start counting down. While the timer value reaches zero, the system will reset. To ensure that this reset condition does not occur, the Watchdog Timer must be periodically refreshed by calling sub-function 2. However the Watchdog timer will be disabled if you set the time-out value to be zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

Note: When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system will reset.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H           ;setting the time-out value
        MOV     BL, 30              ;time-out value is 48 seconds
        INT     15H
 ;
; ADD YOUR APPLICATION PROGRAM HERE
;
        CMP     EXIT_AP, 1          ;is your application over?
        JNE     W_LOOP              ;No, restart your application

        MOV     AX, 6F02H           ;disable Watchdog Timer
        MOV     BL, 0               ;
        INT     15H
;
; EXIT ;
```

Appendix B Address Mapping

IO Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-05F	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	Intel(R) 82865 Graphics Controller
3C0-3DF	Intel(R) 82865 Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

*Default setting

IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	AUDIO/SMBus Cntrlr
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	VGA/SMBus Cntrlr	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Appendix C Intel RAID for SATA configuration

The Intel RAID Option ROM should be integrated with the system BIOS on all motherboards with a supported Intel chipset. The Intel RAID Option ROM is the Intel RAID implementation and provides BIOS and DOS disk services. Please use <Ctrl> + <I> keys to enter the "Intel(R) RAID for Serial ATA" status screen, which should appear early in system boot-up, during the POST (Power-On Self Test).

Using the Intel RAID Option ROM

1. Creating, Deleting and Resetting RAID Volumes:

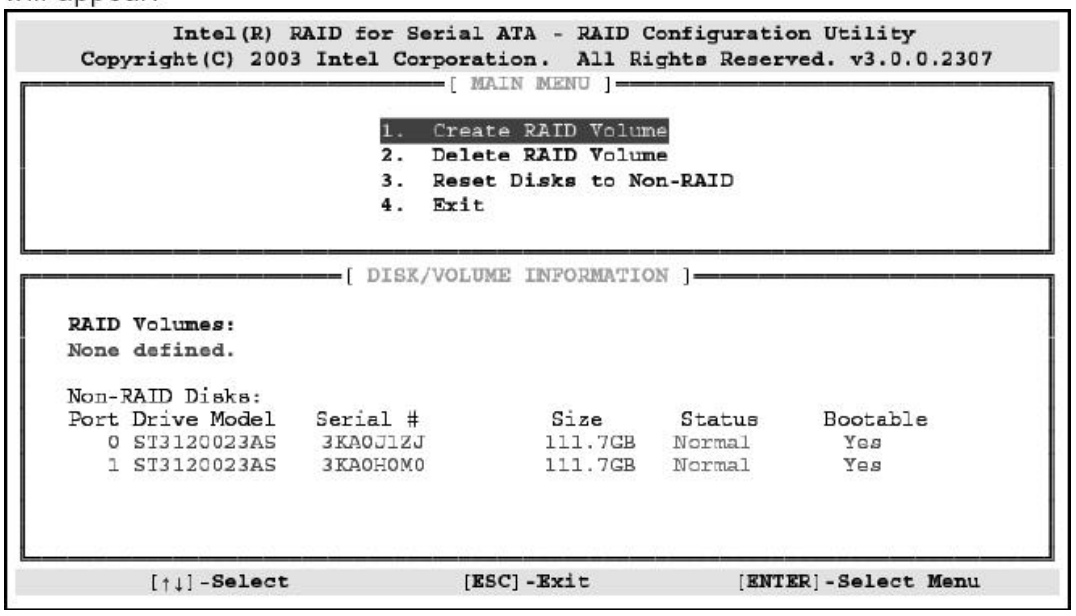
The Serial ATA RAID volume may be configured using the RAID Configuration utility stored within the Intel RAID Option ROM. During the Power-On Self Test (POST), the following message will appear for a few seconds:

```
Intel(R) RAID for Serial ATA - RAID BIOS v3.0.0.2307
Copyright(C) 2003 Intel Corporation.  All Rights Reserved.

RAID Volumes:
None defined.

Non-RAID Disks:
Port  Drive Model      Serial #          Size      Status      Bootable
 0    ST3120023AS     3KA0J1ZJ          111.7GB   Normal        Yes
 1    ST3120023AS     3KA0H0M0          111.7GB   Normal        Yes

Press <CTRL-I> to enter Configuration Utility…
```

After the above message shows, press <Ctrl> and <I> keys simultaneously to enter the RAID Configuration Utility.

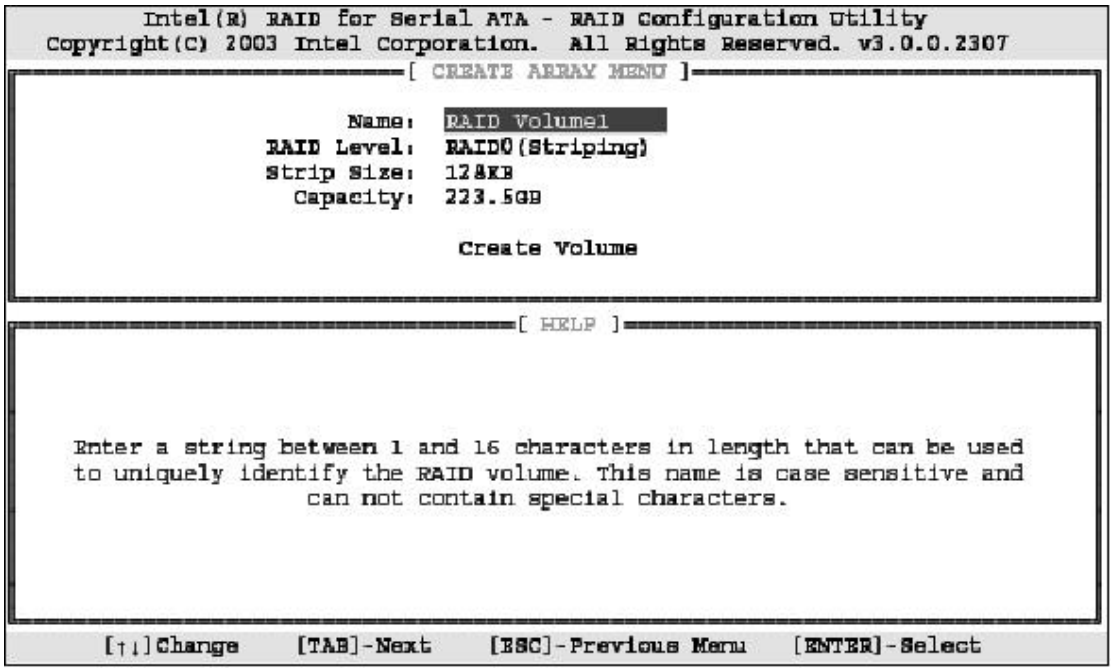
2. Creating, Deleting and Resetting RAID Volumes:

After pressing the <Ctrl> and <I> keys simultaneously, the following window will appear:

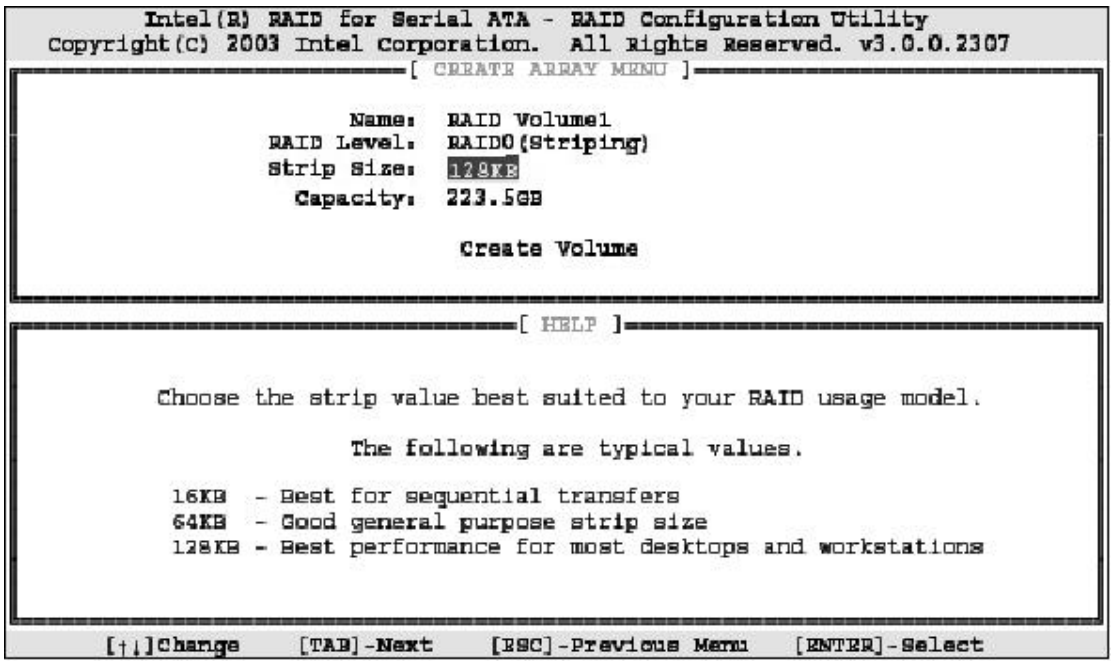


(1) Create RAID Volume

1. Select option 1 “Create RAID Volume” and press <Enter> key. The following screen appears:



2. Specify a RAID Volume name and then press the <TAB> or <Enter> key to go to the next field.

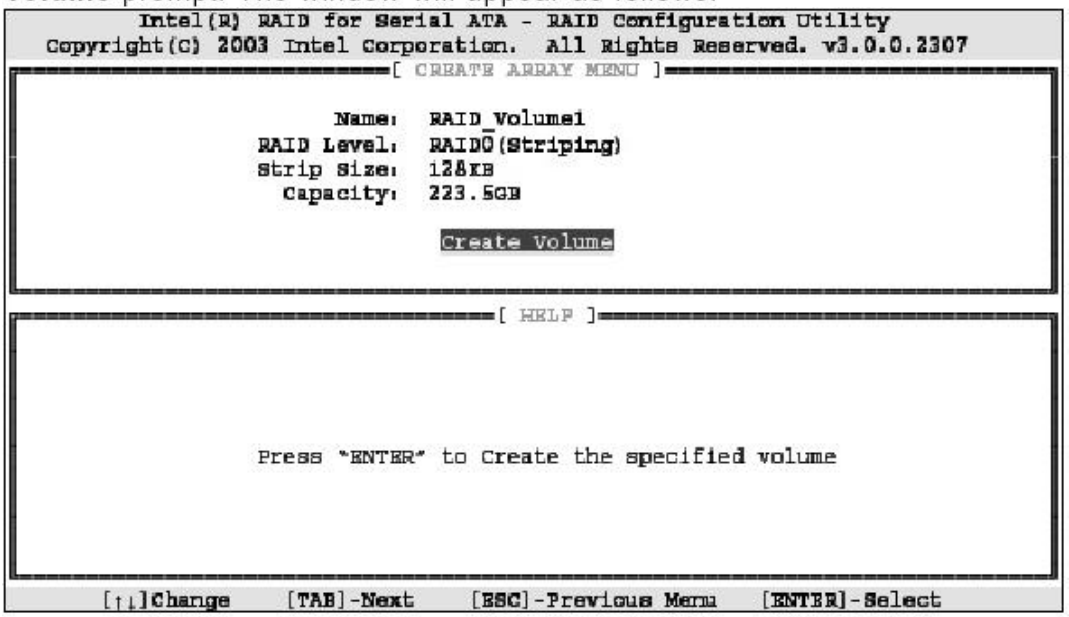


3. Select the strip value for the RAID 0 or RAID 1 array by using the "upper arrow" or "down arrow" keys to scroll through the available values, and pressing the <Enter> key to select and advance to the next field. The available values range from 4KB to 128 KB in power of 2 increments. The strip value should be chosen based on the planned drive usage. Here are some suggested selections:

