# Maximus Extreme

**Motherboard**

E3498

Second Edition V2
October 2007

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# Notices

## Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

> The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

## Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

# Safety information

## Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.

- Seek professional assistance before using an adpater or extension cord. These devices could interrupt the grounding circuit.

- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.

- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

## Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.

- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.

- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.

- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.

- Place the product on a stable surface.

- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

This symbol of the crossed out wheeled bin indicates that the product (electrical, electronic equipment, and mercury-containing button cell battery) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

# About this guide

This user guide contains the information you need when installing and configuring the motherboard.

## How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product introduction**

  This chapter describes the features of the motherboard and the new technology it supports.

- **Chapter 2: Hardware information**

  This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.

- **Chapter 3: Powering up**

  This chapter describes the power up sequence and ways of shutting down the system.

- **Chapter 4: BIOS setup**

  This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

- **Chapter 5: Software support**

  This chapter describes the contents of the support CD that comes with the motherboard package and the software.

- **Chapter 6: ATI CrossFire™ support**

  This chapter describes the ATI CrossFire™ feature and shows the graphics card installation procedures.

- **Appendix: CPU features**

  The Appendix describes the CPU features and technologies that the motherboard supports as well as the debug code table for the LCD Poster.

## Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS websites**

   The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. **Optional documentation**

   Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

## Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

**DANGER/WARNING:** Information to prevent injury to yourself when trying to complete a task.

**CAUTION:** Information to prevent damage to the components when trying to complete a task.

**IMPORTANT**: Instructions that you MUST follow to complete a task.

**NOTE**: Tips and additional information to help you complete a task.

## Typography

| | |
|---|---|
| Bold text | Indicates a menu or an item to select. |
| *Italics* | Used to emphasize a word or a phrase. |
| <Key> | Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key. |
| | Example: <Enter> means that you must press the Enter or Return key. |
| <Key1+Key2+Key3> | If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). |
| | Example: <Ctrl+Alt+D> |
| `Command` | Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets. |
| | Example: At the DOS prompt, type the command line: |
| | `afudos /i[filename]` |
| | `afudos /iMaximus-Extreme.ROM` |

# Maximus Extreme specifications summary

| | |
|---|---|
| **CPU** | LGA775 socket for Intel® Core™2 Extreme / Core™2 Quad/ Core™2 Duo / Pentium® Extreme / Pentium® D / Pentium® 4 Processors<br>Support Intel® next generation 45nm Multi-Core CPU<br>Compatible with Intel® 06/05B/05A processors<br>* Refer to www.asus.com for Intel CPU support list |
| **Chipset** | Intel® X38 / ICH9R with Intel® Fast Memory Access Technology |
| **System Bus** | 1600 / 1333 / 1066 / 800 MHz |
| **Memory** | 4 x DIMM, max. 8GB,<br>DDR3 1800(O.C.)/1600(O.C.)/1333/1066 MHz,<br>non-ECC, un-buffered memory<br>Dual channel memory architecture |
| **Expansion Slots** | 3 x PCIe Gfx slot, support dual PCIe2.0 x16 or PCIe2.0 x16, dual x8<br>2 x PCIe x1, PCIex1_1 (black) is compatible with the audio slot.)<br>2 x PCI 2.2 |
| **CrossFire™ Technology** | Support ATI CrossFire™ graphics cards |
| **Storage** | Southbridge<br> - 6 x SATA 3.0 Gb/s ports<br> - Intel Matrix Storage Technology supports RAID 0, 1, 10, 5, and JBOD.<br><br>JMicron® JMB363 PATA and SATA controller<br> - 1 x UltraDMA 133/100/66 for up to 2 PATA devices<br> - 2 x External SATA 3.0 Gb/s port (SATA On-the-Go) |
| **LAN** | Dual Gigabit LAN controllers, both featuring AI NET2 Teaming technology support |
| **High Definition Audio** | SupremeFX II Audio Card<br>   -   ADI 1988B 8-channel High Definition Audio CODEC<br>   -   Noise Filter<br>Coaxial / Optical S/PDIF out ports at back I/O |
| **IEEE 1394** | 2 x 1394a ports (1 port onboard; 1 port at back I/O) |
| **USB** | 12 x USB 2.0/1.1 ports (6 ports at mid-board, 6 ports at back panel) |

# Maximus Extreme specifications summary

| | |
|---|---|
| **ASUS ROG Overclocking features** | Crosslinx technology<br>Extreme Tweaker<br>Loadline Calibration<br>Intelligent overclocking tools:<br>   - CPU level up<br>   - AI NOS™ (Non-delay Overclocking System)<br>   - AI Overclocking (intelligent CPU frequency tuner)<br>   - AI Booster Utility<br>   - O.C. Profile<br>Overclocking protection:<br>   - COP EX (Component Overheat Protection -EX)<br>   - Voltiminder LED<br>   - ASUS C.P.R. (CPU Parameter Recall) |
| **ASUS Special Features** | Fusion Block System<br>LCD Poster<br>EL I/O<br>Onboard Switches: Power / Reset / Clr CMOS<br>Q-Connector<br>Q-Fan Plus<br>ASUS EZ Flash 2<br>ASUS CrashFree BIOS 3<br>ASUS MyLogo 3™ |
| **Back Panel I/O Ports** | 1 x PS/2 Keyboard (purple)<br>1 x Optical + 1 x Coaxial S/PDIF Out<br>2 x External SATA<br>2 x LAN (RJ45) port<br>6 x USB 2.0/1.1 ports<br>1 x IEEE1394a port<br>1 x Clr CMOS switch |
| **Internal I/O Connectors** | 3 x USB 2.0 connectors support additional 6 USB 2.0 ports<br>1 x Floppy disk drive connector<br>1 x IDE connector for two devices<br>6 x SATA connectors<br>8 x Fan connectors (1 x CPU/ 1 x Power/ 3 x Chassis/ 3 x Optional)<br>3 x Thermal sensor connectors<br>1 x IEEE1394a connector<br>1 x S/PDIF Out connector<br>1 x Chassis Intrusion connector<br>24-pin ATX Power connector<br>8-pin ATX 12V Power connector<br>1 x En/Dis-able Clr CMOS slide switch<br>1 x EL I/O Shield connector |

*(continued on the next page)*

# Maximus Extreme specifications summary

| | |
|---|---|
| **BIOS Features** | 16 Mb AMI BIOS, PnP, DMI2.0, WfM2.0, SM BIOS 2.4, ACPI 2.0a Multi-Language BIOS |
| **Manageability** | WOL by PME, WOR by PME, Chassis Intrusion, PXE |
| **Accessories** | Fusion Block System Accessory<br>DIY Pedestal<br>ASUS Optional Fan<br>3 in 1 ASUS Q-connector kit<br>UltraDMA 133/100/66 cable<br>Floppy disk drive cable<br>Serial ATA cables<br>Serial ATA power cables<br>2-port USB2.0 module + IEEE1394a module<br>EL I/O Shield<br>Thermal sensor cables<br>Cable ties<br>User's manual |
| **Software** | The hottest 3D game: S.T.A.L.K.E.R<br>Support DVD:<br>    Drivers<br>    ASUS PC Probe II<br>    ASUS Update<br>    ASUS AI Suite<br>    Futuremark® 3DMark® 06 Advanced Edition<br>    Kaspersky Anti-Virus software |
| **Form Factor** | ATX Form Factor, 12"x 10.6" (30.5cm x 26.9cm) |

*Specifications are subject to change without notice.

This chapter describes the motherboard
features and the new technologies
it supports.

# Product introduction

# Chapter summary

*1*

# 1.1 Welcome!

Thank you for buying an ASUS® Maximus Extreme motherboard!

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of ASUS quality motherboards!

Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below.

# 1.2 Package contents

Check your motherboard package for the following items.

| | |
|---|---|
| Motherboard | ASUS Maximus Extreme |
| I/O modules | USB 2.0 module + IEEE 1394a module |
| Cables | Ultra DMA 133/100/66 cable<br>Floppy disk drive cable<br>Serial ATA cables<br>Serial ATA power cables<br>Thermal sensor cables |
| Accessories | Fusion Block System Accessory<br>EL I /O shield<br>LCD Poster<br>ASUS Optional Fan<br>3-in-1 ASUS Q-Connector Kit<br>Cable ties<br>DIY Pedestal |
| DVD/CD | ASUS motherboard support DVD<br>The hottest game: S.T.A.L.K.E.R |
| Documentation | User guide |

> If any of the above items is damaged or missing, contact your retailer.

# 1.3    Special features

## 1.3.1    ROG intelligent Performance & Overclocking features

### Crosslinx

Crosslinx is a unique technology utilizing a dedicated special graphics controller to optimize PCIe allocation with x16, x8, x8 lanes. Such architecture eliminates the x4 bottleneck found on competing x16, x16, x4 solutions. Hence, the Crosslinx is able to provide faster graphics performance.

### Fusion Block System

The Fusion Block System is a more efficient thermal solution compared to competing followers with complicated looks. It is a hybrid thermal design that combines the ROG's renowned heatpipe design with the additional ability to connect to a water cooling system. By taking the entire integrated solution into design considerations, the user can enjoy exceptional thermal improvement to Northbridge, Southbridge, Crosslinx, and even VRM with a single connection. The Fusion Block System is the most versatile, efficient, and advanced thermal system there is on a motherboard.

### Component Overheat Protection -EX (COP EX)

The COP EX allows overclockers to increase chipset voltages without the worries of overheating. It can also be used to monitor and save an overheating GPU. The COP EX allows more freedom and less constraint for maximum performance achievement.

### Frequency LED

Worried that no one knows when you've overclocked your system to the max? Let the motherboard do the talking! The onboard Frequency LED highlights when your system is under extreme overclocking or normal states – allowing you to show off your O.C. skills.

### Voltiminder LED

In the persuit of extreme performance, overvoltage adjustment is critical but risky. Acting as the "red zone" of a tachometer, the Voltiminder LED displays the voltage status for CPU, NB, SB, and Memory in a intuitive color-coded fashion. The Voltiminder LED allows quick voltage monitoring for overclockers. See pages 2-1 to 2-3 for details.

## CPU Level Up

Enjoy up to 40% more performance! Overclock immediately with OC profile presets. Much more than simple frequency settings, this profile gives gamers comprehensive and detailed tuning to frequencies, voltagies, and even timings to create a real professional level of overclocking configuration. See pages 4-17 and 5-33 for details.

## 2-Phase DDR3

With the embedded 2-Phase DDR3, this motherboard allows users to reach higher memory frequencies and enjoy better performance. Compared with only one phase solutions, this motherboard ensures longer power component lifespans and higher overclockability due to cooler temperatures and better efficiency.

## 3rd Generation 8 Phase Power Design

*Longer Life & Higher Efficiency!*
With power efficiency so important to operating temperatures, ASUS' 3rd generation 8-phase VRM design leads the industry with its 95% power efficiency. High quality power components such as low RDS (on) MOSFETs for minimum switching loss & lower temperatures, Ferrite core chokes with lower hysteresis loss, and high quality Japanese-made conductive polymer capacitors all add up to ensure longer component life and lower power loss - creating more energy efficiency.

## Loadline Calibration

The Loadline calibration ensures stable and optimal CPU voltage when heavy loading.

## Extreme Tweaker

This feature allows you to fine tune the CPU/memory voltage and gradually increase the memory Front Side Bus (FSB) and PCI Express frequency at 1MHz increment to achieve maximum system performance.

## AI Booster

The ASUS AI Booster allows you to overclock the CPU speed in Windows environment without the hassle of booting the BIOS.

## ASUS O.C. Profile

The motherboard features the ASUS O.C. Profile that allows users to conveniently store or load multiple BIOS settings. The BIOS settings can be stored in the CMOS or a separate file, giving users freedom to share and distribute their favorite settings. See page 4-40 for details.

## C.P.R. (CPU Parameter Recall)

The C.P.R. feature of the motherboard BIOS allows automatic re-setting to the BIOS default settings in case the system hangs due to overclocking. When the system hangs due to overclocking, C.P.R. eliminates the need to open the system chassis and clear the RTC data. Simply shut down and reboot the system, and the BIOS automatically restores the CPU default setting for each parameter.

## 1.3.2    ROG unique features

### Supreme FX II features

Supreme FX II extends all the features of the 1st generation and places a shielding to enhancethe sound quality. It also lights up the model name with stylish LEDs.

#### Noise Filter

This feature detects repetitive and stationary noises (non-voice signals) like computer fans, air conditioners, and other background noises then eliminates it in the incoming audio stream while recording. See page 5-15 and 5-20 for details.

### LCD Poster

The LCD Poster uses an external panel to smartly display the error message of the physical system during the Power-On Self Test (POST) to inform you the boot error instead of the "code name."

### Onboard Switches

A power-on button, a reset button, and a clear CMOS button are onboard to provide overclockers and gamers the convenience of fine-tuning performance when working on a bare (open-case) system. Press the power-on button to wake up the system, the reset button to reboot, and the clear CMOS button to clear setup information when the system hangs due to overclocking. See page 2-40 for details.

## ASUS Q-Fan plus technology

The ASUS Q-Fan plus technology smartly adjusts the CPU and chassis fan 1 speeds according to the system loading to ensure quiet, cool, and efficient operation. See pages 4-33, 4-34 and 5-31 for details.

## Optional Fan *(for water-cooling/passive-cooling only)*

The optional fan is specifically designed to provide sufficient airflow over the CPU power modules and chipset area when water-cooling or passive-cooling is utilized, ensuring effective heat dissipation for the entire system. See page 2-41 for details.

## ASUS Multi-language BIOS

The multi-language BIOS allows you to select the language of your choice from the available options. The localized BIOS menus allow easier and faster configuration. See page 4-12 for details.

## ASUS MyLogo 3

This new feature present in the motherboard allows you to personalize and add style to your system with customizable boot logos. See page 5-9 for details.

## ASUS Quiet Thermal Solution

ASUS Quiet Thermal solution makes system more stable and enhances the overclocking capability.

## ASUS EPU

The ASUS EPU utilizes innovative technology to digitally monitor and tune the CPU power supply with improved VR responses in heavy or light loadings. It automatically provides power for higher performance or improve efficiency by 7% when the PC is running low intensity applications. Working together with AI Gear 3, this can help you attain the best possible power efficiency and energy savings up to 20% to help save the environment. See page 5-29 for details.

### AI Nap

With AI Nap, the system can continue running at minimum power and noise when you are temporarily away. To wake the system and return to the OS environment, simply click the mouse or press a key. See page 5-30 for details.

**Fanless Design - Stack Cool 2**

ASUS Stack Cool 2 is a fan-less and zero-noise cooling solution that lowers the temperature of critical heat generating components. The motherboard uses a special design on the printed circuit board (PCB) to dissipate heat these critical components generate.

## ASUS EZ DIY

ASUS EZ DIY feature collection provides you easy ways to install computer components, update the BIOS or back up your favorite settings.

**ASUS Q-Connector**

ASUS Q-Connector allows you to easily connect or disconnect the chassis front panel cables to the motherboard. This unique module eliminates the trouble of connecting the system panel cables one at a time and avoiding wrong cable connections. See page 2-39 for details.

**ASUS CrashFree BIOS 3**

The ASUS CrashFree BIOS 3 allows users to restore corrupted BIOS data from a USB flash disk containing the BIOS file. See page 4-8 for details.

**ASUS EZ Flash 2**

EZ Flash 2 is a user-friendly BIOS update utility. Simply press the predefined hotkey to launch the utility and update the BIOS without entering the OS. Update your BIOS easily without preparing a bootable diskette or using an OS-based flash utility. See pages 4-5 and 4-39 for details.

### 1.3.3    Product highlights

#### Republic of Gamers

The Republic of Gamers consists only the best of the best. We offer the best hardware engineering, the fastest performance, the most innovating ideas, and we welcome the best gamers to join in. In the Republic of Gamers, mercy rules are only for the weak, and bragging rights means everything. We believe in making statements and we excel in competitions. If your character matches our trait, then join the elite club, make your presence felt, in the Republic of Gamers.

#### Intel® Quad-core Processor ready

This motherboard supports the latest Intel® Quad-core processors in the LGA775 package and Intel's next-generation 45nm multi-core processors. It is excellent for multi-tasking, multi-media and enthusiastic gamers with 1333/1066/800 MHz FSB. Intel® Quad-core processor is one of the most powerful CPU in the world. See page 2-9 for details.

#### Intel® Core™2 Duo/ Intel® Core™2 Extreme CPU support

This motherboard supports the latest Intel® Core™2 processor in the LGA775 package and Intel's next-generation 45nm multi-core processors. With the new Intel® Core™ microarchitecture technology and 1333/1066/800 MHz FSB, the Intel® Core™2 is one of the most powerful and energy efficient CPUs in the world. See page 2-8 for details.

#### Intel® X38 Chipset

The Intel® X38 Express Chipset is the latest chipset designed to support 8GB of dual-channel DDR3 1333/1066/800 architecture, 1333/1066/800 FSB (Front Side Bus), dual PCI Express 2.0 x16 graphics, and multi-core CPUs. With the specially included Intel® Fast Memory Access technology, available memory bandwidth usage is optimized and memory access latency is reduced—allowing faster memory speed.

## PCIe 2.0

This motherboard supports the latest PCIe 2.0 device for twice the current speed and bandwidth. This enhances system performance while still providing backward compatibility to PCIe 1.0 devices. See pages 2-20 and 2-22 for details.

## DDR3 memory support

The motherboard supports DDR3 memory that features data transfer rates of 1333 / 1066 / 800 MHz to meet the higher bandwidth requirements of the latest 3D graphics, multimedia, and Internet applications. The dual-channel DDR3 architecture doubles the bandwidth of your system memory to boost system performance. Furthermore, this motherboard does not restrict the memory size across two channels. Users may install different memory size DIMMs into the two channels and enjoy dual-channel and single-channel functions at the same time. This new feature optimizes the use of available memory size.

## ATI CrossFire™ Technology

ATI's CrossFire™ boosts image quality along with rendering speed, eliminating the need to scale down screen resolution to get high quality images. CrossFire™ allows higher antialiasing, anisotropic filtering, shading, and texture settings. Adjust your display configurations, experiment with the advanced 3D settings, and check the effects with a real-time 3D-rendered previews within ATI Catalyst™ Control Center.

## Serial ATA 3.0 Gb/s technology and SATA-On-The-Go

This motherboard supports the next-generation hard drives based on the Serial ATA (SATA) 3Gb/s storage specification, delivering enhanced scalability and doubling the bus bandwidth for high-speed data retrieval and saves. The external SATA port located at the back I/O provides smart setup and hot-plug functions. Easily backup photos, videos and other entertainment contents to external devices. See page 2-27 for details.

## Dual RAID solution

The Intel® X38 chipset incorporates six Serial ATA connectors with high performance RAID 0, 1, 5 and 10 functions. Making this motherboard an ideal solution to enhance hard disk performance and data back up protection without the cost of add-on cards. See page 2-30 for details.

## IEEE 1394a support

The IEEE 1394a interface provides high speed digital interface for audio/video appliances such as digital television, digital video camcorders, storage peripherals & other PC portable devices. See pages 2-28 and 2-32 for details.

## S/PDIF digital sound ready

This motherboard provides convenient connectivity to external home theater audio systems via coaxial and optical S/PDIF-out (SONY-PHILIPS Digital Interface) jacks.It allows to transfer digital audio without converting to analog format and keeps the best signal quality. See pages 2-28 and 2-37 for details.

## Dual Gigabit LAN solution

The integrated dual Gigabit LAN design allows a PC to serve as a network gateway for managing traffic between two separate networks. This capability ensures rapid transfer of data from WAN to LAN without any added arbitration or latency. See page 2-26 for details.

## High Definition Audio

Enjoy high-end sound quality on your PC! The onboard 8-channel HD audio (High Definition Audio, previously codenamed Azalia) CODEC enables high-quality 192KHz/24-bit audio output, jack-sensing feature, retasking functions and multi-streaming technology that simultaneously sends different audio streams to different destinations. You can now talk to your partners on the headphone while playing multi-channel network games. See pages 2-27 for details.

## Green ASUS

This motherboard and its packaging comply with the European Union's Restriction on the use of Hazardous Substances (RoHS). This is in line with the ASUS vision of creating environment-friendly and recyclable products/packaging to safeguard consumers' health while minimizing the impact on the environment.

This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.

# Hardware information

2

# Chapter summary

2

# 2.1 Before you proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.

• Unplug the power cord from the wall socket before touching any component.

• Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.

• Hold components by the edges to avoid touching the ICs on them.

• Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.

• Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

## Onboard LEDs

The motherboard comes with LEDs that indicate the voltage conditions of CPU, memory, northbridge, southbridge and FSB frenquency. You may adjust the voltages in BIOS. There are also an LED for hard disk drive activity and an onboard switch for power status. For more information on voltage adjustment, refer to 4.4 Extreme Tweaker menu

1. **CPU LED**

    The CPU LED has two voltage displays: CPU Voltage and CPU PLL Voltage; you can select the voltage to display in BIOS. Refer to the illustration below for the location of the CPU LED and the table below for LED definition.
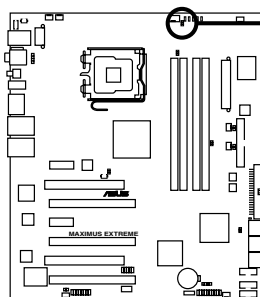


CPU_CRAZY
CPU_HIGH
CPU_NORMAL

**MAXIMUS EXTREME CPU LED**

|  | Normal (green) | High (yellow) | Crazy (red) |
|---|---|---|---|
| **CPU Voltage** | 1.10000~1.50000 | 1.50625~1.69375 | 1.70000~ |
| **CPU PLL Voltage** | 1.50000~1.60000 | 1.62000~1.80000 | 1.82000~ |

## 2. Memory LED

Refer to the illustration below for the location of the memory LED and the table below for LED definition.

DDR_CRAZY
DDR_HIGH
DDR_NORMAL
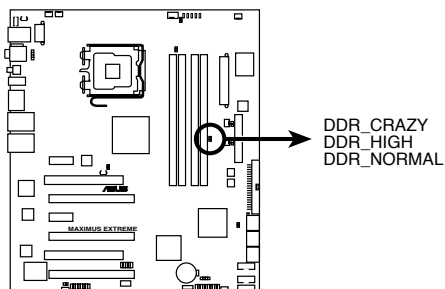
**MAXIMUS EXTREME DDR LED**

|  | Normal (green) | High (yellow) | Crazy (red) |
|---|---|---|---|
| **DRAM Voltage** | 1.50~1.90 | 1.92~2.30 | 2.32~3.04 |

## 3. Northbridge/Southbridge LEDs

The northbridge and southbridge LEDs each have two different voltage displays. The northbridge LED displays either the North Bridge Voltage or the FSB Termination Voltage. The southbridge LED shows either the South Bridge Voltage or the SB 1.5V Voltage. You can select the voltage to display in BIOS. Refer to the illustration below for the location of the northbridge/southbridge LEDs and the table below for LED definition.

NB_CRAZY
NB_HIGH
NB_NORMAL

SB_CRAZY
SB_HIGH
SB_NORMAL
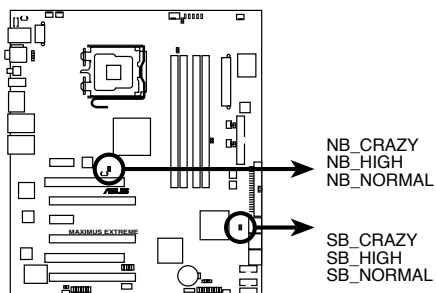
**MAXIMUS EXTREME North/South Bridge LED**

|  | Normal (green) | High (yellow) | Crazy (red) |
|---|---|---|---|
| **North Bridge Voltage** | 1.25~1.49 | 1.51~1.73 | 1.73~ |
| **FSB Termination Voltage** | 1.20~1.40 | 1.42~1.60 | 1.62~ |
| **South Bridge Voltage** | 1.050~1.125 | 1.150~1.175 | 1.200~ |
| **SB 1.5V Voltage** | 1.50~1.60 | 1.65~1.85 | 1.90~ |

4. **FSB frenquency LED**

   There are five LEDs that light up to indicate the level of FSB frequency. One lit yellow LED suggests that the frequency is low (default), while five lit yellow LEDs shows that the frequency is high (fast). Refer to the illustration below for the location of the FSB frenquency LEDs and the table below for LED definition.
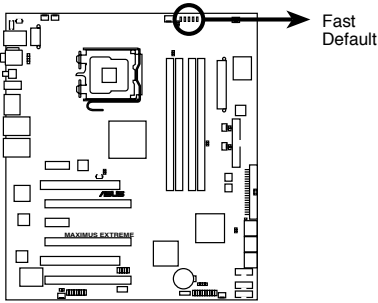


Fast
Default

**MAXIMUS EXTREME Frequency LED**

| CPU FSB 200MHz | 200-299 (Default) | 300-399 (Overclocking) | 400-499 (Overclocking) | 500-599 (Overclocking) | 600~ (Overclocking) |
|---|---|---|---|---|---|
| | 1 (Default) | 2 | 3 | 4 | 5 (Fast) |

| CPU FSB 266MHz | 266-299 (Default) | 300-399 (Overclocking) | 400-499 (Overclocking) | 500-599 (Overclocking) | 600~ (Overclocking) |
|---|---|---|---|---|---|
| | 1 (Default) | 2 | 3 | 4 | 5 (Fast) |

| CPU FSB 333MHz | 333-399 (Default) | 400-499 (Overclocking) | 500-549 (Overclocking) | 550-599 (Overclocking) | 600~ (Overclocking) |
|---|---|---|---|---|---|
| | 1 (Default) | 2 | 3 | 4 | 5 (Fast) |

5.   **Hard Disk LED**

The HD LED is designed for indication of the hard disk activity. It blinks when the data is written into or read from the hard disk drive. It stays unlit if there is no hard disk connected to the motherboard or the hard disk does not function.

HD_LED
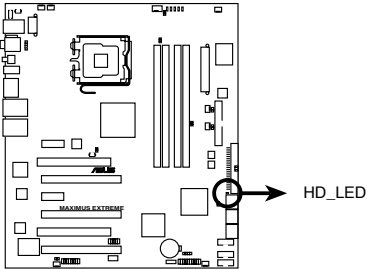
**MAXIMUS EXTREME Hard Disk LED**

6.   **Power LED**

The motherboard comes with a power-on switch as the standby power LED. The switch lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard power-on switch.
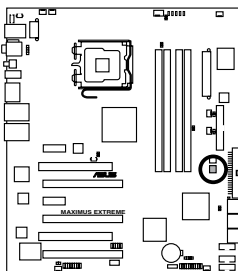
**MAXIMUS EXTREME Power on switch**

# 2.2 Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

## 2.2.1 Placement direction

When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

## 2.2.2 Screw holes

Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.

DO NOT overtighten the screws! Doing so can damage the motherboard.

