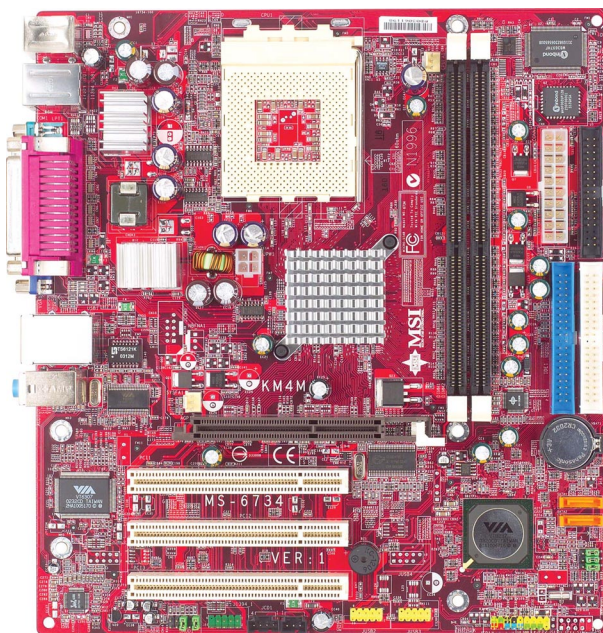# KM4M/KM4AM Series

MS-6734 (v1.X) M-ATX Mainboard

G52-M6734XD

Manual Rev: 1.5
Release Date: July 2004

CE **N1996**

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2
Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

Micro-Star International
MS-6734
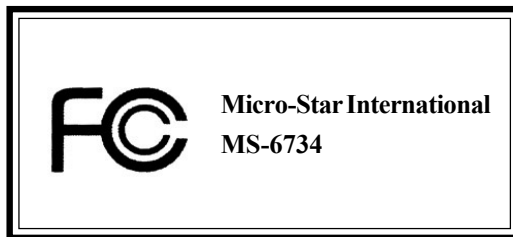
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation

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Copyright Notice

Trademarks

Revision History

Revision	Revision History	Date
V1.0	First release	June 2003
V1.1	NB chipset with optional KM400 / KM400A chipset	December 2003
V1.2	Update 1394 & CPU FSB jumper description	March 2004
V1.3	White Brand version	April 2004
V1.4	Update CPU Description	May 2004
V1.5	Update JAUD1 pin definition & CPU FSB jumper description	July 2004

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Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.
➤ Visit the MSI homepage & FAQ site for technical guide, BIOS updates, driver updates, and other information: **http://www.msi.com.tw** & **http://www.msi. com.tw/program/service/faq/faq/esc_faq_list.php**
➤ Contact our technical staff at: **support@msi.com.tw**

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. **Do not cover the openings.**
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    ➤ The power cord or plug is damaged.
    ➤ Liquid has penetrated into the equipment.
    ➤ The equipment has been exposed to moisture.
    ➤ The equipment has not work well or you can not get it work according to User's Manual.
    ➤ The equipment has dropped and damaged.
    ➤ The equipment has obvious sign of breakage.
12. **Do not leave this equipment in an environment unconditioned, storage temperature above 60^0 C (140^0F), it may damage the equipment.**

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

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CONTENTS

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1

Getting Started

Thank you for purchasing the KM4M / KM4AM (MS-6734 v1.x) Micro-ATX mainboard. The KM4M / KM4AM v1.x Micro-ATX mainboard is based on VIA® Apollo KM400/400A North Bridge & VT8235/8237 South Bridge chipset for optimal system efficiency. Designed to fit the advanced AMD® Athlon™, Athlon™ XP or Duron™ processors, the KM4M / KM4AM delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU
➤ Supports Socket A (Socket-462) for AMD® /Athlon™ XP /Sempron™ processors
➤ Supports AMD Athlon XP Sempron 3200+ @ 200 FSB (for KM4AM)
➤ Supports AMD Athlon XP Sempron 3000+ @ 166 FSB (for KM4M)
  (For the latest information about CPU, please visit http://www.msi.com.tw/pro-gram/products/mainboard/mbd/pro_mbd_cpu_support.php)

Chipset
➤ VIA® KM400/400A North Bridge
   - Supports 200/266/333/400* MHz front side bus (*for KM400A only)
   - Supports DDR200/266/333/400* (*for KM400A only)
   - Supports AGP 4X and AGP 8X
➤ VIA® VT8235/8237 South Bridge
   - Integrated Direct Sound AC97 audio
   - Dual channel Ultra DMA 33/66/100/133 master mode EIDE controller
   - ACPI & PC2001 compliant enhanced power management
   - Integrated USB 2.0 controller
        * 8235 supporting 6 ports
        * 8237 supporting 8 ports
   - Integrated S-ATA 150 supporting 2 ports (8237 only)

Main Memory
➤ Supports four memory banks using two 184-pin DDR DIMMs
➤ Supports up to 2GB PC1600/2100/2700/3200* DDR SDRAMs (*for KM400A only)
  (For the updated supporting memory modules, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_trp_list.php to refer the memory module part in the test report.)

Slots
➤ One AGP (Accelerated Graphics Port) 1.5V 8x/4x slot
➤ Three 32-bit PCI bus slots (support 3.3v/5v PCI bus interface)

On-Board IDE
➤ An IDE controller on the VT8235/8237 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA133/100/66/33 operation modes
➤ Can connect up to four IDE devices
➤ Supports 2 SATA devices (for VT8237 only)

On-Board Peripherals
➤ On-Board Peripherals include:
   - 1 floppy port supports 2 FDDs with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
   - 1 serial port and 1 VGA port
   - 1 parallel port
   - Vertical audio ports
   - 1 RJ-45 LAN Jack
   - 1 SPDIF output (1 x 3 pin) with housing

- USB ports:
  VT8235 supports 6 USB ports (rear *4; front *2)
  VT8237 supports 8 USB ports (rear *4; front *4)
- 1394 ports (Optional)

Audio
➤ RealTek ALC655

IEEE1394 (Optional)
➤ VIA VT6307 (supports 2 1394 connectors)
➤ VIA VT6306 (supports 3 1394 connectors)

LAN
➤ VIA VT6103 LAN controller

BIOS
➤ The mainboard BIOS provides "Plug & Play" BIOS which detects the peripheral devices and expansion cards of the board automatically.
➤ The mainboard provides a Desktop Management Interface (DMI) function which records your mainboard specifications.

Dimension
➤ ATX Form Factor: 9.6 in. (L) x 8.85 in. (W)

Mounting
➤ 6 mounting holes

Others
➤ Suspend to RAM/Disk (S3/S4)
➤ PC2001 compliant
➤ WHQL HCT 11.0 compliant

Mainboard Layout
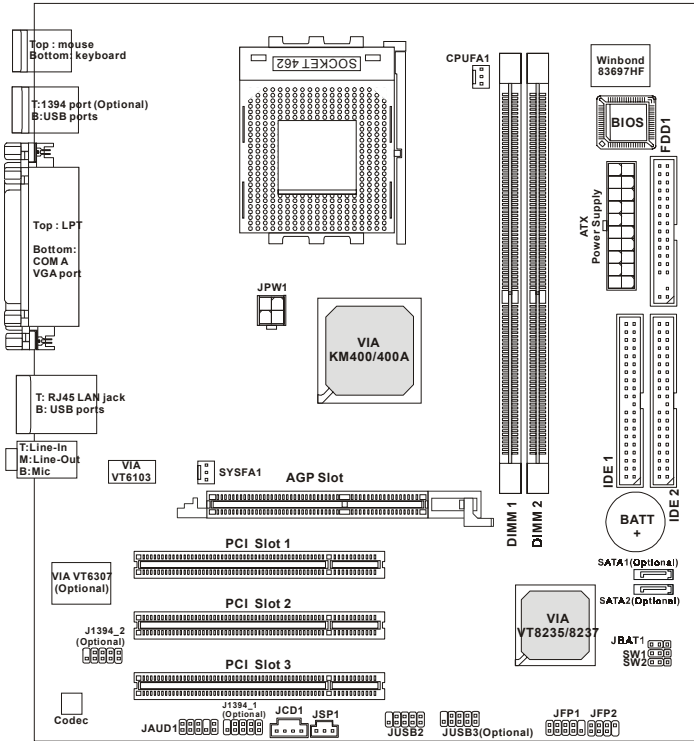
MS-6734 v1.X M-ATX Mainboard

2

Hardware Setup

This chapter tells you how to install the CPU, memory modules, and expansion cards, as well as how to setup the jumpers on the mainboard. Also, it provides the instructions on connecting the peripheral devices, such as the mouse, keyboard, etc.
While doing the installation, be careful in holding the components and follow the installation procedures.

Quick Components Guide

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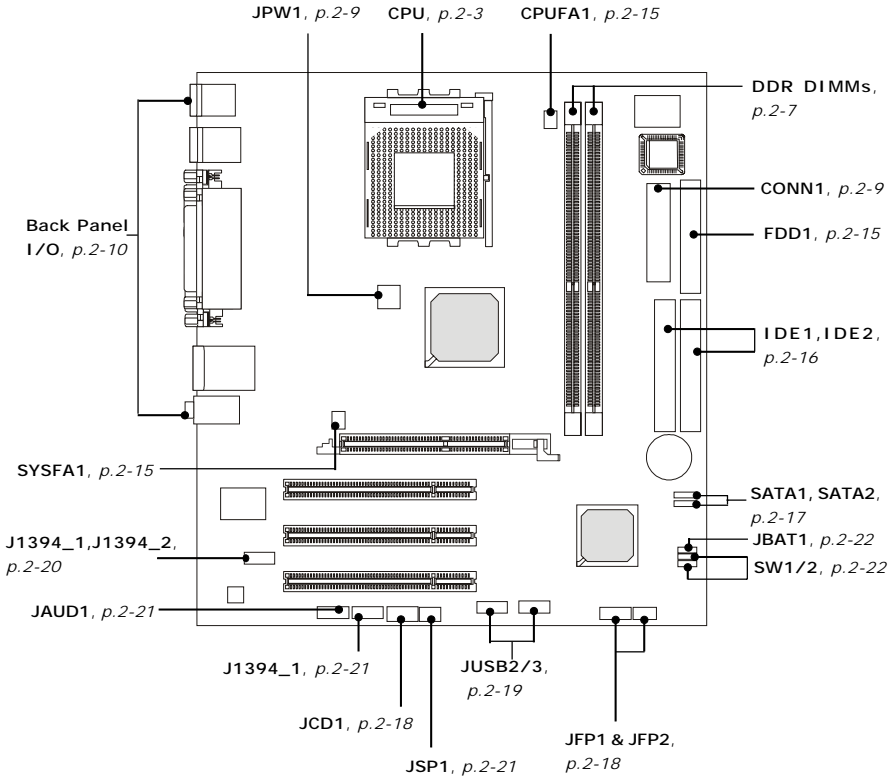
Central Processing Unit: CPU

The mainboard supports AMD® Athlon™, Athlon™ XP and Duron™ processors in the 462 pin package. The mainboard uses a CPU socket called Socket A for easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not find the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

CPU Core Speed Derivation Procedure

If	CPU Clock	=	100MHz
	Core/Bus ratio	=	14
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	100MHz x 14
		=	1.4 GHz

WARNING!   **Thermal Issue for CPU**

As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly crucial when building computer systems. Maintaining the proper thermal environment is key to reliable operation. As such, the processor must be maintained in the specified thermal requirements.

AMD Athlon™/Duron™/Athlon™ XP processor with a speed of **600MHz and above** requires a LARGER heatsink and fan. You also need to add thermal grease between the CPU and heatsink to improve heat dissipation. Then, make sure that the CPU and heatsink are securely fastened and in good contact with each other. These are needed to prevent damaging the processor and ensuring reliable operation. If you want to get more information on the proper cooling, you can visit AMD's website for reference.

CPU Installation Procedures for Socket 462

1. Please turn off the power and unplug the power cord before installing the CPU.

2. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.

3. Look for the gold arrow. The gold arrow should point towards the lever pivot. The CPU can only fit in the correct orientation.

4. If the CPU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your mainboard.

5. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.