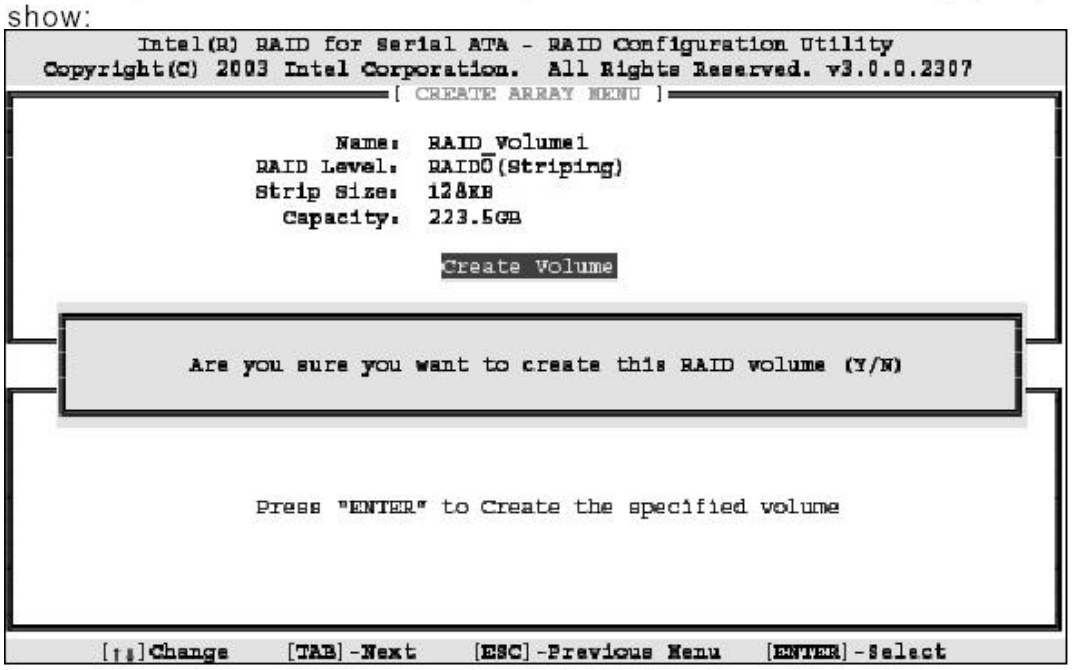
16 KB – Best for sequential transfers
64 KB – Good general purpose strip size
128 KB – Best performance for most desktops and workstations. The default value.

Select the RAID level (**Striping** for RAID0 and **Mirror** for RAID1) by scrolling through the available values by using the "upper arrow" or "down arrow", and press the <Enter> key to select and advance to the next field.

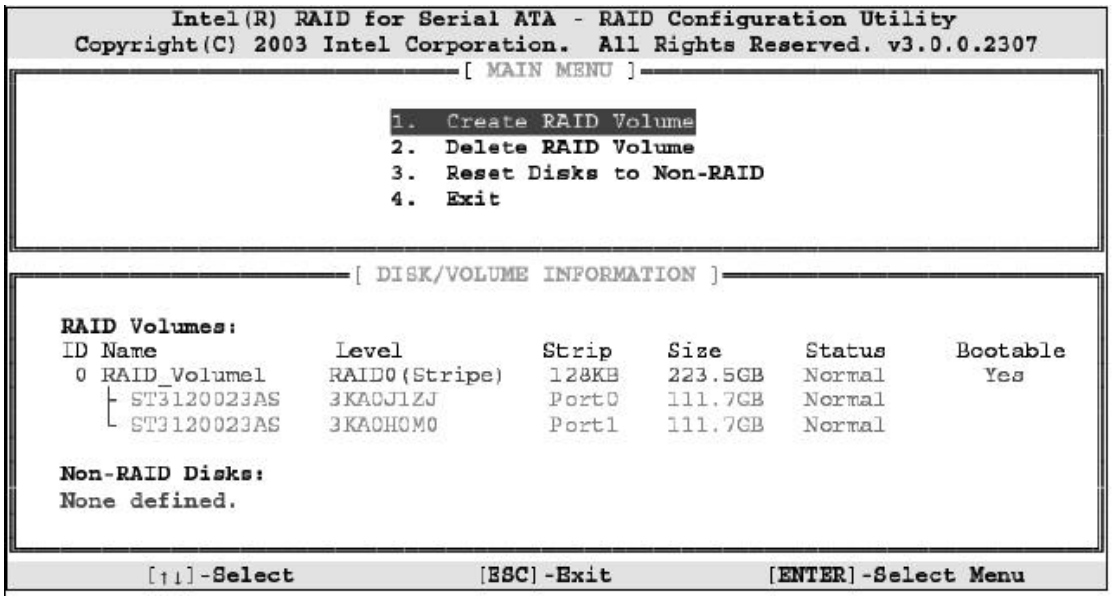
4. From the Strip size, press the <Tab> or <ENTER> key to advance to the **Create Volume** prompt. The window will appear as follows:



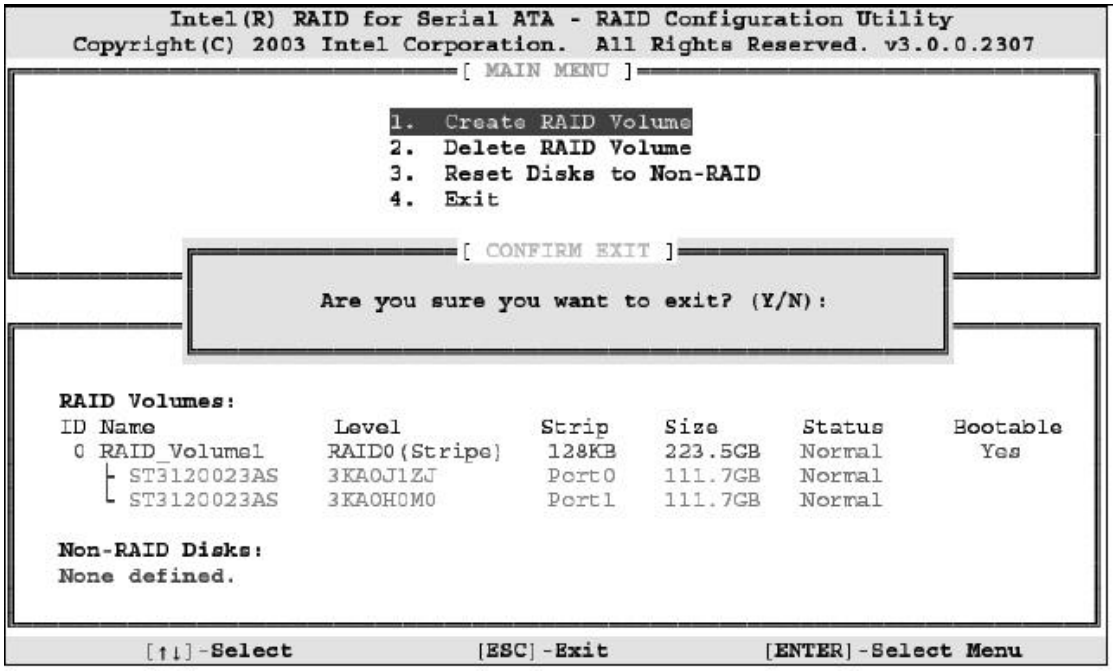
5. Then press <Enter> to create the specified volume and the following prompt will show:



6. Press <Y> to confirm the selection or press <N> to create the RAID volume again. Then you will return to the main menu with an updated status as follows:



7. Scroll to option 4 **Exit** and press <Enter> to exit the RAID Configuration utility. The following prompt appears:

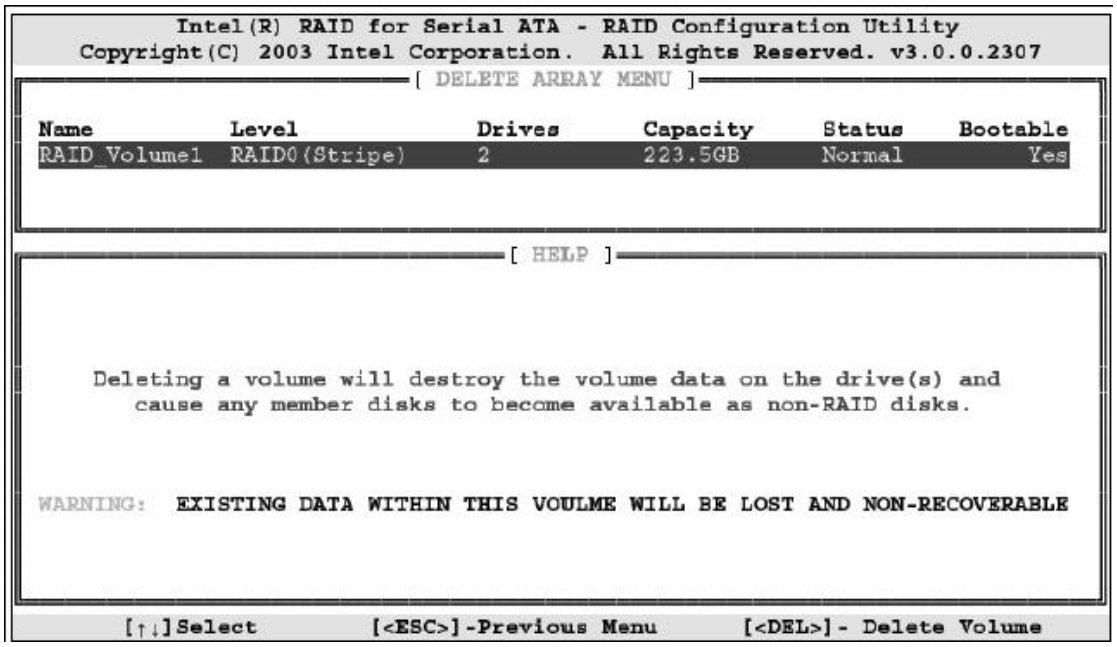


8. Click <Y> to confirm the exit.

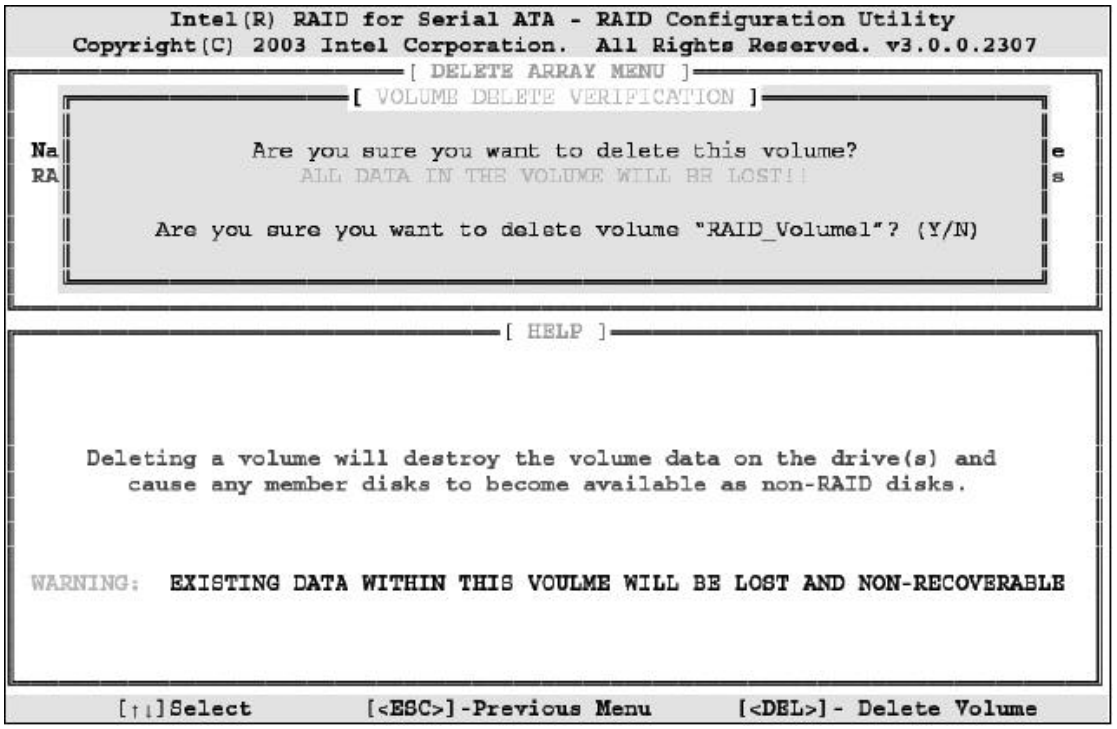
(2) Delete RAID Volume

Here you can delete the RAID volume, but please be noted that all data on RAID drives will be lost.