Place this side towards the rear of the chassis

MAXIMUS EXTREME
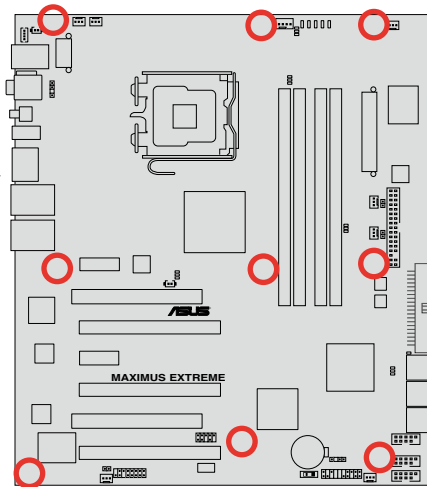
## 2.2.3 Motherboard layout
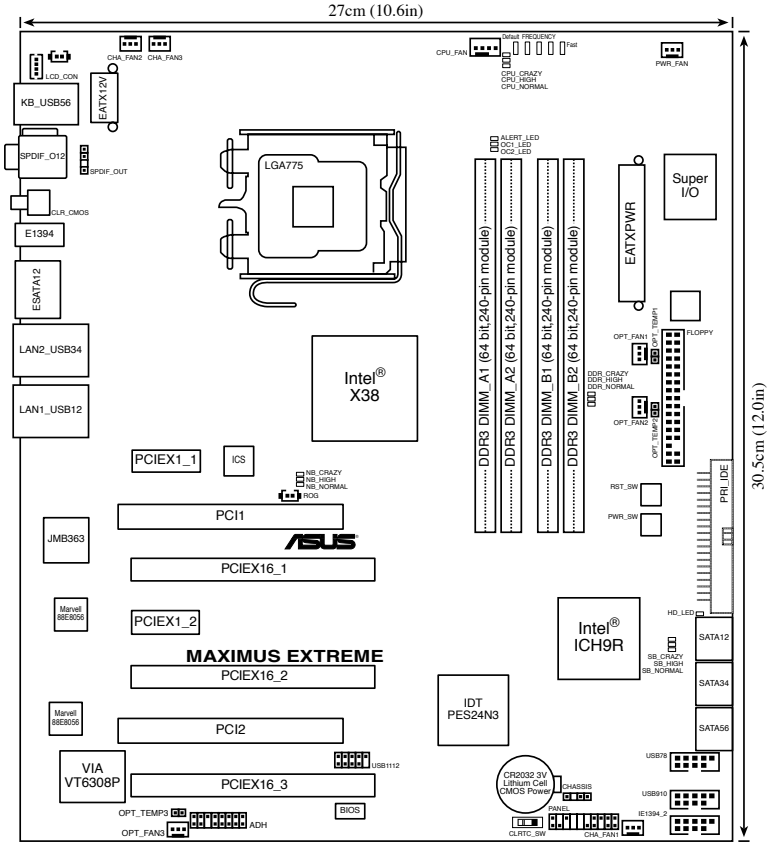


Refer to **2.8 Connectors** for more information about rear panel connectors and internal connectors.

## 2.2.4 Audio card layout
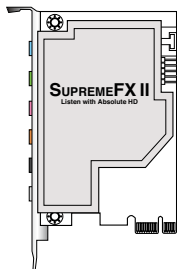
## 2.2.5    Layout contents

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| Onboard switches | | Page |
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# 2.3    Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA775 socket designed for the Intel® Core™2 Quad/ Core™2 Extreme/ Core™2 DUO/ Core™2/ Pentium® D/ Pentium® 4/ Pentium® Extreme.

- Make sure that all power cables are unplugged before installing the CPU.

- If installing a dual-core CPU, connect the chassis fan cable to the CHA_FAN1 connector to ensure system stability.

- Upon purchase of the motherboard, make sure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.

- Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA775 socket.

- The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/ incorrect removal of the PnP cap.

## 2.3.1    Installing the CPU

To install a CPU:

1.    Locate the CPU socket on the motherboard.
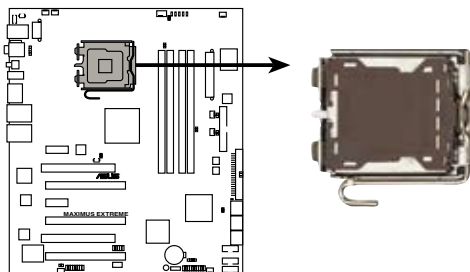


**MAXIMUS EXTREME CPU Socket 775**

Before installing the CPU, make sure that the cam box is facing towards you and the load lever is on your left.

2.    Press the load lever with your thumb (A), then move it to the left (B) until it is released from the retention tab.



Retention tab

Load lever

A

B

PnP cap

This side of the socket box should face you.
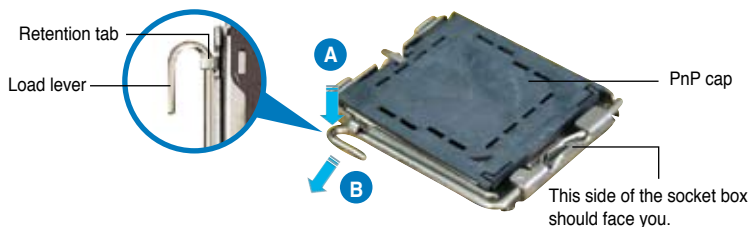
To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

3.    Lift the load lever in the direction of the arrow to a 135º angle.
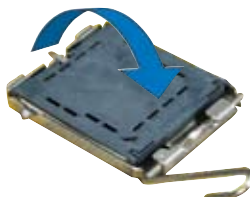
4.  Lift the load plate with your thumb and forefinger to a 100º angle (A), then push the PnP cap from the load plate window to remove (B).

Load plate
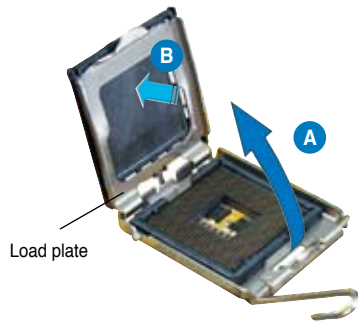
Alignment key

5.  Position the CPU over the socket, making sure that the gold triangle is on the bottom-left corner of the socket then fit the socket alignment key into the CPU notch.

CPU notch

Gold triangle mark
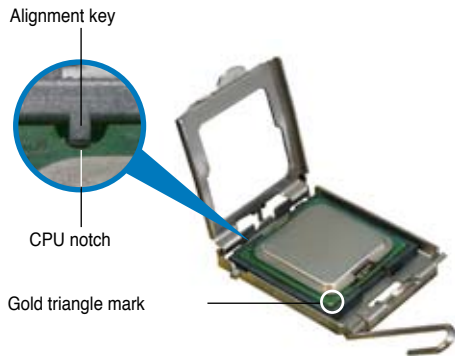
> The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!

6.  Close the load plate (A), then push the load lever (B) until it snaps into the retention tab.
7.  If installing a dual-core CPU, connect the chassis fan cable to the CHA_FAN1 connector to ensure system stability.

> The motherboard supports Intel® LGA775 processors with the Intel® Enhanced Memory 64 Technology (EM64T), Enhanced Intel SpeedStep® Technology (EIST), and Hyper-Threading Technology. Refer to the Appendix for more information on these CPU features.

## 2.3.2    Installing the CPU heatsink and fan

The Intel® LGA775 processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

> •    When you buy a boxed Intel® processor, the package includes the CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use only Intel®-certified multi-directional heatsink and fan.
>
> •    Your Intel® LGA775 heatsink and fan assembly comes in a push-pin design and requires no tool to install.
>
> •    If you purchased a separate CPU heatsink and fan assembly, make sure that you have properly applied Thermal Interface Material to the CPU heatsink or CPU before you install the heatsink and fan assembly.

> Make sure that you have installed the motherboard to the chassis before you install the CPU fan and heatsink assembly.

To install the CPU heatsink and fan:

1.    Place the heatsink on top of the installed CPU, making sure that the four fasteners match the holes on the motherboard.

> Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector.



Motherboard hole

Fastener
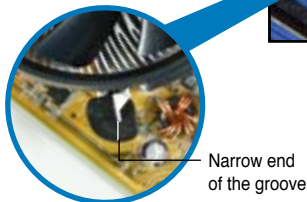
Narrow end of the groove

> Make sure to orient each fastener with the narrow end of the groove pointing outward. (The photo shows the groove shaded for emphasis.)

2.  Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.
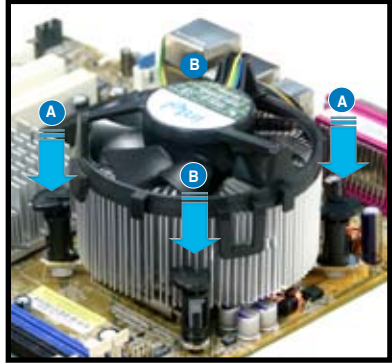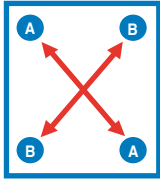


3.  Connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN.
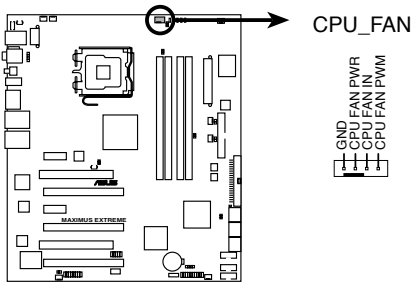


CPU_FAN

**MAXIMUS EXTREME CPU fan connector**

DO NOT forget to connect the CPU fan connector! Hardware monitoring errors will occur if you fail to plug this connector.

## 2.3.3    Uninstalling the CPU heatsink and fan

To uninstall the CPU heatsink and fan:

1.    Disconnect the CPU fan cable from the connector on the motherboard.

2.    Rotate each fastener counterclockwise.
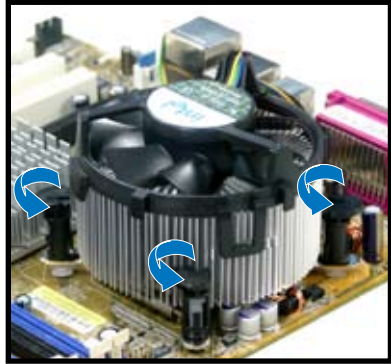
3.    Pull up two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the motherboard.
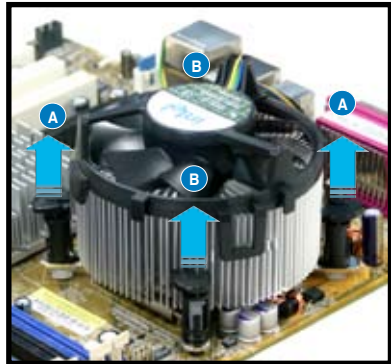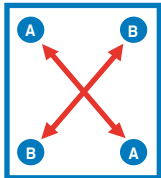
4.    Carefully remove the heatsink and fan assembly from the motherboard.

5.  Rotate each fastener clockwise to ensure correct orientation when reinstalling.
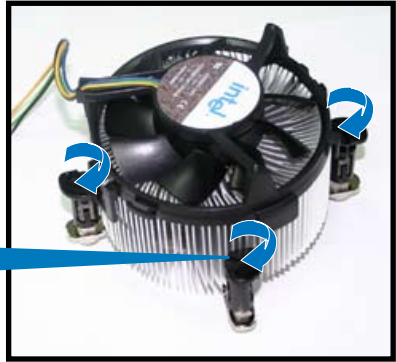


Narrow end of the groove

The narrow end of the groove should point outward after resetting. (The photo shows the groove shaded for emphasis.)



Refer to the documentation in the boxed or stand-alone CPU fan package for detailed information on CPU fan installation.

# 2.4 System memory

## 2.4.1 Overview

The motherboard comes with four Double Data Rate 3 (DDR3) Dual Inline Memory Modules (DIMM) sockets.

A DDR3 module has the same physical dimensions as a DDR3 DIMM but is notched differently. DDR3 modules are developed for better performance with less power consumption.

The figure illustrates the location of the DDR3 DIMM sockets:



**MAXIMUS EXTREME
240-pin DDR3 DIMM sockets**
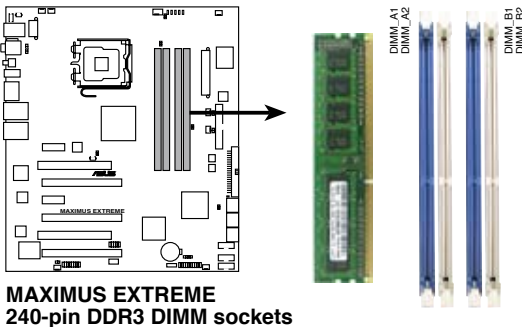
| Channel | Sockets |
|---------|---------|
| Channel A | DIMM_A1 and DIMM_A2 |
| Channel B | DIMM_B1 and DIMM_B2 |

The motherboard supports upto 1333MHz and provides more ratio setting items. Refer to the table below for details.

| FSB | 1600 | | | | | 1333 | | | | 1066 |
|-----|------|------|------|------|-----|------|------|------|-----|------|
| DDR3 | 1600 | 1333 | 1200 | 1000 | 800 | 1333 | 1111 | 1000 | 833 | 889 |

## 2.4.2    Memory configurations

You may install 512 MB, 1 GB, and 2 GB unbuffered non-ECC DDR3 DIMMs into the DIMM sockets.

- • You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.

- • Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.

- • Due to chipset resource allocation, the system may detect less than 8 GB system memory when you installed four 2 GB DDR3 memory modules.

- • If you install four 1 GB memory modules, the system may detect less than 3 GB of total memory because of address space allocation for other critical functions. This limitation applies to Windows Vista 32-bit/Windows XP 32-bit version operating system since it does not support PAE (Physical Address Extention) mode.

- • If you install Windows Vista 32-bit/Windows XP 32-bit version operating system, we recommend that you install less than 3GB of total memory.

Notes on memory limitations

- • Due to chipset limitation, this motherboard can only support up to 8 GB on the operating systems listed below. You may install a maximum of 2 GB DIMMs on each slot.

| 64-bit |
| --- |
| Windows XP Professional x64 Edition |
| Windows Vista x64 Edition |

## Maximus Extreme Motherboard Qualified Vendors Lists (QVL) DDR3-1333MHz capability

| Size | Vendor | Chip No. | CL | Chip Brand | SS/DS | Part No. | DIMM support A* | B* | C* |
|------|--------|----------|-----|------------|-------|----------|------|------|------|
| 512MB | ELPIDA | J5308BASE-DG-E | 8 | ELPIDA | SS | EBJ51UD8BAFA-DG-E | • | • | • |
| 1024MB | ELPIDA | J5308BASE-DG-E | 8 | ELPIDA | DS | EBJ11UD8BAFA-DG-E | • | • | |
| 512MB | ELPIDA | J5308BASE-DJ-E | 9 | ELPIDA | SS | EBJ51UD8BAFA-DJ-E | • | | • |
| 1024MB | ELPIDA | J5308BASE-DJ-E | 9 | ELPIDA | DS | EBJ11UD8BAFA-DJ-E | | | • |

## Maximus Extreme Motherboard Qualified Vendors Lists (QVL) DDR3-1067 MHz capability

| Size | Vendor | Chip No. | CL | Chip Brand | SS/DS | Part No. | DIMM support A* | B* | C* |
|------|--------|----------|-----|------------|-------|----------|------|------|------|
| 512MB | Qimonda | IDSH51-03A1F1C-10F | N/A | QIMONDA | SS | IMSH51U03A1F1C-10F | • | • | • |
| 1024MB | Qimonda | IDSH51-03A1F1C-10F | N/A | QIMONDA | DS | IMSH1GU13A1F1C-10F | • | • | |
| 512MB | ELPIDA | J5308BASE-AC-E | 8 | ELPIDA | SS | EBJ51UD8BAFA-AG-E | • | • | • |
| 1024MB | ELPIDA | J5308BASE-AC-E | 8 | ELPIDA | DS | EBJ11UD8BAFA-AG-E | • | • | |
| 512MB | NANYA | NT5CB64M8AN-BE | N/A | NANYA | SS | NT512C64B88A0NY-BF | • | • | |
| 1024MB | MICRON | D9GTR | 7 | MICRON | SS | MT8JTF12864AY-1G1BZES | • | • | • |
| 1024MB | SAMSUNG | K4B1G0846C-ZCF8 | 8 | SAMSUNG | SS | M378B2873CZ0-CF8 | • | • | • |
| 512MB | SAMSUNG | K4B510846E-ZCG8 | 8 | SAMSUNG | SS | M378B6573EZ0-CG8 | • | • | |
| 512MB | Kingston | IDSH51-03A1F1C-10F | N/A | QIMONDA | SS | KVR1066D3N7/512 | • | • | • |
| 1024MB | Kingston | J5308BASE-AC-E | N/A | ELPIDA | DS | KVR1066D3N7/1G | • | • | • |

## Maximus Extreme Motherboard Qualified Vendors Lists (QVL) DDR3-800 MHz capability

| Size | Vendor | Chip No. | CL | Chip Brand | SS/DS | Part No. | DIMM support A* | B* | C* |
|------|--------|----------|-----|------------|-------|----------|------|------|------|
| 512MB | SAMSUNG | K4B510846E-ZCE7 | N/A | SAMSUNG | SS | M378B6573EZ0-CE7 | • | • | • |
| 512MB | ELPIDA | J5308BASE-AC-E | 6 | ELPIDA | SS | EBJ51UD8BAFA-8C-E | • | • | • |
| 1024MB | ELPIDA | J5308BASE-AC-E | 6 | ELPIDA | DS | EBJ11UD8BAFA-8C-E | • | • | • |
| 512MB | NANYA | NT5CB64M8AN-25D | N/A | NANYA | SS | NT512C64B88A0NY-25D | • | • | |
| 1024MB | NANYA | NT5CB64M8AN-25D | N/A | NANYA | DS | NT1GC64B8HA0NY-25D | • | • | |
| 1024MB | Qimonda | IDSH51-03A1F1C-08E | N/A | QIMONDA | DS | IMSH1GU13A1F1C-08E | • | • | |
| 1024MB | Hynix | HY5TQ1G831ZNF-S6 | N/A | Hynix | SS | HYMT112U64ZNF8-S6 | • | • | |
| 2048MB | Hynix | HY5TQ1G831ZNF-S5 | N/A | Hynix | DS | HYMT125U64ZNF8-S5 | • | • | |

SS - Single-sided    DS - Double-sided
DIMM support:
A  -  Supports one module inserted into either slot, in Single-channel memory configuration.
B  -  Supports one pair of modules inserted into either Channel A or Channel B as one pair of Dual-channel memory configuration.
C  -  Supports four modules inserted into the blue and white slots as two pairs of Dual-channel memory configuration.

Visit the ASUS website for the latest DDR3-1333/1067/800 MHz QVL.

## 2.4.3    Installing a DIMM

⚠️ Unplug the power supply before adding or removing DIMMs or other system components. Failure to do so can cause severe damage to both the motherboard and the components.

To install a DIMM:

1.   Unlock a DIMM socket by pressing the retaining clips outward.

2.   Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.

3.   Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.
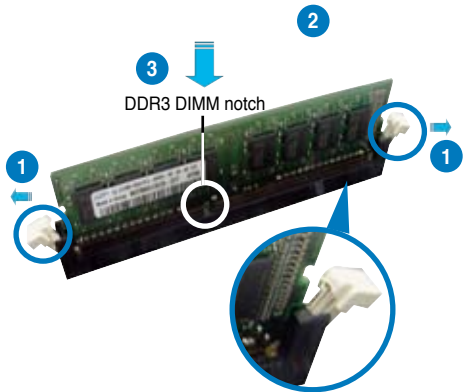
DDR3 DIMM notch

Unlocked retaining clip

✎ •    A DDR3 DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

•    The DDR3 DIMM sockets do not support DDR and DDR2 DIMMs. DO NOT install DDR or DDR2 DIMMs to the DDR3 DIMM sockets.

## 2.4.4    Removing a DIMM

To remove a DIMM:

1.   Simultaneously press the retaining clips outward to unlock the DIMM.

DDR3 DIMM notch

✎ Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.
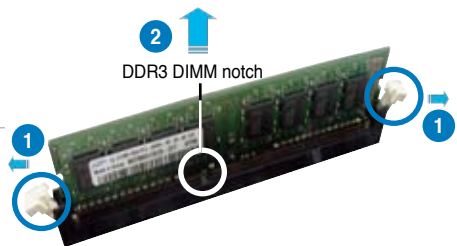
2.   Remove the DIMM from the socket.

# 2.5     Expansion slots

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.

> Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

## 2.5.1     Installing an expansion card

To install an expansion card:

1.     Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2.     Remove the system unit cover (if your motherboard is already installed in a chassis).
3.     Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4.     Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5.     Secure the card to the chassis with the screw you removed earlier.
6.     Replace the system cover.

## 2.5.2     Configuring an expansion card

After installing the expansion card, configure it by adjusting the software settings.

1.     Turn on the system and change the necessary BIOS settings, if any. See Chapter 4 for information on BIOS setup.
2.     Assign an IRQ to the card. Refer to the tables on the next page.
3.     Install the software drivers for the expansion card.

> When using PCI cards on shared slots, ensure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable. Refer to the table on the next page for details.

## 2.5.3 Interrupt assignments

### Standard interrupt assignments

| IRQ | Priority | Standard Function |
|---|---|---|
| 0 | 1 | System Timer |
| 1 | 2 | Keyboard Controller |
| 2 | – | Re-direct to IRQ#9 |
| 3 | 11 | IRQ holder for PCI steering* |
| 4 | 12 | Communications Port (COM1)* |
| 5 | 13 | IRQ holder for PCI steering* |
| 6 | 14 | Floppy Disk Controller |
| 7 | 15 | Printer Port (LPT1)* |
| 8 | 3 | System CMOS/Real Time Clock |
| 9 | 4 | IRQ holder for PCI steering* |
| 10 | 5 | IRQ holder for PCI steering* |
| 11 | 6 | IRQ holder for PCI steering* |
| 12 | 7 | PS/2 Compatible Mouse Port* |
| 13 | 8 | Numeric Data Processor |
| 14 | 9 | Primary IDE Channel |
| 15 | 10 | Secondary IDE Channel |

* These IRQs are usually available for PCI devices.

### IRQ assignments for this motherboard

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| PCI slot 1 | shared | — | — | — | — | — | — | — |
| PCI slot 2 | — | shared | — | — | — | — | — | — |
| LAN(8001) | shared | — | — | — | — | — | — | — |
| SATA(363) | shared | — | — | — | — | — | — | — |
| LAN(8056) | — | shared | — | — | — | — | — | — |
| PCIE x16 1 | shared | — | — | — | — | — | — | — |
| PCIE x16 2 | shared | — | — | — | — | — | — | — |
| PCIE x1 1 | — | shared | — | — | — | — | — | — |
| PCIE x1 2 | shared | — | — | — | — | — | — | — |
| PCIE x1 3 | — | — | shared | — | — | — | — | — |
| USB controller 1 | — | — | — | — | — | — | — | shared |
| USB controller 2 | — | — | — | shared | — | — | — | — |
| USB controller 3 | — | — | shared | — | — | — | — | — |
| USB controller 4 | shared | — | — | — | — | — | — | — |
| USB controller 5 | — | — | — | — | — | shared | — | — |
| USB controller 6 | — | — | shared | — | — | — | — | — |
| USB 2.0 controller 1 | — | — | — | — | — | — | — | shared |
| USB 2.0 controller 2 | — | — | shared | — | — | — | — | — |
| SATA controller 1 | — | — | — | — | — | — | shared | — |
| SATA controller 2 | — | — | — | — | — | — | shared | — |

### 2.5.4    PCI slots

The PCI slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. The figure shows a LAN card installed on a PCI slot.

### 2.5.5    PCI Express x1 slots

This motherboard supports PCI Express x1 network cards, SCSI cards and other cards that comply with the PCI Express specifications.

> •   Install the audio card on the black PCIEx1 slot prior to other compatible cards.
>
> •   When using PCIEx1 cards, install the cards on PCIEx1 slots prior to PCIEx16 slots.

### 2.5.6    PCI Express x16 slots

This motherboard has three PCI Express x16 slots that support PCI Express x16 graphic cards complying with the PCI Express specifications. With two graphics cards installed, the motherboard can enable dual-display.

This motherboard supports two ATI CrossFire™ PCI Express x16 graphics cards that comply with the PCI Express specifications.

> •   In CrossFire™ mode, install the ATI CrossFire™ Edition (Master) graphics card on the primary PCI Express slot.
>
> •   Install two ATI graphics cards from the same GPU family that support CrossFire™ mode.



Audio slot

PCI slot

PCIE x16 slot

PCIE x1 slot

PCI slot

PCIE x16 slot

PCI slot

PCIE x16 slot
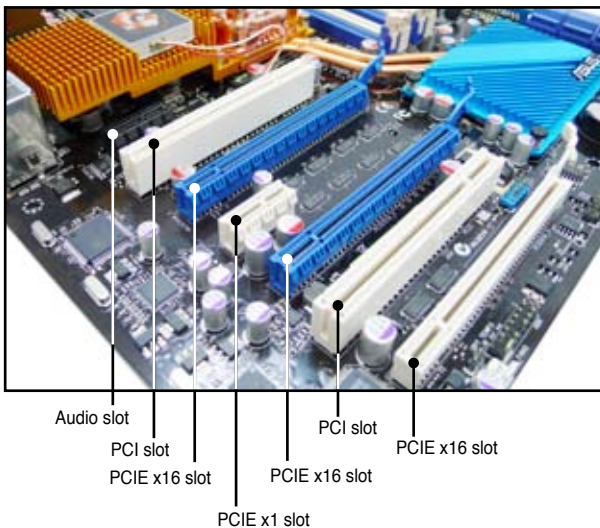
# 2.6  Slide switch

**1.    Clear RTC RAM (CLRTC_SW)**

This onboard slide switch allows you to enable the **clr CMOS** switch on the back I/O. You can clear the CMOS memory and system setup parameters by erasing the CMOS RTC RAM data. The **clr CMOS** switch on the back I/O helps you easily to clear the system setup information such as system passwords.

To erase the RTC RAM:

1.    Press down the **clr CMOS** switch on the back I/O.

2.    Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.



**MAXIMUS EXTREME Clear RTC RAM**
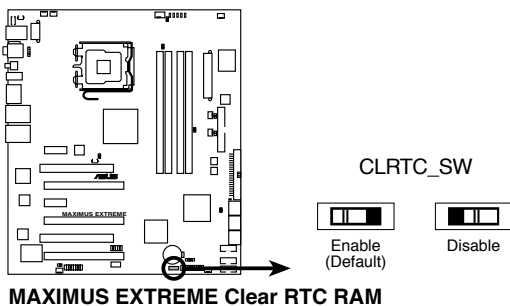
## clr CMOS switch behavior

| System power state | G3* | S5* | S0 (DOS mode) | S0 (OS mode) | S1 | S3 | S4 |
|---|---|---|---|---|---|---|---|
| **Clearing CMOS** | ● | ● | ●** | | | | |

*G3: Power off without +5VSB power (AC power loss); S5: Power off with +5VSB power
** The system shuts down immediately.

• The **clr CMOS** switch will not function if the CLRTC_SW switch is moved to the Disable position, but the shutdwon function in S0 mode (DOS mode) still works.

• Make sure to re-enter your previous BIOS settings after you clear the CMOS.

• You do not need to clear the RTC when the system hangs due to CPU overclocking. With the C.P.R. (CPU Parameter Recall) feature, shut down and reboot the system so the BIOS can automatically reset CPU parameter settings to default values. If the system hangs due to overclocking of memory timing or chipset voltage and the power button fails to function, pressing down the **clr CMOS** switch will shut down the system and clear CMOS simultaneously.

## 2.7 EL I/O shield, LCD Poster and Audio card Installation

### 2.7.1 EL I/O shield and LCD Poster Installation

1. Install the EL I/O shield to the chassis by snaping it in place from inside.

2. Orient the motherboard and install it to the chassis. Make sure that the motherboard external ports fit the I/O openings.





⚠️ Be cautious when installing the motherboard. The I/O shield edge springs may damage the I/O ports.