Open Lever

Sliding Plate   90 degree

Gold arrow

Gold arrow   Correct CPU placement

O

Gold arrow   Incorrect CPU placement

X

Press down the CPU   Close Lever

2-4
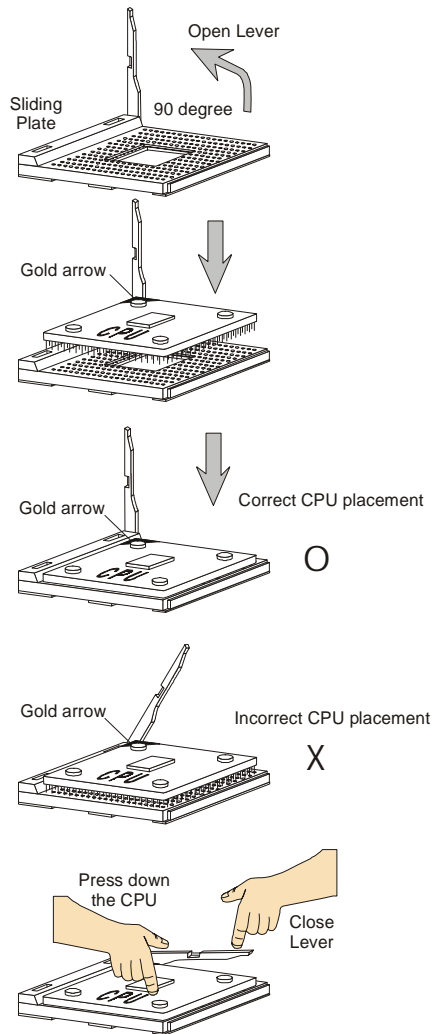
Installing AMD Athlon CPU (Socket 462) Cooler Set

The following instructions will guide you through the heat sink installation procedures. Please consult your agent for the proper CPU cooler set.

1. Position your CPU cooler set onto the CPU.

Apply some heat sink paste
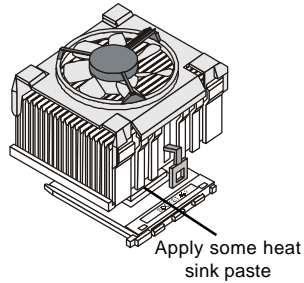
2. Use one end of the clip to hook the latch of the CPU sliding plate.

3. Hook the other latch to fix the cooling fan set. You may need a screw drive to press down the other side of the clip.
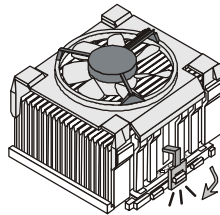
4. Connect the fan to the power supply connector provided on your mainboard.
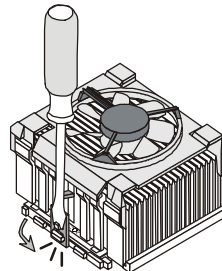
MSI Reminds You...
Please apply some heat sink paste on top of your CPU to dissipate the heat more effectively.

2-5

CPU Clock Frequency Selection through BIOS

The hardware configuration for CPU clock frequency of the motherboard is set to 100MHz by default. Therefore, to make a 133MHz CPU run at 133MHz when it is installed on the board, you have to adjust the CPU clock frequency in the BIOS setup utility.

To set the clock frequency for the installed CPU, refer to *Frequency/Voltage Control* in *Chapter 3. BIOS Setup*.

MSI

MSI Reminds You...

Overheating
Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.

Replacing the CPU
While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.

Overclocking
*This motherboard is designed to support overclocking. However, please make sure your components are able to tolerate such abnormal setting, while doing overclocking. Any attempt to operate beyond product specifications is not recommended. **We do not guarantee the damages or risks caused by inadequate operation or beyond product specifications.***

Memory

The mainboard provides 2 slots for 184-pin DDR SDRAM DIMM (Double In-Line Memory Module) modules and supports the memory size up to 2GB. You can install PC2700/DDR333, PC2100/DDR266 or PC1600/DDR200 modules on the DDR DIMM slots.
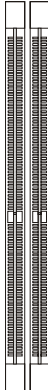
DDR DIMM Slots (DIMM1 & 2)

Memory Speed/CPU FSB Support Matrix

For KM400

	DDR266	DDR333
FSB266	V	V
FSB333	V	V

For KM400A

	DDR266	DDR333	DDR400
FSB266	V	V	V
FSB333	V	V	V
FSB400	V	V	V

DIMM Module Combination

Install at least one DIMM module on the slots. You can install either single- or double-sided modules in any order to meet your own needs.

Memory modules can be installed in any combination as follows:

Slot	Memory Module	Total Memory
DIMM 1 (Bank 0 & 1)	DDR S/D	64MB~1GB
DIMM 2 (Bank 2 & 3)	DDR S/D	64MB~1GB
Maximum System Memory Suppported		64MB~2GB

S: Single Side   D: Double Side

Installing DDR Modules

1. The DDR DIMM has only one notch on the center of module. The module will only fit in the right orientation.
2. Insert the DIMM memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the socket.
3. The plastic clip at each side of the DIMM slot will automatically close.

Volt   Notch
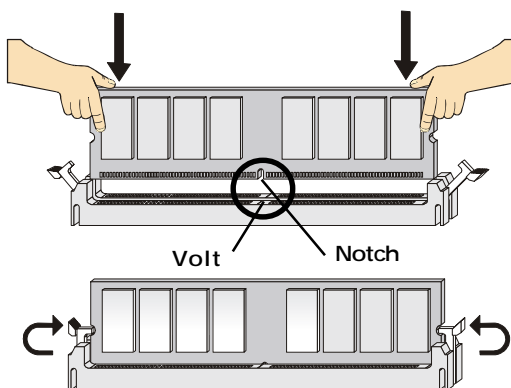
MSI Reminds You...
You can barely see the golden finger if the module is properly inserted in the socket.

Power Supply

The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 20-Pin Power Connector: CONN1

This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

ATX 12V Power Connector: JPW1

This 12V power connector is used to provide power to the CPU.
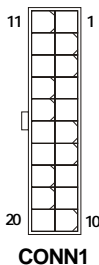
CONN1 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

CONN1
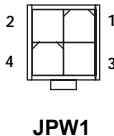
JPW1 Pin Definition

PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

JPW1

Back Panel

The back panel provides the following connectors:

Mouse **IEEE1394** **Parallel** **LAN** **L-in**
(Optional) (Optional) **L-out**
MIC

Keyboard **USB** **COM** **VGA** **USB**
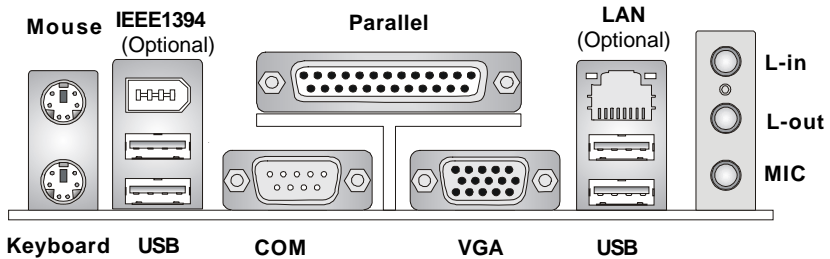
Mouse Connector

The mainboard provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this connector. The connector location and pin assignments are as follows:
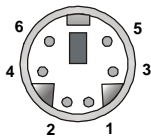
Pin Definition

PS/2 Mouse (6-pin Female)

PIN	SIGNAL	DESCRIPTION
1	Mouse DATA	Mouse DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Mouse Clock	Mouse clock
6	NC	No connection

Keyboard Connector

The mainboard provides a standard PS/2® keyboard mini DIN connector for attaching a PS/2® keyboard. You can plug a PS/2® keyboard directly into this connector.
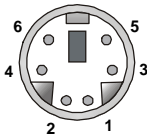
Pin Definition

PS/2 Keyboard (6-pin Female)

PIN	SIGNAL	DESCRIPTION
1	Keyboard DATA	Keyboard DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Keyboard Clock	Keyboard clock
6	NC	No connection

USB Connectors

The mainboard provides a UHCI (Universal Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse or other USB-compatible devices. You can plug the USB device directly into the connector.
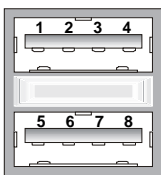
USB Port Description

USB Ports

PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

Serial Port Connector: COM 1

The mainboard offers one 9-pin male DIN connector as serial port COM 1. The port is a 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

Pin Definition

1 2 3 4 5

6 7 8 9
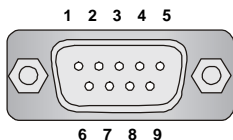
9-Pin Male DIN Connector

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready)
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

VGA Connector

The mainboard provides a DB 15-pin female connector to connect a VGA monitor.

5   1

15   11
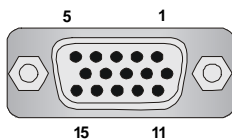
VGA Connector
(DB 15-pin)

Pin	Signal Description	Pin	Signal Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	+5V	10	GND
11	N/C	12	SDA
13	Horizontal Sync	14	Vertical Sync
15	SCL		

IEEE1394 Port (Optional)

The back panel provides one standard IEEE 1394 port. The standard IEEE1394 port connects to IEEE1394 devices without external power. The IEEE1394 high-speed serial bus complements USB by providing enhanced PC connectivity for a wide range of devices, including consumer electronics audio/video (A/V) appliances, storage peripherals, other PCs, and portable devices.
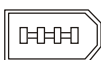
IEEE1394 Port

RJ-45 LAN Jack (Optional)

The mainboard provides a RJ-45 connector that allows your computer to be connected to a network environment.

Activity
Indicators

LAN Jack
(RJ-45)
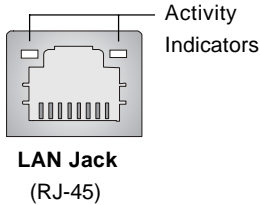
Pin	Signal	Description
1	TDP	Transmit differential pair
2	TDN	Transmit differential pair
3	RDP	Receive differential pair
4	NC	Not used
5	NC	Not used
6	RDN	Receive differential pair
7	NC	Not used
8	NC	Not used

Audio Port Connectors

Line Out is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones.

1/8" Stereo Audio Connectors

Line In

Line Out

Mic In
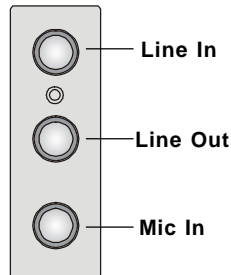
Parallel Port Connector: LPT1

The mainboard provides a 25-pin female centronic connector as LPT. A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.

13   **1**

25   **14**
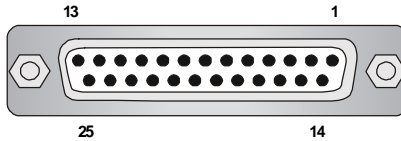
Pin Definition

PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	PaperEnd
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select In
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground

Connectors

The mainboard provides connectors to connect to FDD, IDE HDD, case, LAN, USB Ports and CPU/System FAN.

Floppy Disk Drive Connector: FDD1

The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.

FDD1

Fan Power Connectors: CPUFA1/SYSFA1

The CPUFA1 (processor fan) and SYSFA1 (system fan) support system cooling fan with +12V. It supports three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

GND
+12V
SENSOR

SYSFA1

GND
+12V
SENSOR
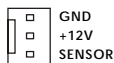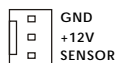
CPUFA1

MSI Reminds You...
1. Always consult the vendors for proper CPU cooling fan.
2. CPUFA1 supports the fan control. You can install the PC Alert utility that will automatically control the CPU fan speed according to the actual CPU temperature.

2-15

Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 33/66/100/133 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA 33/66/100/133 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices.
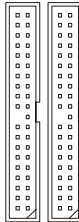
IDE1   IDE2

IDE1 (Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

IDE2 (Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

MSI Reminds You...
If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.

Serial ATA Connectors controlled by VT8237: SATA1 & SATA2 (for KM4AM only)

The Southbridge of the KM4AM mainboard is VIA VT8237 which supports two serial connectors SATA1& SATA2.

SATA1 & SATA2 are dual high-speed Serial ATA interface ports. Each supports 1st generation serial ATA data rates of 150 MB/s. Both connectors are fully compliant with Serial ATA 1.0 specifications. Each Serial ATA connector can connect to 1 hard disk device.

SATA1 & SATA2 Pin Definition
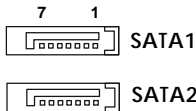
Pin	Signal	Pin	Signal
1	GND	2	TXP
3	TXN	4	ND
5	RXN	6	RXP
7	GND		

Optional Serial ATA cable

Take out the dust cover and connect to the hard disk devices
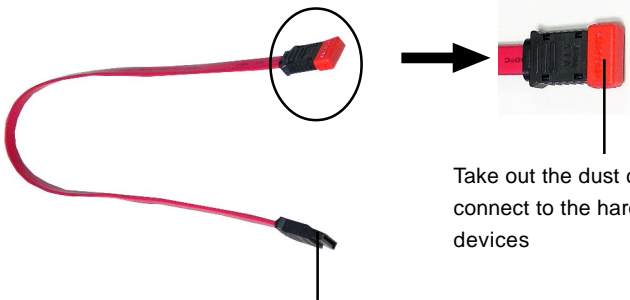
Connect to SATA1 or SATA2

MSI Reminds You...
Please do not fold the serial ATA cable in a 90-degree angle, which will cause the loss of data during the transmission.