Select option 2 **Delete RAID Volume** from the main menu window and press <Enter> key to select a RAID volume for deletion. The following window will appear:



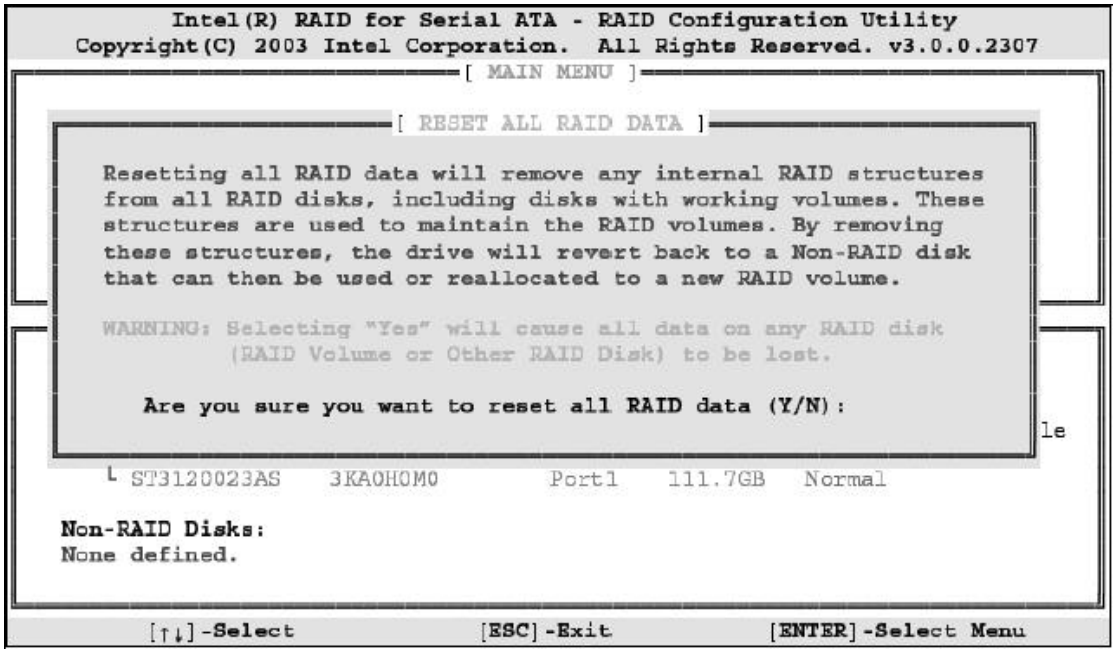
Select the volume and press <Delete> key to delete the RAID volume. The following prompt appears:



Press <Y> key to accept the volume deletion.

(3) Reset Disks to Non-RAID

Select option 3 **Reset Disks to Non-RAID** and press <Enter> to delete the RAID volume and remove any RAID structures from the drives. The following screen appears:



Press <Y> key to accept the selection.

Appendix D AMI BIOS Setup

D.1 Introduction

This manual discusses AMI's Setup program built into the ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

D.2 Starting Setup

The AMI BIOS is immediately activated when you first power on the computer.The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

By pressing <Del> immediately after switching the system on, or

by pressing the <Del>key when the following message appears briefly at the bottom of the screen during the POST.
Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

D.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu

	and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

D.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the **F1** key again.

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AMI BIOS supports an override to the CMOS settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both AMI and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

D.5 BIOS menu bar

The **menu bar** on top of the screen has the following main items:

Main For changing the basic system configuration.

Advanced For changing the advanced system settings.

PCI PnP This entry appears if your system supports PnP / PCI.

Boot For changing the system boot configuration.

Security Use this menu to set User and Supervisor Passwords.

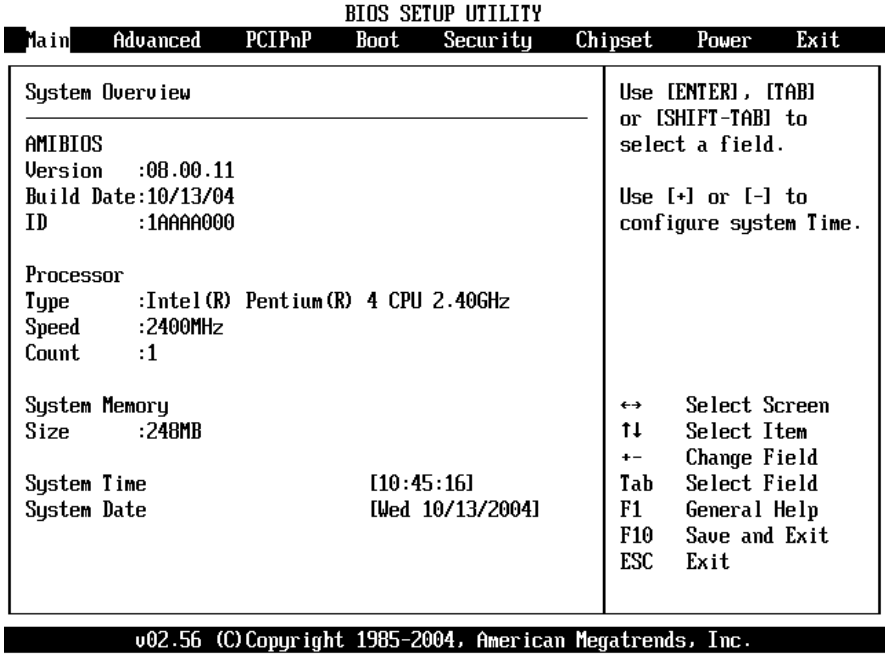
Chipset For changing the chipset setting.

Power For changing the advanced power management configuration.

Exit For selecting the exit options and loading default settings.

D.6 Main

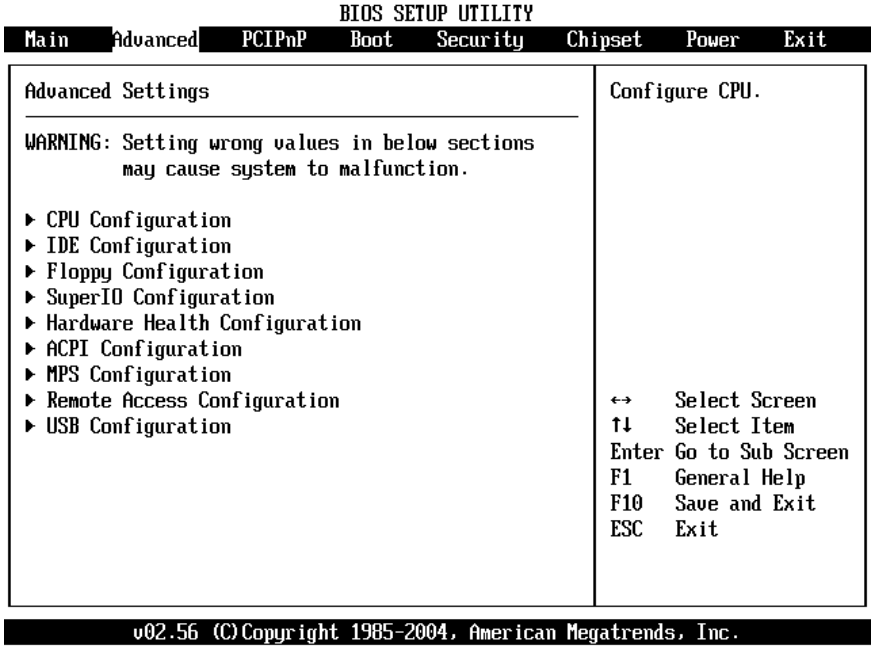
When you enter the BIOS Setup program, the Main menu screen appears giving you an overview of the basic system information.



AMI BIOS This item displays the auto-detected BIOS information.
Processor This item displays the auto-detected CPU specification.
System Memory This item displays the auto-detected system memory.
System Time [xx:xx:xx] This item allows you to set the system time.
System Date [Day xx/xx/xxxx] This item allows you to set the system date.

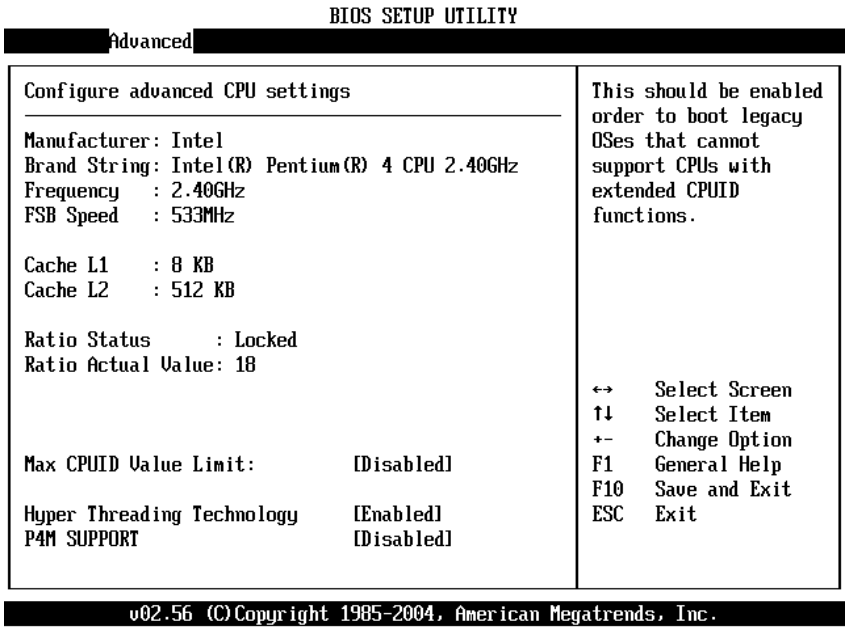
D.7 Advanced

The Advanced menu items allow you to change the settings for the CPU and other system devices.



D.7.1 CPU Configuration

The items in this menu show the CPU-related information auto-detected by BIOS.



Hyper-Threading Technology [Enabled]

This item allows you to enable or disable the processor Hyper-Threading Technology.

Configuration options: [Disabled] [Enabled]

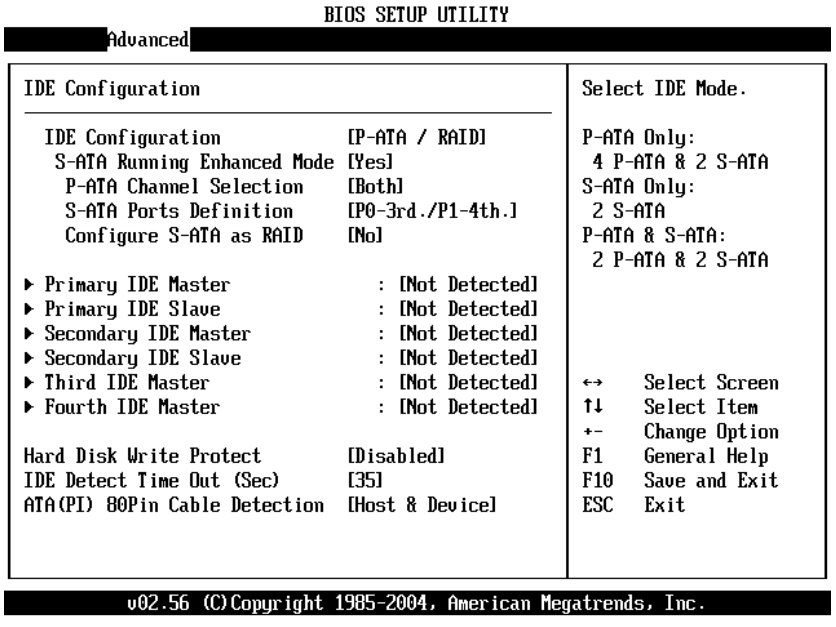
P4M SUPPORT [Disable]

This item allows you to enable or disable the P4-M CPU support.