3. Locate the **P_ELJ1** connector and connect the shield cable to the connector in a correct orientation.

4. Thread the LCD Poster cable through the back I/O shield opening until the stopper fits the opening.
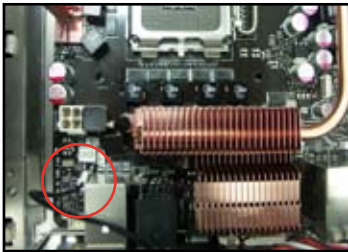




5. Locate and connect the LCD Poster cable to the **LCD_con** connector.

6. Place the LCD Poster on the chassis or to wherever you like.
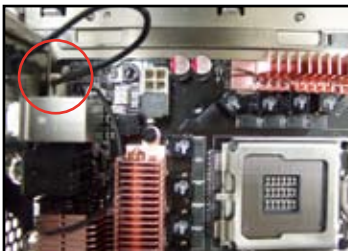
## 2.7.2    Audio card Installation

1.    Take out the Audio card from the
      package.

2.    Locate the audio slot on the
      motherboard.





3.    Align the card connector with the
      slot and press firmly until the card
      sits on the slot completely.

4.    The photo below shows the audio
      card installed on the motherboard.

# 2.8 Connectors

## 2.8.1 Rear panel connectors
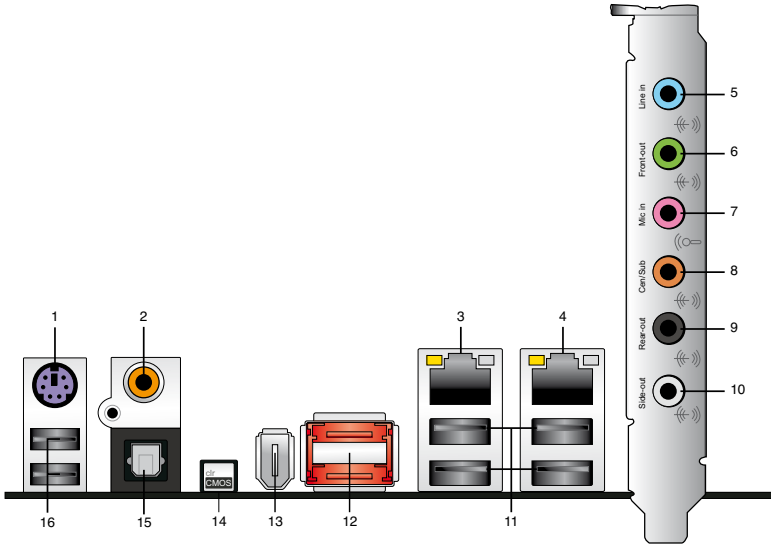


1. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.

2. **Coaxial S/PDIF Out port.** This port connects an external audio output device via a coaxial S/PDIF cable.

3. **LAN 2 (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

4. **LAN 1 (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

### 32-bit OS LAN port LED indications

| Activity/Link | Speed LED | Description |
|---|---|---|
| OFF | OFF | Soft-off Mode |
| YELLOW* | OFF | During Power ON/OFF |
| YELLOW* | ORANGE | 100 Mbps connection |

\* Blinking
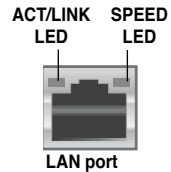
### 64-bit OS LAN port LED indications

| Activity/Link | Speed LED | Description |
|---|---|---|
| DNR | DNR | Soft-off Mode |
| DNR | DNR | During Power ON/OFF |
| DNR | DNR | 100 Mbps connection |
| DNR | DNR | 1 Gbps connection |

**ACT/LINK LED**   **SPEED LED**

**LAN port**

5.	**Line In port (light blue).** This port connects the tape, CD, DVD player, or other audio sources.

6.	**Line Out port (lime).** This port connects a headphone or a speaker. In 4-channel, 6-channel, and 8-channel configuration, the function of this port becomes Front Speaker Out.

7.	**Microphone port (pink).** This port connects a microphone.

8.	**Center/Subwoofer port (orange).** This port connects the center/subwoofer speakers.

9.	**Rear Speaker Out port (black).** This port connects the rear speakers on a 4-channel, 6-channel, or 8-channel audio configuration.

10.	**Side Speaker Out port (gray).** This port connects the side speakers in an 8-channel audio configuration.

> Refer to the audio configuration table below for the function of the audio ports in 2, 4, 6, or 8-channel configuration.

## Audio 2, 4, 6, or 8-channel configuration

| Port | Headset 2-channel | 4-channel | 6-channel | 8-channel |
|------|-------------------|-----------|-----------|-----------|
| Light Blue | Line In | Line In | Line In | Line In |
| Lime | Line Out | Front Speaker Out | Front Speaker Out | Front Speaker Out |
| Pink | Mic In | Mic In | Mic In | Mic In |
| Orange | – | – | Center/Subwoofer | Center/Subwoofer |
| Black | – | Rear Speaker Out | Rear Speaker Ou | Rear Speaker Out |
| Gray | – | – | – | Side Speaker Out |

11.	**USB 2.0 ports 1, 2, 3 and 4.** These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

12.	**External SATA port 1/2**. These ports connect to external Serial ATA hard disk drives. To configure a RAID0, RAID1, RAID 10, RAID 5 or JBOD set, connect external Serial ATA hard disk drives to the External SATA port 1 and 2.

> The external SATA port supports external Serial ATA 3.0 Gb/s devices. Longer cables support higher power requirements to deliver signal up to two meters away, and enables improved hot-swap function.

- Before creating a RAID set using Serial ATA hard disks, make sure that you have connected the Serial ATA signal cable and installed Serial ATA hard disk drives; otherwise, you cannot enter the JMicron RAID utility and SATA BIOS setup during POST.

- If you intend to create a RAID configuration using this connector, set the J-Micron eSATA/PATA Controller Mode in the BIOS to [RAID]. See section **4.5.3 Onboard Device Configuration** for details.

- When using hot-plug and NCQ, set the J-Micron eSATA/PATA Controller Mode in the BIOS to [AHCI]. See section **4.5.3 Onboard Device Configuration** for details.

- Before creating a RAID set, refer to **5.4.4 JMicron® RAID Configuration** or the manual bundled in the motherboard support DVD.

---

- DO NOT insert different connectors to the external SATA ports.

- DO NOT unplug the external Serial ATA box when a RAID 0 or JBOD is configured.

13. **IEEE 1394a port.** This 6-pin IEEE 1394a port provides high-speed connectivity for audio/video devices, storage peripherals, PCs, or portable devices.

14. **Clear CMOS switch.** Press the clear CMOS switch to clear setup information when the system hangs due to overclocking.

15. **Optical S/PDIF Out port**. This port connects an external audio output device via an optical S/PDIF cable.

16. **USB 2.0 ports 5 and 6.** These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

## 2.8.2 Internal connectors

**1. Floppy disk drive connector (34-1 pin FLOPPY)**

This connector is for the provided floppy disk drive (FDD) signal cable. Insert one end of the cable to this connector, then connect the other end to the signal connector at the back of the floppy disk drive.

> Pin 5 on the connector is removed to prevent incorrect cable connection when using a FDD cable with a covered Pin 5.



FLOPPY

**NOTE:** Orient the red markings on the floppy ribbon cable to PIN 1.

PIN 1
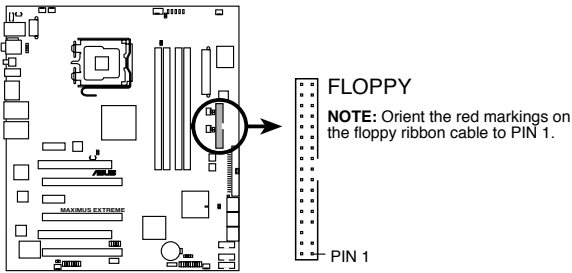
**MAXIMUS EXTREME Floppy disk drive connector**

**2. IDE connector (40-1 pin PRI_IDE)**

The onboard IDE connector is for the Ultra DMA 133/100/66 signal cable. There are three connectors on each Ultra DMA 133/100/66 signal cable: blue, black, and gray. Connect the blue connector to the motherboard's IDE connector, then select one of the following modes to configure your device.

|  | Drive jumper setting | Mode of device(s) | Cable connector |
|---|---|---|---|
| Single device | Cable-Select or Master | - | Black |
| Two devices | Cable-Select | Master | Black |
|  |  | Slave | Gray |
|  | Master | Master | Black or gray |
|  | Slave | Slave |  |

> • Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
>
> • Use the 80-conductor IDE cable for Ultra DMA 133/100/66 IDE devices.

> If any device jumper is set as "Cable-Select," make sure all other device jumpers have the same setting.

PRI_IDE

**NOTE:** Orient the red markings (usually zigzag) on the IDE cable to PIN 1.
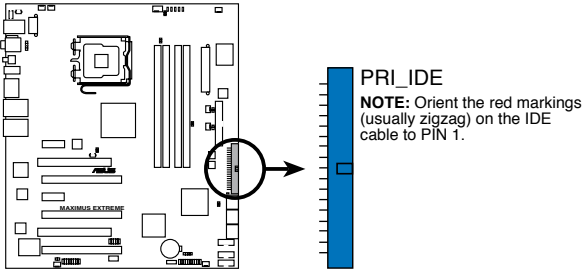
**MAXIMUS EXTREME IDE connector**

3. **ICH9R Serial ATA connectors (7-pin SATA1~6)**

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.

If you installed Serial ATA hard disk drives, you can create a RAID 0, RAID 1, RAID 5, RAID 10 configuration with the Intel® Matrix Storage Technology through the onboard Intel® ICH9R RAID controller.

- These connectors are set to Standard IDE mode by default. In Standard IDE mode, you can connect Serial ATA boot/data hard disk drives to these connectors. If you intend to create a Serial ATA RAID set using these connectors, set the **Configure SATA as** item in the BIOS to [RAID]. See section **4.3.6 SATA Configuration** for details.

- For RAID 5, use at least three hard disk drives. For RAID 10, use at least four hard disk drives. Use two to four Serial ATA hard disk drives for each RAID 0 or RAID 1 set.

- Before creating a RAID set, refer to **5.4.3 Intel® RAID Configuration** or the manual bundled in the motherboard support DVD.



**MAXIMUS EXTREME SATA connectors**
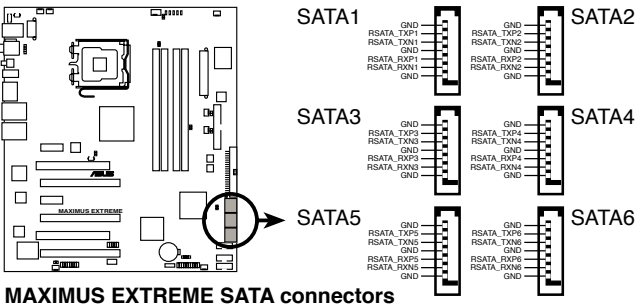
You must install the Windows® XP Service Pack 1 before using Serial ATA hard disk drives. The Serial ATA RAID feature (RAID 0/RAID 1/RAID 5/RAID 10) is available only if you are using Windows® XP or later version.

right angle side

Connect the right-angle side of SATA signal cable to SATA device. Or you may connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.
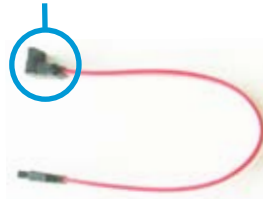
**4.    USB connectors (10-1 pin USB 78, USB 910, USB 1112)**

These connectors are for USB 2.0 ports. Connect the USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.

**MAXIMUS EXTREME
USB 2.0 connectors**
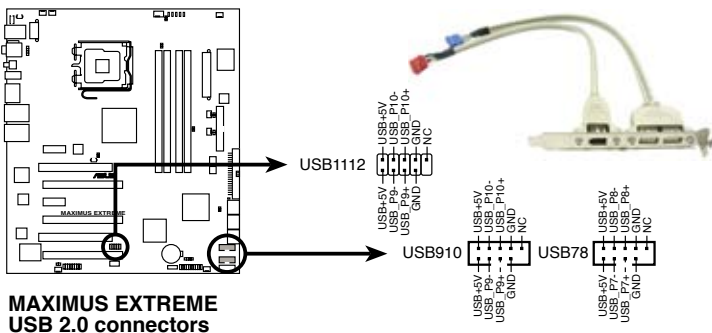
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

You can connect the USB cable to ASUS Q-Connector (USB, blue) first, and then install the Q-Connector (USB) to the USB connector onboard.

**5. IEEE 1394a port connector (10-1 pin IE1394_2)**

This connector is for a IEEE 1394a port. Connect the IEEE 1394a module cable to this connector, then install the module to a slot opening at the back of the system chassis.

IE1394_2

**MAXIMUS EXTREME IEEE 1394a connector**
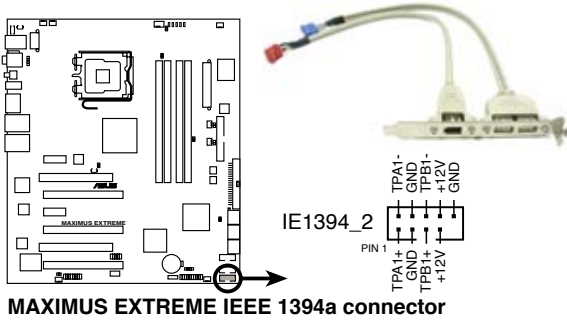
Never connect a USB cable to the IEEE 1394a connector. Doing so will damage the motherboard!

You can connect the 1394 cable to ASUS Q-Connector (1394, red) first, and then install the Q-Connector (1394) to the 1394 connector onboard.

**6. Thermal sensor cable connectors (2-pin OPT_TEMP1-3)**

These connectors are for temperature monitoring. Connect the thermal sensor cables to these connectors and place the other ends to the devices. The OPT_TEMP1/2/3 connectors are for the devices that you want to monitor temperature. The optional fans can work with the temperature sensors for a better cooling effect.

OPT_TEMP1 — Temperature / Ground

OPT_TEMP2 — Temperature / Ground

OPT_TEMP3 — Temperature / Ground

**MAXIMUS EXTREME
Thermal sensor cable connectors**
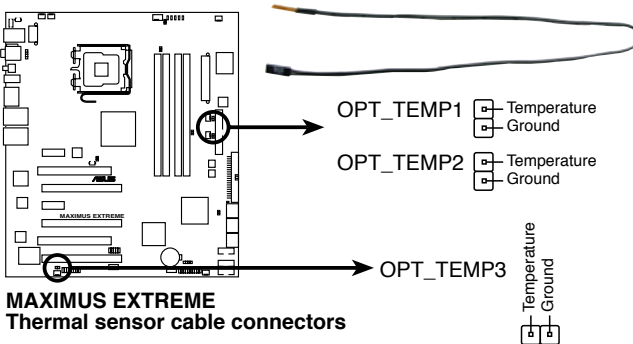
Enable **OPT_TEMP1/2/3 Protection** in BIOS if you connect thermal sensor cables to these connectors.

7.  **CPU, chassis, and optional fan connectors**
    **(4-pin CPU_FAN, 3-pin CHA_FAN1-3, 3-pin PWR_FAN,**
    **3-pin OPT_FAN1-3)**

    The fan connectors support cooling fans of 350 mA ~ 1000 mA (24 W max.) or a total of 1 A ~ 3.48 A (41.76 W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.

    DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!

    **MAXIMUS EXTREME Fan connectors**
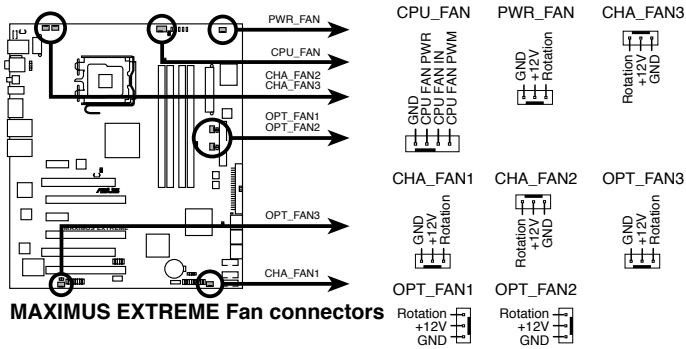
    • If you install two VGA cards, we recommend that you plug the chassis fan cable to the motherboard connector labled CHA_FAN1 or CHA_FAN2 for better themal environment.

    • Only the CPU_FAN, CHA_FAN1-3 and OPT_FAN1-2 support ASUS Q-Fan feature.

## 8. Chassis intrusion connector (4-1 pin CHASSIS)

This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

By default , the pin labeled "Chassis Signal" and "Ground" are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.
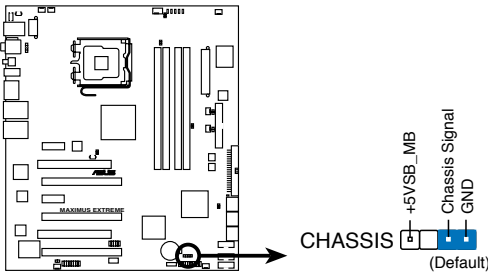


**MAXIMUS EXTREME Chassis intrusion connector**

## 9. ATX power connectors (24-pin EATXPWR, 8-pin EATX12V)

These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.
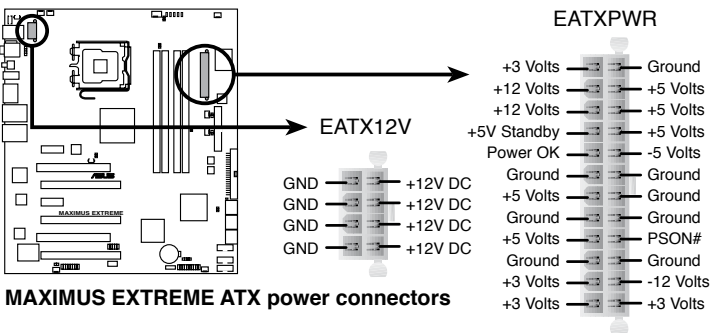


**MAXIMUS EXTREME ATX power connectors**

EATXPWR

| | |
|---|---|
| +3 Volts | Ground |
| +12 Volts | +5 Volts |
| +12 Volts | +5 Volts |
| +5V Standby | +5 Volts |
| Power OK | -5 Volts |
| Ground | Ground |
| +5 Volts | Ground |
| Ground | Ground |
| +5 Volts | PSON# |
| Ground | Ground |
| +3 Volts | -12 Volts |
| +3 Volts | +3 Volts |

EATX12V

| | |
|---|---|
| GND | +12V DC |
| GND | +12V DC |
| GND | +12V DC |
| GND | +12V DC |

- Make sure to remove the cap on the EATX12V connector before connecting an 8-pin EPS +12V power plug.
- Use only an 8-pin EPS +12V power plug for the EATX12V connector.

- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 550 W.

- Do not forget to connect the 4-pin/8pin EATX12V power plug; otherwise, the system will not boot.

- Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

- If you are uncertain about the minimum power supply requirement for your system, refer to the **Recommended Power Supply Wattage Calculator** at http://support.asus.com/PowerSupplyCalculator/PSCalculator. aspx?SLanguage=en-us for details.

- If you want to use two high-end PCI Express x16 cards, use a PSU with 500W to 600W power or above to ensure the system stability.

## Power supply requirements

| Heavy Loading | |
|---|---|
| CPU | SMF 3.2XE |
| DDR533 | 256MB*4 |
| PCI-E VGA | Nvidia 7950GTX*2 |
| SATA-HD | 6 |
| ESATA-HD | 2 |
| IDE-HD | 1 |
| CD-ROM | 1 |
| USB | 2 |
| PCI-E 1X | 0 |
| PCI | 0 |

| | +12V-V2 (4 PIN) | +12V-V1 (24PIN) | +5V | +3.3V | VGA +12V | HDD +12V | HDD +5V | | Total PSU Po_max (W) |
|---|---|---|---|---|---|---|---|---|---|
| Io_max (A) | 17 | 11.4 | 5.66 | 9.18 | 15.76 | 7.6 | 7.96 | 0.548 | |
| Io_rms (A) | 12.35 | 7.68 | 4.42 | 8.52 | 10.74 | 3.32 | 5.26 | 0.413 | |
| Vout (V) | 11.93 | 11.9 | 5.022 | 3.316 | 11.42 | 11.95 | | | |
| Po_max (W) | 202.81 | 135.66 | 28.42 | 30.44 | 179.98 | 90.82 | 4.993 | 5.054 | 678.18 |

## Power supply requirements

| Normal Loading | |
|---|---|
| CPU | PSC 3.73G 1066 |
| DDR800 | 1GB*2 |
| VGA | Nvidia 7800GTX*2 |
| SATA-HD | SATA*4 |
| ESATA-HD | 1 |
| IDE-HD | 1 |
| CD-ROM | 1 |
| USB | 2 |
| PCI | 1 |

| | +12V-V2 (4 PIN) | +12V-V1 (24PIN) | +5V | +3.3V | VGA +12V | HDD +12V | HDD +5V | +5VSB | Total PSU Po_max (W) |
|---|---|---|---|---|---|---|---|---|---|
| Io_max (A) | 12.72 | 11.44 | 6.88 | 8.72 | 8.88 | 4.04 | 4.14 | 0.588 | |
| Io_rms (A) | 9.16 | 8.1 | 5.6 | 8 | 5.86 | 2.14 | 2.92 | 0.435 | |
| Vout (V) | 11.94 | 11.9 | 5.026 | 3.32 | 11.57 | 11.99 | 5.04 | 5.05 | |
| Po_max (W) | 151.88 | 136.14 | 34.58 | 28.95 | 102.74 | 48.44 | 20.87 | 2.97 | 526.56 |

| Light Loading | |
|---|---|
| CPU | PSC 3.8G EM64T |
| DDR667 | 512MB*2 |
| VGA | Nvidia 7800GTX*1 |
| SATA-HD | SATA*2 |
| IDE-HD | 1 |
| CD-ROM | 1 |
| USB | 1 |
| PCI | 1 |

| | +12V-V2 (4 PIN) | +12V-V1 (24PIN) | +5V | +3.3V | VGA +12V | HDD +12V | HDD +5V | +5VSB | Total PSU Po_max (W) |
|---|---|---|---|---|---|---|---|---|---|
| Io_max (A) | 12.36 | 7.6 | 8.44 | 3.24 | 4.28 | 4.34 | 3.58 | 0.556 | |
| Io_rms (A) | 8.98 | 4.8 | 6.76 | 3.01 | 2.84 | 23.4 | 2.48 | 0.396 | |
| Vout (V) | 11.93 | 11.93 | 5.026 | 3.33 | 11.91 | 12.03 | 5.09 | 5.066 | |
| Po_max (W) | 147.45 | 90.67 | 42.42 | 10.79 | 50.97 | 52.21 | 18.22 | 2.82 | 415.56 |

10. **Digital audio connector (4-1 pin SPDIF, for ASUS HDMI VGA card)**

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s).  If you are using ASUS HDMI-equipped graphics card, connect the HDMI card to this connector with a S/PDIF out cable.



SPDIF_OUT

GND
SPDIFOUT

+5V
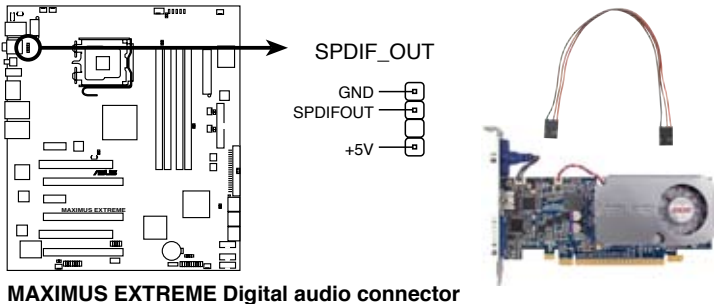
**MAXIMUS EXTREME Digital audio connector**

The ASUS HDMI-equipped graphics card and S/PDIF out cable are purchased separately.

11. **ROG connector (2-pin ROG)**

This connector is for the box (labeled as Republic of Gamers) on the heatpipe assembly. Connect the cable of the box and it lights when the system is on.
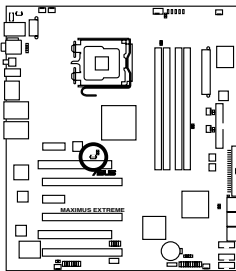


**MAXIMUS EXTREME ROG connector**

**12. System panel connector (20-8 pin PANEL)**

This connector supports several chassis-mounted functions.
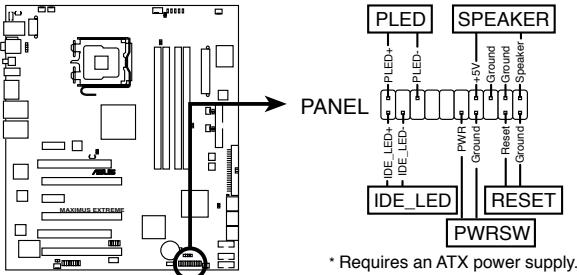


**MAXIMUS EXTREME System panel connector**

* Requires an ATX power supply.

- **System power LED (2-pin PLED)**

  This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED (2-pin IDE_LED)**

  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

- **System warning speaker (4-pin SPEAKER)**

  This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

- **ATX power button/soft-off button (2-pin PWRSW)**

  This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **Reset button (2-pin RESET)**

  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

## ASUS Q-Connector (system panel)

You can use the ASUS Q-Connector to connect/disconnect chassis front panel cables in a few steps. Refer to the instructions below to install the ASUS Q-Connector.

1.  Connect the front panel cables to the ASUS Q-Connector.

    Refer to the labels on the Q-Connector to know the detailed pin definitions, then match them to the respective front panel cable labels.
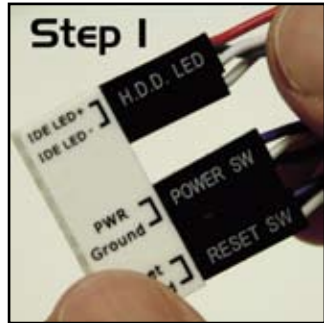
2.  Install the ASUS Q-Connector to the system panel connector, making sure the orientation matches the labels on the motherboard.
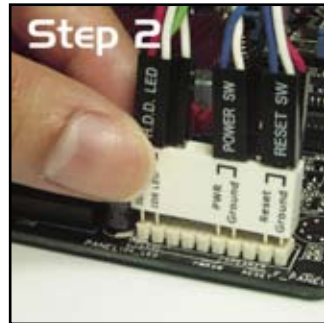
3.  The front panel functions are now enabled. The figure shows the Q-Connector properly installed on the motherboard.
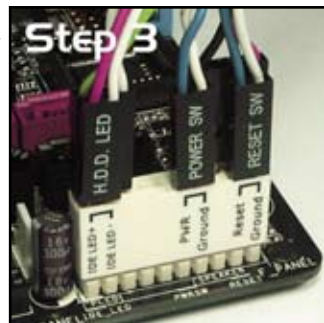
### 2.8.3 Onboard switches

Onboard switches allow you to fine-tune performance when working on a bare or open-case system. This is ideal for overclockers and gamers who continually change settings to enhance system performance.

**1. Power-on switch**

Press the clear power-on switch to wake/power up the system.
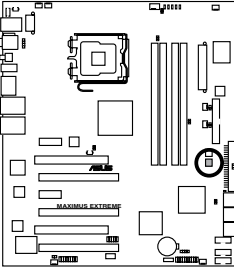


**MAXIMUS EXTREME Power on switch**

**2. Reset switch**

Press the reset switch to reboot the system.
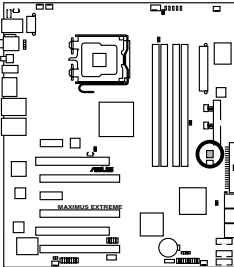


**MAXIMUS EXTREME Reset switch**

## 2.8.4    Installing the optional fans

Install the optional fan only if you are using a passive cooler or a water cooler. Installing the optional fan with an active CPU cooler will interfere with the airflow and destabilize the system.

### Optional fan on one side fins

1.    Position the fan above the pipe and heatsink assembly.

2.    Fit the fan to the grooved edge of the heatsink.
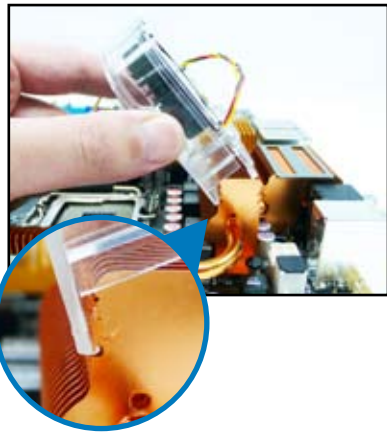




3.    Carefully push down the fan until it snugly fits the heatsink, then connect the fan cable.

4.    The photo shows the fan installed on the motherboard.
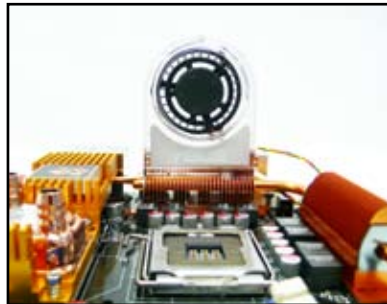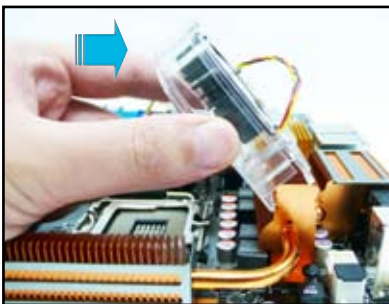




Plug the optional fan cables to the CHA_FAN2, CHA_FAN3 or PWR_FAN connector on the motherboard.