Front Panel Connectors: JFP1 & JFP2

The mainboard provides two front panel connectors for electrical connection to the front panel switches and LEDs. JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.
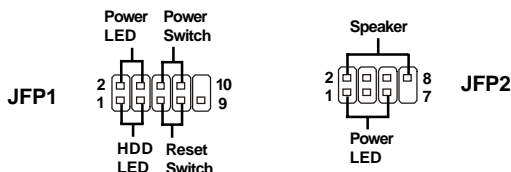
JFP1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	HD_LED_P	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED_N	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW_N	Reset Switch low reference pull-down to GND
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_P	Reset Switch high reference pull-up
8	PWR_SW_N	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

JFP2 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	SPK-
3	SLED	4	BUZ+
5	PLED	6	BUZ-
7	NC	8	SPK+

CD-In Connector: JCD1

The connector is for CD-ROM audio connector.
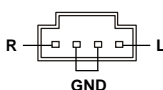
JCD1

Front USB Connectors: JUSB2 & JUSB3 (JUSB3 is optional)

The mainboard provides one standard USB 2.0 pin headers *JUSB2* and one optional standard *JUSB3*. USB 2.0 technology increases data transfer rate up to a maximum throughput of 480Mbps, which is 40 times faster than USB 1.1, and is ideal for connecting high-speed USB interface peripherals such as **USB HDD**, **digital cameras**, **MP3 players**, **printers**, **modems and the like**.

**JUSB2/
JUSB3 (Optional)**

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key	10	USBOC

Connected to JUSB2
or JUSB3

USB 2.0 Bracket
(Optional)

IEEE 1394 Connectors: J1394_1 & J1394_2 (Optional)

The mainboard provides one or two optional 1394 pin headers *J1394_1* and *J1394_2* that allow you to connect optional IEEE 1394 ports.

```
 9  ┌─┐┌─┐┌─┐┌─┐┌─┐  1
10  └─┘└─┘└─┘└─┘└─┘  2
```

J1394_1 / J1394_2 (Optional)

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	TPA+	2	TPA-
3	Ground	4	Ground
5	TPB+	6	TPB-
7	Cable power	8	Cable power
9	Key (no pin)	10	Ground

IEEE1394 Bracket (Optional)

Foolproof Design

Front Panel Audio Connector: JAUD1

The JAUD1 front panel audio connector allows you to connect to the front panel audio and is compliant with Intel® Front Panel I/O Connectivity Design Guide.

```
2 □□□□□ 10
1 □□□□□  9
```

JAUD1

JAUD1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	AUD_MIC	Front panel microphone input signal
2	AUD_GND	Ground used by analog audio circuits
3	AUD_MIC_BIAS	Microphone power
4	AUD_VCC	Filtered +5V used by analog audio circuits
5	AUD_FPOUT_R	Right channel audio signal to front panel
6	AUD_RET_R	Right channel audio signal return from front panel
7	HP_ON	Reserved for future use to control headphone amplifier
8	KEY	No pin
9	AUD_FPOUT_L	Left channel audio signal to front panel
10	AUD_RET_L	Left channel audio signal return from front panel

MSI Reminds You...

If you don't want to connect to the front audio header, pins 5 & 6, 9 & 10 have to be jumpered in order to have signal output directed to the rear audio ports. Otherwise, the Line-Out connector on the back panel will not function.

```
6    10
□□■□□
5    9
```
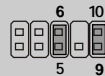
SPDIF-Out Connector: JSP1

This connector is used to connect SPDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.

VCC —□□□— GND

SPDIF

Connected to JSP1

JSP1

SPDIF Bracket (optional)
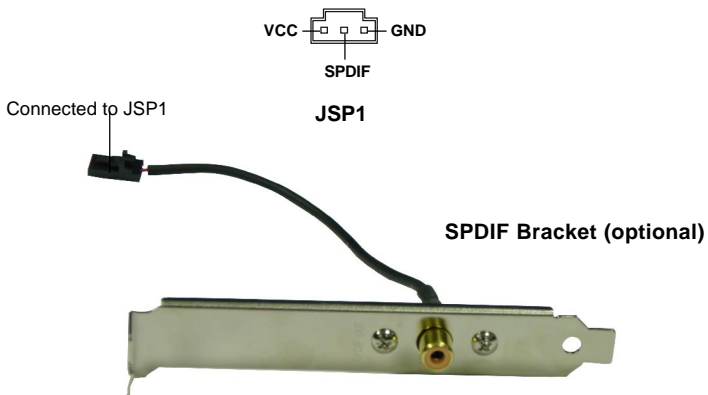
Jumpers

The motherboard provides the following jumpers for you to set the computer's function. This section will explain how to change your motherboard's function through the use of jumpers.

Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, se the JBAT1 (Clear CMOS Jumper) to clear data. Follow the instructions below to clear the data:

3 ☐☐☐ **1**

JBAT1

3   1

3   1

Clear Data   **Keep Data**
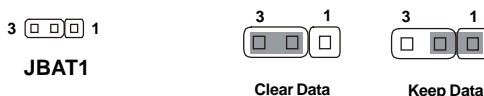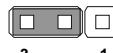
MSI Reminds You...
You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

CPU Frequency Jumpers: SW1 & SW2

These two jumpers provide 100MHz, 133MHz, 166MHz, and 200MHz Front Side Bus frequency selection for overclocking purpose.

3 ☐☐☐ **1**

SW1 & SW2

FSB = 100MHz	**3 1** **SW1**	**3 1** **SW2**
FSB = 133MHz	**3 1** **SW1**	**3 1** **SW2**
FSB = 166MHz	**3 1** **SW1**	**3 1** **SW2**
FSB = 200MHz (for KM4AM only)	**3 1** **SW1**	**3 1** **SW2**

Slots

The motherboard provides one AGP slot and three 32-bit PCI bus slots.

AGP (Accelerated Graphics Port) Slot

The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory. The mainboard supports 4x/8x 1.5V AGP card.
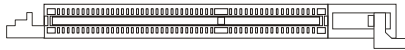
AGP Slot

PCI (Peripheral Component Interconnect) Slots

The PCI slots allow you to insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.
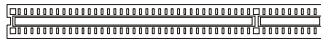
PCI Slots

PCI Interrupt Request Routing

The IRQ, acronym of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor.
The PCI IRQ pins are typically connected to the PCI bus INT A# ~ INT D# pins as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT A#	INT B#	INT C#	INT D#
PCI Slot 2	INT B#	INT C#	INT D#	INT A#
PCI Slot 3	INT C#	INT D#	INT A#	INT B#

3

BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.
You may need to run the Setup program when:
◈ An error message appears on the screen during the system booting up, and requests you to run SETUP.
◈ You want to change the default settings for customized features.

MSI

MSI Reminds You...
1. The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.
2. While booting up, the BIOS version is shown in the 1st line appearing after the memory counting. It is usually in the format: example: W7005MS V2.0 091096
where:
1st digit refers to BIOS maker as A=AMI(R); W=AWARD(R)
2nd - 5th digit refers to the model number.
6th - 7th digit refers to the customer, MS=all standard customers.
V2.0 refers to the BIOS version.
091096 refers to the date this BIOS is released.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

```
Press DEL to enter SETUP
```

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General help, only for Status Page Setup Menu and Option Page Setup Menu

Getting Help
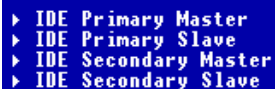
After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the control keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu containing additional options can be launched from this field. You can use control keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press <Esc >.

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

The Main Menu

Once you enter Phoenix-Award® BIOS CMOS Setup Utility, the Main Menu (Figure 1) will appear on the screen. The Main Menu allows you to select from twelve setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

```
                 Phoenix - AwardBIOS CMOS Setup Utility
 ▶ Standard CMOS Features            ▶ Frequency/Voltage Control
 ▶ Advanced BIOS Features              Load Fail-Safe Defaults
 ▶ Advanced Chipset Features           Load Optimized Defaults
 ▶ Integrated Peripherals              Set Supervisor Password
 ▶ Power Management Setup              Set User Password
 ▶ PnP/PCI Configurations              Save & Exit Setup
 ▶ PC Health Status                   Exit Without Saving

 Esc : Quit        F9 : Menu in BIOS        ↑ ↓ → ←   : Select Item
 F10 : Save & Exit Setup

                   Time, Date, Hard Disk Type...
```

Standard CMOS Features
Use this menu for basic system configurations, such as time, date etc.

Advanced BIOS Features
Use this menu to setup the items of special enhanced features.

Advanced Chipset Features
Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

Power Management Setup
Use this menu to specify your settings for power management.

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

PC Health Status
This entry shows your PC health status.

Frequency/Voltage Control
Use this menu to specify your settings for frequency/voltage control.

Load Fail-Safe Defaults
Use this menu to load the BIOS values for the best system performance, but the system stability may be affected.

Load Optimized Defaults
Use this menu to load factory default settings into the BIOS for stable system performance operations.

Set Supervisor Password
Use this menu to set Supervisor Password.

Set User Password
Use this menu to set User Password.

Save & Exit Setup
Save changes to CMOS and exit setup.

Exit Without Saving
Abandon all changes and exit setup.

Standard CMOS Features

The items in Standard CMOS Features Menu are divided into 11 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

```
            Phoenix - AwardBIOS CMOS Setup Utility
                     Standard CMOS Features
  ┌─────────────────────────────────────────┬──────────────────────┐
  │ Date (mm:dd:yy)        Mon, Dec 15 2003  │     Item Help        │
  │ Time (hh:mm:ss)        16 :  5 : 37      ├──────────────────────┤
  │                                          │ Menu Level    ▸      │
  │ ▸ IDE Primary Master                     │                      │
  │ ▸ IDE Primary Slave                      │ Change the day, month,│
  │ ▸ IDE Secondary Master                   │ year and century     │
  │ ▸ IDE Secondary Slave                    │                      │
  │                                          │                      │
  │ Drive A               [None]             │                      │
  │ Drive B               [None]             │                      │
  │                                          │                      │
  │ Video                 [EGA/VGA]          │                      │
  │ Halt On               [All , But Keyboard]│                     │
  │                                          │                      │
  │ Base Memory                 640K         │                      │
  │ Extended Memory            65472K        │                      │
  │ Total Memory                1024K        │                      │
  └─────────────────────────────────────────┴──────────────────────┘
  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
      F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults
```

Date
This allows you to set the system to the date that you want (usually the current date). The format is <day><month> <date> <year>.

> **day**   Day of the week, from Sun to Sat, determined by BIOS. Read-only.
> **month**   The month from Jan. through Dec.
> **date**   The date from 1 to 31 can be keyed by numeric function keys.
> **year**   The year can be adjusted by users.

Time
This allows you to set the system time that you want (usually the current time). The time format is <hour> <minute> <second>.

IDE Primary/Secondary Master/Slave
Press PgUp/<+> or PgDn/<-> to select *Manual*, *None* or *Auto* type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use *Manual* to define your own drive type manually.

3-5

If you select *Manual*, related information is asked to be entered to the following items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

Access Mode	The settings are CHS, LBA, Large, Auto.
Capacity	The formatted size of the storage device.
Cylinder	Number of cylinders.
Head	Number of heads.
Precomp	Write precompensation.
Landing Zone	Cylinder location of the landing zone.
Sector	Number of sectors.

Drive A:/B:
This item allows you to set the type of floppy drives installed. Available options: *None*, *360K 5.25, 1.2 MB 5.25*, *720 KB 3.5*, *1.44 MB 3.5* and *2.88 MB 3.5*.

Video
The setting controls the type of video adapter used for the primary monitor of the system. Available options: *EGA/VGA* , *CGA 40*, *CGA 80*, *MONO*.

Halt On
The setting determines whether the system will stop if an error is detected at boot. Available options are:

All Errors	The system stops when any error is detected.
No Errors	The system doesn't stop for any detected error.
All, But Keyboard	The system doesn't stop for a keyboard error.
All, But Diskette	The system doesn't stop for a disk error.
All, But Disk/Key	The system doesn't stop for either a disk or a key-board error.

Base/Extended/Total Memory
The three items show the memory status of your system (read only).