Configuration options: [Disabled] [Enabled]

D.7.2 IDE Configuration

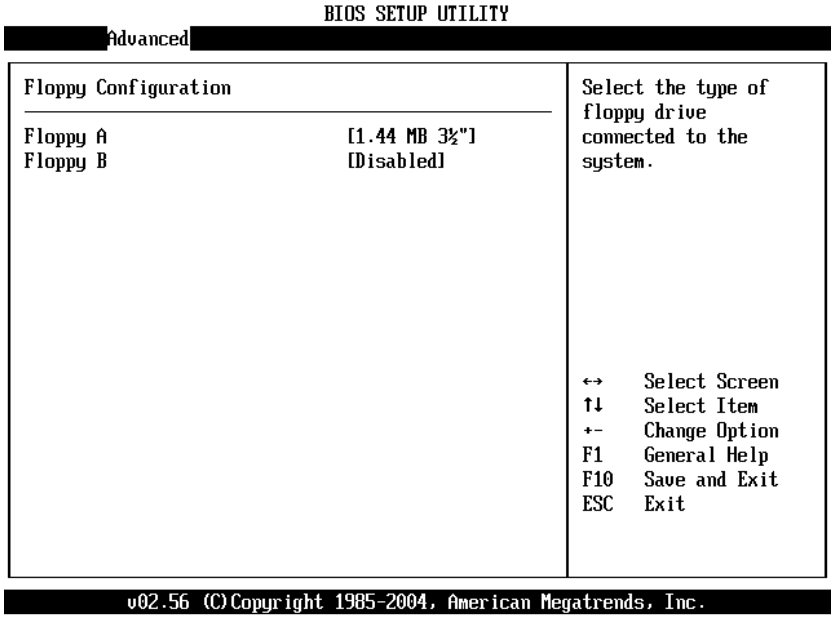
The items in this menu allow you to set or change the configurations for the IDE devices installed in the system. Select an item then press Enter if you wish to configure the item.



IDE Configuration [P-ATA/RAID]
This item allows you to select the IDE mode
Configuration options: [Disabled] [P-ATA/RAID] [S-ATA Only] [P-ATA/S-ATA]
Primary and Secondary IDE Master/Slave
Third and Fourth IDE Master
The values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring) are auto-detected by BIOS and are not user-configurable. These items show N/A if no IDE device is installed in the system.
Type [Auto]
Selects the type of IDE drive. Setting to Auto allows automatic selection of the appropriate IDE device type. Select CDROM if you are specifically configuring a CD-ROM drive. Select ARMD (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.
Configuration options: [Not Installed] [Auto] [CDROM] [ARMD].
LBA/Large Mode [Auto]
Enables or disables the LBA mode. Setting to Auto enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled.
Configuration options: [Disabled] [Auto]
Block (Multi-sector Transfer) [Auto]
Enables or disables data multi-sectors transfers. When set to Auto, the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to Disabled, the data transfer from and to the device occurs one sector at a time.
Configuration options: [Disabled] [Auto]
PIO Mode [Auto]
Selects the PIO mode.
Configuration options: [Auto] [0] [1] [2] [3] [4]
DMA Mode [Auto]
Selects the DMA mode.
Configuration options: [Auto] [SWDMA0] [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5]
SMART Monitoring [Auto]
Sets the Smart Monitoring, Analysis, and Reporting Technology.
Configuration options: [Auto] [Disabled] [Enabled]
32Bit Data Transfer [Disabled]
Enables or disables 32-bit data transfer.
Configuration options:[Disabled] [Enabled]
Hard Disk Write protect [Disabled]
This item allows you to enable or disable the hard disk write protect
Configuration options: [Disabled] [Enabled]
IDE Detect Time Out (Sec) [35]
Selects the time out value for detecting ATA/ATAPI devices.
Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]
ATA(PI) 80Pin Cable Detection [Host & Device]
Configuration options: [Host & Device] [Host] [Device]

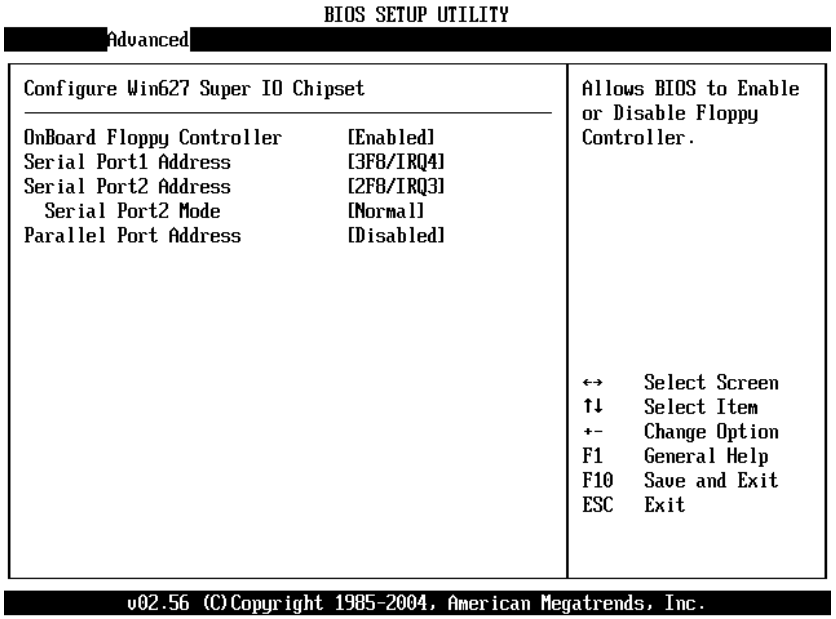
D.7.3 Floppy Configuration

Sets the type of floppy drive installed.
Configuration options: [Disabled][360K, 5.25 in.][1.2M , 5.25 in.][720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M,3.5in.]

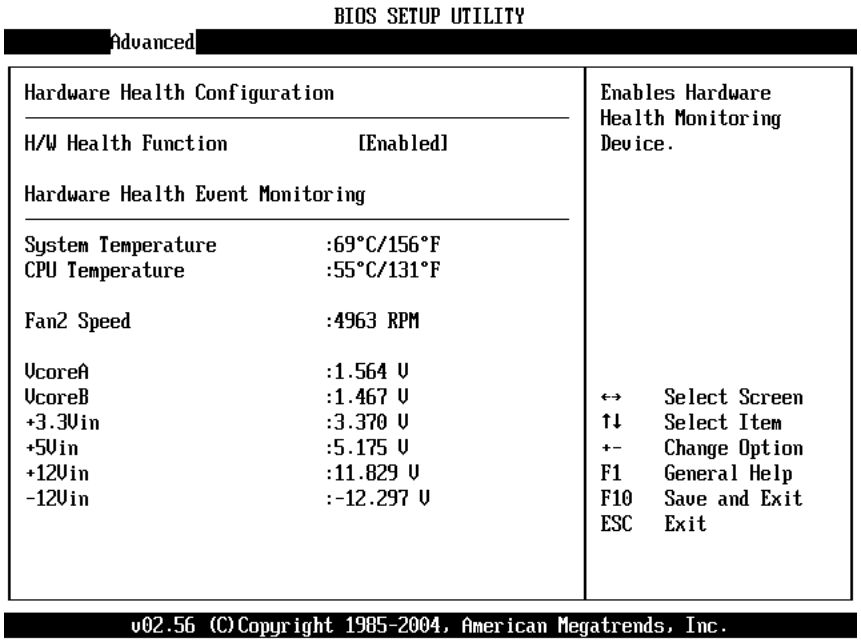


D.7.4 Super IO Configuration

On Board Floppy Controller [Enabled]
Allows you to enable or disable the floppy disk controller.
Configuration options: [Disabled] [Enabled]
S**erial Port1 Address [3F8/IRQ4]**
Allows you to select the Serial Port1 base address.
Configuration options: [Disabled] [3F8/IRQ4] [3E8/IRQ4] [2E8/IRQ3]
Serial Port2 Address [2F8/IRQ3]
Allows you to select the Serial Port2 base address.
Configuration options: [Disabled] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]
Parallel Port Address [378]
Allows you to select the Parallel Port base addresses.
Configuration options: [Disabled] [378] [278] [3BC]
Parallel Port Mode [Normal]
Allows you to select the Parallel Port mode.
Configuration options: [Normal] [Bi-directional] [EPP] [ECP]
Parallel Port IRQ [IRQ7]
Configuration options: [IRQ5] [IRQ7]

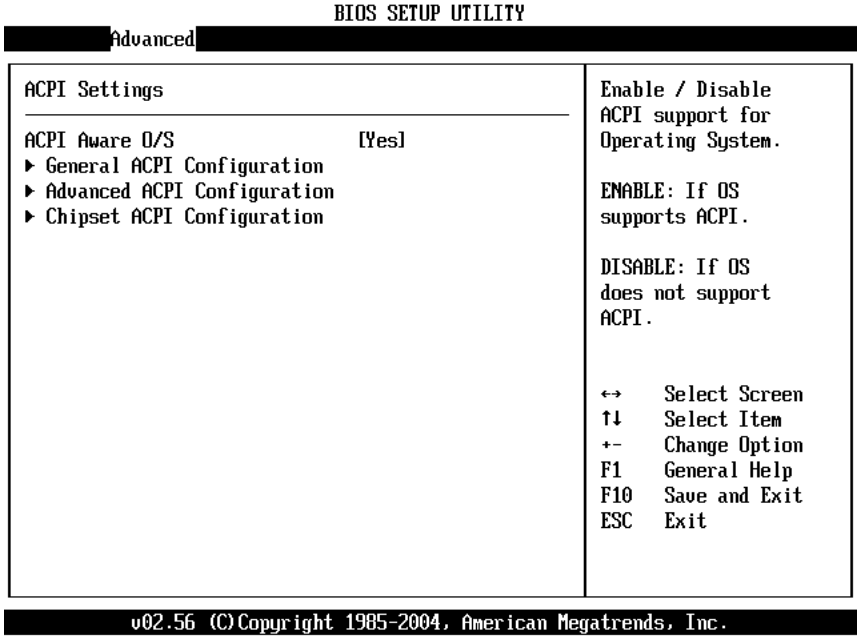


D.7.5 Hardware Health Configuration



D.7.6 ACPI Configuration

Allows you to change the settings for the Advanced Power Management (APM). Select an item then press Enter to display the configuration options.



General ACPI Configuration

Allows you to select the ACPI state to be used for system suspend. Configuration options: [S1 (POS) Only]

Advanced ACPI Configuration

Use this section to configure additional ACPI options.

ACPI 2.0 Features [No]

Allows you to add more tables for ACPI 2.0 specifications. Configuration options: [No] [Yes]

ACPI APIC support [Enabled]

Allows you to enable or disable the ACPI support in the ASIC. When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]

AMI OEMB table [Enabled]
Allows you to enable or disable the inclusion of the BIOS ->AML exchange pointer to (X)RSDT pointer list.
Configuration options: [Disabled] [Enabled]
Headless mode [Disabled]
Enable/Disable headless operation mode through ACPI.