When you are using water-cooling modules, make sure to install TWO optional fans to obtain a more effective heat dissipation.

## 2.8.5 Installing the DIY Pedestal

1.  Take out the DIY Pedestal from the motherboard package.

2.  Arrange and stick the DIY Pedestal to the back of your motherboard.

3.  Place the motherboard with the DIY Pedestal as desired to get a more efficient heat dissipation.

- • The tape on the rubber studs is for one-time use. Replace the tape if the adhesive surface fails to function.
- • You can use the DIY Pedestal in other creative ways based on your needs.

## 2.8.6    Installing Fusion Block System accessory

Install your watercooling system to the motherboard using the bundled accessories to obtain the best thermal solution.

**Package contents**

| | | |
|---|---|---|
|  |  |  |
| 3/8" ID tubes x 2 | 1/2" to 3/8" ID fittings x 2 | 10mm to 3/8" ID fittings x 2 |
|  |  | |
| 1/2" ID tube clips x 2 | 3/8" ID tube clips x 6 | |

The pictures below are for demonstration only. The heatpipe assembly and motherboard layout may vary depending on model, but the installation steps remains the same.

**For watercooling system with 3/8" ID tubes**

1.    Firmly press a tube clip and fit the tube into the clip.
2.    Press the clip and connect the tube to the waterblock. When done, release the clip to tighten the two together.
3.    Repeat Step 1 and 2 for another tube. Make sure that both tubes are well connected to prevent leak, and then fill the coolant into the reservoir.
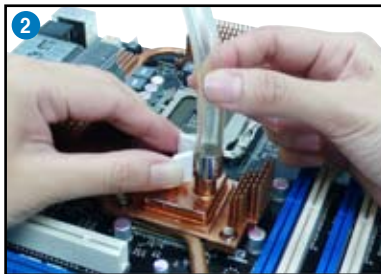
## For watercooling system with 1/2" or 10mm ID tubes

1.  Insert a fitting (1/2" to 3/8" ID or 10mm to 3/8" ID) into the tube.

    Your watercooling system may come with tube clips. Use the clips to fasten the fittings and the tubes together.

2.  Connect a supplied 3/8" ID tube to the fitting.
3.  Firmly press a tube clip and hitch it to the bottom end of the 3/8" ID tube.
4.  Press another clip and hitch it to the top end of the 3/8" ID tube.
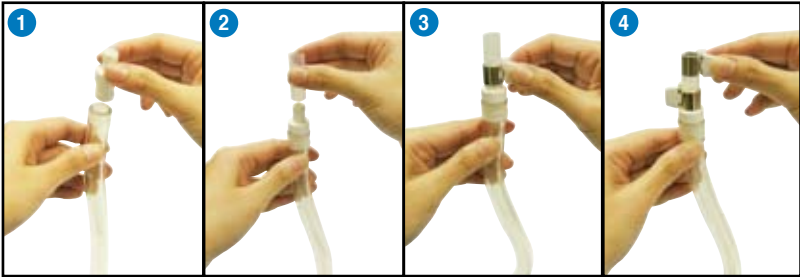


5.  Press the clip and connect the assembled tube to the waterblock. When done, release the clip to tighten the two together.
6.  Repeat Step 1 to 5 for another tube. Make sure that both tubes are well connected to prevent leak, and then fill the coolant into the reservoir. The picture shows a watercooling system installed to the motherboard.
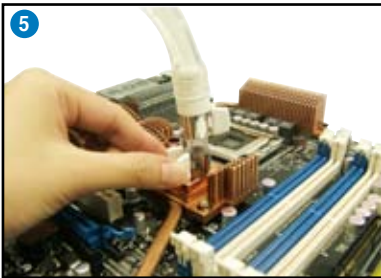
This chapter describes the power up
sequence, the vocal POST messages,
and ways of shutting down the system.

# Powering up 3

# Chapter summary

3

# 3.1    Starting up for the first time

1.    After making all the connections, replace the system case cover.

2.    Be sure that all switches are off.

3.    Connect the power cord to the power connector at the back of the system chassis.

4.    Connect the power cord to a power outlet that is equipped with a surge protector.

5.    Turn on the devices in the following order:

    a.    Monitor

    b.    External SCSI devices (starting with the last device on the chain)

    c.    System power

6.    After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with "green" standards or if it has a "power standby" feature, the monitor LED may light up or switch between orange and green after the system LED turns on.

    The system then runs the power-on self tests or POST. While the tests are running, the BIOS beeps (see BIOS beep codes table below) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

| BIOS Beep | Description |
|---|---|
| One short beep | VGA detected<br>Quick boot set to disabled<br>No keyboard detected |
| One continuous beep followed by two short beeps then a pause (repeated) | No memory detected |
| One continuous beep followed by three short beeps | No VGA detected |
| One continuous beep followed by four short beeps | Hardware component failure |

7.    At power on, hold down the <Delete> key to enter the BIOS Setup. Follow the instructions in Chapter 4.

## 3.2 Turning off the computer

### 3.2.1 Using the OS shut down function

If you are using Windows® XP:

1. Click the Start button then select Turn Off Computer.
2. Click the Turn Off button to shut down the computer.
3. The power supply should turn off after Windows® shuts down.

If you are using Windows® Vista:

1. Click the Start button then select ShutDown.
2. The power supply should turn off after Windows® shuts down.

### 3.2.2 Using the dual function power switch

While the system is ON, pressing the power switch for less than four seconds puts the system to sleep mode or to soft-off mode, depending on the BIOS setting. Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting. Refer to section **4.5  Power Menu** in Chapter 4 for details.

This chapter tells how to change
the system settings through the BIOS
Setup menus. Detailed descriptions
of the BIOS parameters are also
provided.

# BIOS setup *4*

# Chapter summary

**4**

# 4.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup.

1. **ASUS Update** (Updates the BIOS in Windows® environment.)
2. **ASUS EZ Flash 2** (Updates the BIOS using a floppy disk or USB flash disk.)
3. **ASUS AFUDOS** (Updates the BIOS using a bootable floppy disk.)
4. **ASUS CrashFree BIOS 3** (Updates the BIOS using a bootable floppy disk, USB flash disk or the motherboard support DVD when the BIOS file fails or gets corrupted.)

Refer to the corresponding sections for details on these utilities.

> Save a copy of the original motherboard BIOS file to a bootable floppy disk or USB flash disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or AFUDOS utilities.

## 4.1.1 ASUS Update utility

The ASUS Update is a utility that allows you to manage, save, and update the motherboard BIOS in Windows® environment. The ASUS Update utility allows you to:

- Save the current BIOS file
- Download the latest BIOS file from the Internet
- Update the BIOS from an updated BIOS file
- Update the BIOS directly from the Internet, and
- View the BIOS version information.

This utility is available in the support DVD that comes with the motherboard package.

> ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).

**Installing ASUS Update**

To install ASUS Update:

1. Place the support DVD in the optical drive. The Drivers menu appears.
2. Click the Utilities tab, then click Install ASUS Update VX.XX.XX.
3. The ASUS Update utility is copied to your system.

Quit all Windows® applications before you update the BIOS using this utility.

### Updating the BIOS through the Internet

To update the BIOS through the Internet:

1.    Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.
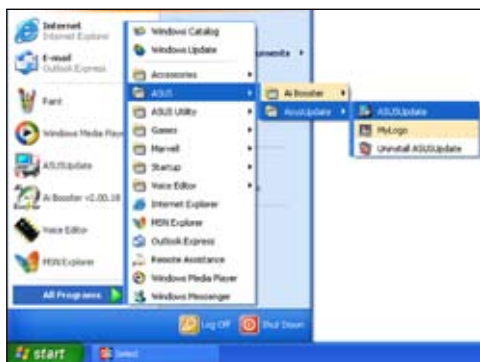




2.    Select **Update BIOS** from the Internet option from the drop-down menu, then click **Next**.

3.    Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.

4. From the FTP site, select the BIOS version that you wish to download. Click **Next**.

5. Follow the screen instructions to complete the update process.



The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail all its features.

## Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.

2. Select Update BIOS from a file option from the drop-down menu, then click **Next**.



3. Locate the BIOS file from the Open window, then click **Open**.

4. Follow the screen instructions to complete the update process.
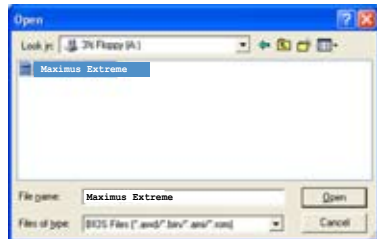
### 4.1.2    Creating a bootable floppy disk

1.    Do either one of the following to create a bootable floppy disk.

*DOS environment*

    a.    Insert a 1.44MB floppy disk into the drive.

    b.    At the DOS prompt, type *format* **A:/S** then press <Enter>.

*Windows® XP environment*

    a.    Insert a 1.44 MB floppy disk to the floppy disk drive.

    b.    Click **Start** from the Windows® desktop, then select **My Computer**.

    c.    Select the 3 1/2 Floppy Drive icon.

    d.    Click File from the menu, then select **Format**. A **Format 3 1/2 Floppy Disk** window appears.

    e.    Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.

2.    Copy the original or the latest motherboard BIOS file to the bootable floppy disk.

## 4.1.3    ASUS EZ Flash 2 utility

The ASUS EZ Flash 2 feature allows you to update the BIOS without having to go through the long process of booting from a floppy disk and using a DOS-based utility. The EZ Flash 2 utility is built-in the BIOS chip so it is accessible by pressing <Alt> + <F2> during the Power-On Self Tests (POST).

To update the BIOS using EZ Flash 2:

1.    Visit the ASUS website (www.asus.com) to download the latest BIOS file for the motherboard.

2.    Save the BIOS file to a floppy disk or a USB flash disk, then restart the system.

3.    You can launch the EZ Flash 2 by two methods.

   (1)   Insert the floppy disk / USB flash disk that contains the BIOS file to the floppy disk drive or the USB port.

          Press <Alt> + <F2> during POST to display the following.

```
              ASUSTek EZ Flash 2 BIOS ROM Utility V3.06
     FLASH TYPE: MXIC 25L1605A
          ─ Current ROM ─                      ─ Update ROM ─
      BOARD: MAXIMUS Extreme           BOARD: Unknown
      VER: 0108                        VER: Unknown
      DATE: 09/19/07                   DATE: Unknown
     PATH: A:\

      A:




     ─ Note ─
     [Enter] Select or Load        [B] Backup    [ESC] Exit

     [Tab] Switch                  [Up/Down/Home/End] Move
```
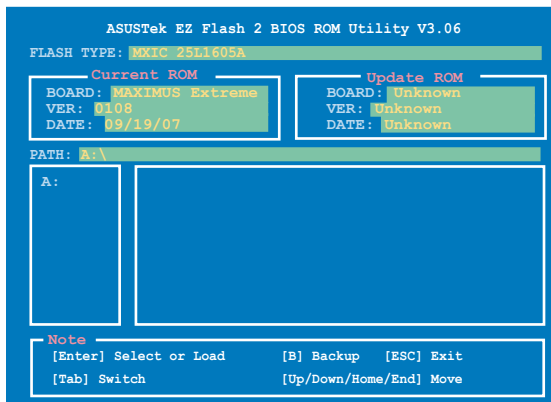
   (2)   Enter BIOS setup program. Go to the **Tools** menu to select **EZ Flash2** and press <Enter> to enable it.

          You can switch between drives by pressing <Tab> before the correct file is found. Then press <Enter>.

4.    When the correct BIOS file is found, EZ Flash 2 performs the BIOS update process and automatically reboots the system when done.

> •    This function can support devices such as USB flash disk, or floppy disk with **FAT 32/16** format and single partition only.
>
> •    DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

## 4.1.4 AFUDOS utility

The AFUDOS utility allows you to update the BIOS file in DOS environment using a bootable floppy disk with the updated BIOS file. This utility also allows you to copy the current BIOS file that you can use as backup when the BIOS fails or gets corrupted during the updating process.

### Copying the current BIOS

To copy the current BIOS file using the AFUDOS utility:

> • Make sure that the floppy disk is not write-protected and has at least 1024KB free space to save the file.
>
> • The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be same as shown.

1.  Copy the AFUDOS utility (afudos.exe) from the motherboard support DVD to the bootable floppy disk you created earlier.

2.  Boot the system in DOS mode, then at the prompt type:

    **afudos /o[filename]**

    where the [filename] is any user-assigned filename not more than eight alphanumeric characters for the main filename and three alphanumeric characters for the extension name.

    ```
    A:\>afudos /oOLDBIOS1.rom
    ```

    **Main filename    Extension name**

3.  Press <Enter>. The utility copies the current BIOS file to the floppy disk.

    ```
    A:\>afudos /oOLDBIOS1.rom
    AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
    Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
       Reading flash ..... done
       Write to file...... ok
    A:\>
    ```

    The utility returns to the DOS prompt after copying the current BIOS file.

### Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

1.  Visit the ASUS website (www.asus.com) and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable floppy disk.

> Write the BIOS filename on a piece of paper. You need to type the exact BIOS filename at the DOS prompt.

2. Copy the AFUDOS utility (afudos.exe) from the motherboard support DVD to the bootable floppy disk you created earlier.

3. Boot the system in DOS mode, then at the prompt type:

   **afudos /i[filename]**

   where [filename] is the latest or the original BIOS file on the bootable floppy disk.

   ```
   A:\>afudos /iMaximus Extreme.ROM
   ```

4. The utility verifies the file and starts updating the BIOS.

   ```
   A:\>afudos /iMaximus Extreme.ROM
   AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
   Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

      WARNING!! Do not turn off power during flash BIOS
      Reading file ....... done
      Reading flash ...... done

      Advance Check ......
      Erasing flash ...... done
      Writing flash ...... 0x0008CC00 (9%)
   ```

> Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

   ```
   A:\>afudos /iMaximus Extreme.ROM
   AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
   Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

      WARNING!! Do not turn off power during flash BIOS
      Reading file ....... done
      Reading flash ...... done

      Advance Check ......
      Erasing flash ...... done
      Writing flash ...... done
      Verifying flash .... done

      Please restart your computer

   A:\>
   ```

## 4.1.5 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using the motherboard support DVD, the floppy disk, or the USB flash disk that contains the updated BIOS file.

Prepare the motherboard support DVD, the floppy disk or the USB flash disk containing the updated motherboard BIOS before using this utility.

### Recovering the BIOS from the support DVD

To recover the BIOS from the support DVD:

1. Turn on the system.
2. Insert the motherboard support DVD to the optical drive.
3. The utility displays the following message and automatically checks the DVD for the BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "Maximus Extreme.ROM". Completed.
Start flashing...
```

4. Restart the system after the utility completes the updating process.

### Recovering the BIOS from the USB flash disk

To recover the BIOS from the USB flash disk:

1. Insert the USB flash disk that contains BIOS file to the USB port.
2. Turn on the system.
3. The utility will automatically checks the devices for the BIOS file When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.
4. Restart the system after the utility completes the updating process.

- • Only the USB flash disk with FAT 32/16 format and single partition can support ASUS CrashFree BIOS 3. The device size should be smaller than 8GB.

- • DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

# 4.2 BIOS setup program

This motherboard supports a programmable Serial Peripheral Interface (SPI) chip that you can update using the provided utility described in section **4.1 Managing and updating your BIOS**.

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup." This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the SPI chip.

The SPI chip on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit Menu. See section **4.9 Exit Menu**.

- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

- Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.

## 4.2.1　BIOS menu screen

Menu items     Menu bar     Configuration fields     General help

```
                          BIOS SETUP UTILITY
  Main    Extreme Tweaker   Advanced   Power   Boot   Tools   Exit

    System Time                [10:55:25]                Use [ENTER], [TAB] or
    System Date                [Wed 08/22/2007]          [SHIFT-TAB] to select
    Legacy Diskette A          [1.44M, 3.5 in]           a field.
    Language                   [English]
                                                         Use [+] or [-] to
                                                         configure system Time.
      SATA 1                   [Not Detected]
      SATA 2                   [Not Detected]
      SATA 3                   [Not Detected]
      SATA 4                   [Not Detected]
      SATA 5                   [Not Detected]
      SATA 6                   [Not Detected]
                                                         ←→   Select Screen
    ▶ SATA Configuration                                 ↑↓   Select Item
    ▶ System Information                                 +-   Change Field
                                                         Tab  Select Field
                                                         F1   General Help
                                                         F10  Save and Exit
                                                         ESC  Exit

        v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.
```

Sub-menu items     Navigation keys

## 4.2.2　Menu bar

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

| | |
|---|---|
| **Main** | For changing the basic system configuration |
| **Extreme Tweaker** | For changing the overclocking settings |
| **Advanced** | For changing the advanced system settings |
| **Power** | For changing the advanced power management (APM) configuration |
| **Boot** | For changing the system boot configuration |
| **Tools** | For Configuring options for special functions |
| **Exit** | For selecting the exit options and loading default settings |

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

## 4.2.3　Navigation keys

At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.

Some of the navigation keys differ from one screen to another.

## 4.2.4    Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting Main shows the Main menu items.

The other items (Advanced, Power, Boot, and Exit) on the menu bar have their respective menu items.
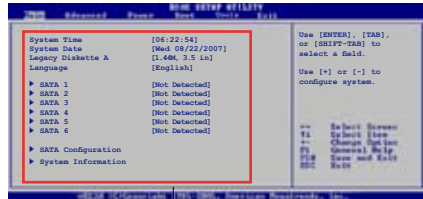


**Main menu items**

## 4.2.5    Sub-menu items

A solid triangle before each item on any menu screen means that the iteam has a sub-menu. To display the sub-menu, select the item and press <Enter>.

## 4.2.6    Configuration fields

These fields show the values for the menu items. If an item is user- configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to **4.2.7 Pop-up window**.

## 4.2.7    Pop-up window

Select a menu item then press <Enter> to display a pop-up window with the configuration options for that item.

## 4.2.8    Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> /<Page Down> keys to display the other items on the screen.
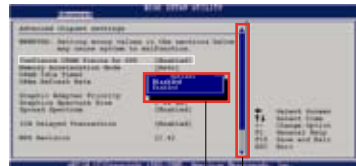


**Pop-up window**

**Scroll bar**

## 4.2.9    General help

At the top right corner of the menu screen is a brief description of the selected item.

# 4.3 Main menu

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

Refer to section **4.2.1 BIOS menu screen** for information on the menu screen items and how to navigate through them.

```
                          BIOS SETUP UTILITY
  Main     Extreme Tweaker    Advanced    Power    Boot    Tools    Exit

  System Time                   [10:55:25]              Use [ENTER], [TAB] or
  System Date                   [Thu 08/22/2007]        [SHIFT-TAB] to select
  Legacy Diskette A             [1.44M, 3.5 in]         a field.
  Language                      [English]
                                                        Use [+] or [-] to
                                                        configure system Time.
  ▶ SATA 1                      [Not Detected]
  ▶ SATA 2                      [Not Detected]
  ▶ SATA 3                      [Not Detected]
  ▶ SATA 4                      [Not Detected]
  ▶ SATA 5                      [Not Detected]
  ▶ SATA 6                      [Not Detected]          ←→   Select Screen
                                                        ↑↓   Select Item
  ▶ SATA Configuration                                  +-   Change Field
  ▶ System Information                                  Tab  Select Field
                                                        F1   General Help
                                                        F10  Save and Exit
                                                        ESC  Exit

       v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.
```

## 4.3.1 System Time [xx:xx:xx]

Allows you to set the system time.

## 4.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

## 4.3.3 Legacy Diskette A [1.44M, 3.5 in.]

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

## 4.3.4 Language [English]

Allows you to choose the BIOS language version from the options.
Configuration options: [Chinese BIG5] [Chinese (GB)] [Japanese] [Français] [German] [English]

## 4.3.5    SATA 1-6

While entering Setup, the BIOS automatically detects the presence of Serial ATA devices. There is a separate sub-menu for each SATA device. Select a device item then press <Enter> to display the SATA device information.

```
                          BIOS SETUP UTILITY
 Main

 SATA 1                                        Select the type of
                                               device connected to
 Device     :Not Detected                      the system.

 Type                        [Auto]
 LBA/Large Mode              [Auto]
 Block(Multi-Sector Transfer) [Auto]
 PIO Mode                    [Auto]
 DMA Mode                    [Auto]
 SMART Monitoring            [Auto]
 32Bit Data Transfer         [Enabled]

                                               ←→   Select Screen
                                               ↑↓   Select Item
                                               +-   Change Option
                                               F1   General Help
                                               F10  Save and Exit
                                               ESC  Exit

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```
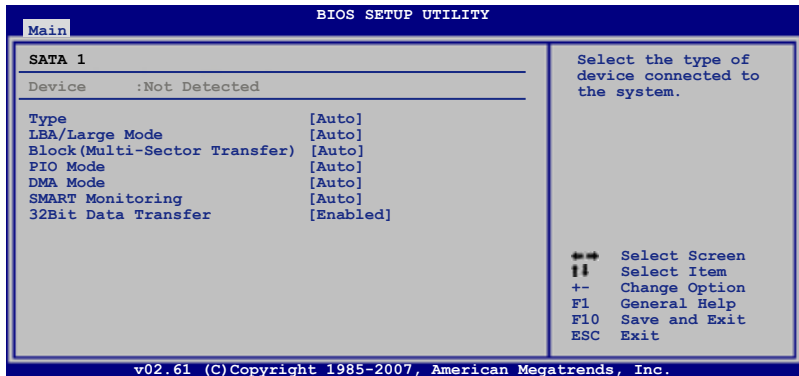
The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show N/A if no IDE device is installed in the system.

### Type [Auto]

Selects the type of IDE drive. Setting to [Auto] allows automatic selection of the appropriate IDE device type. Select [CDROM] if you are specifically configuring a CD-ROM drive. Select [ARMD] (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.
Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

### LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to [Auto] enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled. Configuration options: [Disabled] [Auto]

### Block (Multi-sector Transfer) [Auto]

Enables or disables data multi-sectors transfers. When set to [Auto], the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time.
Configuration options: [Disabled] [Auto]

### PIO Mode [Auto]

Selects the PIO mode.
Configuration options: [Auto] [0] [1] [2] [3] [4]

### DMA Mode [Auto]

Selects the DMA mode. Configuration options: [Auto] [SWDMA0] [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5]

### SMART Monitoring [Auto]

Sets the Smart Monitoring, Analysis, and Reporting Technology. Configuration options: [Auto] [Disabled] [Enabled]

### 32Bit Data Transfer [Enabled]

Enables or disables 32-bit data transfer. Configuration options: [Disabled] [Enabled]

## 4.3.6    SATA Configuration

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

```
                         BIOS SETUP UTILITY
   Main

   SATA Configuration                                  Options

   SATA Configuraton          [Enhanced]        Disabled
    Configure SATA as         [IDE]             Compatible
                                                Enhanced
   Hard Disk Write Protect    [Disabled]
   IDE Detect Time Out (Sec)  [35]
```
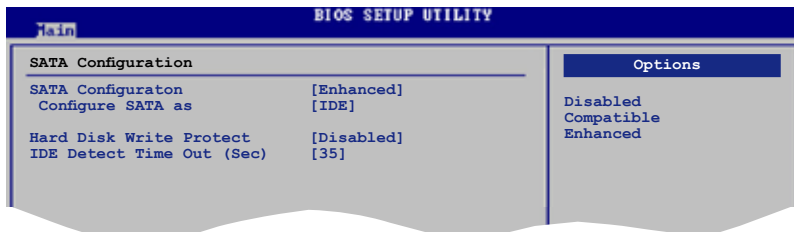
### SATA Configuration [Enhanced]

Configuration options: [Disabled] [Compatible] [Enhanced]

> *Configure SATA as [IDE]*
> Sets the configuration for the Serial ATA connectors supported by the Southbridge chip.
>
> The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.
>
> If you want to create a RAID 0, RAID 1, RAID 5, RAID 10, or the Intel® Matrix Storage Technology configuration from the Serial ATA hard disk drives, set this item to [RAID].
>
> If you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices, keep the defaul setting [IDE].

If you want the Serial ATA hard disk drives to use the Advanced Host Controller Interface (AHCI), set this item to [AHCI].

### Hard Disk Write Protect [Disabled]

Disables or enables device write protection. This will be effective only if device is accessed through BIOS. Configuration option: [Disabled] [Enabled]

### IDE Detect Time Out (Sec) [35]

Selects the time out value for detecting ATA/ATAPI devices.
Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

## 4.3.7    AHCI Configuration

This menu is for AHCI configuration. It appears only when you set the **Configure SATA as** item under **SATA Configuration** to [AHCI].

```
                          BIOS SETUP UTILITY
  Main

  AHCI Settings                                          Some SATA CD/DVD in
                                                         AHCI mode need to
  AHCI CD/DVD Boot Time out              [15]            wait ready longer.

  ▶ AHCI  Port1  [Not Detected]
  ▶ AHCI  Port2  [Not Detected]
  ▶ AHCI  Port3  [Not Detected]
  ▶ AHCI  Port4  [Not Detected]
  ▶ AHCI  Port5  [Not Detected]
  ▶ AHCI  Port6  [Not Detected]
```
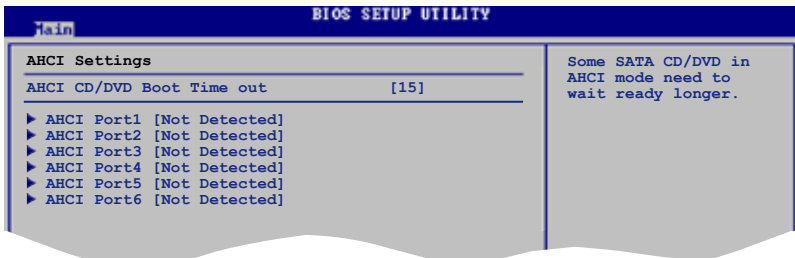
### AHCI CD/DVD Boot Time out [15]

Allows you to set the waiting time for SATA CD/DVD in AHCI mode.
Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

### AHCI Port1~6 [XXX]

Displays the auto-detected SATA devices.

```
                          BIOS SETUP UTILITY
  Main

  AHCI Port1                                             Select the type of
                                                         devices connected to
  Device      :Not Detected                              the system.

  SATA Port1                     [Auto]
  SMART Monitoring               [Enabled]
```
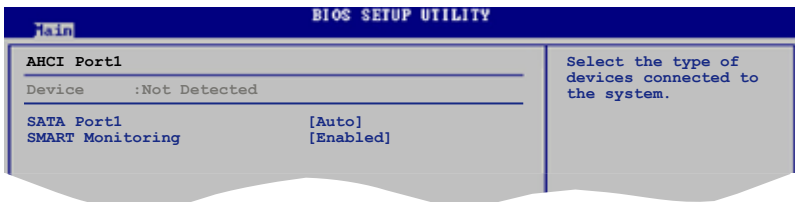
*SATA Port1 [Auto]*
Allows you to select the type of device connected to the system.
Configuration options: [Auto] [Not Installed]

*SMART Monitoring [Enabled]*
Enables or disables the Self-Monitoring, Analysis and Reporting Technology
(SMART). Configuration options: [Disabled] [Enabled]

## 4.3.8    System Information

This menu gives you an overview of the general system specifications. The BIOS
automatically detects the items in this menu.

```
                         BIOS SETUP UTILITY
 Main

  AMIBIOS

  Version    : 0108
  Build Date : 09/19/07

  Processor

  Type     : Intel(R) Core(TM)2 CPU 6300 @ 1.86GHz
  Speed    : 1876MHz
  Count    : 2

  System Memory

  Available   : 2048 MB                        ←→   Select Screen
                                                ↑↓   Select Item
                                                F1   General Help
                                                F10  Save and Exit
                                                ESC  Exit


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```
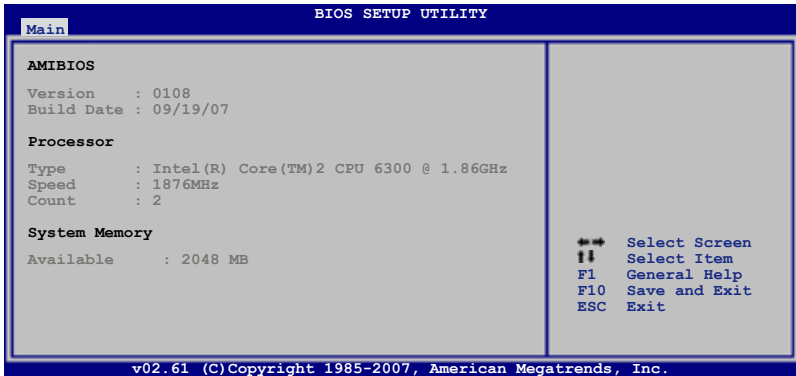
**AMI BIOS**

Displays the auto-detected BIOS information.

**Processor**

Displays the auto-detected CPU specification.

**System Memory**

Displays the auto-detected system memory.

# 4.4 Extreme Tweaker menu

The Extreme Tweaker menu items allow you to configure overclocking-related items.

⚠️ Take caution when changing the settings of the Extreme Tweaker menu items. Incorrect field values can cause the system to malfunction.