Advanced BIOS Features

```
        Phoenix - AwardBIOS CMOS Setup Utility
                 Advanced BIOS Features

   Quick Boot              [Enabled]        ┌──────────────────┐
   Anti-Virus Protection   [Disabled]       │    Item Help     │
 ▶ Boot Sequence           [Press Enter]    ├──────────────────┤
   CPU Internal Cache      [Enabled]         Menu Level    ▶
   External Cache          [Enabled]
   CPU L2 Cache ECC Checking [Enabled]       Allows the system to
   Swap Floppy             [Disabled]        skip certain tests
   Seek Floppy             [Disabled]        while booting. This
   Boot Up NumLock Status  [On]              will decrease the time
   Typematic Rate Setting  [Disabled]        needed to boot the
 x Typematic Rate (Chars/Sec) 6              system
 x Typematic Delay (Msec)     250
   Security Option         [Setup]
   APIC Mode               [Enabled]
   MPS Table Version       [1.4]
   HDD S.M.A.R.T. Capability [Disabled]


 ↑↓←→:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
   F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults
```

Quick Boot
Setting the item to *Enabled* allows the system to boot within 5 seconds since it will skip some check items. Available options: *Enabled*, *Disabled*.

Anti-Virus Protection
The item is to set the Virus Warning feature for IDE Hard Disk boot sector protection. If the function is enabled and any attempt to write data into this area is made, BIOS will display a warning message on screen and beep. Settings: *Disabled* and *Enabled*.

Boot Sequence
Press <Enter> to enter the sub-menu screen.

```
        Phoenix - AwardBIOS CMOS Setup Utility
                    Boot Sequence

   1st Boot Device        [Floppy]         ┌──────────────────┐
   2nd Boot Device        [HDD-0]          │    Item Help     │
   3rd Boot Device        [CDROM]          ├──────────────────┤
   Boot Other Device      [Enabled]         Menu Level    ▶▶

                                            Select Your Boot
```
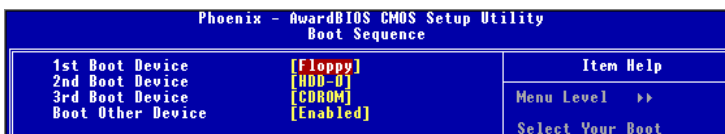
1st/2nd/3rd Boot Device
The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system.

Boot Other Device
Setting the option to *Enabled* allows the system to try to boot from other devices if the system fails to boot from the 1st/2nd/3rd boot device. Settings: *Enabled, Disabled*.

> **MSI Reminds You...**
> *Available settings for "1st/2nd/3rd Boot Device" vary depending on the bootable devices you have installed. For example, if you did not install a floppy drive, the setting "Floppy" does not show up.*

CPU Internal Cache
The item allows you to turn on or off CPU's internal (L1) cache. Settings: *Enabled* and *Disabled*.

CPU L2 Cache ECC Checking
This setting allows you to enable or disable the ECC (Error-Correcting Code) feature for error detection and correction when data passes through L2 (external) cache memory. Setting options: *Enabled*, *Disabled*.

Swap Floppy
Setting to *Enabled* will swap floppy drives A: and B:.

Seek Floppy
Setting to *Enabled* will make BIOS seek floppy drive A: before booting the system. Settings: *Disabled*, *Enabled.*

Boot Up NumLock Status
This setting is to set the Num Lock status when the system is powered on. Setting to *On* will turn on the Num Lock key when the system is powered on. Setting to *Off* will allow users to use the arrow keys on the numeric keypad. Setting options: *On*, *Off*.

Typematic Rate Setting
When *Disabled*, the following two items (Typematic Rate and Typematic Delay) are irrelevant. Keystrokes repeat at a rate determined by the keyboard controller in your system. When *Enabled*, you can select a typematic rate and typematic delay.

Typematic Delay (Msec)
This item allows you to select the delay between when the key was first pressed and when the acceleration begins. Settings: *250*, *500*, *750* and *1000*.

Typematic Rate (Chars/Sec)
After **Typematic Rate Setting** is enabled, this item allows you to set the rate (characters/second) at which the keys are accelerated. Settings: *6*, *8*, *10*, *12*, *15*, *20*, *24* and *30*.

Security Option
This specifies the type of BIOS password protection that is implemented. Settings are described below:

Option	Description
Setup	The password prompt appears only when end users try to run Setup.
System	A password prompt appears every time when the computer is powered on or when end users try to run Setup.

APIC Mode
This field is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance with PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQ resources for the system. Settings: *Enabled* and *Disabled*.

MPS Table Version
This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Settings: *1.4*, *1.1*.

HDD S.M.A.R.T. Capability
This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline. Settings: *Enabled* and *Disabled*.

Advanced Chipset Features
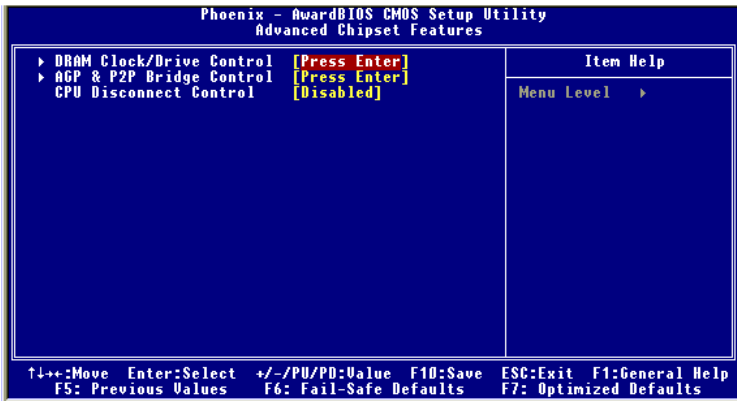
> **MSI Reminds You...**
> *Change these settings only if you are familiar with the chipset.*

DRAM Clock/Drive Control
Press <Enter> and the following sub-menu appears.
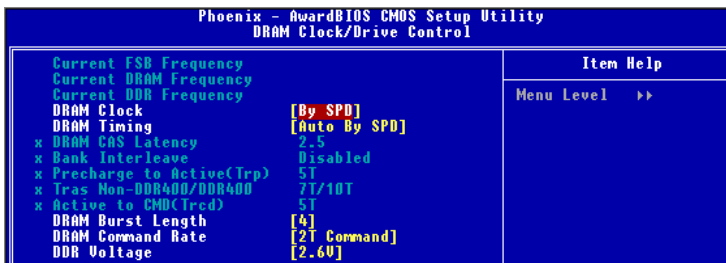
Current FSB / DRAM / DDR Frequency
These items show the current FSB/DRAM/DDR frequency. (read only)

DRAM Clock
This item is used to configure the clock frequency of the installed DRAM.
Settings: *By SPD, 100MHz, 133MHz, 166MHz, 200MHz.*

DRAM Timing
Selects whether DRAM timing is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to *Auto By SPD* enables DRAM timings to be determined by BIOS based on the configurations on the SPD. Selecting *Manual* allows users to configure the DRAM timings manually. Options: *Auto By SPD, Manual, Turbo, Ultra.*

DRAM CAS Latency
When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. The settings are: *1.5, 2, 2.5*, *3*.

Bank Interleave
This field selects 2-bank or 4-bank interleave for the installed SDRAM. Disable the function if 16MB SDRAM is installed. Settings: *Disabled*, *2 Bank* and *4 Bank*.

Precharge To Active (Trp)
This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refreshing may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Available settings: *2T, 3T*.

Trans Non-DDR400/DDR400
This controls the timing delay (in clock cycles) before non-DDR400 and DDR400 starts a write command after receiving it. Settings: *6T/8T, 7T/10T, 5T/6T, 8T/12T*. 12T increases the delay time while 5T provides the least timing delay. This option is effective only if DDR400 is running.

Active to CMD (Trcd)
When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance. Setting options: *2T, 3T*.

DRAM Burst Length
This setting allows you to set the size of Burst-Length for DRAM. Bursting feature is a technique that DRAM itself predicts the address of the next memory location to be accessed after the first address is accessed. To use the feature, you need to define the burst length, which is the actual length of burst plus the starting address and allows internal address counter to properly generate the next memory location. The bigger the size, the faster the DRAM performance. Settings: *4*, *8*.

DRAM Command Rate
This setting controls the SDRAM command rate. Selecting *1T* allows SDRAM signal controller to run at 1T (T=clock cycles) rate. Selecting *2T* makes SDRAM signal controller run at 2T rate. *1T* is faster than *2T*. Setting options: *1T Command, 2T Command.*

DDR Voltage
Adjusting the DDR voltage can increase the DDR speed. Any changes made to this setting may cause a stability issue, so ***changing the DDR voltage for long-term purpose is NOT recommended***.

AGP & P2P Bridge Control
Press <Enter> and the following sub-menu appears.

```
              Phoenix - AwardBIOS CMOS Setup Utility
                    AGP & P2P Bridge Control
   ┌─────────────────────────────────────────────┬──────────────────────┐
   │ AGP Aperture Size       [128M]               │      Item Help       │
   │ AGP Mode                [4X]                 ├──────────────────────┤
   │ AGP Driving Control     [Auto]               │ Menu Level    ▶▶     │
   │ x AGP Driving Value      DA                  │                      │
   │ AGP Fast Write          [Disabled]           │                      │
   │ AGP 3.0 Calibration cycle [Enabled]          │                      │
   │ VGA Share Memory Size   [32M]                │                      │
   └─────────────────────────────────────────────┴──────────────────────┘
```
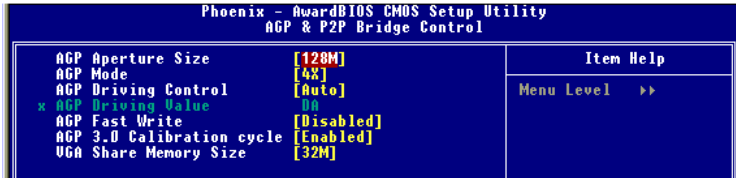
AGP Aperture Size
This setting controls just how much system RAM can be allocated to AGP for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The option allows the selection of an aperture size of *4MB, 8MB, 16MB, 32MB, 64MB, 128MB, 256MB, 512MB* and *1G.*

AGP Mode
The item sets an appropriate mode for the installed AGP card. Setting options: *1x*, *2x*, *4x*. Select *4x* only if your AGP card supports it.

AGP Driving Control
This field is used to adjust the AGP driving force. Selecting *Manual* allows you to select an AGP driving force in AGP Driving Value. It is strongly suggested to select *Auto* to avoid causing any system error.

AGP Driving Value
This item specifies an AGP driving force.

AGP Fast Write
This option enables or disables the AGP Fast Write feature. The Fast Write technology allows the CPU to write directly to the graphics card without passing anything through the system memory and improves the AGP 4X speed. Select *Enabled* only when your AGP card supports the feature. Options: *Disabled, Enabled*.

AGP 3.0 Calibration cycle
This setting disables/enables the AGP auto calibration. Setting options: *Disabled*, *Enabled.*

VGA Share Memory Size
The system shares memory to the onboard VGA card. This setting controls the exact memory size shared to the VGA card. Setting options: *16MB, 32MB, 64MB.*

CPU Disconnect Control
The item is to reduce the power consumption of the AMD K7 system. When set to *Enabled*, the processor is allowed to disconnect the s2k interface when the AMD k7 system is in some power saving states. Options: *Enabled, Disabled.*

Integrated Peripherals

```
            Phoenix - AwardBIOS CMOS Setup Utility
                     Integrated Peripherals
   Onboard 1394 Chip          [Enabled]            │    Item Help
 ▶ VIA OnChip IDE Device      [Press Enter]        │
 ▶ VIA OnChip PCI Device      [Press Enter]        │  Menu Level    ▶
 ▶ SuperIO Device             [Press Enter]        │
   Init Display First         [PCI Slot]           │



↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
    F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults
```
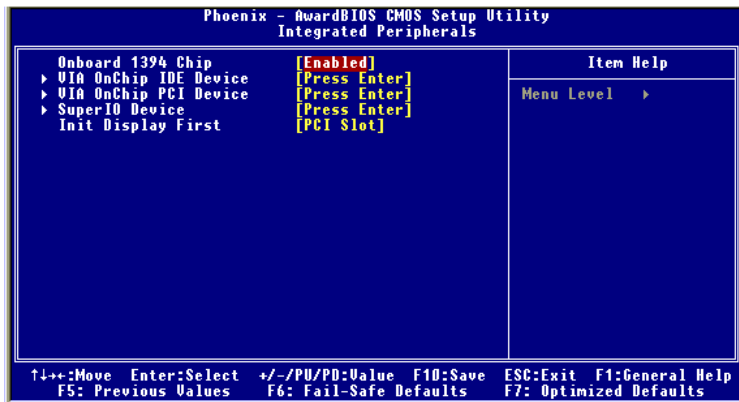
Onboard 1394 Chip
This setting is used to enable/disable the onboard IEEE 1394 controller. Setting options: *Disabled*, *Enabled*.