D.7.7 MPS Configuration

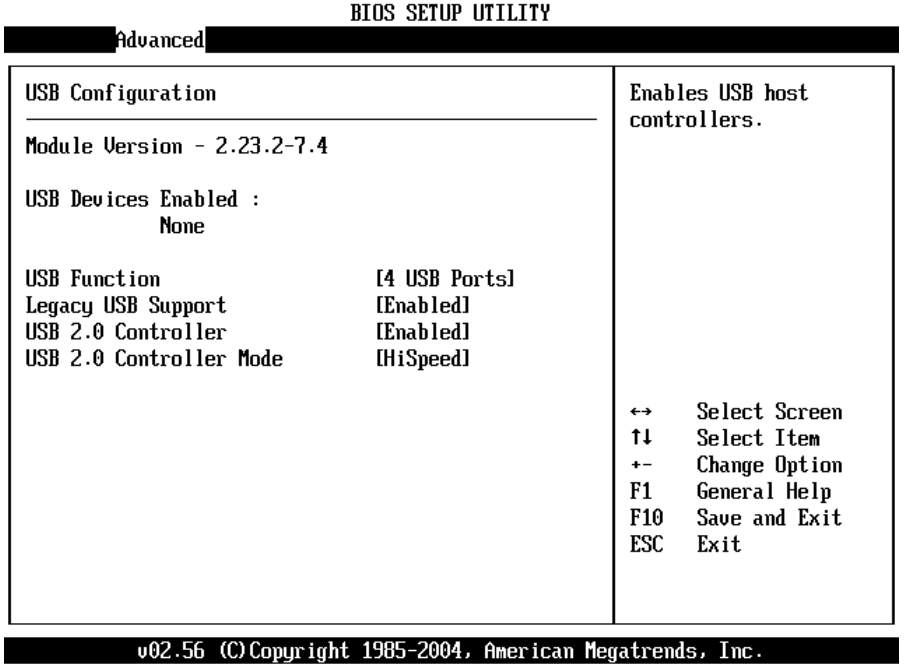
Configure the Multi-Processor table
MPS Revision [1.4]
Configuration options: [1.1] [1.4]

D.7.8 Remote Access Configuration

Configure Remote Access.
Remote Access [Disabled]
Configuration options: [Disabled] [Enabled]

D.7.9 USB Configuration

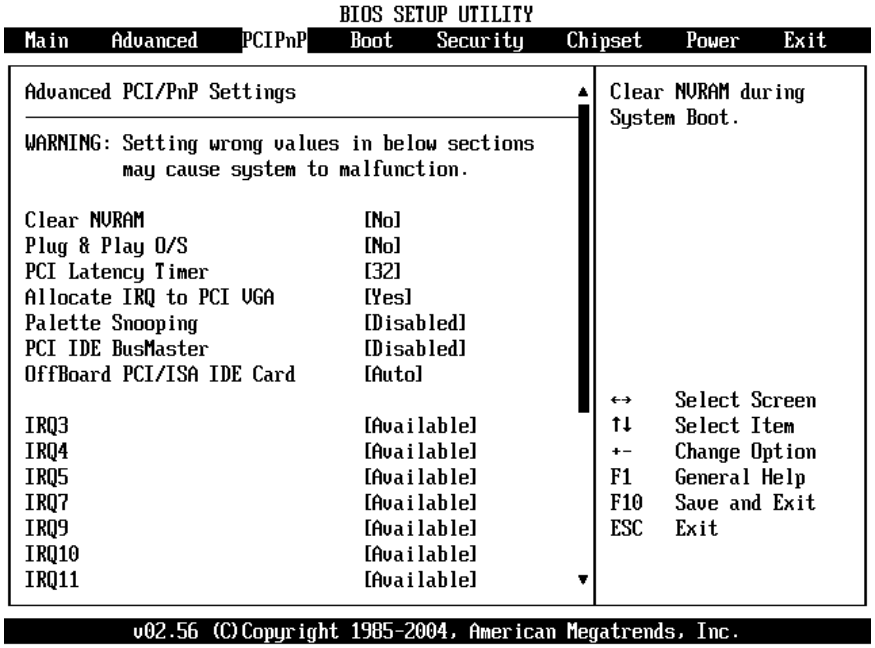
The items in this menu allows you to change the USB-related features. Select an item then press Enter to display the configuration options.



USB Function [8 USB Ports]
Allows you to set the number of USB ports to activate.
Configuration options: [Disabled] [2 USB Ports] [4 USB Ports] [6 USB Ports] [8 USB Ports]
Legacy USB Support [Enable]
Enable support for legacy USB.
Configuration options: [Disabled] [Enabled]
USB 2.0 Controller [Enabled]
Allows you to enable or disable the USB 2.0 controller.
Configuration options: [Disabled] [Enabled]
USB 2.0 Controller Mode [HiSpeed]
Allows you to configure the USB 2.0 controller in HiSpeed (480 Mbps) or Full Speed (12 Mbps).
Configuration options: [HiSpeed] [Full Speed]

D.8 PCI PnP

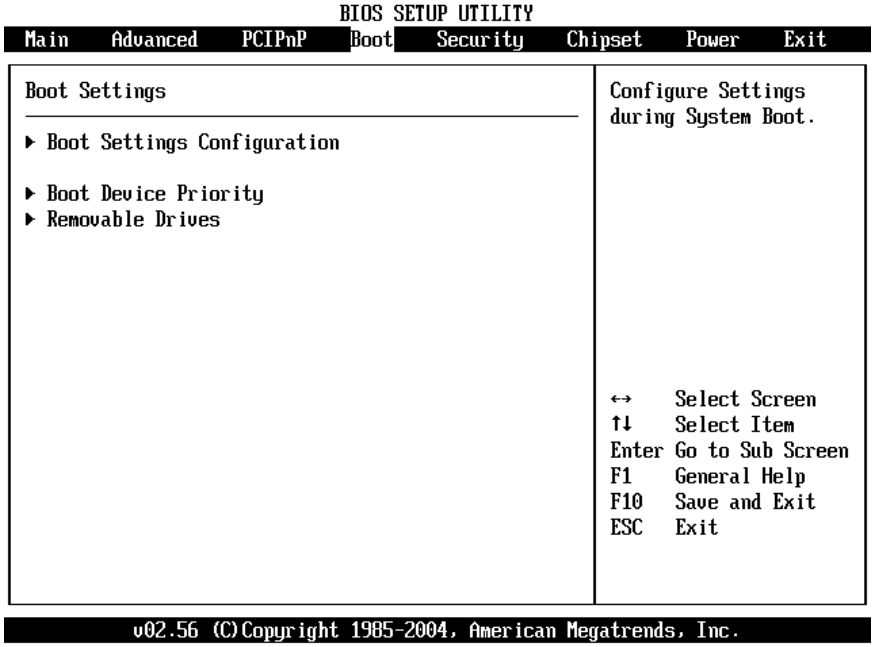
The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel memory size block for legacy ISA devices.



Clear NVRAM [NO]
Clear NVRAM during system boot.
Plug & Play O/S [NO]
When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you installed a Plug & Play operating system, the operating system configures the Plug & Play devices not required for boot.
Configuration options: [No] [Yes]
PCI Latency Timer [32]
Allows you to select the value in units of PCI clocks for the PCI device latency timer register.
Configuration options: [32] [64] [96] [128] [160] [192] [224] [248].
Allocate IRQ to PCI VGA [Yes]
When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested.
Configuration options: [No] [Yes]
Palette Snooping [Disabled]
When set to [Enabled], the palette snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Setting to [Disabled] deactivates this feature.
Configuration options: [Disabled] [Enabled]
PCI IDE Bus Master [Disabled]
Allows BIOS to use PCI bus mastering when reading/writing to IDE devices. Configuration options: [Disabled] [Enabled]
Off Board PCI / ISA IDE Card [Auto]
Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card.
IRQ xx [Available]
When set to [Available], the specific IRQ is free for use of PCI/PnP devices. When set to [Reserved], the IRQ is reserved for legacy ISA devices.
Configuration options: [Available] [Reserved]

D.9 Boot

The Boot menu items allow you to change the system boot options. Select an item then press Enter to display the sub-menu.



D.9.1 Boot Settings Configuration

configure settings during system boot.

Quick Boot [Enabled]

Enabling this item allows BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.

Configuration options: [Disabled] [Enabled]

Quiet Boot [Disabled]

This allows you to enable or disable the full screen logo display feature.

Configuration options: [Disabled] [Enabled]

Add On ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.

Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.

Configuration options: [Off] [On]

PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse.

Configuration options: [Disabled] [Enabled] [Auto]

Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for F1 key to be pressed when error occurs.

Configuration options: [Disabled] [Enabled]

Hit 'DEL' Message Display [Enabled]

When set to Enabled, the system displays the message 'Press DEL to run Setup' during POST.

Configuration options: [Disabled] [Enabled]

Interrupt 19 Capture [Disabled]

When set to [Enabled], this function allows the option ROMs to trap Interrupt 19.

Configuration options: [Disabled] [Enabled]

D.9.2 Boot Device Priority

Specifies the boot device priority sequence.

1st ~ xxth Boot Device

These items specify the boot device priority sequence from the available hard disk drives. The number of items that appear on the screen depends on the number of hard disk drives installed in the system.

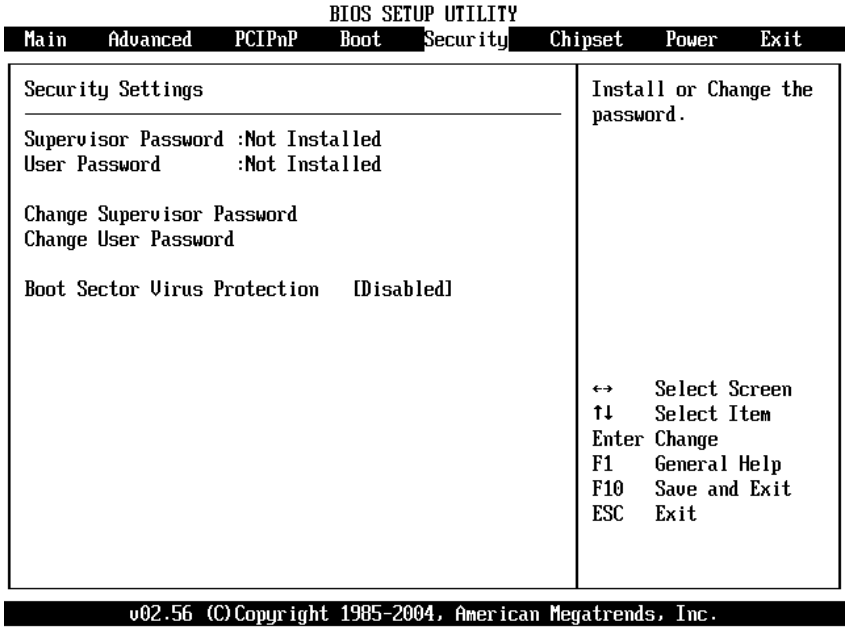
Configuration options: [xxxxx Drive] [Disabled]

Removable Drives

Specifies the boot device priority sequence from available removable drives.

D.10 Security

The Security menu items allow you to change the system security settings. Select an item then press Enter to display the configuration options.



Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen shows the default Not Installed. After you have set a password, this item shows Installed.

Change User Password

Select this item to set or change the user password. The User Password item on top of the screen shows the default Not Installed. After you have set a password, this item shows Installed.