```
                              BIOS SETUP UTILITY
    Main     Extreme Tweaker    Advanced     Power     Boot     Tools    Exit

    Configure System Performance Settings                     Select the desired CPU
                                                              level, and relevant
    CPU Level Up                    [Auto]                    parameters will be
    Ai Overclock Tuner              [Auto]                    auto-adjusted based on
    CPU Ratio Control               [Auto]                    the CPU level chosen.
    FSB Strap to North Bridge       [Auto]                    If you would like to
                                                              adjust other settings
    DRAM Frequency                  [Auto]                    in more details, set
    DRAM Command Rate               [Auto]                    Ai Overclock Tuner to
    DRAM Timing Control             [Auto]                    Manual after you
      Primary Info : 6-6-6-15-4-36-6-4                        select a CPU level.
      Secondary Info : 8-4-6-4-7-4-7
    DRAM Static Read Control        [Auto]
    DRAM Dynamic Write Control      [Auto]                   ←→   Select Screen
    Ai Clock Twister                [Auto]                   ↑↓   Select Item
    Ai Clock Skew for Channel A     [Auto]                   +-   Change Field
    Ai Clock Skew for Chaneel B     [Ato]                    F1   General Help
    Ai Transaction Booster          [Auto]                   F10  Save and Exit
                                                             ESC  Exit

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```

Scroll down to see more items.

```
    NB LED Selection                [NB Volt]
    SB LED Selection                [SB Volt]
    CPU LED Selection               [CPU Volt]
    Frequency LED                   [Turn on]
    Voltiminder LED                 [Enabled]

    CPU  Spread Spectrum            [Auto]
    PCIE Spread spectrum            [Auto]

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```

## 4.4.1 Configure System Performance Settings

### CPU Level Up [Auto]

Allows you to select a CPU level, and the related parameters will be automatically adjusted according to the selected CPU level. If you want to manually configure the settings in detail, set **Ai Overclock Tuner** to [Manual] after selecting a CPU level. Configuration options: [Auto] [E6400] [E6550] [E6600] [E6700] [X6800] [E6850]

📝 The configuration options may vary depending on your CPU type.

## Ai Overclock Tuner [Auto]

Allows selection of CPU overclocking options to achieve desired CPU internal frequency. Select either one of the preset overclocking configuration options:

| Manual | Allows you to individually set overclocking parameters. |
|---|---|
| Auto | Loads the standard settings for the system. |
| X.M.P | Loads the optimal settings for the system. |
| CPU Level Up | Allows you to select a CPU level, and the related parameters will be adjusted automatically. |

Some of the following items appear when you set **Ai Overclock Tuner** to [Manual] or [X.M.P]. The items vary depending on which option you select.

## eXtreme Memory Profile [Profile #1]

Allows you to select the memory profile during overclocking between [Profile #1] (high performance) and [Profile #2] (high frequency). This item appears only when you set **Ai Overclock Tuner** to [X.M.P.].
Configuration options: [Profile #1] [Profile #2]

## OC By CPU Level Up [Select Level]

After you to select a CPU level, the **FSB Frequency** and **DRAM Frequency** items will be adjusted accordingly. This item appears only when you set **Ai Overclock Tuner** to [Manual].
Configuration options: [Select Level] [E6400] [E6550] [E6600] [E6700] [X6800] [E6850]

## CPU Ratio Control [Auto]

Configuration options: [Auto] [Manual]

The following item appears when the **CPU Ratio Control** item is set to [Manual].

### *Ratio CMOS Setting [7]*
Whether this item is configurable depends on your CPU type. The valid value ranges differently according to your CPU type. If this item is configurable, enter the value using the numeric keypad.

## FSB Frequency [XXX]

Displays the frequency sent by the clock generator to the system bus and PCI bus. Use the <+> and <-> keys to adjust the FSB frequency. You can also type the desired FSB frequency using the numeric keypad. The values range from 200 to 800. Refer to the table below for the correct Front Side Bus and CPU External Frequency settings. This item appears only when you set **Ai Overclock Tuner** to [Manual].

**FSB/CPU External Frequency Synchronization**

| Front Side Bus | CPU External Frequency |
|:---:|:---:|
| FSB 1333 | 333 MHz |
| FSB 1066 | 266 MHz |
| FSB 800 | 200 MHz |

## FSB Strap to North Bridge [Auto]

Configuration options: [Auto] [200MHz] [266MHz] [333MHz]

## PCIE Frequency [Auto]

Allows you to set the PCI Express frequency.
Configuration options: [100] [101]~[149] [150]

## DRAM Frequency [Auto]

Allows you to set the DDR3 operating frequency.
Configuration options: [Auto] [DDR3-800MHz] [DDR3-887 MHz] [DDR3-1066MHz]

⚠️ A very high DRAM frequency may cause the system to become unstable! If this happens, revert to the default setting.

✎ The configuration options may vary depending on the CPU level you select.

## DRAM Command Rate [Auto]

Configuration options: [Auto] [1T] [2T]

## DRAM Timing Control [Auto]

Configuration options: [Auto] [Manual]

✎ The following items appear when you set the **DRAM Timing Control** item to [Manual].

*CAS# Latency [ 5 DRAM Clocks]*
Configuration options: [5 DRAM Clocks] [6 DRAM Clocks]~[10 DRAM Clocks] [11 DRAM Clocks]

*RAS# to CAS# Delay [ 5 DRAM Clocks]*
Configuration options: [3 DRAM Clocks] [4 DRAM Clocks]~[17 DRAM Clocks] [18 DRAM Clocks]

*RAS# Precharge [ 5 DRAM Clocks]*
Configuration options: [3 DRAM Clocks] [4 DRAM Clocks]~[17 DRAM Clocks] [18 DRAM Clocks]

*RAS# Active Time [15 DRAM Clocks]*
Configuration options: [3 DRAM Clocks] [4 DRAM Clocks]~[33 DRAM Clocks] [34 DRAM Clocks]

*RAS# to RAS# Delay [Auto]*
Configuration options: [Auto] [1 DRAM Clocks]~[15 DRAM Clocks]

*ROW Refresh Cycle Time [Auto]*
Configuration options: [Auto] [30 DRAM Clocks] [36 DRAM Clocks] [48 DRAM Clocks] [60 DRAM Clocks] [72 DRAM Clocks]

*Write Recovery Time [Auto]*
Configuration options: [Auto] [1 DRAM Clocks]~[15 DRAM Clocks]

*Read to Precharge Time [Auto]*
Configuration options: [Auto] [1 DRAM Clocks]~[15 DRAM Clocks]

*Read to Write Delay(S/D) [Auto]*
Configuration options: [Auto] [1 DRAM Clocks]~[15 DRAM Clocks]

*Write to Read Delay(S) [Auto]*
Configuration options: [Auto] [1 DRAM Clocks]~[15 DRAM Clocks]

*Write to Read Delay(D) [Auto]*
Configuration options: [Auto] [1 DRAM Clocks]~[15 DRAM Clocks]

*Read to Read Delay(S) [Auto]*
Configuration options: [Auto] [1 DRAM Clocks]~[15 DRAM Clocks]

*Read to Read Delay(D) [Auto]*
Configuration options: [Auto] [1 DRAM Clocks]~[15 DRAM Clocks]

*Write to Write Delay(S) [Auto]*
Configuration options: [Auto] [1 DRAM Clocks]~[15 DRAM Clocks]

*Write to Write Delay(D) [Auto]*
Configuration options: [Auto] [1 DRAM Clocks]~[15 DRAM Clocks]

## DRAM Static Read Control [Auto]

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

## DRAM Dynamic Write Control [Auto]

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

## Ai Clock Twister [Auto]

Allows you to configure the DRAM performance. Setting to [Light] enhances the DRAM compatibility; setting to [Strong] enhances the DRAM performance. Configuration options: [Auto] [Moderate] [Light] [Strong]

### Ai Clock Skew for Channel A [Auto]

Configuration options: [Auto] [Advance 350ps] [Advance 300ps] [Advance 250ps]
[Advance 200ps] [Advance 150ps] [Advance 100ps] [Advance 50ps] [Normal] [Delay 50ps]
[Delay 100ps] [Delay 150ps] [Delay 200ps] [Delay 250ps] [Delay 300ps] [Delay 350ps]

### Ai Clock Skew for Channel B [Auto]

Configuration options: [Auto] [Advance 350ps] [Advance 300ps] [Advance 250ps]
[Advance 200ps] [Advance 150ps] [Advance 100ps] [Advance 50ps] [Normal] [Delay 50ps]
[Delay 100ps] [Delay 150ps] [Delay 200ps] [Delay 250ps] [Delay 300ps] [Delay 350ps]

### Ai Transaction Booster [Auto]

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

### CPU Voltage [Auto]

Allows you to select the CPU voltage. The text color in the configuration field
corresponds to the onboard CPU LED color, both of which indicate voltage
condition. When you set **CPU LED Selection** to [CPU Volt], the onboard CPU LED
displays CPU voltage condition. Refer to page 2-1 for CPU LED definition.
Configuration options: [Auto] [1.10000V] [1.10625V] [1.11250V] [1.11875V]
[1.12500V] [1.13125V] [1.13750V] [1.14375V] [1.15000V] [1.15625V] [1.16250V]
[1.16875V] [1.17500V] [1.18125V] [1.18750V] [1.19375V] [1.20000V] [1.20625V]
[1.21250V] [1.21875V] [1.22500V] [1.23125V] [1.23750V] [1.24375V] [1.25000V]
[1.25625V] [1.26250V] [1.26875V] [1.27500V] [1.28125V] [1.28750V] [1.29375V]
[1.30000V]~[1.87500V] [1.88125V] [1.88750V] [1.89375V] [1.90000V] [1.95000V]
[1.97500V] [2.00000V] [2.05000V] [2.07500V] [2.10000V]~[2.20000V] [2.22500V]
[2.25000V] [2.27500V] [2.30000V]

> ⚠️ Refer to the CPU documentation before setting the CPU voltage. Setting a
> high voltage may damage the CPU permanently, and setting a low voltage may
> make the system unstable.

### CPU PLL Voltage [Auto]

Allows you to select the CPU PLL voltage. The text color in the configuration
field corresponds to the onboard CPU LED color, both of which indicate voltage
condition. When you set **CPU LED Selection** to [PLL Volt], the onboard CPU LED
displays CPU PLL voltage condition. Refer to page 2-1 for CPU LED definition.
Configuration options: [Auto] [1.50V] [1.52V] [1.54V] [1.56V] [1.58V] [1.60V]~
[2.90V] [2.92V] [2.94V] [2.96V] [2.98V] [3.00V]

### North Bridge Voltage [Auto]

Allows you to select the northbridge voltage. The text color in the configuration field
indicates voltage condition. When you set the **NB LED Selection** item to [NB Volt],
the onboard northbridge LED displays northbridge voltage condition. Refer to page
2-2 for northbridge LED definition.
Configuration options: [Auto] [1.25V] [1.27V] [1.29V]~[1.77V] [1.79V] [1.81V]

### DRAM Voltage [Auto]

Allows you to select the DRAM voltage. The text color in the configuration field corresponds to the onboard memory LED color, both of which indicate voltage condition. Refer to page 2-2 for memory LED definition.
Configuration options: [Auto] [1.50V] [1.52V] [1.54V] ~ [3.00V] [3.02V] [3.04V]

### FSB Termination Voltage [Auto]

Allows you to select the front side bus (FSB) termination voltage. The text color in the configuration field indicates voltage condition. When you set the **NB LED Selection** item to [FSBT Volt], the onboard northbridge LED displays FSB termination voltage condition. Refer to page 2-2 for northbridge LED definition. Configuration options: [Auto] [1.20V] [1.22V] [1.24V] [1.26V] [1.28V] [1.30V]~[1.90V] [1.92V] [1.94V] [1.96V] [1.98V] [2.00V]

Setting a high FSB termination voltage may damage the chipset and CPU.

### South Bridge Voltage [Auto]

Allows you to select the southbridge voltage. The text color in the configuration field indicates voltage condition. When you set the **SB LED Selection** item to [SB Volt], the onboard southbridge LED displays southbridge voltage condition. Refer to page 2-2 for southbridge LED definition.
Configuration options: [Auto] [1.050V] [1.075V] [1.110V] [1.125V] [1.150V] [1.175V] [1.200V] [1.225V]

### Loadline Calibration [Auto]

Enables or disables Loadline Calibration.
Configuration options: [Auto] [Disabled] [Enabled]

### CPU GTL Reference [Auto]

Allows you to set the CPU GTL reference.
Configuration options: [Auto] [0.63x] [0.61x] [0.59x] [0.57x]

### North Bridge GTL Refernece [Auto]

Configuration options: [Auto] [0.67V] [0.63V] [0.60V] [0.57V] [0.56V] [0.53V] [0.51V] [0.49V]

### DDR3 Channel A REF Voltage [Auto]

Allows you to manually set the memory voltage, or you can set to [Auto] for the safe mode.
Configuration options: [DDR3_REF-30mv] [DDR3_REF-20mv] [DDR3_REF-10mv] [DDR3_REF] [DDR3_REF+10mv] [DDR3_REF+20mv] [DDR3_REF+30mv]

### DDR3 Channel B REF Voltage [Auto]

Allows you to manually set the memory voltage, or you can set to [Auto] for the safe mode.
Configuration options: [DDR3_REF-30mv] [DDR3_REF-20mv] [DDR3_REF-10mv] [DDR3_REF] [DDR3_REF+10mv] [DDR3_REF+20mv] [DDR3_REF+30mv]

### DDR3 Controller REF Voltage [Auto]

Allows you to manually set the memory voltage, or you can set to [Auto] for the safe mode.
Configuration options: [DDR3_REF-30mv] [DDR3_REF-20mv] [DDR3_REF-10mv] [DDR3_REF] [DDR3_REF+10mv] [DDR3_REF+20mv] [DDR3_REF+30mv]

### SB 1.5V Voltage [Auto]

Allows you to select the southbridge 1.5V voltage. The text color in the configuration field indicates voltage condition. When you set the **SB LED Selection** item to [SB 1.5 Volt], the onboard southbridge LED displays southbridge 1.5V voltage condition. Refer to page 2-2 for southbridge LED definition.
Configuration options: [Auto] [1.50V] [1.55V] [1.60V] [1.65V] [1.70V] [1.75V] [1.80V] [1.85V] [1.90V] [1.95V] [2.00V] [2.05V]

### NB LED Selection [NB Volt]

Allows you to switch the onboard northbridge LED display between northbridge voltage [NB Volt] and front side bus termination voltage [FSBT Volt].
Configuration options: [NB Volt] [FSBT Volt]

### SB LED Selection [SB Volt]

Allows you to switch the onboard southbridge LED display between southbridge voltage [SB Volt] and southbridge 1.5V voltage [SB 1.5 Volt].
Configuration options: [SB 1.5 Volt] [SB Volt]

### CPU LED Selection [CPU Volt]

Allows you to switch the onboard CPU LED display between CPU voltage [CPU Volt] and CPU PLL voltage [PLL Volt].
Configuration options: [CPU Volt] [PLL Volt]

### Frequency LED [Turn on]

Turns on/off the onboard frequnecy LED. Configuration options: [Turn on] [Turn off]

### Voltiminder LED [Enabled]

Enables or disables the onboard Voltiminder LED.
Configuration options: [Enabled] [Disabled]

### CPU Spread Spectrum [Auto]

Allows you to enable or disable the CPU spread spectrum.
Configuration options: [Auto] [Disabled]

### PCIE Spread Spectrum [Auto]

Allows you to enable or disable the PCIE spread spectrum.
Configuration options: [Auto] [Disabled]

# 4.5    Advanced menu

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

```
                          BIOS SETUP UTILITY
  Main     Extreme Tweaker    Advanced    Power    Boot    Tools    Exit

                                                 Configure CPU.
 ▶ CPU Configuration
 ▶ Chipset
 ▶ Onboard Devices Configuration
 ▶ USB Configuration
 ▶ PCIPnP




                                              ←→   Select Screen
                                              ↑↓   Select Item
                                              +-   Change Field
                                              Tab  Select Field
                                              F1   General Help
                                              F10  Save and Exit
                                              ESC  Exit

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```
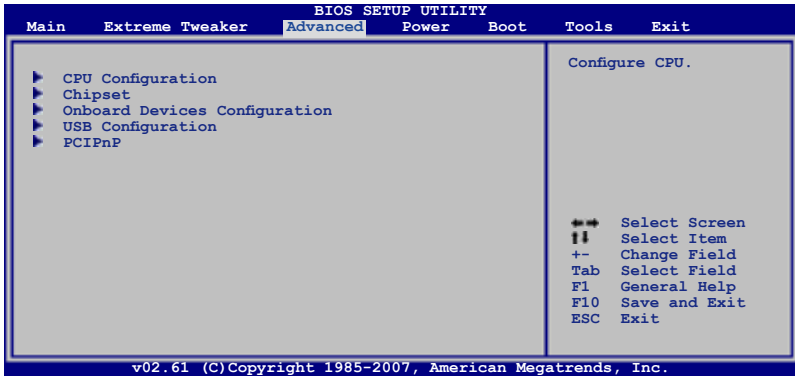
## 4.5.1 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.

```
                         BIOS SETUP UTILITY
                  Advanced

  Configure advanced CPU settings                         Options

  Manufacturer:Intel
  Brand String:Intel(R) Core(TM)2 CPU 6300@ 1.86GHz       Auto
  Frequency  :1.86GHz                                     Manual
  FSB Speed  :1066 MHz
  Cache L1   :64 KB
  Cache L2   :2048 KB
  CPUID      :6F5
  Ratio Status:Unlocked (Max:07, Min:06)
  Ratio Actual Value: 7

  CPU Ratio Control          [Manual]
  C1E Support                [Enabled]
  CPU TM Function            [Enabled]
  Vanderpool Technology      [Enabled]          ←→   Select Screen
  Execute Disable Bit        [Enabled]          ↑↓   Select Item
  Max CPUID Value Limit      [Disabled]         +-   Change Option
  Intel(R) SpeedStep(tm) Tech. [Disabled]       F1   General Help
                                                F10  Save and Exit
                                                ESC  Exit

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```

### CPU Ratio Control [Auto]

Configuration options: [Auto] [Manual]

> The following item appears when the item **CPU Ratio Control** is set to [Manual].

*Ratio CMOS Setting [7]*
Whether this item is configurable depends on your CPU type. The valid value ranges differently according to your CPU type. If this item is configurable, enter the value using the numeric keypad.

### C1E Support [Enabled]

Allows you to enable or disable C1E Support.
Configuration options: [Enabled] [Disabled]

### CPU TM Function [Enabled]

Configuration options: [Disabled] [Enabled]

### Vanderpool Technology [Enabled]

Enable this item when your CPU supports Vanderpool techonology.
Configuration options: [Enabled] [Disabled]

### Execute Disable Bit [Enabled]

Allows you to enable or disable the No-Execution Page Protection Technology. Setting this item to [Disabled] forces the XD feature flag to always return to zero (0). Configuration options: [Disabled] [Enabled]

## Max CPUID Value Limit [Disabled]

Setting this item to [Enabled] allows legacy operating systems to boot even without support for CPUs with extended CPUID functions.
Configuration options: [Disabled] [Enabled]

## Intel(R) SpeedStep (TM) Tech. [Enabled]

This item appears when the **CPU Ratio Control** item is set to [Auto]. Configuration options: [Enabled] [Disabled]

## 4.5.2    Chipset

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

```
                          BIOS SETUP UTILITY
                     Advanced

  Advanced Chipset Settings                       Configure North Bridge
                                                  features.
  ─────────────────────────────────────────────

  WARNING: Setting wrong values in below sections
           may cause system to malfunction.

  ▶ North Bridge Configuration
```

### *North Bridge Chipset Configuration*

```
                          BIOS SETUP UTILITY
                     Advanced

  North Bridge Chipset Configuration              ENABLE: Allow
                                                  remapping of
  ─────────────────────────────────────────────  overlapped PCI memory
                                                  above the total
  Memory Remap Feature      [Disabled]            physical memory.
  Initiate Graphic Adapter  [PEG/PCI]
  PEG Port Control          [Auto]                DISABLE: Do not allow
     PEG Port Force x1      [Disabled]            remapping of memory.
```

*Memory Remap Feature [Disabled]*
Allows you to enable or disable the remapping of the overlapped PCI memory above the total physical memory. Enable this option only when you install 64-bit operating system. Configuration options: [Disabled] [Enabled]

*Initiate Graphic Adapter [PEG/PCI]*
Allows you to decide which graphics controller to use as the primary boot device. Configuration options: [PCI/PEG] [PEG/PCI]

*PEG Port Control [Auto]*
Configuration options: [Auto] [Disabled]

**PEG Force x1 [Disabled]**
This item appears when **PEG Port Control** is set to [Auto].
Configuration options: [Enabled] [Disabled]

## 4.5.3    OnBoard Devices Configuration

```
                        BIOS SETUP UTILITY
              Advanced

 Onboard Device Configuration                        Enable or Disable
                                                     High Definition Audio
                                                     Controller
 High Definition Audio          [Enabled]
    Front Panel Type            [HD Audio]
 J-Micron PATA/SATA Controller  [Enabled]
    Controller Mode             [IDE]
    JMicron SATA/RAID OptRom     [Enabled]
 Marvell GigaBit LAN 1          [Enabled]
    LAN Boot ROM                [Disabled]
 Marvell GigaBit LAN 2          [Enabled]
    LAN Boot ROM                [Disabled]
 VIA 1394                       [Enabled]              ➡➡  Select Screen
 LCD Poster Backlight           [Disabled]            ↑↓   Select Item
 LCD Poster Off                 [Disabled]            +-   Change Option
 ROG LOGO LIGHT                 [Turn On]             F1   General Help
                                                     F10  Save and Exit
                                                     ESC  Exit

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```

### High Definition Audio [Enabled]

Allows you to enable or disable the High Definition Audio. The following item appears only when you enable this item.
Configuration options: [Enabled] [Disabled]

> *Front Panel Support Type [HD Audio]*
> Allows you to set the front panel audio connector (AAFP) mode to legacy AC'97 or high-definition audio depending on the audio standard that the front panel audio module supports. Configuration options: [AC97] [HD Audio]

### J-Micron PATA/SATA Controller [Enabled]

Configuration options: [Enabled] [Disabled]

> The following two items will not appear if **J-Micron PATA/SATA Controller** is set to [Disabled].

> *Controller Mode [IDE]*
> Configuration options: [RAID] [IDE] [AHCI]

> *JMicron SATA/RAID OptRom [Enabled]*
> Configuration options: [Disabled] [Enabled]

### Marvell GigaBit LAN 1/2 [Enabled]

Configuration options: [Enabled] [Disabled]

> *LAN Boot ROM [Disabled]*
> Configuration options: [Disabled] [Enabled]

### VIA 1394 [Enabled]

Configuration options: [Enabled] [Disabled]

### LCD Poster Backlight [Disabled]

Configuration options: [Enabled] [Disabled]

### LCD Poster Off [Disabled]

Configuration options: [Disabled] [Enabled]

### ROG LOGO LIGHT [Turn On]

Configuration options: [Turn On] [Turn Off]

## 4.5.4    USB Configuration

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

```
                          BIOS SETUP UTILITY
                      Advanced

 USB Configuration                                      Options

 USB Devices Enabled:                            Enabled
             None                                Disabled

 USB Functions           [Enabled]
 USB 2.0 Controller      [Enabled]
 USB 2.0 Controller Mode [HiSpeed]
 BIOS EHCI Hand-off      [Enabled]
 Port 64/60 Emulation    [Disabled]
 Legacy USB Support      [Auto]
```
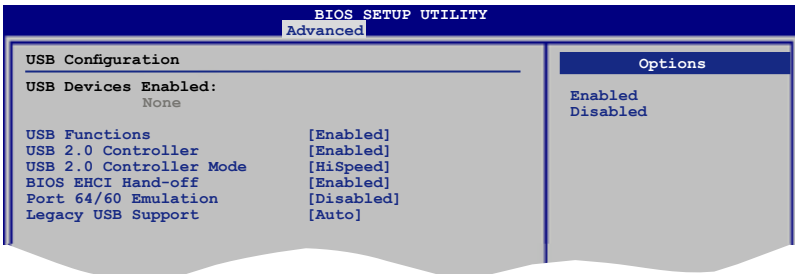
The **USB Devices Enabled** item shows the auto-detected values. If no USB device is detected, the item shows None.

### USB Functions [Enabled]

Allows you to enable or disable the USB functions. The following sub-items appear when this item is set to [Enabled]. Configuration options: [Disabled] [Enabled]

The following items appear only when you set **USB Functions** to [Enabled].

### USB 2.0 Controller [Enabled]

Allows you to enable or disable the USB 2.0 controller.
Configuration options: [Enabled] [Disabled]

### USB 2.0 Controller Mode [HiSpeed]

Allows you to set the USB 2.0 controller mode to HiSpeed (480 Mbps) or FullSpeed (12 Mbps). Configuration options: [FullSpeed] [HiSpeed]

**USB 2.0 Controller Mode** appears only when you enable the **USB 2.0 Controller**.

## BIOS EHCI Hand-off [Enabled]

Allows you to enable the support for operating systems without an EHCI hand-off feature. Configuration options: [Disabled] [Enabled]

## Port 64/60 Emulation [Disabled]

Allows you to enable or disable the I/O port 60h/64h emulation support. This item should be enabled for the complete USB keyboard legacy support for non-USB aware OSes. Configuration options: [Disabled] [Enabled]

## Legacy USB Support [Auto]

Allows you to enable or disable the support for legacy USB devices. Setting to [Auto] allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.
Configuration options: [Disabled] [Enabled] [Auto]

## 4.5.5    PCI PnP

The PCIPnP menu items allow you to change the advanced settings for PCI/PnP devices.

> Take caution when changing the settings of the PCI PnP menu items. Incorrect field values can cause the system to malfunction.

```
                         BIOS SETUP UTILITY
                     Advanced

     Advanced PCI/PnP Settings                    NO: lets the BIOS
                                                  configure all the
     WARNING: Setting wrong values in below sections   devices in the system.
              may cause system to malfunction.    YES: lets the
                                                  operating system
     Plug And Play O/S            [No]            configure Plug and Play
                                                  (PnP) devices not
                                                  required for boot if
                                                  your system has a Plug
                                                  and Play operating
                                                  system.


                                                  ←→    Select Screen
                                                  ↑↓    Select Item
                                                  +-    Change Option
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit
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```

## Plug And Play O/S [No]

When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot.
Configuration options: [No] [Yes]

# 4.6 Power menu

The Power menu items allow you to change the settings for the Advanced
Power Management (APM). Select an item then press <Enter> to display the
configuration options.