VIA OnChip IDE Device
Press <Enter> to enter the sub-menu and the following screen appears:

```
            Phoenix - AwardBIOS CMOS Setup Utility
                     VIA OnChip IDE Device
   OnChip SATA              [Enabled]          │     Item Help
   IDE DMA transfer access  [Enabled]          │
   OnChip IDE Channel0      [Enabled]          │  Menu Level   ▶▶
   OnChip IDE Channel1      [Enabled]          │
   Primary Master    PIO    [Auto]             │
   Primary Slave     PIO    [Auto]             │
   Secondary Master PIO     [Auto]             │
   Secondary Slave  PIO     [Auto]             │
   Primary Master   UDMA    [Disabled]         │
   Primary Slave    UDMA    [Disabled]         │
   Secondary Master UDMA    [Disabled]         │
   Secondary Slave  UDMA    [Disabled]         │
```

On-Chip Serial ATA
This setting is used to specify the SATA controller. Settings: *Disable, Enabled.*

IDE DMA Transfer Access
This item is used to enable or disable the DMA transfer function of the IDE Hard Drive. The settings are: *Enabled, Disabled*.

OnChip IDE Channel 0/1
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Choose *Enabled* to activate each channel separately. Settings: *Enabled, Disabled*.

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Primary/Secondary Master/Slave PIO
The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device. The settings are: *Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4*.

Primary/Secondary Master/Slave UltraDMA
Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, Ultra DMA/66 and Ultra DMA/100 select Auto to enable BIOS support. The settings are: *Auto, Disabled*.

VIA OnChip PCI Device
Press <Enter> to enter the sub-menu and the following screen appears:

```
          Phoenix - AwardBIOS CMOS Setup Utility
                 VIA OnChip PCI Device

   AC97 Audio              [Auto]           │      Item Help
   OnChip LAN              [Disabled]       │
 x Onboard Lan Boot ROM     Disabled        │  Menu Level  ▶▶
   OnChip USB Controller   [All Disabled]   │
   OnChip USB20 Controller [Enabled]        │
   USB Device Function     [Disabled]       │
   USB Legacy KB Support   [Disabled]       │
   USB Legacy MS Support   [Disabled]       │
```

AC97 Audio
Auto allows the motherboard's BIOS to detect whether you're using any audio device. If so, the onboard audio controller will be enabled. If not, the onboard audio controller will be disabled. If you want to use different controller cards to connect audio connectors, set the field to *Disabled.* Setting options: *Disabled, Auto*.

OnChip LAN
Setting to [Auto] allows the BIOS to auto-detect the LAN controller and enable it. Setting options: *Auto* and *Disabled*.

Onboard Lan Boot ROM
The item enables or disables the initialization of the onboard LAN Boot ROM during bootup. Selecting *Disabled* will speed up the boot process.

OnChip USB Controller
This setting is used to enable/disable the onboard USB1.1 controller. Setting options: *Disabled*, *Enabled*.

OnChip USB2.0 Controller
This setting is used to enable/disable the onboard USB2.0 controller. Setting options: *Disabled*, *Enabled*.

USB Device Function
This setting is used to enable/disable the onboard USB device controller. Setting options: *Disabled*, *Enabled*.

USB Legacy Keyboard/MS Support
Select *Enabled* if you need to use a keyboard/mouse in the operating system. Setting
options: *Enabled, Disabled*.

Super IO Device
Press <Enter> to enter the sub-menu and the following screen appears:

```
                 Phoenix - AwardBIOS CMOS Setup Utility
                              SuperIO Device
    Onboard FDC Controller      [Enabled]            Item Help
    Onboard Serial Port 1       [Auto]
    Onboard Parallel Port       [378/IRQ7]     Menu Level    ▶▶
    Parallel Port Mode          [ECP]
    EPP Mode Select             [EPP1.7]
    ECP Mode Use DMA            [3]
```

Onboard FDC Controller
Select Enabled if your system has a floppy disk controller (FDD) installed on the
system board and you wish to use it. If you install add-on FDC or the system has no
floppy drive, select Disabled in this field. The settings are: *Enabled* and *Disabled*.

Onboard Serial Port 1
Select an address and corresponding interrupt for the first serial port. The settings
are: *3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto*.
directional transmission/reception is allowed. Under Half Duplex mode, only
asynchronous, bi-directional transmission/reception is allowed.

Onboard Parallel Port
There is a built-in parallel port on the on-board Super I/O chipset that provides Standard,
ECP, and EPP features. It has the following options:

Disabled	
3BC/IRQ7	Line Printer port 0
278/IRQ5	Line Printer port 2
378/IRQ7	Line Printer port 1

Parallel Port Mode
SPP : Standard Parallel Port
EPP : Enhanced Parallel Port
ECP : Extended Capability Port
ECP + EPP: Extended Capability Port + Enhanced Parallel Port

SPP/EPP/ECP/ECP+EPP
To operate the onboard parallel port as Standard Parallel Port only, choose "SPP." To
operate the onboard parallel port in the EPP mode simultaneously, choose "EPP." By
choosing "ECP", the onboard parallel port will operate in ECP mode only. Choosing
"ECP + EPP" will allow the onboard parallel port to support both the ECP and EPP
modes simultaneously.

EPP Mode Select
The onboard parallel port is EPP Spec. compliant, so after the user chooses the
onboard parallel port with the EPP function, the following message will be displayed

3-15

on the screen: "EPP Mode Select." At this time either *EPP 1.7* spec or *EPP 1.9* spec can be chosen.

ECP Mode Use DMA
The ECP mode has to use the DMA channel, so choose the onboard parallel port with the ECP feature. After selecting it, the following message will appear: "ECP Mode Use DMA." At this time, the user can choose between DMA channel *3* or *1*.

Init Display First
This item specifies which VGA card is your primary graphics adapter. Settings: *PCI Slot* and *AGP*.

Power Management Setup

```
            Phoenix - AwardBIOS CMOS Setup Utility
                    Power Management Setup

   IPCA function            [Enabled]          ┌─────────────────┐
   Sleep State              [S1/POS]           │    Item Help    │
   Power Management Option  [User Define]      ├─────────────────┤
   HDD Power Down           [Disable]          │ Menu Level   ▶  │
   Suspend Mode             [Disable]          │                 │
   MODEM Use IRQ            [3]                 │                 │
   Power Button Function    [Power Off]        │                 │
   Run VGABIOS if S3 Resume [Auto]             │                 │
   After AC Power Lost      [Power Off]        │                 │
 ▶ IRQ/Event Activity Detect [Press Enter]     │                 │



 ↑↓←→:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
     F5: Previous Values   F6: Fail-Safe Defaults   F7: Optimized Defaults
```

MSI Reminds You...
S3-related functions described in this section are available only when your BIOS supports S3 sleep mode.

IPCA Function
This item is to activate the ACPI (Advanced Configuration and Power Management Interface) function. If your operating system is ACPI-aware, such as Windows 98SE/2000/ME, select *Enabled.* Available options: *Enabled*, *Disabled.*

Sleep State
This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows ME and Windows 2000, you can choose to enter the Standby mode in S1(POS) or S3(STR) fashion through the setting of this field. Options are:

S1/POS   The S1 sleep mode is a low power state. In this state, no sys-tem context is lost (CPU or chipset) and hardware maintains all system context.

S3/STR   The S3 sleep mode is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a "wake up" event occurs.

Power Management Option
This item is used to select the degree (or type) of power saving and is related to these modes: *Suspend Mode* and *HDD Power Down*. There are three options for power management:

Min Saving   Minimum Power Management. Suspend Mode=1 Hour
Max Saving   Maximum Power Management. Suspend Mode=1 Min
User Define   Allows end users to configure each mode separately.

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HDD Power Down
If HDD activity is not detected for the length of time specified in this field, the hard disk drive will be powered down while all other devices remain active. Settings are *Disabled* and *1 through 15 Min*.

Suspend Mode
If system activity is not detected for the length of time specified in this field, all devices except CPU will be shut off. Settings: *Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min, 1 Hour.*

MODEM Use IRQ
This determines the IRQ in which the MODEM can use. Activity of the selected IRQ always awakens the system. Settings: *3, 4, 5, 7, 9, 10, 11, NA..*

Power Button Function
This feature sets the function of the power button. Settings are:

> *Power Off*   The power button functions as normal power off button.
> *Suspend*   When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

Run VGABIOS if S3 Resume
When *ACPI Suspend Mode* is set to S3 or S1&S3, users can select the options in this field. Selecting [Yes] allows BIOS to call VGABIOS to initialize the VGA card when system wakes up (resumes) from S3 sleep state. The system resume time is shortened when you disable the function, but system will need an AGP driver to initialize the VGA card. Therefore, if the AGP driver of the card does not support the initialization feature, the display may work abnormally or not function after resuming form S3. Options: *Auto, Yes, No.*

After AC Power Lost
This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

> *Power Off*   Leaves the computer in the power off state.
> *Power On*   Leaves the computer in the power on state.
> *Last State*   Restores the system to the previous status before power failure or interrupt occurred.

IRQ/Event Activity Detect
Press <Enter> and the following sub-menu appears.

```
              Phoenix - AwardBIOS CMOS Setup Utility
                      IRQ/Event Activity Detect
  ┌──────────────────────────────────────────┬──────────────────────┐
  │ PS2KB Wakeup Select        [Hot key]      │     Item Help        │
  │ PS2KB Wakeup from S3/S4/S5 [Disable]      ├──────────────────────┤
  │ PS2MS Wakeup from S3/S4/S5 [Disabled]     │ Menu Level    ▶▶     │
  │ USB Resume from S3         [Enabled]      │                      │
  │ VGA                        [OFF]          │ When Select Password,│
  │ LPT & COM                  [LPT/COM]      │ Please press ENTER key│
  │ HDD & FDD                  [ON]           │ to change Password   │
  │ PCI Master                 [OFF]          │ Max 8 numbers.       │
  │ Wake Up On PME             [Enabled]      │                      │
  │ Resume by Alarm            [Disabled]     │                      │
  │ x Date (of Month)              0          │                      │
  │ x Resume Time (hh:mm:ss)    0 : 0 : 10    │                      │
  │ ▶ IRQs Activity Monitoring [Press Enter]  │                      │
  └──────────────────────────────────────────┴──────────────────────┘
```

PS2KB Wakeup Select
The item specify how the system will be awakened from power saving mode when input signal of the keyboard is detected. If set to *Hot Key*, it allows you to select the options in PS2 KB Wake UP from S3. If set to *Password*, please press <Enter> to input password and its maximum password is 8 numbers. Options are: *Hot Key, Password*.

PS2KB Wake Up from S3/S4/S5
This setting allows you to enter "Hot Key" (max. 8 numbers) to wake up the system from S3 state. Settings are: *Disable, Ctrl+F1~Ctrl+F12, Power, Wake, Any Key*.

PS2MS Wake Up from S3/S4/S5
This setting allows the activity of the mouse to wake up the system from S3 state. Settings are: *Enabled* and *Disabled*.

USB Resume from S3
This item allows the activity of the USB device to wake up the system from S3 (Suspend to RAM) state. Settings are: *Enabled* and *Disabled*.

VGA, LPT & COM, HDD & FDD, PCI Master
These fields specify whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected.

Wake Up On PME
When set to *Enabled*, the feature allows your system to be awakened from the power saving modes through any event on PME (Power Management Event). Settings are: *Enabled* and *Disabled*.

Resume By Alarm
The field is used to enable or disable the feature of booting up the system on a scheduled time/date.

MSI Reminds You...
If you have changed this setting, you must let the system boot up until it enters the operating system, before this function will work.

Date(of Month) Alarm
The field specifies the date for *Resume By RTC Alarm*. Settings: 0~31.

Time(hh:mm:ss) Alarm
The field specifies the time for *Resume By RTC Alarm*. Format is <hour><minute><second>.

IRQ Activity Monitoring
Press <Enter> and the following sub-menu appears.

```
          Phoenix - AwardBIOS CMOS Setup Utility
                 IRQs Activity Monitoring

 Primary INTR          [ON]                    Item Help
 IRQ3  (COM 2)         [Enabled]
 IRQ4  (COM 1)         [Enabled]        Menu Level   ▶▶▶
 IRQ5  (LPT 2)         [Enabled]
 IRQ6  (Floppy Disk)   [Enabled]
 IRQ7  (LPT 1)         [Enabled]
 IRQ8  (RTC Alarm)     [Disabled]
 IRQ9  (IRQ2 Redir)    [Disabled]
 IRQ10 (Reserved)      [Disabled]
 IRQ11 (Reserved)      [Disabled]
 IRQ12 (PS/2 Mouse)    [Enabled]
 IRQ13 (Coprocessor)   [Enabled]
 IRQ14 (Hard Disk)     [Enabled]
 IRQ15 (Reserved)      [Disabled]
```

Primary INTR
Selecting *ON* will cause the system to wake up from power saving modes if activity is detected from any enabled IRQ channels. Settings: *ON, OFF*.