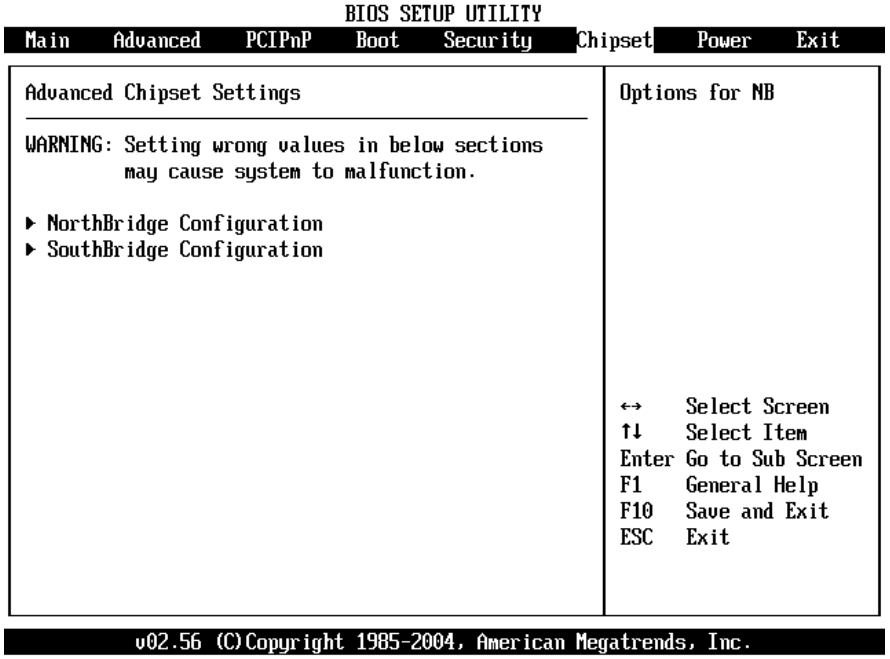
Boot Sector Virus Protection [Disabled]

Allows you to enable or disable the boot sector virus protection.

Configuration options: [Disabled] [Enabled]

D.11 Chipset

The Chipset menu items allow you to change the advanced chipset settings. Select an item then press Enter to display the sub-menu.



D.11.1 North Bridge Configuration

Configure DRAM Timing by SPD [Enabled]
When this item is enabled, the DRAM timing parameters are set according to the DRAM SPD (Serial Presence Detect). When disabled, you can manually set the DRAM timing parameters through the DRAM sub-items.
Configuration options: [Disabled] [Enabled]

Memory Hole [Disabled]
Configuration options: [Disabled] [15MB-16MB]

Init. Graphic Adapter Priority [Internal VGA]
Allows selection of the graphics controller to use as primary boot device.
Configuration options: [Internal VGA] [PCI/Int-VGA]

Internal Graphics Mode Select [Enable, 8MB]
Select the amount of system memory used by the internal graphics device.
Configuration options: [Enable, 1MB] [Enable, 4MB] [Enable, 8MB] [Enable, 16MB] [Enable, 32MB]

Graphics Aperture Size [64MB]
Allows you to select the size of mapped memory for AGP graphic data.
Configuration options: [4MB] [8MB] [16MB] [32MB] [64MB] [128MB] [256MB]

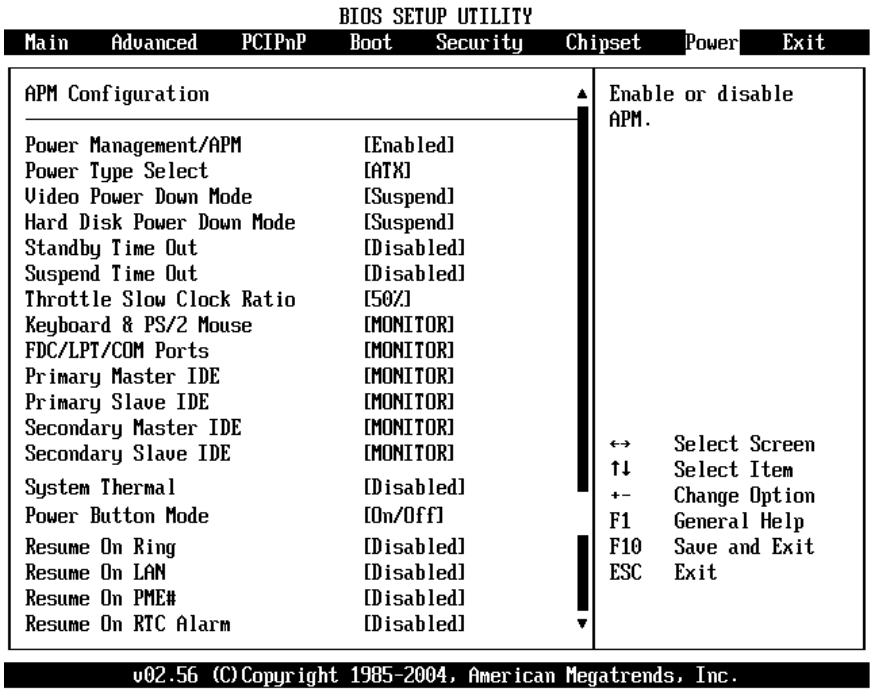
C.S.A Gigabit Ethernet [Auto]
Allows you to enable or disable the C.S.A Gigabit Ethernet.

D.11.2 South Bridge Configuration

On Board AC'97 Audio [Auto]
Allows you to enable or disable the AC'97 Audio.
Configuration options: [Auto] [Disabled]

Restore on AC Power Loss [Last State]
When set to Power Off, the system goes into off state after an AC power loss.
When set to Power On, the system goes on after an AC power loss.
When set to Last State, the system goes into either off or on state
Whatever was the system state before the AC power loss.
Configuration options: [Power Off] [Power On] [Last State]

D.12 Power



Power Management/APM [Enabled]
Allows you to enable or disable the Advanced Power Management (APM) feature.
Configuration options: [Disabled] [Enabled]

Power Type Select [ATX]
Allows you to select the power type mode.
Configuration options: [ATX] [AT]

Video Power Down Mode [Suspend]
Allows you to select the video power down mode.
Configuration options: [Disabled] [Standby] [Suspend]

Hard Disk Power Down Mode [Suspend]
Allows you to select the hard disk power down mode.
Configuration options: [Disabled] [Standby] [Suspend]

Standby Time Out [Disabled]
Allows you to select the specified time at which the system goes on standby.
Configuration options:[Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [10 Min] [20 Min] [30 Min] [40 Min] [50 Min] [60 Min]

Suspend Time Out [Disabled]
Allows you to select the specified time at which the system goes on suspend.
Configuration options:[Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [10 Min] [20 Min] [30 Min] [40 Min] [50 Min] [60 Min]

Throttle Slow Clock Ratio [50%]
Allows you to select the duty cycle in throttle mode.
Configuration options: [87.5%] [75.0%] [62.5%] [50%] [37.5%] [25%] [12.5%]

System Thermal [Disabled]
power management event.
Configuration options: [Disabled] [Enabled]

Power Button Mode [On/Off]
Allows the system to go into On/Off mode or suspend mode when the power button is pressed.
Configuration options: [On/Off] [Suspend]

Resume On Ring [Disabled]
Allows you to enable or disable RI to generate a wake event.
Configuration options: [Disabled] [Enabled]

Resume On LAN [Disabled]

Allows you to enable or disable LAN GPI to generate a wake event.
Configuration options: [Disabled] [Enabled]

Resume On PME# [Disabled]

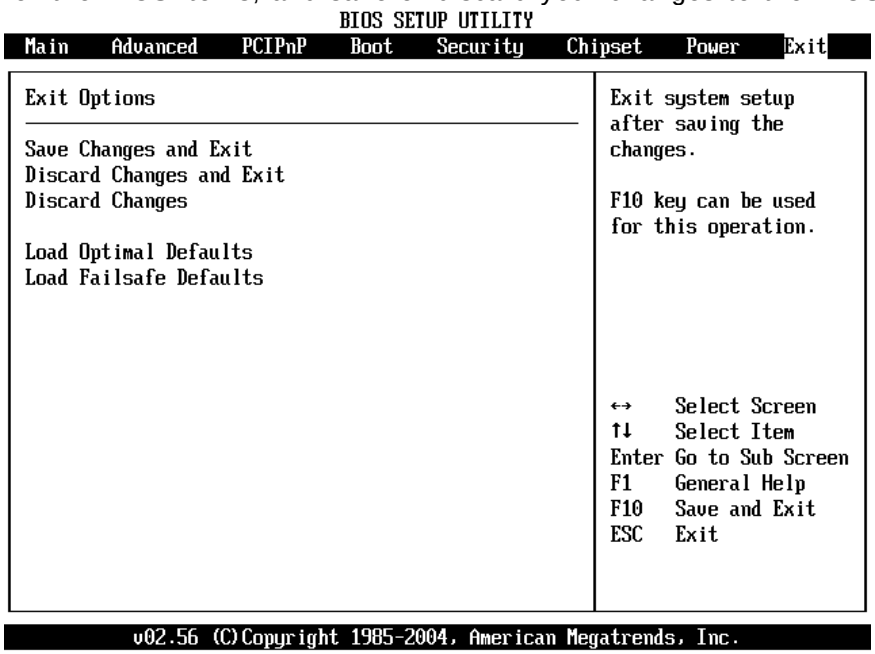
Allows you to enable or disable PCI PME# to generate a wake event.
Configuration options: [Disabled] [Enabled]

Resume On RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to Enabled, the items RTC Alarm Date, RTC Alarm Hour, RTC Alarm Minute, and RTC Alarm Second appear with set values.
Configuration options: [Disabled] [Enabled]

D.13 Exit

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



Save Changes and Exit

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears.
Select [Yes] to save changes and exit.

Discard Changes and Exit

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.

Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.

Load Optimal Defaults

This option allows you to load optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

Load Failsafe Defaults

This option allows you to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

3F6-3F6	Primary IDE Channel

3F7-3F7	Standard floppy disk controller	
3F8-3FF	Serial Port 1 (COM1)	

1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

*Default setting

IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	AUDIO/SMBus Cntrlr
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	VGA/SMBus Cntrlr	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Appendix E Intel RAID for SATA configuration

The Intel RAID Option ROM should be integrated with the system BIOS on all motherboards with a supported Intel chipset. The Intel RAID Option ROM is the Intel RAID implementation and provides BIOS and DOS disk services. Please use <Ctrl> + <I> keys to enter the "Intel(R) RAID for Serial ATA" status screen, which should appear early in system boot-up, during the POST (Power-On Self Test).

Using the Intel RAID Option ROM

1. Creating, Deleting and Resetting RAID Volumes:

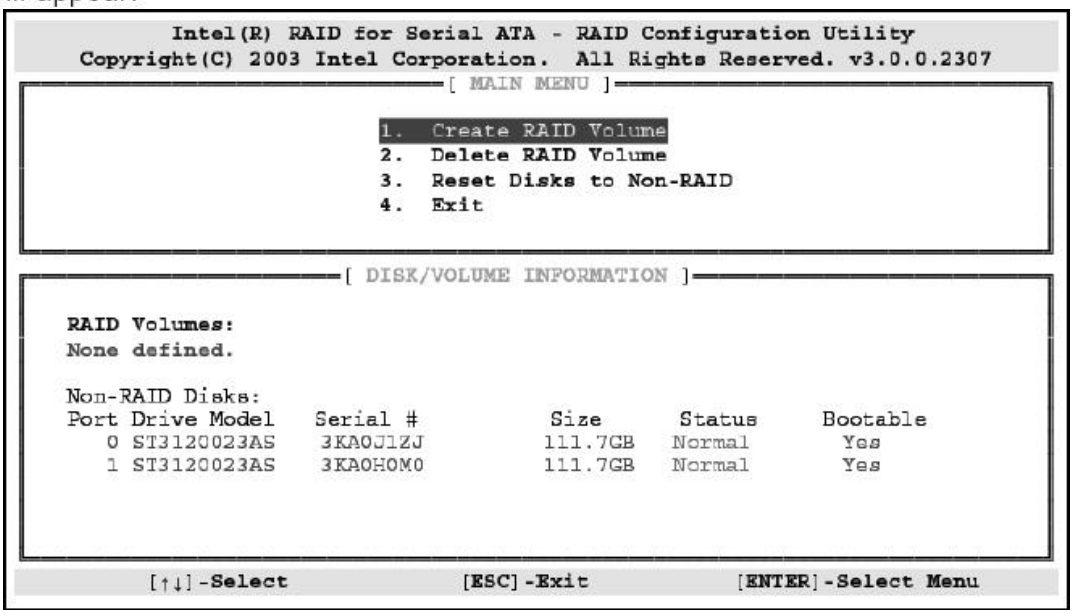
The Serial ATA RAID volume may be configured using the RAID Configuration utility stored within the Intel RAID Option ROM. During the Power-On Self Test (POST), the following message will appear for a few seconds:

```
Intel(R) RAID for Serial ATA - RAID BIOS v3.0.0.2307
Copyright(C) 2003 Intel Corporation.  All Rights Reserved.