```
                           BIOS SETUP UTILITY
   Main     Extreme Tweaker    Advanced    Power    Boot    Tools    Exit

   Suspend Mode                 [Auto]                 Select the ACPI state
   Repost Video on S3 Resume    [Disabled]             used for System
   ACPI 2.0 Support             [Disabled]             Suspend.
   ACPI APIC Support            [Enabled]

   ▶  APM Configuration
   ▶  Hardware Monitor

                                                       ←→   Select Screen
                                                       ↑↓   Select Item
                                                       +-   Change Option
                                                       F1   General Help
                                                       F10  Save and Exit
                                                       ESC  Exit

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```
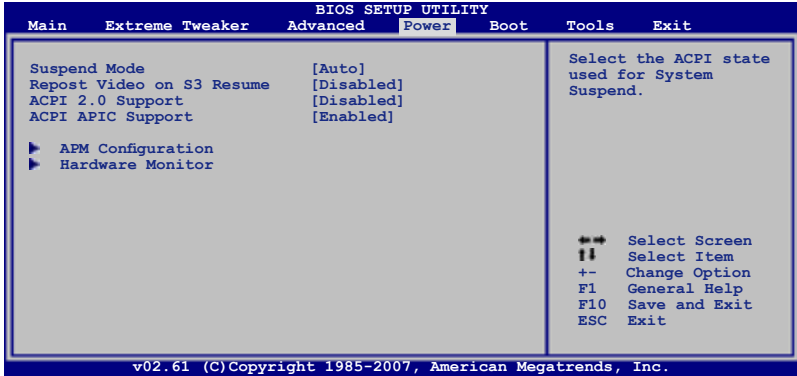
## 4.6.1 Suspend Mode [Auto]

Allows you to select the Advanced Configuration and Power Interface (ACPI) state
to be used for system suspend.
Configuration options: [S1 (POS) Only] [S3 Only] [Auto]

## 4.6.2 Repost Video on S3 Resume [Disabled]

Determines whether to invoke VGA BIOS POST on S3/STR resume.
Configuration options: [Disabled] [Enabled]

## 4.6.3 ACPI 2.0 Support [Disabled]

Specifies the Advanced Configuration and Power Interface (ACPI) version
supported. Configuration options: [Disabled] [Enabled]

## 4.6.4 ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface
(ACPI) support in the Advanced Programmable Interrupt Controller (APIC). When
set to [Enabled], the ACPI APIC table pointer is included in the RSDT pointer list.
Configuration options: [Disabled] [Enabled]

## 4.6.5 APM Configuration

```
                    BIOS SETUP UTILITY
                         Power

  APM Configuration                              <Enter> to select
                                                 whether or not to
                                                 restart the system
  Restore on AC Power Loss      [Power Off]      after AC power loss.
  Power On By RTC Alarm         [Disabled]
  Power On By PCI Devices       [Disabled]
  Power On By PCIE Devices      [Disabled]
  Power On By PS/2 Keyboard     [Disabled]


                                                 ←→   Select Screen
                                                 ↑↓   Select Item
                                                 +-   Change Option
                                                 F1   General Help
                                                 F10  Save and Exit
                                                 ESC  Exit

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```

### Restore On AC Power Loss [Power Off]

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

### Power On By RTC Alarm [Disabled]

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

### Power On By PCI Devices [Disabled]

Allows you to enable or disable the PME to wake up from S5 by PCI devices.
Configuration options: [Disabled] [Enabled]

### Power On By PCIE Devices [Disabled]

Allows you to enable or disable the PCIE devices to generate a wake event.
Configuration options: [Disabled] [Enabled]

### Power On By PS/2 Keyboard [Disabled]

Allows you to disable the Power On by PS/2 keyboard function or set specific keys
on the PS/2 keyboard to turn on the system. This feature requires an ATX power
supply that provides at least 1A on the +5VSB lead.
Configuration options: [Disabled] [Space Bar] [Ctrl-Esc] [Power Key]

### 4.6.6 Hardware Monitor

```
                        BIOS SETUP UTILITY
                            Power
┌─────────────────────────────────────────────┬─────────────────────────┐
│  Hardware Monitor                             │ CPU Temperature         │
│                                               │                         │
│  CPU   Temperature          [38.5°C/102°F]    │                         │
│  MB    Temperature          [36°C/96.5°F]     │                         │
│  NB    Temperature          [35°C/95°F]       │                         │
│  SB    Temperature          [43°C/109°F]      │                         │
│  OPT1 Temperature           [N/A]             │                         │
│  OPT2 Temperature           [N/A]             │                         │
│  OPT3 Temperature           [N/A]             │                         │
│                                               │                         │
│  COP EX                                       │                         │
│  NB Overheat Protection     [Disabled]        │  ➡➡  Select Screen      │
│  SB Overheat Protection     [Disabled]        │  ↑↓  Select Item        │
│  OPT_TEMP1 Overheat Protection [Disabled]     │  +-  Change Field       │
│  OPT_TEMP2 Overheat Protection [Disabled]     │  F1  General Help       │
│  OPT_TEMP3 Overheat Protection [Disabled]     │  F10 Save and Exit      │
│                                               │  ESC Exit               │
│  ▶ CPU Fan and Chassis Fan                    │                         │
│  ▶ OPT Q-Fan and Power Fan                    │                         │
│                                               │                         │
├─────────────────────────────────────────────┴─────────────────────────┤
│       v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.          │
└────────────────────────────────────────────────────────────────────────┘
```

Scroll down to see more items.

```
┌─────────────────────────────────────────────┬─────────────────────────┐
│  VCORE Voltage              [ 1.288V]         │                         │
│  CPU PLL Voltage            [ 1.600V]         │                         │
│  North Bridge Voltage       [ 1.264V]         │                         │
│  DRAM Voltage               [ 1.568V]         │                         │
│  FSB Termination Voltage    [ 1.232V]         │                         │
│  South Bridge Voltage       [ 1.072V]         │                         │
│  DDR3 Controller REF Voltage [ 0.784V]        │  ➡➡  Select Screen      │
│  SB 1.5V Voltage            [ 1.520V]         │  ↑↓  Select Item        │
│  3.3V Voltage               [ 3.264V]         │  +-  Change Field       │
│  5V Voltage                 [ 5.064V]         │  F1  General Help       │
│  12V Voltage                [12.208V]         │  F10 Save and Exit      │
│                                               │  ESC Exit               │
├─────────────────────────────────────────────┴─────────────────────────┤
│       v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.          │
└────────────────────────────────────────────────────────────────────────┘
```

### CPU Temperature; MB Temperature; NB Temperature; SB Temperature; OPT1/2/3 Temperature [xxxºC/xxxºF]

The onboard hardware monitor automatically detects and displays the CPU, motherboard, northbridge, southbridge, and the assigned device temperatures. Select [Ignored] if you do not wish to display the detected temperatures.

### NB Overheat Protection; SB Overheat Protection [Disabled]

The system automatically shuts down when the North Bridge or South Bridge chipset is heated over the set temperature to protect from damage. Configuration optitons: [Disabled] [70ºC] [80ºC] [90ºC]

### OPT_TEMP1/2/3 Overheat Protection [Disabled]

The system automatically shuts down when any of the thermal sensor cables connected to the motherboard is heated over the set temperature to protect from damage. Configuration optitons: [Disabled] [50ºC] [60ºC] [70ºC] [80ºC] [90ºC]

## CPU Fan and Chassis Fan

```
                    BIOS SETUP UTILITY
                   Power

                                                  CPU Fan Speed
CPU Fan Speed              [4470RPM]
CPU Q-Fan Control         [Disabled]


Chassis Fan 1 Speed       [N/A]
Chassis Fan 2 Speed       [N/A]
Chassis Fan 3 Speed       [N/A]
Chassis Q-Fan Controls    [Disabled]


                                                ←→  Select Screen
                                                ↑↓  Select Item
                                                +-  Change Field
                                                F1  General Help
                                                F10 Save and Exit
                                                ESC Exit

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```
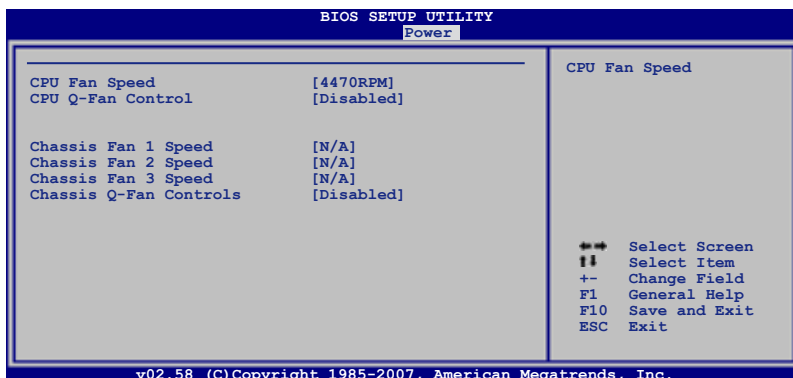
*CPU Fan Speed [xxxxRPM] or [Ignored] / [N/A]*
The onboard hardware monitor automatically detects and displays the CPU
fan speed in rotations per minute (RPM). If the fan is not connected to the
motherboard, the field shows N/A.

*CPU Q-Fan Control [Disabled]*
Allows you to enable or disable the CPU Q-Fan controller.
Configuration options: [Disabled] [Enabled]

> The **CPU Fan Profile** item appears when you enable the CPU Q-Fan Control
> feature.

*CPU Fan Profile [Optimal]*
Allows you to set the appropriate performance level of the CPU Q-Fan. When
set to [Optimal], the CPU fan automatically adjusts depending on the CPU
temperature. Set this item to [Silent Mode] to minimize fan speed for quiet
CPU fan operation, or [Performance Mode] to achieve maximum CPU fan
speed. Configuration options: [Optimal] [Silent Mode] [Performance Mode]

*Chassis Fan 1/2/3 Speed [xxxxRPM] or [Ignored] / [N/A]*
The onboard hardware monitor automatically detects and displays the
chassis fan speed in rotations per minute (RPM). If the fan is not connected
to the motherboard, the field shows N/A.

*Chassis Q-Fan Controls [Disabled]*
Allows you to enable or disable the chassis Q-Fan controller.
Configuration options: [Disabled] [Enabled]

The following two items appear when you enable the **Chassis Q-Fan Controls** feature.

*Chassis Fan Ratio [Auto]*
Configuration options: [Auto] [90%] [80%] [70%] [60%]

*Chassis Target Temperature [37ºC]*
Configuration options: [28ºC] [31ºC] [34ºC] [37ºC] [40ºC] [43ºC] [46ºC]

## OPT Q-Fan and Power Fan

```
                       BIOS SETUP UTILITY
                          Power

┌──────────────────────────────────────┐    Fan configuration
  OPT_Fan 1 Reading        :N/A              mode setting
  OPT_Fan1 Q-Fan Control      [RATIO]
  Duty Cycle Mode             [90]
  OPT_Fan 2 Reading        :N/A
  OPT_Fan2 Q-Fan Control      [RATIO]
  Duty Cycle Mode             [90]
  OPT_Fan 3 Reading        :N/A
  OPT_Fan3 Q-Fan Control      [RATIO]
  Duty Cycle Mode             [90]

  PWN_Fan Speed            :N/A
                                          ←→    Select Screen
                                          ↑↓    Select Item
                                          +-    Change Field
                                          F1    General Help
                                          F10   Save and Exit
                                          ESC   Exit

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```
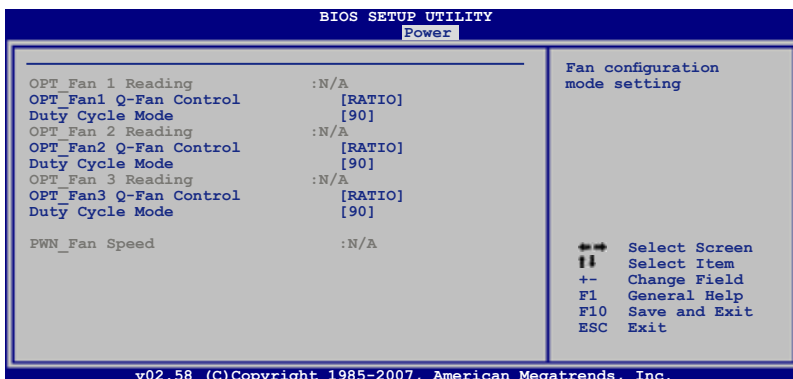
The onboard hardware monitor automatically detects the optional fan speed. If the fan is not connected to the motherboard, the field shows N/A.

*OPT_Fan1/2/3 Q-Fan Control [RATIO]*
Allows you to select the optional fan control mode. When this item is set to [RATIO], you can configure the **Duty Cycle Mode** item. If you set this item to [Q-FAN], you are allowed to configure the **TargetTemp Value** item. The Q-Fan detects the temperature of the fan connected to the OPT_FAN1/2/3 connector and adjusts the fan speed.
Configuraiton options: [RATIO] [Q-FAN]

You need to connect the thermal sensor cables to the OPT_TEMP1/2/3 connectors to enable this function.

*Duty Cycle Mode [90]*
Allows you to set the fan duty cycle. When the **OPT_Fan1/2/3 Q-Fan Control** item is set to [Q-FAN], this item does not appear.
Configuraiton options: [70] [80] [90] [100%]

*TargetTemp Value [32]*
Allows you to set the temperature at which the optional fan starts up. When the **OPT_Fan1/2/3 Q-Fan Control** item is set to [DUTY CYCLE], this item does not appear. Configuration options: [16] [24] [32] [40] [48] [56] [64] [72]

**VCORE Voltage, CPU PLL Voltage, North Bridge Voltage, DRAM Voltage, FSB Termination Voltage, South Bridge Voltage, DDR3 Controller REF Voltage, SB 1.5V Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage**

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.

# 4.7    Boot menu

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

```
                              BIOS SETUP UTILITY
    Main    Extreme Tweaker    Advanced    Power    Boot    Tools    Exit

                                                  Specifies the Boot
 ▶  Boot Device Priority                          Device Priority
                                                  sequence.

 ▶  Boot Settings Configuration                   A virtual floppy disk
 ▶  Security                                       drive (Floppy Drive B:)
                                                  may appear when you set
                                                  the CD-ROM drive as the
                                                  first boot device.


                                                  ←→    Select Screen
                                                  ↑↓    Select Item
                                                  Enter Go to Sub Screen
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit

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```

## 4.7.1    Boot Device Priority

```
                              BIOS SETUP UTILITY
                                        Boot
 Boot Device Priority                             Specifies the boot
                                                  sequence from the
                                                  availabe devices.
 1st Boot Device              [1st FLOPPY DRIVE]
 2nd Boot Device              [Hard Drive]        A device enclosed
 3rd Boot Device              [ATAPI CD-ROM]      in parenthesis has
                                                  been disabled in
                                                  the corresponding
                                                  menu.


                                                  ←→    Select Screen
                                                  ↑↓    Select Item
                                                  +-    Change Option
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit

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```

### 1st ~ xxth Boot Device [xxx Drive]

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.
Configuration options: [xxx Drive] [Disabled]

## 4.7.2 Boot Settings Configuration

```
                          BIOS SETUP UTILITY
                                         Boot

     Boot Settings Configuration                      Allows BIOS to skip
                                                      certain tests while
     Quick Boot              [Enabled]                booting. This will
     Full Screen Logo        [Enabled]                decrease the time
     AddOn ROM Display Mode   [Force BIOS]            needed to boot the
     Bootup Num-Lock          [On]                    system.
     Wait for 'F1' if Error   [Enabled]
     Hit 'DEL' Message Display [Enabled]
     Interrupt 19 Capture     [Disabled]


                                                   ←→    Select Screen
                                                   ↑↓    Select Item
                                                   +-    Change Option
                                                   F1    General Help
                                                   F10   Save and Exit
                                                   ESC   Exit

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```

### Quick Boot [Enabled]

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

### Full Screen Logo [Enabled]

This allows you to enable or disable the full screen logo display feature. Configuration options: [Disabled] [Enabled]

> Set this item to [Enabled] to use the ASUS MyLogo 3™ feature.

### AddOn ROM Display Mode [Force BIOS]

Sets the display mode for option ROM. Configuration options: [Force BIOS] [Keep Current]

### Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock. Configuration options: [Off] [On]

### Wait for 'F1' If Error [Enabled]

When set to [Enabled], the system waits for the <F1> key to be pressed when error occurs. Configuration options: [Disabled] [Enabled]

### Hit 'DEL' Message Display [Enabled]

When set to [Enabled], the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Disabled] [Enabled]

### Interrupt 19 Capture [Disabled]

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

### 4.7.3    Security

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

```
                        BIOS SETUP UTILITY
                                    Boot

  Security Settings                         <Enter> to change
                                            password.
  Supervisor Password        :Not Installed <Enter> again to
  User Password              :Not Installed disabled password.

  Change Supervisor Password
  Change User Password


                                            ←→   Select Screen
                                            ↑↓   Select Item
                                            Enter Change
                                            F1    General Help
                                            F10   Save and Exit
                                            ESC   Exit

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```

### Change Supervisor Password

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

To set a Supervisor Password:

1.    Select the Change Supervisor Password item and press <Enter>.
2.    From the password box, type a password composed of at least six letters and/or numbers, then press <Enter>.
3.    Confirm the password when prompted.
The message "Password Installed" appears after you successfully set your password.

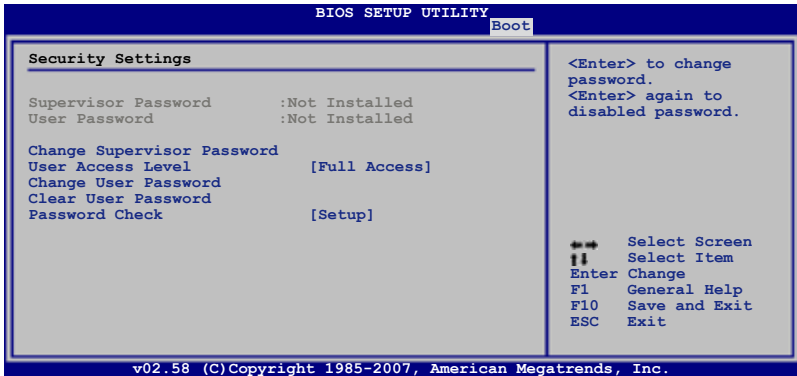To change the supervisor password, follow the same steps as in setting a user password.

To clear the supervisor password, select the Change Supervisor Password then press <Enter>. The message "Password Uninstalled" appears.

> If you forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section **2.6 Slide switch** for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.

```
                        BIOS SETUP UTILITY
                                          Boot

    Security Settings                              <Enter> to change
                                                   password.
    Supervisor Password        :Not Installed      <Enter> again to
    User Password              :Not Installed       disabled password.

    Change Supervisor Password
    User Access Level              [Full Access]
    Change User Password
    Clear User Password
    Password Check                 [Setup]
                                                   ←→   Select Screen
                                                   ↑↓   Select Item
                                                   Enter Change
                                                   F1    General Help
                                                   F10   Save and Exit
                                                   ESC   Exit

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```

### User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items. Configuration options: [No Access] [View Only] [Limited] [Full Access]

[No Access] prevents user access to the Setup utility.

[View Only] allows access but does not allow change to any field.

[Limited] allows changes only to selected fields, such as Date and Time.

[Full Access] allows viewing and changing all the fields in the Setup utility.

### Change User Password

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

To set a User Password:

1.    Select the Change User Password item and press <Enter>.
2.    On the password box that appears, type a password composed of at least six letters and/or numbers, then press <Enter>.
3.    Confirm the password when prompted.
The message "Password Installed" appears after you set your password successfully.

To change the user password, follow the same steps as in setting a user password.
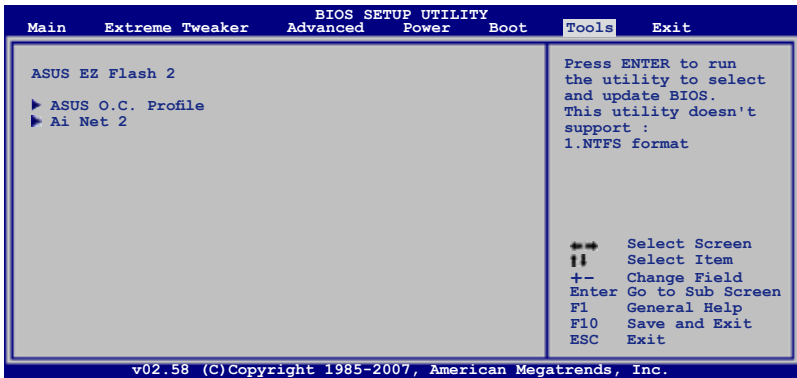
### Clear User Password

Select this item to clear the user password.

### Password Check [Setup]

When set to [Setup], BIOS checks for user password when accessing the Setup utility. When set to [Always], BIOS checks for user password both when accessing Setup and booting the system. Configuration options: [Setup] [Always]
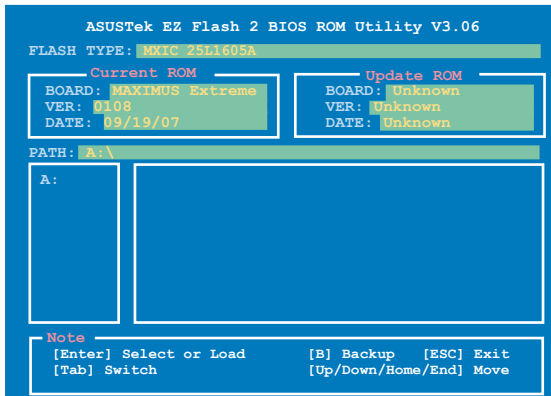
# 4.8 Tools menu

The Tools menu items allow you to configure options for special functions. Select an item then press <Enter> to display the sub-menu.

```
                        BIOS SETUP UTILITY
   Main    Extreme Tweaker    Advanced    Power    Boot    Tools    Exit

   ASUS EZ Flash 2                              Press ENTER to run
                                                the utility to select
 ▶ ASUS O.C.  Profile                           and update BIOS.
 ▶ Ai Net 2                                      This utility doesn't
                                                support :
                                                1.NTFS format




                                                ←→  Select Screen
                                                ↑↓  Select Item
                                                +-   Change Field
                                                Enter Go to Sub Screen
                                                F1   General Help
                                                F10  Save and Exit
                                                ESC  Exit

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```
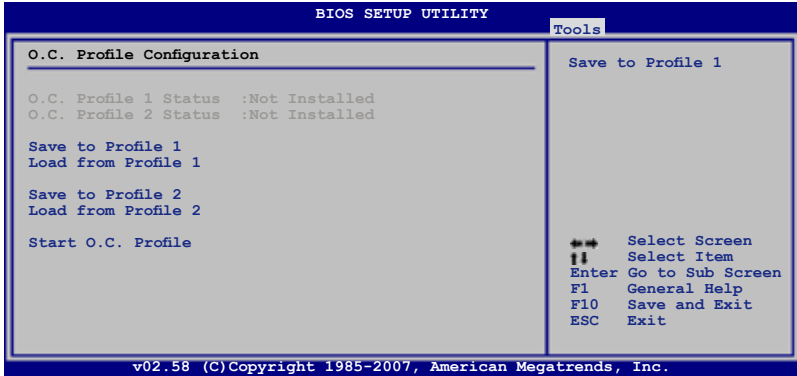
## 4.8.1 ASUS EZ Flash 2

Allows you to run ASUS EZ Flash 2. When you press <Enter>, a confirmation message appears. Use the left/right arrow key to select between [Yes] or [No], then press <Enter> to confirm your choice. Please see page 4-5, section 4.1.3 for details.

```
        ASUSTek EZ Flash 2 BIOS ROM Utility V3.06
   FLASH TYPE: MXIC 25L1605A
   ┌─ Current ROM ──────────┐  ┌─ Update ROM ──────────┐
    BOARD: MAXIMUS Extreme       BOARD: Unknown
    VER: 0108                    VER: Unknown
    DATE: 09/19/07               DATE: Unknown
   └────────────────────────┘  └───────────────────────┘
   PATH: A:\

    A:



   ┌─ Note ──────────────────────────────────────────┐
    [Enter] Select or Load    [B] Backup   [ESC] Exit
    [Tab] Switch              [Up/Down/Home/End] Move
```

---

## 4.8.2 ASUS O.C. Profile

This item allows you to store or load multiple BIOS settings.

```
                          BIOS SETUP UTILITY
                                                Tools
 O.C. Profile Configuration                  Save to Profile 1

 O.C. Profile 1 Status  :Not Installed
 O.C. Profile 2 Status  :Not Installed

 Save to Profile 1
 Load from Profile 1

 Save to Profile 2
 Load from Profile 2

 Start O.C. Profile                          ←→   Select Screen
                                             ↑↓   Select Item
                                             Enter Go to Sub Screen
                                             F1   General Help
                                             F10  Save and Exit
                                             ESC  Exit

        v02.58 (C)Copyright 1985-2007, American Megatrends, Inc.
```
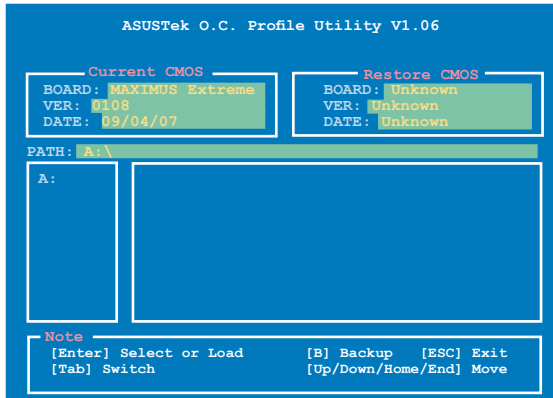
### Save to Profle 1/2

Allows you to save the current BIOS file to the BIOS Flash. Press <Enter> to save the file.

### Load from Profile 1/2

Allows you to load the previous BIOS settings saved in the BIOS Flash. Press <Enter> to load the file.
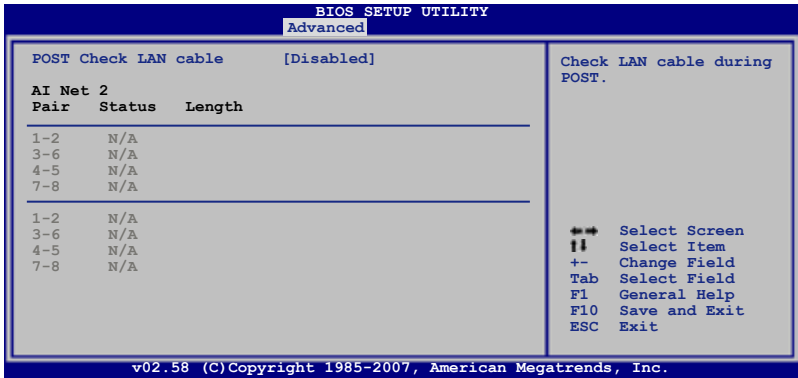
### Start O.C. Profile

Allows you to run the utility to save and load CMOS. Press <Enter> to run the utility.