IRQ3~IRQ15
IRQ3~IRQ15 enable or disable the monitoring of the specified IRQ line. If set to [Enabled], the activity of the specified IRQ line will prevent the system from entering power saving modes or awaken it from power saving modes.

MSI Reminds You...
IRQ (Interrupt Request) lines are system resources allocated to I/O devices. When an I/O device needs to gain attention of the operating system, it signals this by causing an IRQ to occur. After receiving the signal, when the operating system is ready, the system will interrupt itself and perform the service required by the I/O device.

PNP/PCI Configurations

This section describes configuring the PCI bus system and PnP (Plug & Play) feature. PCI, or **P**eripheral **C**omponent **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

```
            Phoenix - AwardBIOS CMOS Setup Utility
                    PnP/PCI Configurations

   Clear ESCD              [Disabled]              │      Item Help
                                                   ├─────────────────────
   Resources Controlled By [Auto(ESCD)]           │  Menu Level   ►
 x IRQ Resources            Press Enter           │
                                                   │  Default is Disabled.
   PCI/VGA Palette Snoop   [Disabled]             │  Select Enabled to
   Assign IRQ For VGA      [Enabled]              │  reset Extended System
   Assign IRQ For USB      [Enabled]              │  Configuration Data
                                                   │  ESCD) when you exit
                                                   │  Setup if you have
                                                   │  installed a new add-on
                                                   │  and the system
                                                   │  reconfiguration has
                                                   │  caused such a serious
                                                   │  conflict that the OS
                                                   │  cannot boot

 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
      F5: Previous Values     F6: Fail-Safe Defaults    F7: Optimized Defaults
```
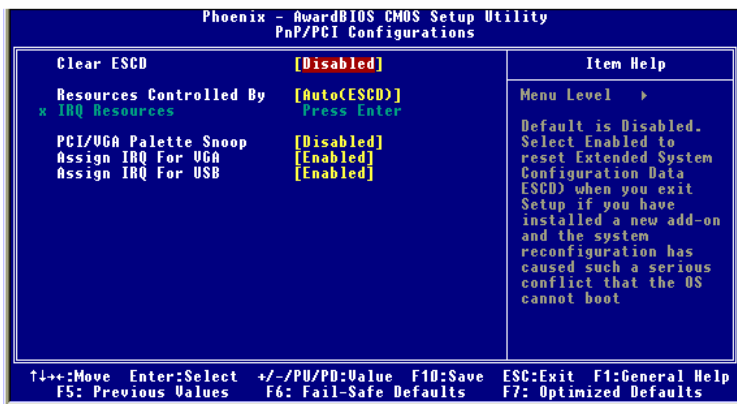
Clear ESCD
Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system can not boot. The settings are: *Enabled* and *Disabled*.

Resource Controlled By
The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95/98. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "Ř"). The settings are: *Auto (ESCD)*, *Manual*.

IRQ Resources
The items are adjustable only when *Resources Controlled By* is set to *Manual*. Press <Enter> and you will enter the sub-menu of the items. IRQ Resources list IRQ 3/4/5/7/9/10/11/12/14/15 for users to set each IRQ a type depending on the type of device using the IRQ. Settings are:

PCI Device	For Plug & Play compatible devices designed for PCI bus architecture.
Reserved	The IRQ will be reserved for further request.

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PCI/VGA Palette Snoop
When set to *Enabled*, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two VGA devices in the computer (one PCI and one ISA) and the:

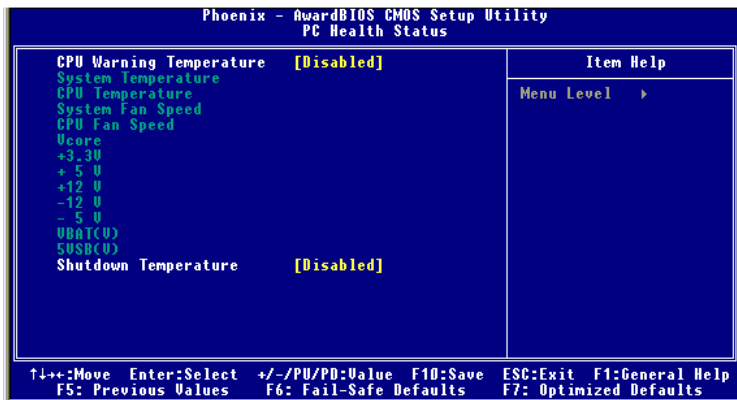| VGA Palette Snoop Bit Setting	Action
Disabled	Data read or written by the CPU is only directed to the PCI VGA device's palette registers.
Enabled	Data read or written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device's palette registers, permitting the palette registers of both VGA devices to be identical.

The setting must be set to *Enabled* if any ISA bus adapter in the system requires VGA palette snooping.

Assign IRQ for VGA/USB
The items allow you to assign an IRQ line to the VGA card and USB device separately. Options: *Enabled, Disabled.*

PC Health Status

This section shows the status of your CPU, fan, overall system status, etc. Monitor function is available only if there is hardware monitoring mechanism onboard.

```
          Phoenix - AwardBIOS CMOS Setup Utility
                    PC Health Status

  CPU Warning Temperature    [Disabled]          │      Item Help
  System Temperature                             ├──────────────────
  CPU Temperature                                │  Menu Level    ▶
  System Fan Speed                               │
  CPU Fan Speed                                  │
  Vcore                                          │
  +3.3V                                          │
  + 5 V                                          │
  +12 V                                          │
  -12 V                                          │
  - 5 V                                          │
  VBAT(V)                                        │
  5VSB(V)                                        │
  Shutdown Temperature       [Disabled]          │

 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
      F5: Previous Values    F6: Fail-Safe Defaults  F7: Optimized Defaults
```

CPU Warning Temperature
This item is used to specify a thermal limit for CPU. If CPU temperature reaches the specified limit, the system will issue a warning which allows you to prevent the CPU overheat problem. Settings: *Disabled, 50ºC/122ºF, 53ºC/127ºF, 56ºC/133ºF, 60ºC/140ºF, 63ºC/145ºF, 66ºC/151ºF* and *70ºC/158ºF.*

System/CPU Temperature, System/CPU Fan Speed, Vcore, +3.3V, +5V, +12V, -12V, -5V, VBAT(V), 5VSB(V)
These items display the current status of all of the monitored hardware devices/ components such as CPU voltages, temperatures and all fans' speeds.
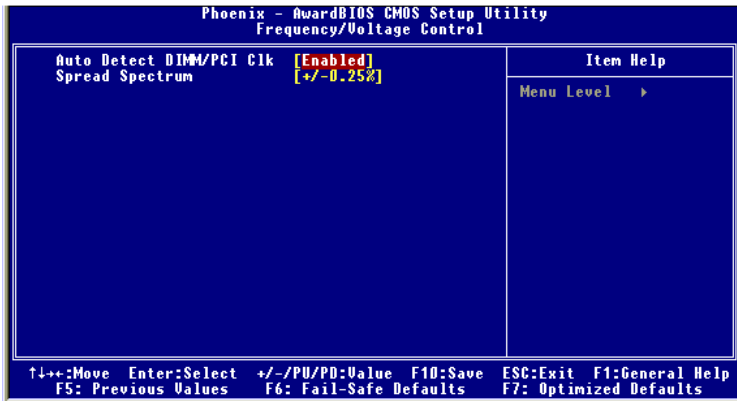
Shutdown Temperature
When the processor reaches the preset temperature, the ACPI-aware system will be shut down. Settings: *Disabled, 60ºC/140ºF, 65ºC/149ºF, 70ºC/158ºF, 75ºC/167ºF.*

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Frequency/Voltage Control

Use this menu to specify your settings for frequency/voltage control.

```
              Phoenix - AwardBIOS CMOS Setup Utility
                     Frequency/Voltage Control
┌─────────────────────────────────────────────┬───────────────────────┐
│  Auto Detect DIMM/PCI Clk   [Enabled]        │      Item Help        │
│  Spread Spectrum            [+/-0.25%]        │                       │
│                                               │   Menu Level    ▶     │
│                                               │                       │
│                                               │                       │
│                                               │                       │
│                                               │                       │
│                                               │                       │
│                                               │                       │
│                                               │                       │
│                                               │                       │
│                                               │                       │
│                                               │                       │
├─────────────────────────────────────────────┴───────────────────────┤
│ ↑↓←→:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help │
│    F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults     │
└─────────────────────────────────────────────────────────────────────┘
```

Auto Detect DIMM/PCI Clk
This option allows you to enable/disable the feature of auto detecting the clock frequency of the installed DIMM/PCI bus. The settings are: *Enabled, Disabled*.

Spread Spectrum
When the motherboard's clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at *Disabled* for optimal system stability and performance. But if you are plagued by EMI, activate the Spread Spectrum for EMI reduction. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clockspeed which may just cause your overclocked processor to lock up. Options: *Disabled, +/-0.25%, +/-0.35%, +/-0.50%, +/-0.75%*.

Load Fail-Safe/Optimized Defaults

The two options on the main menu allow users to restore all of the BIOS settings to the default Fail-Safe or Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard. The Fail-Safe Defaults are the default values set by the BIOS vendor for stable system performance.

When you select Load Fail-Safe Defaults, a message as below appears:

```
Load Fail-Safe Defaults (Y/N)? N
```

Pressing *Y* loads the BIOS default values for the most stable, minimal system performance.

When you select Load Optimized Defaults, a message as below appears:

```
Load Optimized Defaults (Y/N)? N
```

Pressing *Y* loads the default factory settings for optimal system performance.

Set Supervisor/User Password

When you select this function, a message as below will appear on the screen:

```
Enter Password:
```

Type the password, up to eight characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also have BIOS to request a password each time the system is booted. This would prevent unauthorized use of your computer. The setting to determine when the password prompt is required is the Security Option of the Advanced BIOS Feature menu. If the Security Option is set to *System*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when you try to enter Setup.

> **MSI Reminds You...**
> ***About Supervisor Password & User Password:***
> *Supervisor password: Can enter and change the settings of the setup menu.*
> *User password: Can only enter but do not have the right to change the settings of the setup menu.*

VIA VT8237 Serial ATA RAID Introduction

The Southbridge VT8237 provides a hybrid solution that combines two independent SATA ports for support of up to two Serial ATA (Serial ATA RAID) drives.

Serial ATA (SATA) is the latest generation of the ATA interface. SATA hard drives deliver blistering transfer speeds of up to 150MB/sec. Serial ATA uses long, thin cables, making it easier to connect your drive and improving the airflow inside your PC.

The key features of VT8237 SATA RAID are:

1. Support two SATA + two PATA hard disk drives.
2. Only SATA supports RAID.
3. Supports ATA 133 high performance hard disk drive.
4. Dual independent ATA channels and maximum connection of four hard disk drives allowed.
5. Supports Ultra DMA mode 6/5/4/3/2/1/0, DMA mode 2/1/0, and PIO mode 4/3/2/1/0.
6. Supports RAID 0 and RAID 1.
7. 4 KB to 64 KB striping block size support.
8. Bootable disk or disk array support.
9. Windows-based RAID configure and management software tool. (Compatible with BIOS)
10. Supports hot-swap failed disk drive in RAID 1 array.
11. ATA SMART function support.
12. Microsoft Windows 98, Me, NT4.0, 2000, XP operating systems support.
13. Event log for easy troubleshooting.

Introduction

This section gives a brief introduction on the RAID-related background knowledge and a brief introduction on VIA SATA RAID Host Controller. For users wishing to install their VIA SATA RAID driver and RAID software, proceed to **Driver and RAID Software Installation** section.

RAID Basics

RAID (Redundant Array of Independent Disks) is a method of combining two or more hard disk drives into one logical unit. The advantage of an Array is to provide better performance or data fault tolerance. Fault tolerance is achieved through data redundant operation, where if one drives fails, a mirrored copy of the data can be found on another drive. This can prevent data loss if the operating system fails or hangs. The individual disk drives in an array are called "members". The configuration information of each member is recorded in the "reserved sector" that identifies the drive as a member. All disk members in a formed disk array are recognized as a single physical drive to the operating system.