RAID Volumes:
None defined.

Non-RAID Disks:
Port Drive Model       Serial #          Size      Status      Bootable
 0   ST3120023AS       3KA0J1ZJ          111.7GB   Normal        Yes
 1   ST3120023AS       3KA0H0M0          111.7GB   Normal        Yes
Press <CTRL-I> to enter Configuration Utility...
```

After the above message shows, press <Ctrl> and <I> keys simultaneously to enter the RAID Configuration Utility.

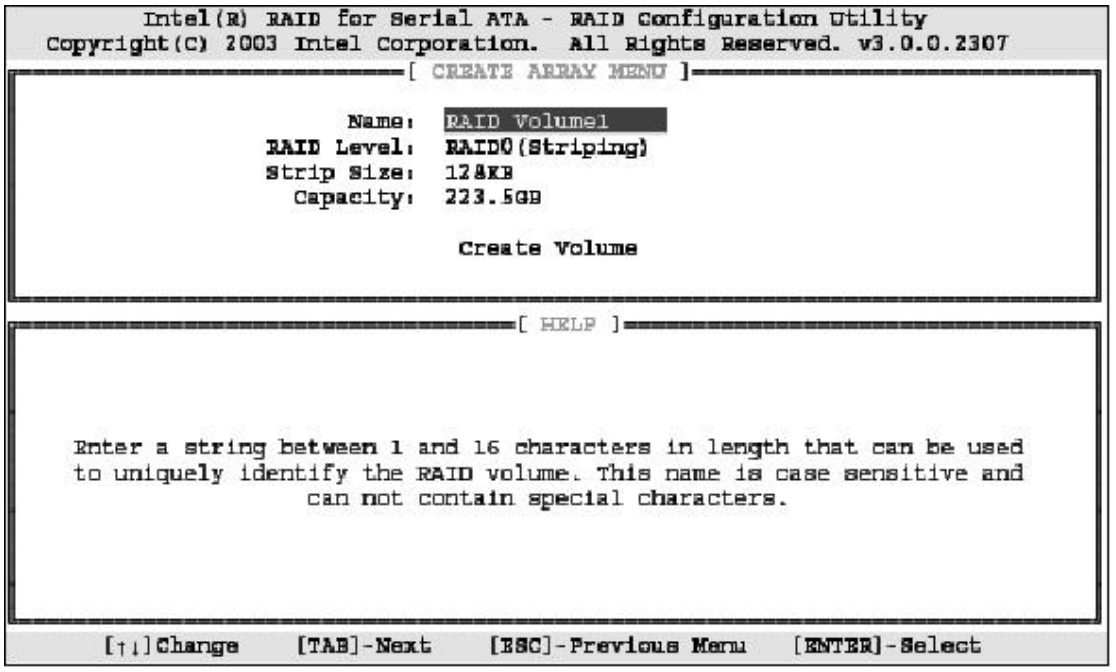
2. Creating, Deleting and Resetting RAID Volumes:

After pressing the <Ctrl> and <I> keys simultaneously, the following window will appear:

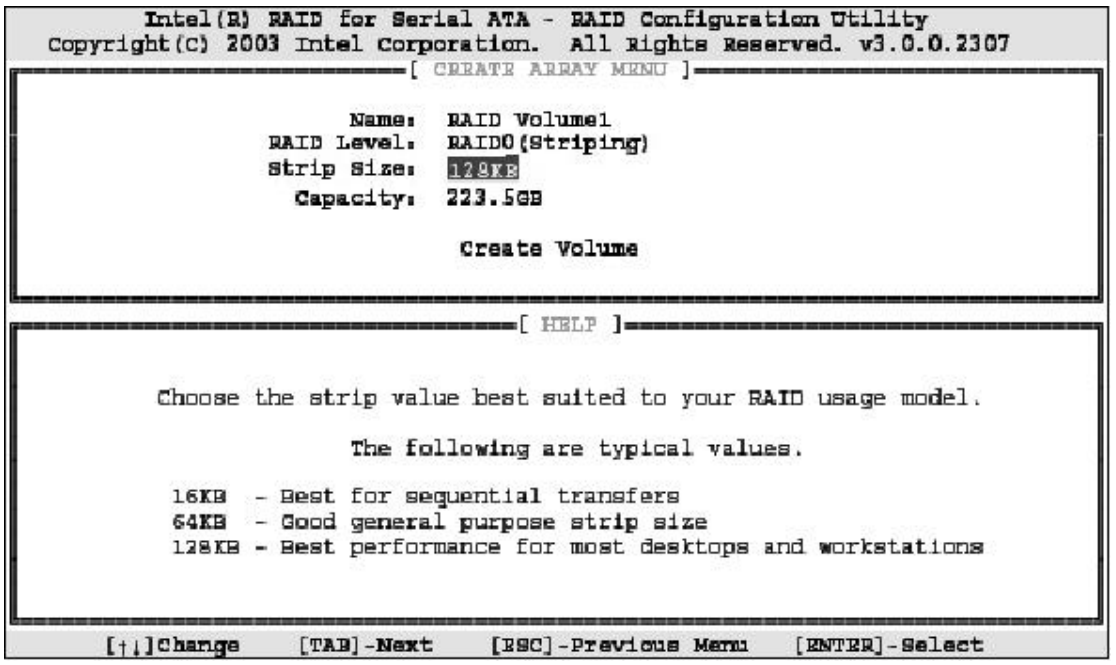


(1) Create RAID Volume

1. Select option 1 “Create RAID Volume” and press <Enter> key. The following screen appears:



2. Specify a RAID Volume name and then press the <TAB> or <Enter> key to go to the next field.

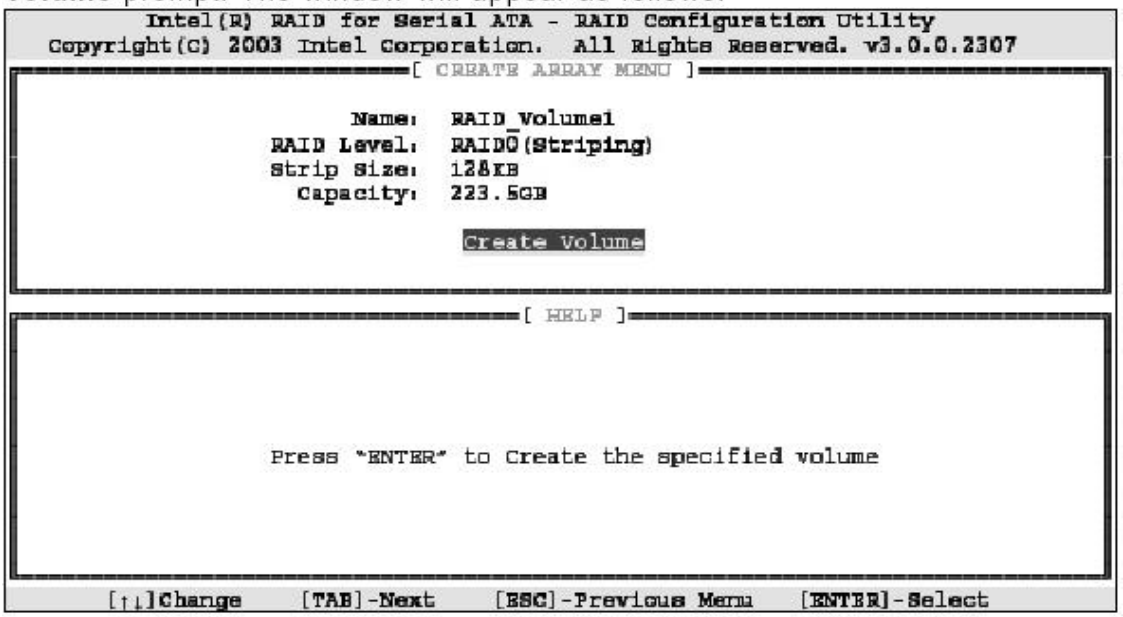


3. Select the strip value for the RAID 0 or RAID 1 array by using the "upper arrow" or "down arrow" keys to scroll through the available values, and pressing the <Enter> key to select and advance to the next field. The available values range from 4KB to 128 KB in power of 2 increments. The strip value should be chosen based on the planned drive usage. Here are some suggested selections:

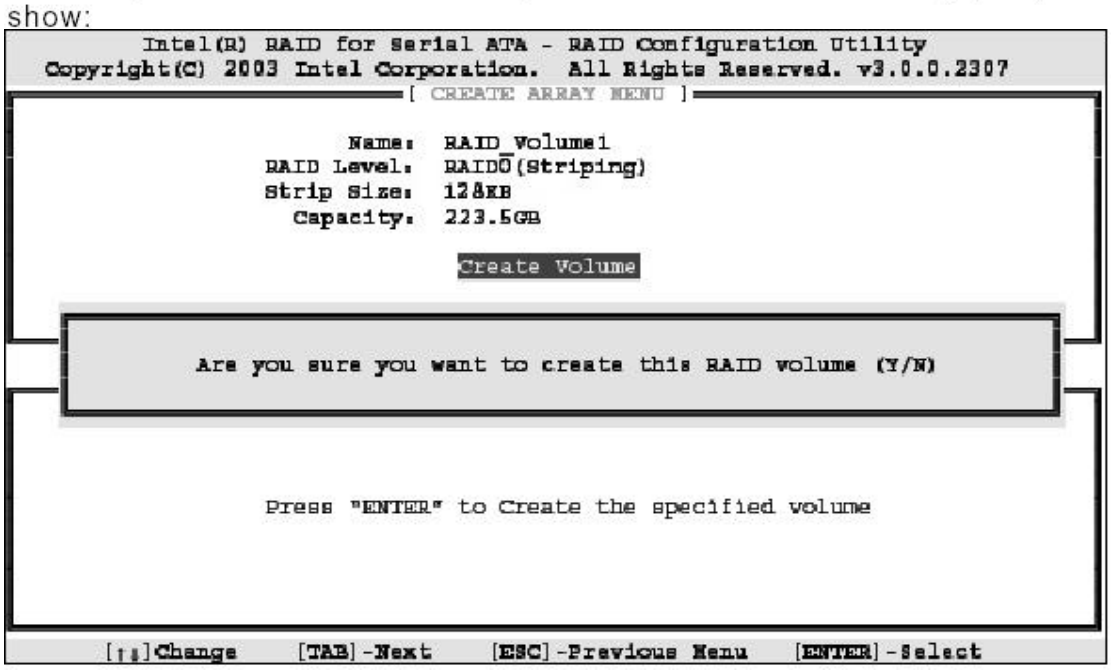
16 KB – Best for sequential transfers
64 KB – Good general purpose strip size
128 KB – Best performance for most desktops and workstations. The default value.

Select the RAID level (**Striping** for RAID0 and **Mirror** for RAID1) by scrolling through the available values by using the "upper arrow" or "down arrow", and press the <Enter> key to select and advance to the next field.