```
            ASUSTek O.C. Profile Utility V1.06

        ┌─ Current CMOS ─┐        ┌─ Restore CMOS ─┐
        BOARD: MAXIMUS Extreme    BOARD: Unknown
        VER:  0108                VER:  Unknown
        DATE: 09/04/07            DATE: Unknown

    PATH: A:\

     A:




        ┌─ Note ─┐
         [Enter] Select or Load    [B] Backup   [ESC] Exit
         [Tab] Switch              [Up/Down/Home/End] Move
```

- This function can support devices such as USB flash disk or floppy disk with FAT 32/16 format and single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent the system boot failure!
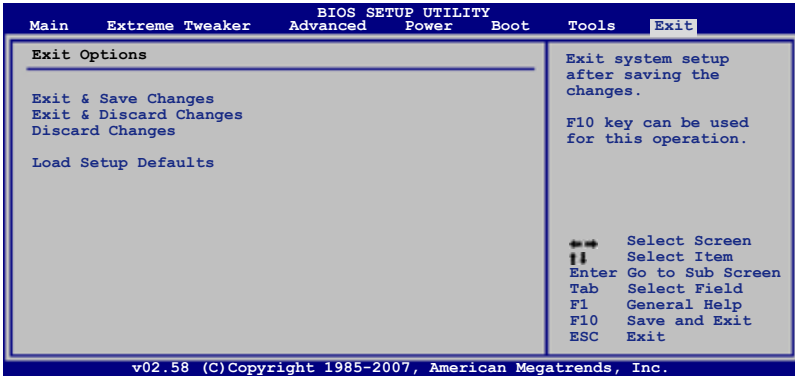
## 4.8.3 AI Net 2

```
                          BIOS SETUP UTILITY
                   Advanced

  POST Check LAN cable       [Disabled]              Check LAN cable during
                                                     POST.
  AI Net 2
  Pair   Status   Length

  1-2      N/A
  3-6      N/A
  4-5      N/A
  7-8      N/A

  1-2      N/A
  3-6      N/A                            ←→    Select Screen
  4-5      N/A                            ↑↓    Select Item
  7-8      N/A                            +-    Change Field
                                          Tab   Select Field
                                          F1    General Help
                                          F10   Save and Exit
                                          ESC   Exit

        v02.58 (C)Copyright 1985-2007, American Megatrends, Inc.
```

### POST Check LAN Cable  [Disabled]

Enables or disables checking of the LAN cable during the Power-On Self-Test (POST). Configuration options: [Disabled] [Enabled]

# 4.9 Exit menu

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

```
                          BIOS SETUP UTILITY
  Main    Extreme Tweaker    Advanced    Power    Boot    Tools   Exit

  Exit Options                                         Exit system setup
                                                       after saving the
  Exit & Save Changes                                  changes.
  Exit & Discard Changes
  Discard Changes                                      F10 key can be used
                                                       for this operation.
  Load Setup Defaults



                                                       ←→    Select Screen
                                                       ↑↓    Select Item
                                                       Enter Go to Sub Screen
                                                       Tab   Select Field
                                                       F1    General Help
                                                       F10   Save and Exit
                                                       ESC   Exit

        v02.58 (C)Copyright 1985-2007, American Megatrends, Inc.
```

> Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

## Exit & Save Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. An onboard backup battery sustains the CMOS RAM so it stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select **YES** to save changes and exit.

> If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Press <Enter> to save the changes while exiting.

## Exit & Discard Changes

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than System Date, System Time, and Password, the BIOS asks for a confirmation before exiting.

## Discard Changes

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

## Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select **YES** to load default values. Select **Exit & Save Changes** or make other changes before saving the values to the non-volatile RAM.

This chapter describes the contents of
the support DVD that comes with the
motherboard package.

# Software support 5

**Chapter summary**

5

# 5.1    Installing an operating system

This motherboard supports Windows® XP/64-bit XP/Vista/64-bit Vista operating systems (OS). Always install the latest OS version and corresponding updates to maximize the features of your hardware.

> • Motherboard settings and hardware options vary. Use the setup procedures presented in this chapter for reference only. Refer to your OS documentation for detailed information.
>
> • Make sure that you instal Windows® XP Service Pack2 or later versions before installing the drivers for better compatibility and system stability.

# 5.2    Support DVD information

The support DVD that came with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.

> The contents of the support DVD are subject to change at any time without notice. Visit the ASUS website (www.asus.com) for updates.

## 5.2.1    Running the support DVD

Place the support DVD to the optical drive. The DVD automatically displays the Drivers menu if Autorun is enabled in your computer.



**Click an icon to display support DVD/motherboard information**

**Click an item to install**

> If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the DVD.

### 5.2.2 Drivers menu

The drivers menu shows the available device drivers if the system detects installed devices. Install the necessary drivers to activate the devices.



### ASUS InstAll - Installation Wizard for Drivers

Launches the ASUS InstAll driver installation wizard.

### Intel Chipset Inf Update Program

Installs the Intel® chipset inf update program.

### SoundMAX ADI Audio Driver

Installs the SoundMAX® ADI1988 audio driver and application.

### JMicron JMB36X Controller Driver

Installs JMicron JMB36X controller driver.

### Marvell Yukon Gigabit Ethernet Driver

Installs the Marvell Yukon Gigabit Ethernet Driver.

### USB 2.0 Driver

Installs the Universal Serial Bus 2.0 (USB 2.0) driver.

## 5.2.3    Utilities menu

The Utilities menu shows the applications and other software that the motherboard supports.



Click to display the next screen



Click to display the previous screen

### ASUS InstAll-Installation Wizard for Utilities

Installs all of the utilities through the Installation Wizard.

### Marvell Yukon VCT Application

Installs the Marvell Yukon VCT applications.

### Marvell Yukon CPA Application

Installs the Marvell Yukon CPA applications.

### ASUS PC Probe II

This smart utility monitors the fan speed, CPU temperature, and system voltages, and alerts you of any detected problems. This utility helps you keep your computer in healthy operating condition.

### ASUS AI Suite

Installs the ASUS AI Suite.

### ASUS Update

The ASUS Update utility allows you to update the motherboard BIOS in Windows® environment. This utility requires an Internet connection either through a network or an Internet Service Provider (ISP).

### Adobe Acrobat Reader V7.0

Installs the Adobe® Acrobat® Reader that allows you to open, view, and print documents in Portable Document Format (PDF).

### Microsoft DirectX 9.0c

Installs the Microsoft® DirectX 9.0c driver. The Microsoft DirectX® 9.0c is a multimedia technology that enhances computer graphics and sound. DirectX® improves the multimedia features of you computer so you can enjoy watching TV and movies, capturing videos, or playing games in your computer. Visit the Microsoft website (www.microsoft.com) for updates.

### Anti-Virus Utility

The anti-virus application scans, identifies, and removes computer viruses. View the online help for detailed information.

### 3DMark06 Software

Installs the 3Dmark06 software.

### WinDVD Copy5 Trial

Installs the WinDVD Copy5 Trial version.

### InterVideo MediaOne Gallary

Installs the InterVideo Media One Gallary software.

### Ulead PhotoImpact 12 SE

Installs the Ulead PhotoImpact 12 SE software.

### CyberLink PowerBackup

Installs the CyberLink Powerbackup software.

### Corel Snapfire Plus SE

Installs the Corel Snapfire Plus SE software.

### 5.2.4 Make Disk menu

The Make Disk menu contains items to create the Intel ICH9R or JMicron® JMB363 RAID/AHCI driver disk.



**Intel ICH9 32/64 bit RAID/AHCI Driver**

Allows you to create an ICH9R 32/64bit RAID/AHCI driver disk.

**JMicron JMB36X 32/64 bit RAID/AHCI Driver**

Allows you to create a JMicron JMB363 32/64bit RAID/AHCI driver disk.

### 5.2.5    Manual menu

The Manual menu contains a list of supplementary user manuals. Click an item to open the folder of the user manual.

Most user manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader from the Utilities menu before opening a user manual file.



### 5.2.6    Video menu

Click the Video tab to display a list of video clips. Click the Extreme OC Clip item to watch how an overclocking guru breaks 3DMark world record with an ROG motherboard.

## 5.2.7 ASUS Contact information

Click the Contact tab to display the ASUS contact information. You can also find this information on the inside front cover of this user guide.
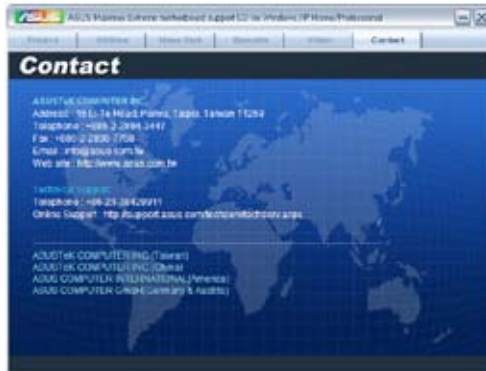


## 5.2.8 Other information

The icons on the top right corner of the screen give additional information on the motherboard and the contents of the support DVD. Click an icon to display the specified information.

### Motherboard Info

Displays the general specifications of the motherboard.
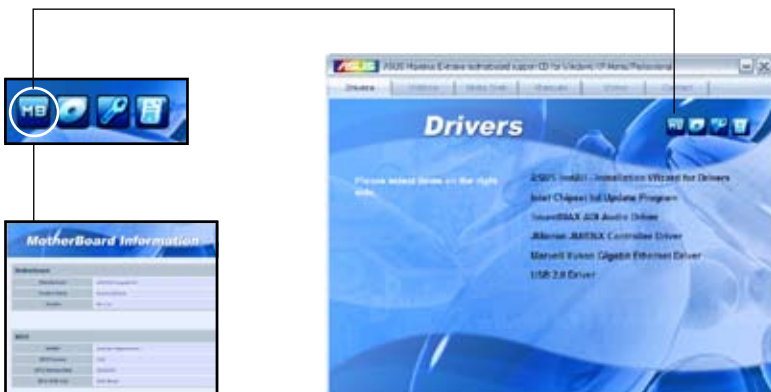
**Browse this DVD**

Displays the support DVD contents in graphical format.
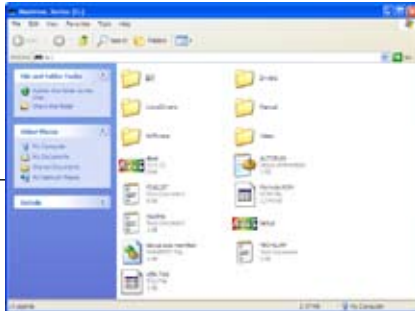


**Technical support form**

Displays the ASUS Technical Support Request Form that you have to fill out when requesting technical support.
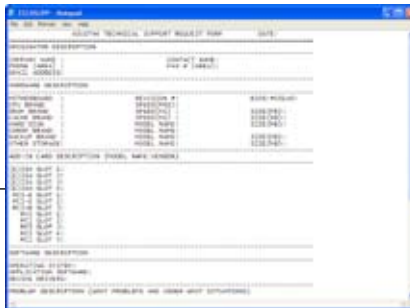


**Filelist**

Displays the contents of the support DVD and a brief description of each in text format.
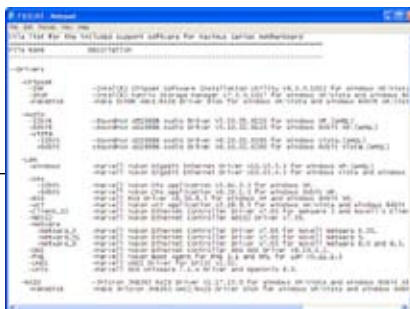
# 5.3    Software information

Most of the applications in the support DVD have wizards that will conveniently guide you through the installation. View the online help or readme file that came with the software application for more information.

## 5.3.1    ASUS MyLogo 3™

The ASUS MyLogo 3™ utility lets you customize the boot logo. The boot logo is the image that appears on screen during the Power-On Self-Tests (POST). The ASUS MyLogo 3™ is automatically installed when you install the ASUS Update utility from the support DVD. See section **5.2.3 Utilities menu** for details.

- Before using the ASUS MyLogo 3™, use the AFUDOS utility to make a copy of your original BIOS file, or obtain the latest BIOS version from the ASUS website. See section **4.1.4 AFUDOS utility**.

- Make sure that the BIOS item Full Screen Logo is set to [Enabled] if you wish to use ASUS MyLogo 3™. See section **4.7.2 Boot Settings Configuration**.

- You can create your own boot logo image in GIF file formats.

- The file size should be smaller than 150 K.

To launch the ASUS MyLogo 3™:

1.    Launch the ASUS Update utility. Refer to section **4.1.1 ASUS Update utility** for details.

2.    Select **Options** from the drop down menu, then click **Next**.

3.    Check the option **Launch MyLogo** to replace system boot logo before flashing BIOS, then click **Next**.

4.    Select **Update BIOS** from a file from the drop down menu, then click **Next**.

5.    When prompted, locate the new BIOS file, then click **Next**. The ASUS MyLogo window appears.

6.    From the left window pane, select the folder that contains the image you intend to use as your boot logo.
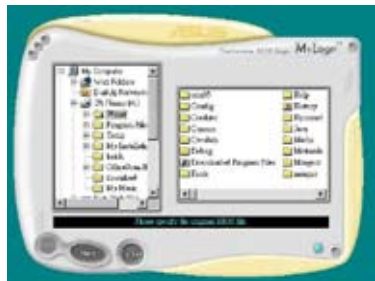
7.  When the logo images appear on the
    right window pane, select an image to
    enlarge by clicking on it.
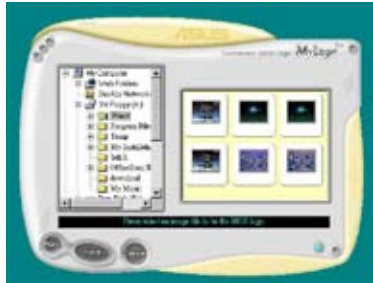


8.  Adjust the boot image to your desired
    size by selecting a value on the Ratio
    box.



9.  When the screen returns to the ASUS Update utility, flash the original BIOS to
    load the new boot logo.
10. After flashing the BIOS, restart the computer to display the new boot logo
    during POST.

## 5.3.2 AI NET 2

The AI NET 2 features the Marvell® Virtual Cable Tester™ (VCT). VCT is a cable diagnostic utility that reports LAN cable faults and shorts using the Time Domain Reflectometry (TDR) technology. The VCT detects and reports open and shorted cables, impedance mismatches, pair swaps, pair polarity problems, and pair skew problems of up to 64 ns at one meter accuracy.

The VCT feature reduces networking and support costs through a highly manageable and controlled network system. This utility can be incorporated in the network systems sofware for ideal field support as well as development diagnostics.

### Using the Virtual Cable Tester™

To use the the Marvell® Virtual Cable Tester™ utility:

1. Launch the VCT utility from the Windows® desktop by clicking **Start > All Programs > Marvell > Virtual Cable Tester**.

2. Click **Virtual Cable Tester** from the menu to display the screen below.
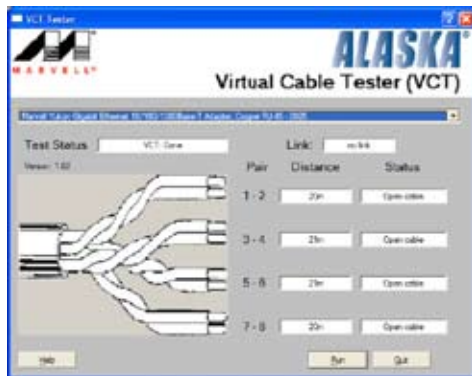


3. Click the **Run** button to perform a cable test.

> • The VCT only runs on systems with Windows® XP or Windows® Vista™ operating systems.
>
> • The VCT utility only tests Ethernet cables connected to Gigabit LAN port(s).
>
> • The Run button on the Virtual Cable Tester™ main window is disabled if no problem is detected on the LAN cable(s) connected to the LAN port(s).
>
> • If you want the system to check the status of the LAN cable before entering the OS, enable the item Post Check LAN Cable in the BIOS Setup.

### 5.3.3 AI Audio 2 (SoundMAX® High Definition Audio utility)

The ADI AD1988 High Definition Audio CODEC provides 8-channel audio capability through the SoundMAX® audio utility with AudioESP™ software to deliver the ultimate audio experience on your PC. The software implements high quality audio synthesis/rendering, 3D sound positioning, and advanced voice-input technologies.

Follow the installation wizard to install the ADI AD1988 Audio Driver from the support DVD that comes with the motherboard package to activate the SoundMAX® audio utility.

You must use 4-channel, 6-channel or 8-channel speakers for this setup.

If the SoundMAX® audio utility is correctly installed, you will find the SoundMAX®/ SoundMAX® BlackHawk icon on the taskbar.

## A. SoundMAX BlackHawk (AI Audio 2)

If you are using Windows Vista™ operating system, from the taskbar, double-click on the SoundMAX® BlackHawk icon to display the SoundMAX® control panel.



### *Enabling AI Audio 2*

Click the power button  to activate digital signal processing. AI Audio 2, with the new SoundMAX® BlackHawk by Sonic Focus, brings you more multi-media enjoyment.

**Fidelity Compensation**
After you click the power button, the utility will compensate for the fidelity lost in the compression process and make the audio output quasi-original when reverting the compressed audio streams back to the uncompressed condition.

**Sound Field Expansion**
AI Audio 2 also expands the stereophonic sound field to a multi-channel one with realistic front and rear environment.

**Surround Virtualization**
Activating this function virtualizes surround sound with the vocal clarity added for use with stereo speakers or headphones.

> SoundMAX BlackHawk (AI Audio2) is available only under the Windows® Vista™ operating system.

*Playback Settings*

To configure the playback settings, click the **Playback** button on the control panel. You can adjust the volume of the **Speakers** and **SPDIF Interface** or mute the audio.

**Preset settings**

Click and expand the drop-down menu to select your preferred Digital Signal Processing (DSP) preset. Move the sliders to customize the values of **Voice Clarity**, **Dynamics**, **Brilliance**, and **Deep Bass** of each preset. Click Save to save the changes to the current preset. Or, click **Reset** to discard the changes and restore the preset to the factory defaults.

**Surround settings**

Allows you to change the settings of the stereo speakers. Move the sliders to change the listener position or adjust the center channel volume. Press the **Test Speakers** button to perform speaker test.

**Port settings**

Click this port settings tab to display the rear panel ports configuration for the speakers or rear panel digital port configuration for the SPDIF interface.
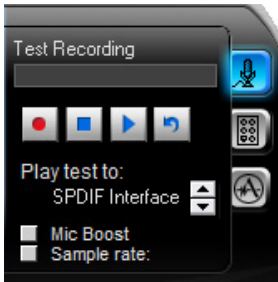
*Recording Settings*

To change the recording settings, click the **Recording** button on the control panel. You can adjust the speaker delay of **Microphone** or **Line In** by moving the slider rightward or leftward.

**Record testing**
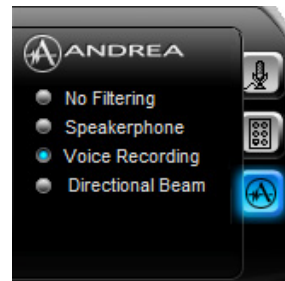Click the tab to perform test recording and play the test sample through the speakers or the SPDIF interface.

**Port settings**
Click the tab to display the rear panel ports for Microphone or Line In.

**ANDREA settings**
Allows you to select an enhanced microphone input features, including **No Filtering**, **Speakerphone**, **Voice Recording**, and **Directional Beam**.

*More Settings*

Click for the further configurations.

**Equalizer**
Allows you to configure and customize all the DSP presets frequencies.

**Speakers**

Allows you to adjust the **Speaker Trim** and **Speaker Delay**.



**Bass**

Allows you to do the Bass management.



**Preferences**

Displays the preference options for this utility, version information, AudioESP, etc.

## B. SoundMAX

If you are using Windows XP operating system, from the taskbar, double-click on the SoundMAX® icon to display the SoundMAX® Control Panel.



*Audio Setup Wizard*

By clicking the [icon] icon from the SoundMAX® control panel, you can easily configure your audio settings. Simply follow the succeeding screen instructions and begin enjoying High Definition Audio.

*Jack configuration*
This screen helps you configure
your computer's audio ports,
depending on the audio devices
you have installed.

*Adjust speaker volume*
This screen helps you adjust
speaker volume. Click the **Test**
button to hear the changes you
have made.





*Adjust microphone volume*
This screen helps you adjust microphone volume. You will be asked to read
pre-written text to allow the AudioWizard to adjust the volume as you speak.

*Audio preferences*

Click the ⬥ icon to go to the Preferences page. This page allows you to change various audio settings.

*General options*
Click the General tab to choose your playback and recording devices, enable/disable the AudioESP™ feature, and enable/disable digital output.
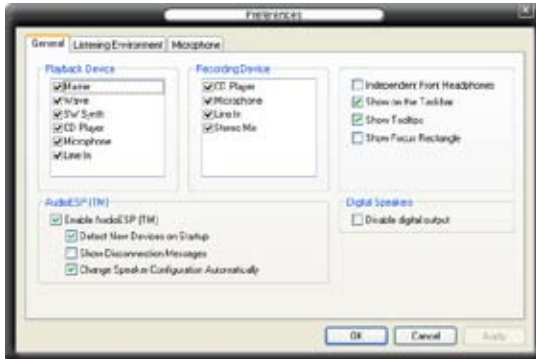


*Listening Environment options*
Click the Listening Environment tab to set up your speaker, acoustic environment, and enable/disable the Virtual Theater Surround function.
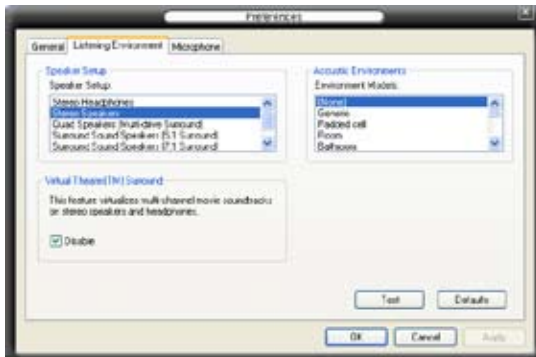
*Microphone options*
Click the Microphone tab allows you to optimize your microphone input settings.

### 5.3.4 ASUS PC Probe II

PC Probe II is a utility that monitors the computer's vital components, and detects and alerts you of any problem with these components. PC Probe II senses fan rotations, CPU temperature, and system voltages, among others. Because PC Probe II is software-based, you can start monitoring your computer the moment you turn it on. With this utility, you are assured that your computer is always at a healthy operating condition.

### Installing PC Probe II

To install PC Probe II on your computer:

1. Place the support DVD to the optical drive. The Drivers installation tab appears if your computer has an enabled Autorun feature.

> If Autorun is not enabled in your computer, browse the contents of the support DVD to locate the setup.exe file from the ASUS PC Probe II folder. Double-click the **setup.exe** file to start installation.

2. Click the **Utilities** tab, then click **ASUS PC Probe II**.
3. Follow the screen instructions to complete installation.

### Launching PC Probe II

You can launch the PC Probe II right after installation or anytime from the Windows® desktop.

To launch the PC Probe II from the Windows® desktop, click **Start > All Programs > ASUS > PC Probe II > PC Probe II v1.xx.xx**. The PC Probe II main window appears.

After launching the application, the PC Probe II icon appears in the Windows® taskbar. Click this icon to close or restore the application.

### Using PC Probe II

*Main window*
The PC Probe II main window allows you to view the current status of your system and change the utility configuration. By default, the main window displays the Preference section. You can close or restore the Preference section by clicking on the triangle on the main window right handle.

**Click to close the Preference panel**

---

| Button | Function |
|---|---|
| CONFIG | Opens the Configuration window |
| | Opens the Report window |
| DMI | Opens the Desktop Management Interface window |
| PCI | Opens the Peripheral Component Interconnect window |
| WMI | Opens the Windows Management Instrumentation window |
| USAGE | Opens the hard disk drive, memory, CPU usage window |
| ◁▷ | Shows/Hides the Preference section |
| ⊖ | Minimizes the application |
| ⊗ | Closes the application |

*Sensor alert*
When a system sensor detects a problem, the main window right handle turns red, as the illustrations below show.



When displayed, the monitor panel for that sensor also turns red. Refer to the Monitor panels section for details.

## Preferences

You can customize the application using the Preference section in the main window. Click the box before each preference to activate or deactivate.
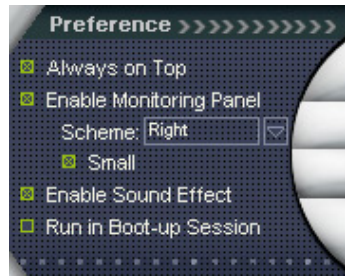
## Hardware monitor panels

The hardware monitor panels display the current value of a system sensor such as fan rotation, CPU temperature, and voltages.

The hardware monitor panels come in two display modes: hexagonal (large) and rectangular (small). When you check the Enable Monitoring Panel option from the Preference section, the monitor panels appear on your computer's desktop.

**Large display**

**Small display**

*Changing the monitor panels position*
To change the position of the monitor panels in the desktop, click the arrow down button of the Scheme options, then select another position from the list box. Click OK when finished.

*Moving the monitor panels*
All monitor panels move together using a magnetic effect. If you want to detach a monitor panel from the group, click the horseshoe magnet icon. You can now move or reposition the panel independently.
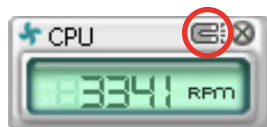
*Adjusting the sensor threshold value*
You can adjust the sensor threshold value in the monitor panel by clicking the  or  buttons. You can also adjust the threshold values using the Config window.

You cannot adjust the sensor threshold values in a small monitoring panel.

**Click to increase value**

**Click to decrease value**
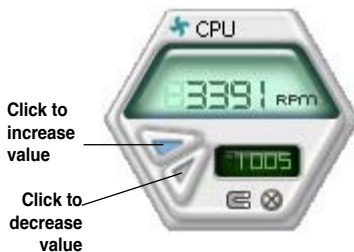
*Monitoring sensor alert*

The monitor panel turns red when a component value exceeds or is lower than the threshold value. Refer to the illustrations below.



**Large display**



**Small display**

## WMI browser

Click to display the WMI (Windows Management Instrumentation) browser. This browser displays various Windows® management information. Click an item from the left panel to display on the right panel. Click the plus sign (+) before WMI Information to display the available information.



You can enlarge or reduce the browser size by dragging the bottom right corner of the browser.

## DMI browser

Click to display the DMI (Desktop Management Interface) browser. This browser displays various desktop and system information. Click the plus sign (+) before DMI Information to display the available information.

**PCI browser**

Click PCI to display the PCI
(Peripheral Component Interconnect)
browser. This browser provides
information on the PCI devices installed
on your system. Click the plus sign
(+) before the PCI Information item to
display available information.

**Usage**

The Usage browser displays real-time information on the CPU, hard disk drive
space, and memory usage. Click USAGE to display the Usage browser.

*CPU usage*
The CPU tab displays real-
time CPU usage in line graph
representation. If the CPU has
an enabled Hyper-Threading,
two separate line graphs display
the operation of the two logical
processors.
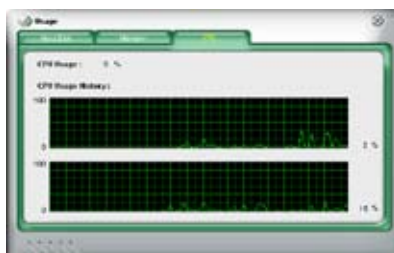
*Hard disk drive space usage*
The Hard Disk tab displays the
used and available hard disk
drive space. The left panel of the
tab lists all logical drives. Click
a hard disk drive to display the
information on the right panel.
The pie chart at the bottom of
the window represents the used
(blue) and the available HDD
space.
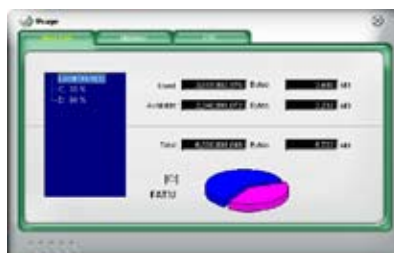
*Memory usage*
The Memory tab shows both used and available physical memory. The pie chart at the bottom of the window represents the used (blue) and the available physical memory.

## Configuring PC Probe II

Click [CONFIG] to view and adjust the sensor threshold values.

The Config window has two tabs: Sensor/Threshold and Preference. The Sensor/Threshold tab enables you to activate the sensors or to adjust the sensor threshold values. The Preference tab allows you to customize sensor alerts, or change the temperature scale.
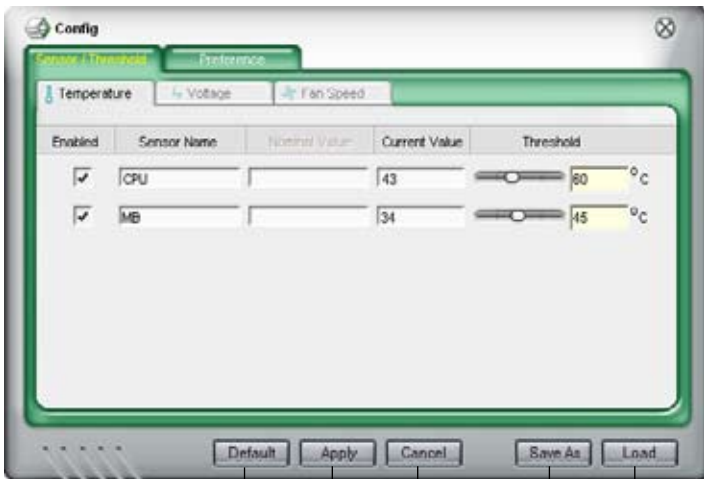
**Loads the default threshold values for each sensor**

**Applies your changes**

**Cancels or ignores your changes**

**Loads your saved configuration**

**Saves your configuration**

### 5.3.5 ASUS AI Suite

ASUS AI Suite allows you to launch AI Gear 3, AI Booster, AI Nap, Q-Fan 2, and CPU Level Up utilities easily.

Install the **ASUS EPU + AI Gear 3 Driver** before the ASUS AI Suite utility. Otherwise, ASUS AI Suite will not function properly.

### Installing AI Suite

To install AI Suite on your computer:

1. Place the support DVD to the optical drive. The Drivers installation tab appears if your computer has an enabled Autorun feature.
2. Click the Utilities tab, then click **AI Suite**.
3. Follow the screen instructions to complete installation.

### Launching AI Suite

You can launch AI Suite right after installation or anytime from the Windows® desktop.

To launch AI Suite from the Windows® desktop, click **Start** > **All Programs** > **ASUS** > **AI Suite** > **AI Suite v1.xx.xx**. The AI Suite main window appears.

After launching the application, the AI Suite icon appears in the Windows® taskbar. Click this icon to close or restore the application.

### Using AI Suite

Click the AI Gear 3, AI Nap, AI Booster, Q-Fan 2, or CPU Level Up icon to launch the utility, or click the Normal icon to restore the system to normal state.

Press to restore to normal

Press to launch AI Gear 3

Press to launch AI Booster

Press to launch AI Nap

Press to launch CPU Level Up

Press to launch Q-Fan 2
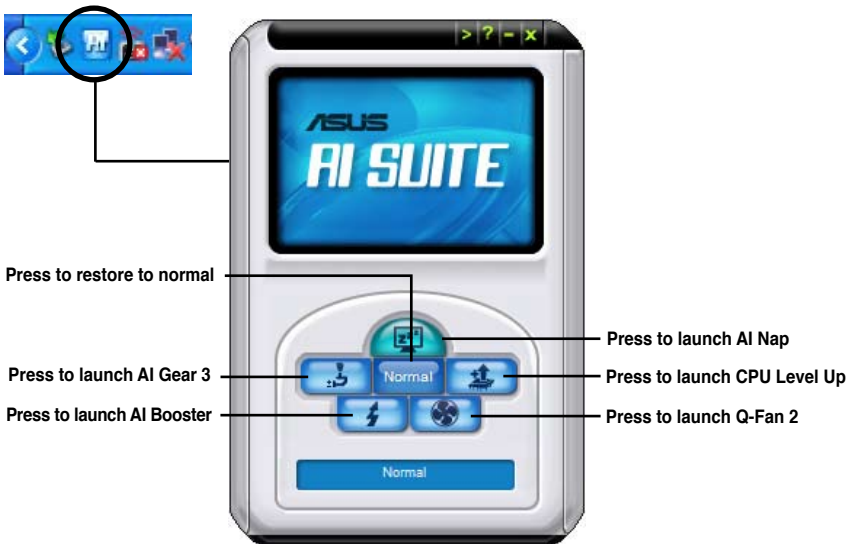
Other feature buttons

Click ![>] on right corner of the main window to open the monitor window.



**Displays the CPU/ system temperature, CPU/memory/PCIE voltage, and CPU/ chassis fan speed**

**Displays the FSB/CPU frequency**
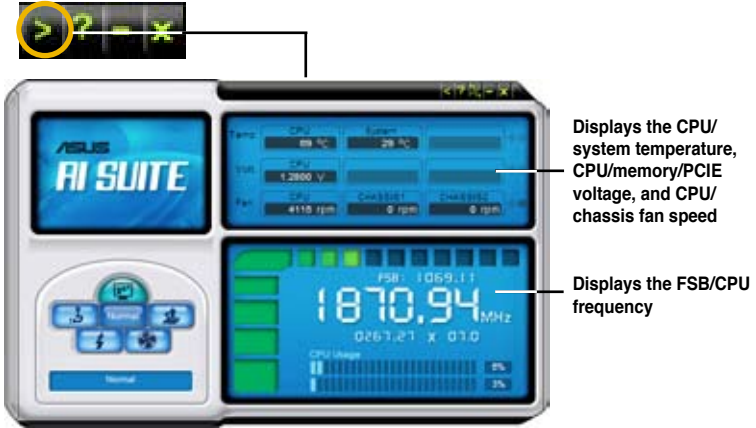
Click ![°C/°F] on right corner of the expanded window to switch the temperature from degrees Centigrade to degrees Fahrenheit.

### 5.3.6 ASUS EPU Utility—AI Gear 3

ASUS AI Gear 3 is a utility designed to configure and support all ASUS Energy Processing Unit (EPU) features. This easy-to-use utility provides four system performance profiles that adjust the processor frequency and vCore voltage for different computing needs.

After installing ASUS AI Suite from the bundled support DVD, you can launch ASUS AI Gear 3 by double-clicking the AI Suite icon on your Windows OS taskbar and then click the AI Gear 3 button on the AI Suite main window.

Here are some simple ways to use AI Gear 3:

- Click the four gear mode buttons below, including **Turbo**, **High Performance**, **Medium Power Saving**, and **Max. Power Saving**, or shift the gear to the performance setting that you like.
- Click **Calibration** first, and switch to **Auto** mode to have AI Gear 3 automatically adjust the system performance according to the CPU loading.
- Under **Auto** mode, click **Settings** to set the time for the system to enter AI Nap mode.



Calibration

Auto Mode

Settings

Turbo Mode

High Performance Mode

Medium Power Saving Mode

Max Power Saving Mode
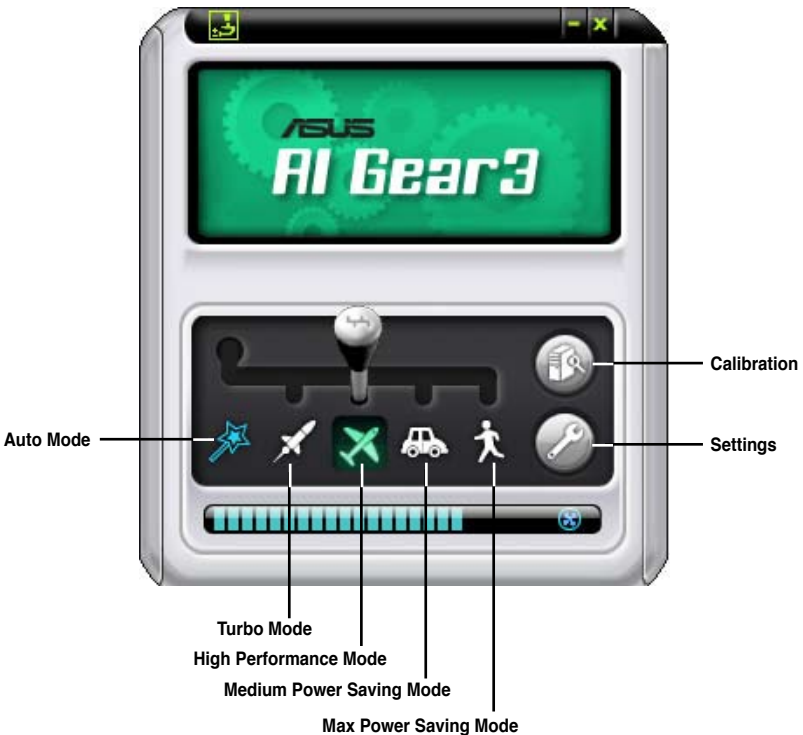
### 5.3.7 ASUS AI Nap

This feature allows you to minimize the power consumption of your computer whenever you are away. Enable this feature for minimum power consumption and a quieter system operation.

After installing AI Suite from the bundled Support DVD, you can launch the utility by double-clicking the AI Suite icon on the Windows OS taskbar and click the AI Nap button on the AI Suite main window.

Click **Yes** on the confirmation screen.
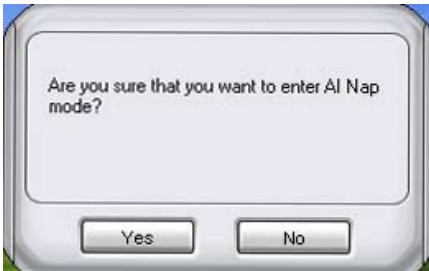


To exit AI Nap mode, press the system power or mouse button then click **Yes** on the confirmation screen.
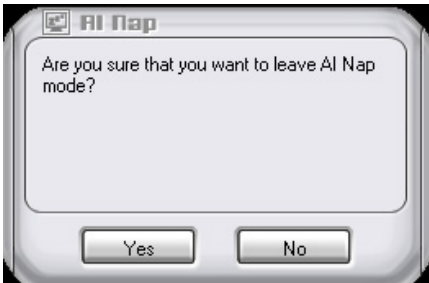


To switch the power button functions from AI Nap to shutting down, just right click the **AI Suite** icon on the OS taskbar, select **AI Nap** and click **Use power button**. Unclick the the item to switch the function back.

## 5.3.8    ASUS Q-Fan 2

This ASUS Q-Fan 2 Control feature allows you to set the appropriate performance level of the CPU Q-Fan 2 or the Chassis Q-Fan 2 for more efficient system operation. After enabling the Q-Fan 2 function, the fans can be set to automatically adjust depending on the temperature, to decrease fan speed, or to achieve the maximum fan speed.

After installing AI Suite from the bundled Support DVD, you can launch the utility by double-clicking the AI Suite icon on the Windows® OS taskbar and click the Q-Fan 2 button on the AI Suite mAIn window.

Click the drop-down menu button and display the fan names. Select **CPU Q-Fan** or **CHASSIS Q-Fan**. Click the **Enabled** box to activate this function.

**Enable Q-Fan 2 box**

**drop-down list button**

**Profile** list appears after clicking the **Enabled** box. Click the drop-down list button and select a profile. **Optimal** mode makes the fans adjust speed with the temperature; **Silent** mode minimizes fan speed for quiet fan operation; **Performance** mode boosts the fan to achieve maximal fan speed for the best cooling effect.

**click to display the drop-down list and select a Q-Fan 2 mode**
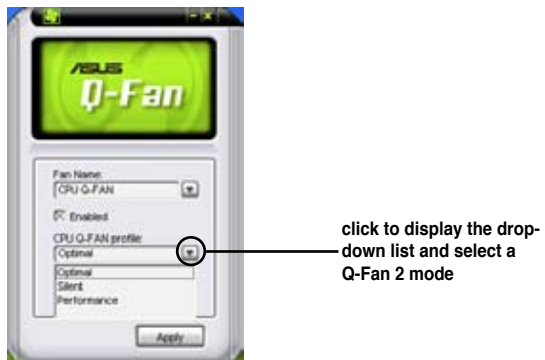
Click **Apply** at the bottom to save the setup.

### 5.3.9 ASUS AI Booster

The ASUS AI Booster application allows you to overclock the CPU speed in WIndows® environment without the hassle of booting the BIOS.

After installing AI Suite from the bundled Support DVD, you can launch the utility by double-clicking the AI Suite icon on the Windows® OS taskbar and click the AI Booster button on the AI Suite main window.
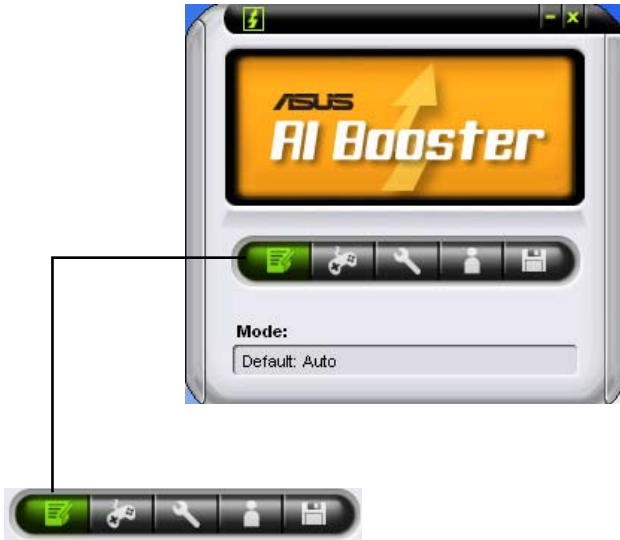


The options on the taskbar allow you to use the default settings, adjust CPU/Memory/PCI-E frequency manually, or create and apply your personal overclocking configurations.

## 5.3.10 CPU Level Up

The CPU Level Up application allows you to overclock immediately with OC profile presets in WIndows® environment without the hassle of booting the BIOS. This application provides comprehensive and detailed tuning to frequencies, voltagies, and even timings to create a real professional level of overclocking configuration.

After installing AI Suite from the bundled Support DVD, you can launch the utility by double-clicking the AI Suite icon on the Windows® OS taskbar and click the CPU Level Up button on the AI Suite main window.
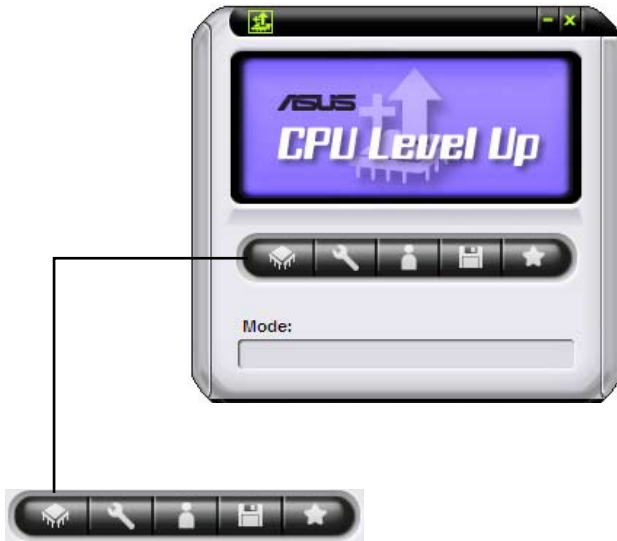


The options on the taskbar allow you to select the CPU level, adjust advanced CPU/Memory/PCI-E frequency, or create and apply your personal overclocking configurations.

# 5.4 RAID configurations

The motherboard comes with the Intel® ICH9R Southbridge RAID controller that allows you to configure IDE and Serial ATA hard disk drives as RAID sets.

## 5.4.1 RAID definitions

**RAID 0** (Data striping) optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

**RAID 1** (Data mirroring) copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

**RAID 10** is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 10 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

**RAID 5** stripes both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.

**Intel® Matrix Storage.** The Intel® Matrix Storage technology supported by the ICH9R chip allows you to create a RAID 0, RAID 1, RAID 5, and RAID 10 function to improve both system performance and data safety. You can also combine two RAID sets to get higher performance, capacity, or fault tolerance provided by the difference RAID function. For example, RAID 0 and RAID 1 set can be created by using only two identical hard disk drives.

> If you want to boot the system from a hard disk drive included in a created RAID set, copy first the RAID driver from the support DVD to a floppy disk/USB device before you install an operating system to the selected hard disk drive. Refer to section **5.5 Creating a RAID driver disk** for details.

## 5.4.2     Installing Serial ATA hard disks

The motherboard supports Serial ATA hard disk drives. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SATA hard disks for a RAID configuration:

1.    Install the SATA hard disks into the drive bays.
2.    Connect the SATA signal cables.
3.    Connect a SATA power cable to the power connector on each drive.

## 5.4.3     Intel® RAID configurations

This motherboard supports RAID 0, RAID 1, RAID 5, RAID 10 (0+1) and Intel® Matrix Storage configurations for Serial ATA hard disks drives through the Intel® ICH9R Southbridge chip.

### Setting the RAID item in BIOS

You must set the RAID item in the BIOS Setup before you can create a RAID set(s). To do this:

1.    Enter the BIOS Setup during POST.
2.    Go to the Main Menu, select IDE Configuration, then press <Enter>.
3.    Select the item Configure SATA As, then press <Enter> to display the configuration options.
4.    Select RAID from the Configure SATA As item options, then press <Enter>.
5.    Select the item Onboard Serial-ATA BOOTROM, press <Enter>, then select Enabled from the options.
6.    Save your changes, then exit the BIOS Setup.

Refer to the system or the motherboard user guide for details on entering and navigating through the BIOS Setup.

## Intel® Matrix Storage Manager Option ROM Utility

The Intel® Matrix Storage Manager Option ROM utility allows you to create RAID 0, RAID 1, RAID 10 (RAID 0+1), and RAID 5 set(s) from Serial ATA hard disk drives that are connected to the Serial ATA connectors supported by the Southbridge.

To enter the Intel® Application Accelerator RAID Option ROM utility:

1.    Install all the Serial ATA hard disk drives.

2.    Turn on the system.

3.    During POST, press <Ctrl+I> to display the utility main menu.