Hard disk drives can be combined together through a few different methods. The different methods are referred to as different RAID levels. Different RAID levels represent different performance levels, security levels and implementation costs. The RAID levels which the VIA VT8237 SATA RAID Host Controller supports are RAID 0 and RAID 1. The table below briefly introduced these RAID levels.

RAID Level	No. of Drives	Capacity	Benefits
RAID 0 (Striping)	2	Number drives * 2	Highest performance without data protection
RAID 1 (Mirroring)	2	Smallest size	Data protection

RAID 0 (Striping)

RAID 0 reads and writes sectors of data interleaved between multiple drives. If any disk member fails, it affects the entire array. The disk array data capacity is equal to the number of drive members times the capacity of the smallest member. The striping block size can be set from 4KB to 64KB. RAID 0 does not support fault tolerance.

RAID 1 (Mirroring)

RAID 1 writes duplicate data onto a pair of drives and reads both sets of data in parallel. If one of the mirrored drives suffers a mechanical failure or does not respond, the remaining drive will continue to function. Due to redundancy, the drive capacity of the array is the capacity of the smallest drive. Under a RAID 1 setup, an extra drive called the .spare drive. can be attached. Such a drive will be activated to replace a failed drive that is part of a mirrored array. Due to the fault tolerance, if any RAID 1 drive fails, data access will not be affected as long as there are other working drives in the array.

BIOS Configuration

When the system powers on during the POST (Power-On Self Test) process, press
<Tab> key to enter the BIOS configuration.

```
VIA Technologies, Inc.  VIA VT6420 RAID BIOS Setting Utility V1.10
Copyright (C) VIA Technologies, Inc. All Right reserved.

Press < Tab > key into User Window!
Scan Devices, Please wait...
Channel 0 Master:  Maxtor 34098H4
Channel 1 Master:  Maxtor 34098H4
```
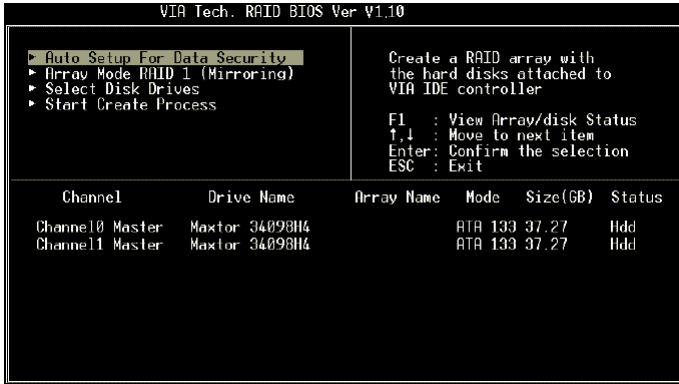
The Serial ATA RAID volume may be configured using the VIA Tech. RAID BIOS.
Always use the arrow keys to navigate the main menu, use up and down arrow key
to select the each item and press <Enter> to call out the list of creation steps. The
main interface of BIOS configuration utility is as below:

```
                    VIA Tech. RAID BIOS Ver V1.10

  ▶ Create Array                      Create a RAID array with
  ▶ Delete Array                      the hard disks attached to
  ▶ Create/Delete Spare               VIA IDE controller
  ▶ Select Boot Array
  ▶ Serial Number View                F1   : View Array/disk Status
                                      ↑,↓  : Move to next item
                                      Enter: Confirm the selection
                                      ESC  : Exit

     Channel        Drive Name      Array Name   Mode   Size(GB)  Status

   Channel0 Master  Maxtor 34098H4               ATA 133  37.27    Hdd
   Channel1 Master  Maxtor 34098H4               ATA 133  37.27    Hdd
```

Create Disk Array

Use the up and down arrow keys to select the **Create Array** command and press <Enter>.

```
                    VIA Tech. RAID BIOS Ver V1.10

 ▶ Auto Setup For Data Security          Create a RAID array with
 ▶ Array Mode RAID 1 (Mirroring)         the hard disks attached to
 ▶ Select Disk Drives                    VIA IDE controller
 ▶ Start Create Process
                                         F1   : View Array/disk Status
                                         ↑,↓  : Move to next item
                                         Enter: Confirm the selection
                                         ESC  : Exit

       Channel        Drive Name     Array Name   Mode   Size(GB)  Status

  Channel0 Master   Maxtor 34098H4                ATA 133 37.27    Hdd
  Channel1 Master   Maxtor 34098H4                ATA 133 37.27    Hdd
```
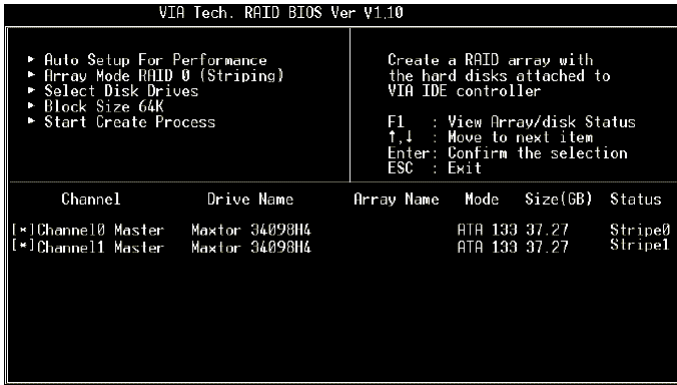
> **MSI Reminds You...**
> *The "Channel", "Drive Name", "Mode" and "Size (GB)" in the following*
> *example might be different from your system.*

Select **Array Mode** and press <Enter>, a list of array modes will appear. Highlight the target array mode that you want to create, and press <Enter> to confirm the selection. If RAID 1 or RAID 0/1 is selected, an option list will popup and enable the users to select **Create only** or **Create and duplicate**. **Create only** will allow BIOS to only create an array. The data on the mirroring drive may be different from the source drive. **Create and duplicate** lets BIOS copy the data from the source to the mirroring drive.

```
                    VIA Tech. RAID BIOS Ver V1.10

 ▶   RAID 0 for performance              Create a RAID array with
 ▶   RAID 1 for data protection          the hard disks attached to
 ▶   RAID 0/1                            VIA IDE controller
 ▶   RAID SPAN for capacity
                                         F1   : View Array/disk Status
                                         ↑,↓  : Move to next item
                                         Enter: Confirm the selection
                                         ESC  : Exit

       Channel        Drive Name     Array Name   Mode   Size(GB)  Status

  Channel0 Master   Maxtor 34098H4                ATA 133 37.27    Hdd
  Channel1 Master   Maxtor 34098H4                ATA 133 37.27    Hdd
```

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After array mode is selected, there are two methods to create a disk array. One method is "**Auto Setup**" and the other one is "**Select Disk Drives**".   **Auto Setup** allows BIOS to select the disk drives and create arrays automatically, but it does not duplicate the mirroring drives even if the user selected **Create and duplicate** for RAID 1. It is recommended all disk drives are new ones when wanting to create an array. **Select Disk Drives** lets the user select the array drives by their requirements. When using **Select Disk Drives**, the channel column will be activated.   Highlight the target drives that you want to use and press <Enter> to select them. After all drives have been selected, press <Esc> to go back to the creation steps menu.

If user selects a RAID 0 array in step 2, the block size of the array can also be selected. Use the arrow key to highlight **Block Size** and press <Enter>, then select a block size from the popup menu. The block size can be 4KB to 64KB.

> **MSI Reminds You...**
> *Even though 64KB is the recommended setting for most users, you should choose the block size value which is best suited to your specific RAID usage model.*
> *4KB: For specialized usage models requiring 4KB blocks*
> *8KB: For specialized usage models requiring 8KB blocks*
> *16KB: Best for sequential transfers*
> *32KB: Good for sequential transfers*
> *64KB: Optimal setting*

Use the arrow key to highlight **Start Create Process** and press <Enter>. A warning message will appear, Press **Y** to finish the creation, or press **N** to cancel the creation. Important note: All existing content in the hard drive will be destroyed after array creation.

Delete Disk Array

A RAID can be deleted after it has been created. To delete a RAID, use the following steps:

1. Select **Delete Array** in the main menu and press <Enter>. The channel column will be activated.
2. Select the member of an array that is to be deleted and press <Enter>. A warning message will show up, press Y to delete or press N to cancel.

Deleting a disk array will destroy all the data on the disk array except RAID 1 arrays. When a RAID is deleted, the data on these two hard disk drives will be reserved and become two normal disk drives.

Create and Delete Spare Hard Drive

If a RAID 1 array is created and there are drives that do not belong to other arrays, the one that has a capacity which is equal to or greater than the array capacity can be selected as a spare drive for the RAID 1 array. Select **Create/Delete Spare** and press <Enter>, the channel column will then be activated. Select the drive that you want to use as a spare drive and press <Enter>, the selected drive will be marked as **Spare**. The spare drive cannot be accessed in an OS.

To delete a spare drive, highlight **Create/Delete Spare** and press <Enter>. The spare drive will be highlighted, press <Enter> to delete the spare drive.

View Serial Number of Hard Drive

Highlight **Serial Number View** and press <Enter>. Use arrow key to select a drive, the selected drive's serial number can be viewed in the last column. The serial number is assigned by the disk drive manufacturer.

Press the **F1** key to show the array status on the lower screen. If there are no disk arrays then nothing will be displayed on the screen.

Duplicate Critical RAID 1 Array

When booting up the system, BIOS will detect if the RAID 1 array has any inconsistencies between user data and backup data. If BIOS detects any inconsistencies, the status of the disk array will be marked as critical, and BIOS will prompt the user to duplicate the RAID 1 in order to ensure the backup data consistency with the user data.
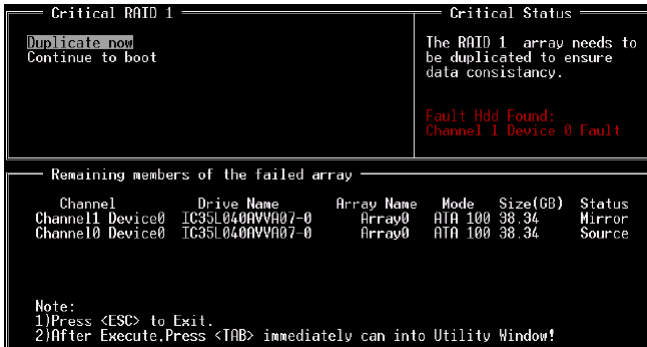
If user selects **Continue to boot,** it will enable duplicating the array after booting into OS.

Rebuild Broken RAID 1 Array

When booting up the system, BIOS will detect if any member disk drives of RAID has failed or is absent. If BIOS detects any disk drive failures or missing disk drives, the status of the array will be marked as broken.

If BIOS detects a broken RAID 1 array but there is a spare hard drive available for rebuilding the broken array, the spare hard drive will automatically become the mirroring drive. BIOS will show a main interface just like a duplicated RAID 1. Selecting **Continue to boot** enables the user to duplicate the array after booting into operating system.

If BIOS detects a broken RAID 1 array but there is no spare hard drive available for rebuilding the array, BIOS will provide several operations to solve such problem.
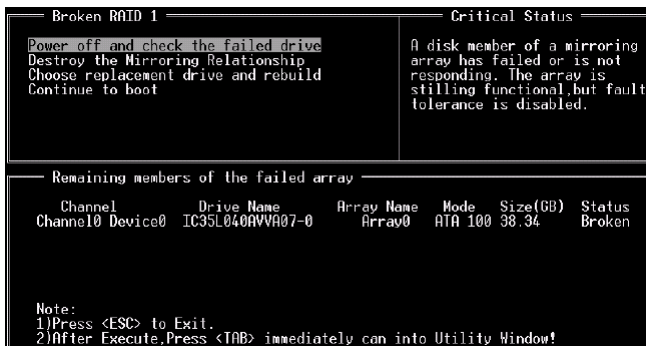
1. Power off and Check the Failed Drive:
This item turns off the computer and replaces the failed hard drive with a good one. If your computer does not support APM, you must turn off your computer manually. After replacing the hard drive, boot into BIOS and select **Choose replacement drive and rebuild** to rebuild the broken array.

2. Destroy the Mirroring Relationship:
This item cancels the data mirroring relationship of the broken array. For broken RAID 1 arrays, the data on the surviving disk will remain after the destroy operation. However, **Destroy the Mirroring Relationship** is not recommend because the data on the remaining disk will be lost when the hard drive is used to create another RAID 1 array.