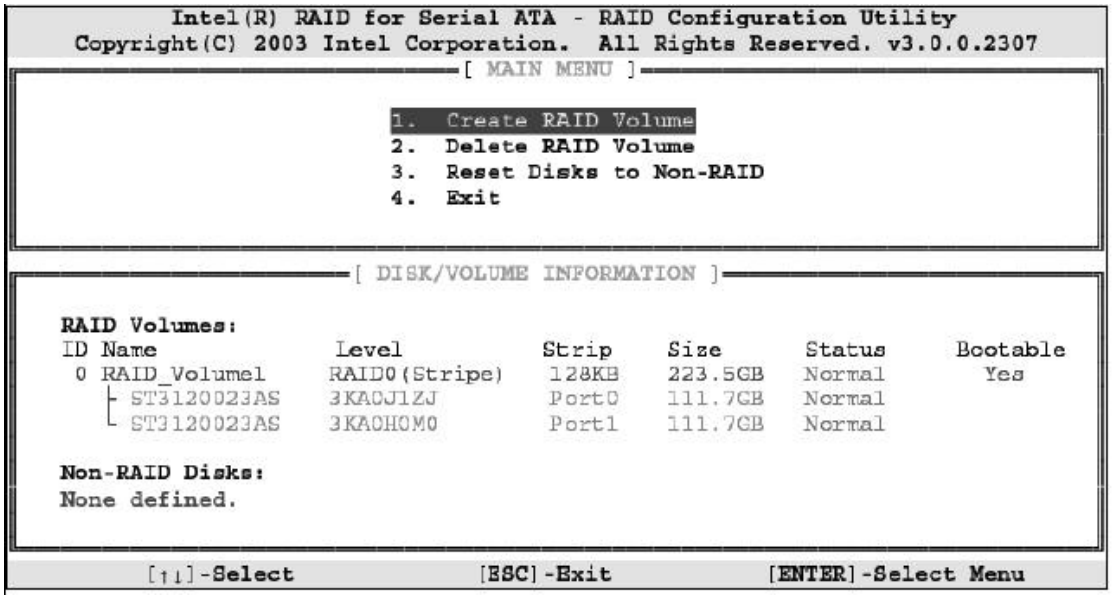
4. From the Strip size, press the <Tab> or <ENTER> key to advance to the **Create Volume** prompt. The window will appear as follows:



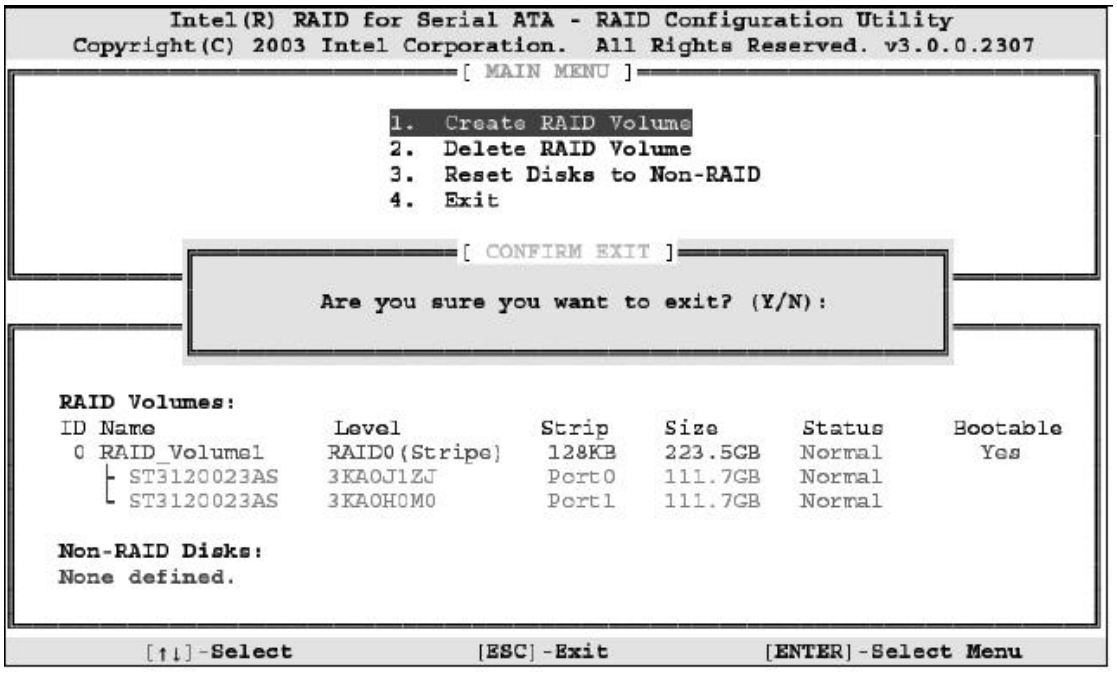
5. Then press <Enter> to create the specified volume and the following prompt will show:



6. Press <Y> to confirm the selection or press <N> to create the RAID volume again. Then you will return to the main menu with an updated status as follows:



7. Scroll to option 4 **Exit** and press <Enter> to exit the RAID Configuration utility. The following prompt appears:

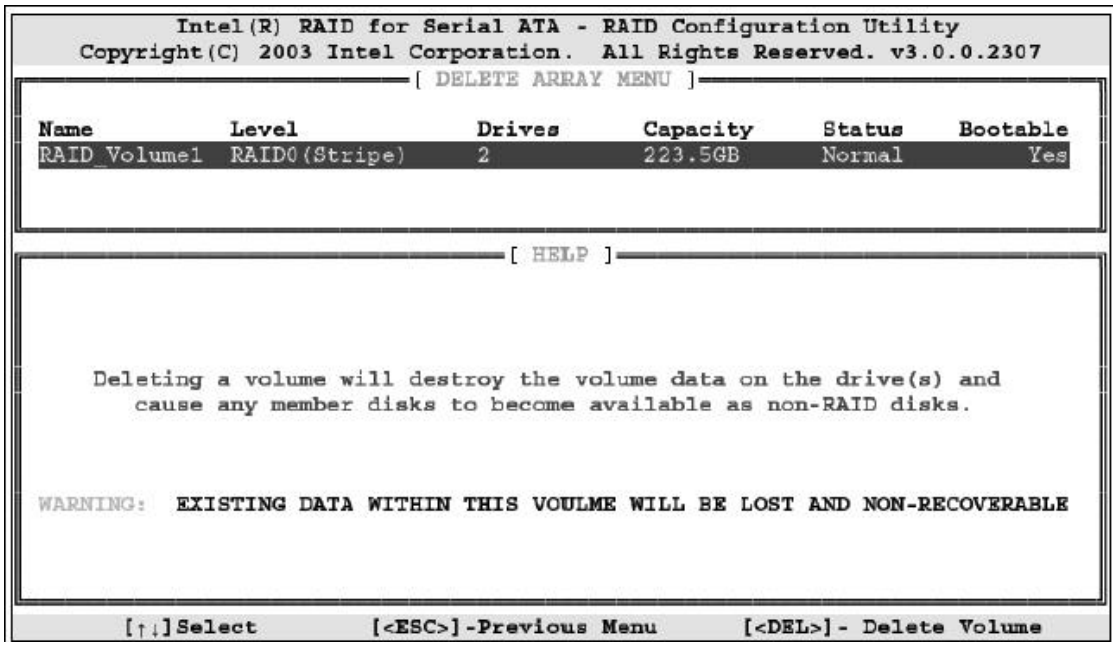


8. Click <Y> to confirm the exit.

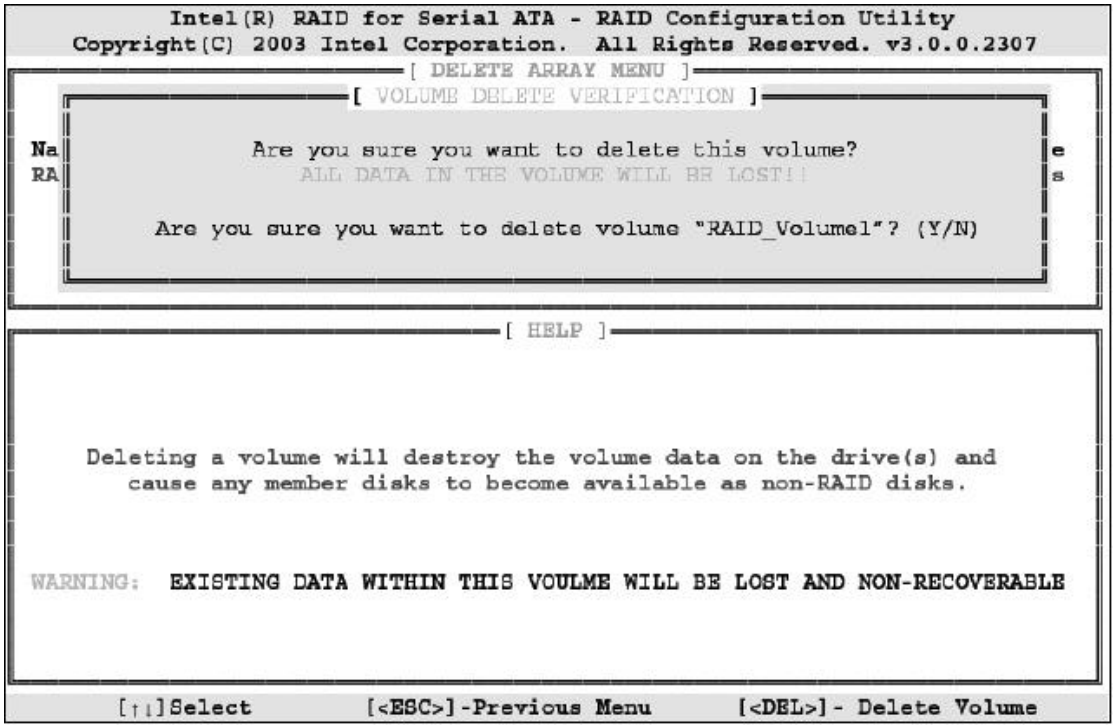
(2) Delete RAID Volume

Here you can delete the RAID volume, but please be noted that all data on RAID drives will be lost.

Select option 2 **Delete RAID Volume** from the main menu window and press <Enter> key to select a RAID volume for deletion. The following window will appear:



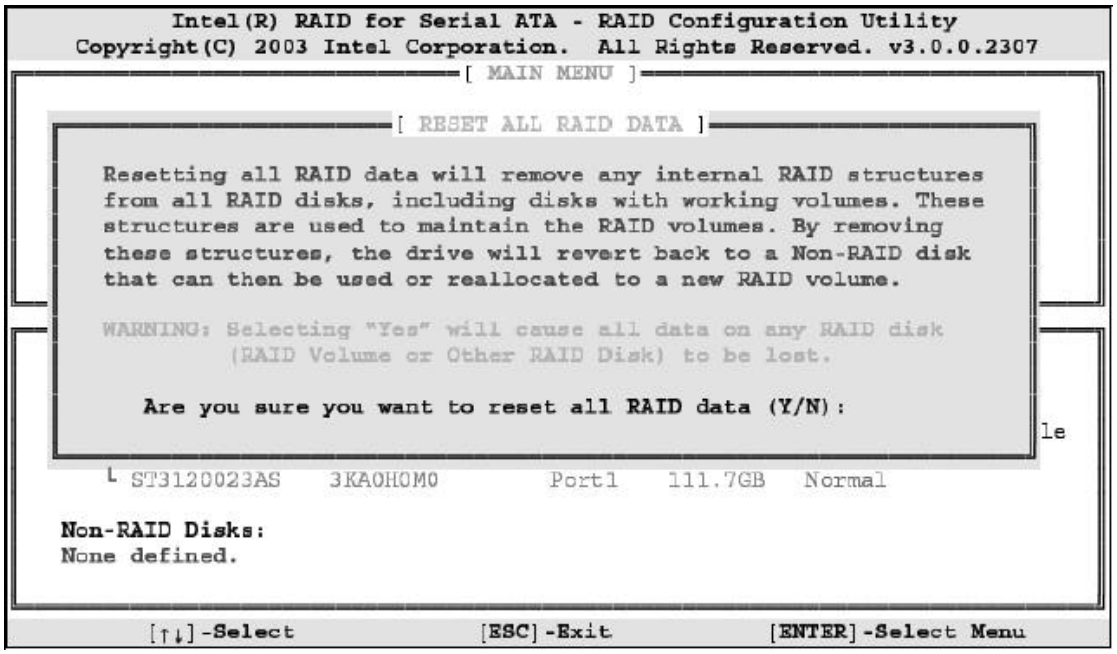
Select the volume and press <Delete> key to delete the RAID volume. The following prompt appears:



Press <Y> key to accept the volume deletion.

(3) Reset Disks to Non-RAID

Select option 3 **Reset Disks to Non-RAID** and press <Enter> to delete the RAID volume and remove any RAID structures from the drives. The following screen appears:



Press <Y> key to accept the selection.