3. Choose Replacement Drive and Rebuild:
This item enables users to select an already-connected hard drive to rebuild the broken array. After choosing a hard drive, the channel column will be activated.
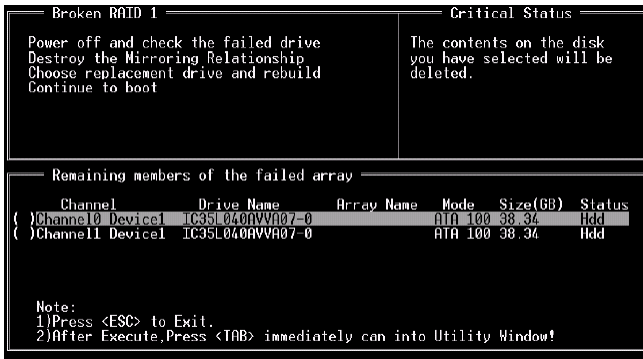
 Highlight the target hard drive and press <Enter>, a warning message will appear. Press **Y** to use that hard drive to rebuild, or press **N** to cancel. Please note selecting option **Y** will destroy all the data on the selected hard drive.

4. Continue to boot:
This item enables BIOS to skip the problem and continue booting into OS.

Installing RAID Software & Drivers

Install Driver in Windows OS

➤ **New Windows OS (2000/XP/NT4) Installation**
   The following details the installation of the drivers while installing Windows XP.
   1.   Start the installation:
        Boot from the CD-ROM. Press **F6** when the message "Press F6 if you need
   to install third party SCSI or RAID driver" appears.
   2.   When the Windows Setup window is generated, press **S** to specify an
   Additional Device(s).
   3.   Insert the driver diskette *VIA VT6420/VT8237 Disk Driver* into drive A: and
   press <Enter>.
   4.   Depending on your operation system, choose *VIA Serial ATA RAID
   Controller(Windows XP)*, *VIA Serial ATA RAID Controller(Windows 2000)*
   or *VIA Serial ATA RAID Controller(Windows NT4)* from the list that appears
   on Windows XP Setup screen, press the <Enter> key.
   5. Press <Enter> to continue with installation or if you need to specify any addi-
   tional devices to be installed, do so at this time. Once all devices are specified,
   press <Enter> to continue with installation.
   6. From the Windows XP Setup screen, press the <Enter> key. Setup will now
   load all device files and then continue the Windows XP installation

➤ **Existing Windows XP Driver Installation**
   1. Insert the MSI CD into the CD-ROM drive.
   2. The CD will auto-run and the setup screen will appear.
   3. Under the Driver tab, click on *VIA SATA RAID Utility*.
   4. The drivers will be automatically installed.

➤ **Confirming Windows XP Driver Installation**
   1. From Windows XP, open the **Control Panel** from **My Computer** followed by
   the System icon.
   2. Choose the **Hardware** tab, then click the **Device Manager** tab.
   3. Click the "**+**" in front of the **SCSI and RAID Controllers** hardware type. The
   driver *VIA IDE RAID Host Controller* should appear.

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Installation of VIA SATA RAID Utility

The VIA SATA RAID Utility is the software package that enables high-performance RAID 0 arrays in the Windows* XP operating system. This version of VIA SATA RAID Utility contains the following key features:

               ➤ Serial ATA RAID driver for Windows XP
               ➤ VIA SATA RAID utility
   ➤ RAID0 and RAID1 functions

Insert the MSI CD and click on the **VIA SATA RAID Utility** to install the software.
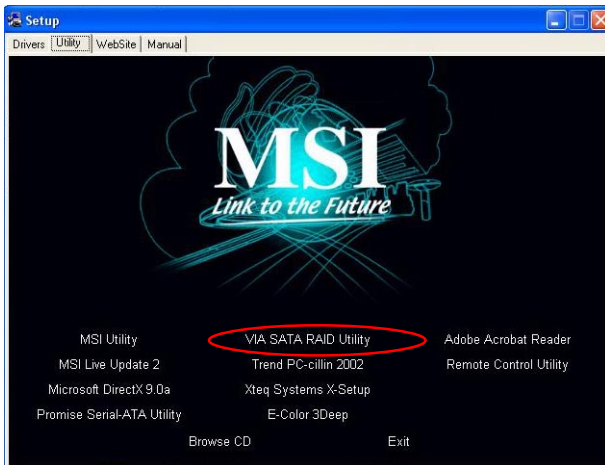
The **InstallShield Wizard** will begin automatically for installation. Click on the **Next** button to proceed the installation in the welcoming window.
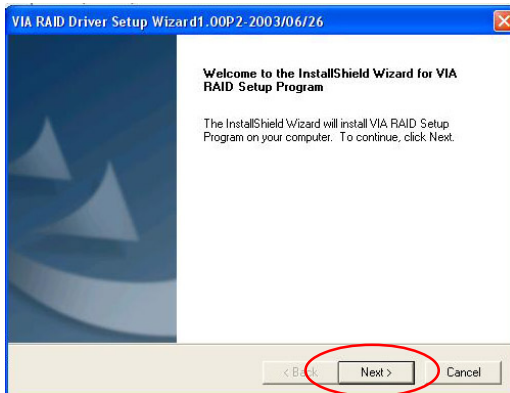
Put a check mark in the check box to install the feature you want. Then click **Next** button to proceed the installation.
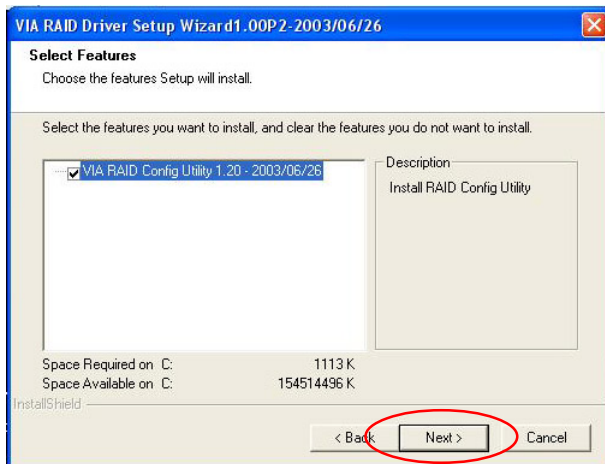
Using VIA RAID Tool

Once the installation is complete, go to **Start** ---> **Programs** --->**VIA** --->**raid_tool. exe** to enable **VIA RAID Tool**.
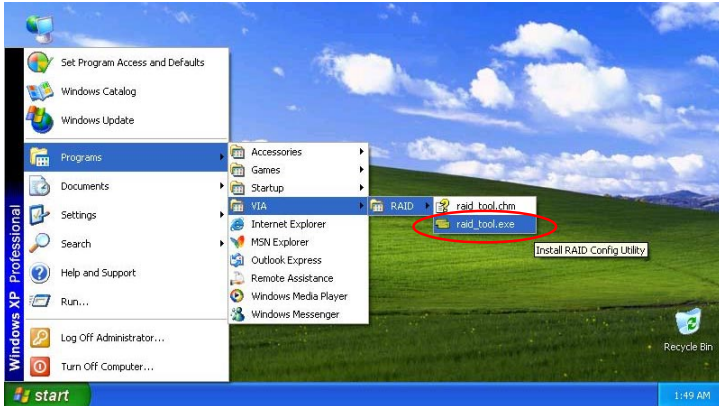
After the software is finished installation, it will automatically started every time Windows is initiated. You may double-click on the 🖥 icon shown in the system tray of the tool bar to launch the **VIA RAID Tool** utility.


The main interface is divided into two windows and the toolbar above contain the main functions. Click on these toolbar buttons to execute their specific functions. The left windowpane displays the controller and disk drives and the right windowpane displays the details of the controller or disk drives. The available features are as following:

View by Controller

View by Devices

View Event log

Help Topics

Click on ![icon] o r ![icon] button to determine the viewing type of left window pane. There are two viewing types: By controllers and by device. Click on the object in the left window pane to display the status of the object in the right windowpane. The following screen shows the status of Array 0---RAID 0.
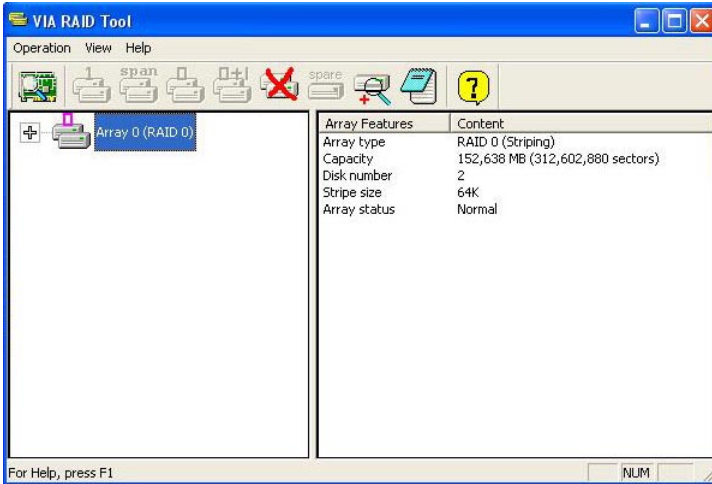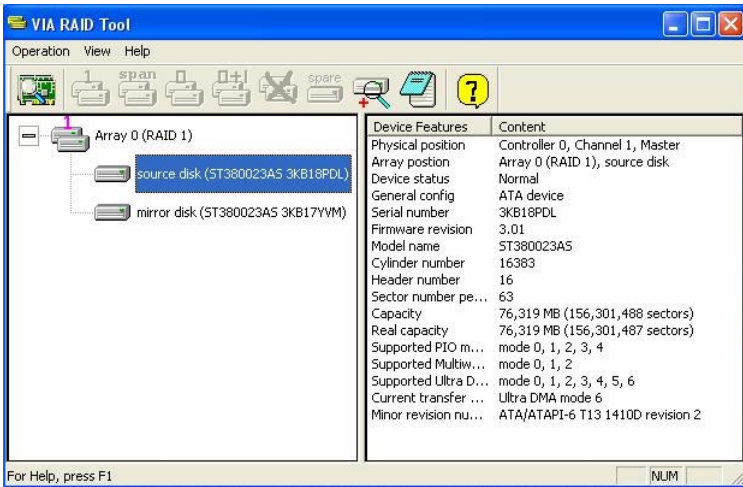

Click on the plus (+) symbol next to Array 0---RAID 0 to see the details of each disk.

4-14
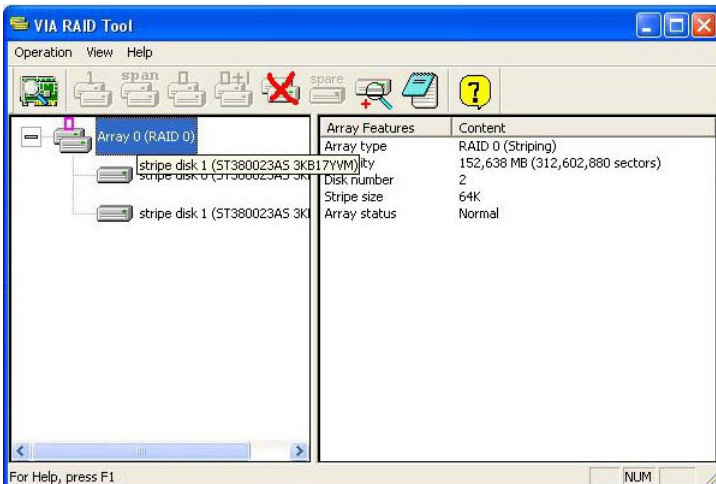
You may also use the same [icon] o r [icon] button to view the statuses of Array 0---RAID 1.
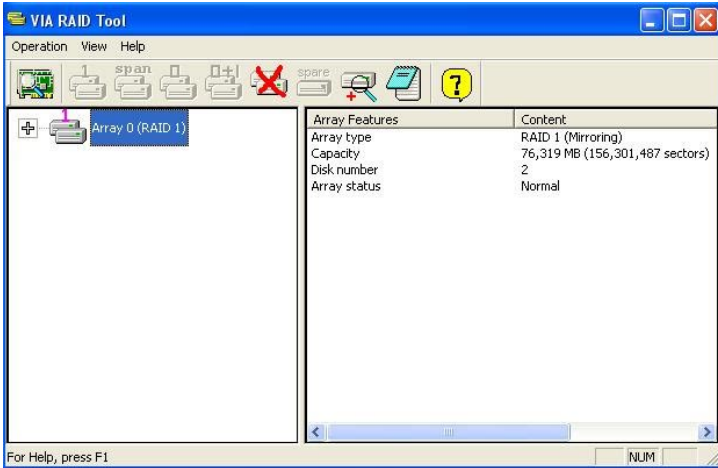
Click on the plus (+) symbol next to Array 0---RAID 1 to see the details of each disk.

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