```
    Intel(R) Matrix Storage Manager Option ROM v5.0.0.1032 ICH9R wRAID5
       Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
    ===============================[ MAIN MENU ]===============================
                          1. Create RAID Volume
                          2. Delete RAID Volume
                          3. Reset Disks to Non-RAID
                          4. Exit


    =======================[ DISK/VOLUME INFORMATION ]=======================
     RAID Volumes:
     None defined.

     Physical Disks:
     Port Drive Model        Serial #            Size      Type/Status(Vol ID)
     0    XXXXXXXXXXX        XXXXXXXX            XX.XXGB   Non-RAID Disk
     1    XXXXXXXXXXX        XXXXXXXX            XX.XXGB   Non-RAID Disk
     2    XXXXXXXXXXX        XXXXXXXX            XX.XXGB   Non-RAID Disk
     3    XXXXXXXXXXX        XXXXXXXX            XX.XXGB   Non-RAID Disk




        [↑↓]-Select          [ESC]-Exit          [ENTER]-Select Menu
```

The navigation keys at the bottom of the screen allow you to move through the menus and select the menu options.

The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.

## Creating a RAID 0 set (striped)

To create a RAID 0 set:

1.  From the utility main menu, select 1. Create RAID Volume, then press
    <Enter>. This screen appears.

```
      Intel(R) Matrix Storage Manager Option ROM v5.0.0.1032 ICH9R wRAID5
            Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
    ═══════════════════════════[ CREATE ARRAY MENU ]═══════════════════════════

                          Name:   Volume0
                    RAID Level:    RAID0(Stripe)
                         Disks:    Select Disks
                    Strip Size:    128KB
                      Capacity:    0.0    GB


                              Create Volume


    ═══════════════════════════[ DISK/VOLUME INFORMATION ]══════════════════════



          Enter a string between 1 and 16 characters in length that can be used
         to uniquely identify the RAID volume. This name is case sensitive and
                          cannot contain special characters.




       [↑↓]-Change     [TAB]-Next     [ESC]-Previous Menu     [Enter]-Select
```

2.  Enter a name for the RAID 0 set, then press <Enter>.
3.  When the RAID Level item is highlighted, press the up/down arrow key to
    select RAID 0(Stripe), then press <Enter>.
4.  When the Disks item is highlighted, press <Enter> to select the hard disk
    drives to configure as RAID. This pop-up screen appears.

```
                        ═════════════[ SELECT DISKS ]═════════════
    Port Drive Model          Serial #            Size Status
        0 XXXXXXXXXXXX         XXXXXXXX           XX.XGB Non-RAID Disk
        1 XXXXXXXXXXXX         XXXXXXXX           XX.XGB Non-RAID Disk
        2 XXXXXXXXXXXX         XXXXXXXX           XX.XGB Non-RAID Disk
        3 XXXXXXXXXXXX         XXXXXXXX           XX.XGB Non-RAID Disk


              Select 2 to 4 disks to use in creating the volume.

    ═[↑↓]-Previous/Next  [SPACE]-Selects  [ENTER]-Selection Complete═
```

5.  Use the up/down arrow key to highlight a drive, then press <Space> to
    select. A small triangle marks the selected drive. Press <Enter> after
    completing your selection.

6. Use the up/down arrow key to select the stripe size for the RAID 0 array, then press <Enter>. The available stripe size values range from 4 KB to 128 KB. The default stripe size is 128 KB.

TIP: We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

7. Key in the RAID volume capacity that you want, then press <Enter>. The default value indicates the maximum allowed capacity.

8. Press <Enter> when the Create Volume item is highlighted. This warning message appears.

WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.

Are you sure you want to create this volume? (Y/N):

9. Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the Create Volume menu.

## Creating a RAID 1 set (mirrored)

To create a RAID 1 set:

1. From the utility main menu, select 1. Create RAID Volume, then press <Enter>. This screen appears.

```
        Intel(R) Matrix Storage Manager Option ROM v5.0.0.1032 ICH9R wRAID5
            Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
    ════════════════════════[ CREATE ARRAY MENU ]════════════════════════

                      Name:   Volume1
                RAID Level:   RAID1(Mirror)
                     Disks:   Select Disks
                Strip Size:   N/A
                  Capacity:   XX.X  GB

                             Create Volume


    ══════════════════════[ DISK/VOLUME INFORMATION ]═════════════════════



        Enter a string between 1 and 16 characters in length that can be used
        to uniquely identify the RAID volume. This name is case sensitive and
                         cannot contain special characters.




        [↑↓]-Change     [TAB]-Next      [ESC]-Previous Menu      [Enter]-Select
```

2. Enter a name for the RAID 1 set, then press <Enter>.

3. When the RAID Level item is highlighted, press the up/down arrow key to select RAID 1(Mirror), then press <Enter>.

4. When the Capacity item is highlighted, key in the RAID volume capacity that you want, then press <Enter>. The default value indicates the maximum allowed capacity.

5. Press <Enter> when the Create Volume item is highlighted. This warning message appears.

```
            WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.

        Are you sure you want to create this volume? (Y/N):
```

6. Press <Y> to create the RAID volume and return to main menu or <N> to go back to Create Volume menu.

## Creating a RAID 10 set (RAID 0+1)

To create a RAID 10 set:

1.  From the utility main menu, select 1. Create RAID Volume, then press
    <Enter>. This screen appears.

```
    Intel(R) Matrix Storage Manager Option ROM v5.0.0.1032 ICH9R wRAID5
         Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
    ══════════════════════[ CREATE ARRAY MENU ]══════════════════════

                       Name:   Volume10
                 RAID Level:   RAID10(RAID0+1)
                      Disks:   Select Disks
                 Strip Size:   128KB
                   Capacity:   XXX.X GB

                             Create Volume


    ═══════════════════[ DISK/VOLUME INFORMATION ]═══════════════════


       Enter a string between 1 and 16 characters in length that can be used
       to uniquely identify the RAID volume. This name is case sensitive and
                       cannot contain special characters.



    [↑↓]-Change    [TAB]-Next     [ESC]-Previous Menu     [Enter]-Select
```
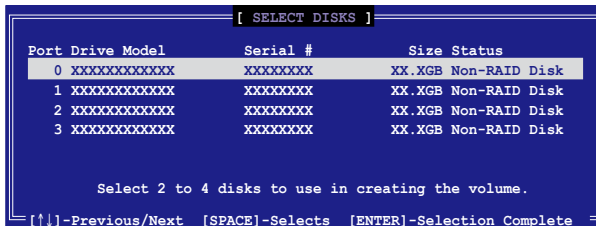
2.  Enter a name for the RAID 10 set, then press <Enter>.

3.  When the RAID Level item is highlighted, press the up/down arrow key to
    select RAID 10 (RAID 0+1), then press <Enter>.

4.  When the Stripe Size item is highlighted, press the up/down arrow key to
    select the stripe size for the RAID 10 array, then press <Enter>. The available
    stripe size values range from 4 KB to 128 KB. The default stripe size is 64
    KB.
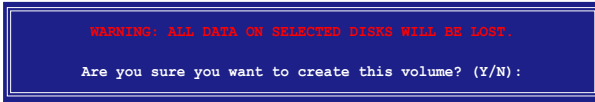
    ✎   TIP: We recommend a lower stripe size for server systems, and a higher stripe
        size for multimedia computer systems used mainly for audio and video editing.

5.  Key in the RAID volume capacity that you want then press <Enter> when
    the Capacity item is highlighted. The default value indicates the maximum
    allowed capacity.

6.    Press <Enter> when the Create Volume item is highlighted. This warning
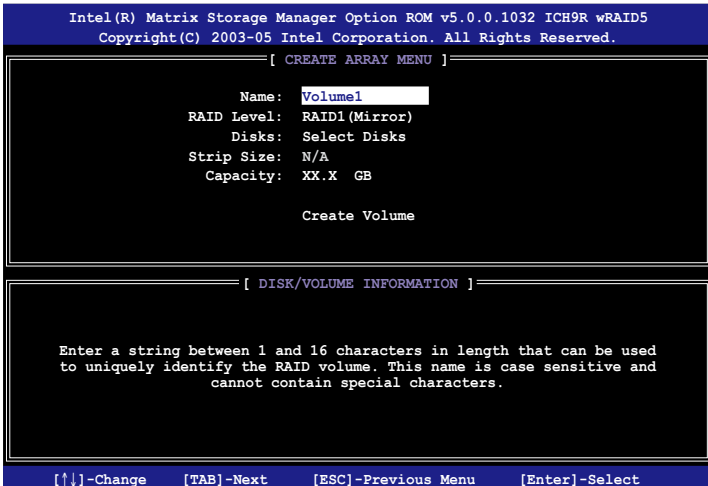      message appears.

```
WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.

Are you sure you want to create this volume? (Y/N):
```

7.    Press <Y> to create the RAID volume and return to the main menu or <N> to
      go back to the Create Volume menu.

## Creating a RAID 5 set (parity)

To create a RAID 5 set:

1.    From the utility main menu, select 1. Create RAID Volume, then press
      <Enter>. This screen appears.

```
Intel(R) Matrix Storage Manager Option ROM v5.0.0.1032 ICH9R wRAID5
        Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
=============================[ CREATE ARRAY MENU ]=============================

                  Name:    Volume5
            RAID Level:    RAID5(Parity)
                 Disks:    Select Disks
            Strip Size:    64KB
              Capacity:    0.0  GB

                          Create Volume


========================[ DISK/VOLUME INFORMATION ]========================



        Enter a string between 1 and 16 characters in length that can be used
        to uniquely identify the RAID volume. This name is case sensitive and
                        cannot contain special characters.



   [↑↓]-Change      [TAB]-Next      [ESC]-Previous Menu      [Enter]-Select
```

2.    Enter a name for the RAID 5 set, then press <Enter>.
3.    When the RAID Level item is highlighted, press the up/down arrow key to
      select RAID 5(Parity), then press <Enter>.

4.    The Disks item is highlighted, press <Enter> to select the hard disk drives to
      configure as RAID. The following pop-up screen appears.

```
╔══════════════════[ SELECT DISKS ]═══════════════════╗

   Port Drive Model          Serial #          Size Status
     0 XXXXXXXXXXXX          XXXXXXXX          XX.XGB Non-RAID Disk
     1 XXXXXXXXXXXX          XXXXXXXX          XX.XGB Non-RAID Disk
     2 XXXXXXXXXXXX          XXXXXXXX          XX.XGB Non-RAID Disk
     3 XXXXXXXXXXXX          XXXXXXXX          XX.XGB Non-RAID Disk


         Select 2 to 4 disks to use in creating the volume.

╚═[↑↓]-Previous/Next  [SPACE]-Selects  [ENTER]-Selection Complete═╝
```
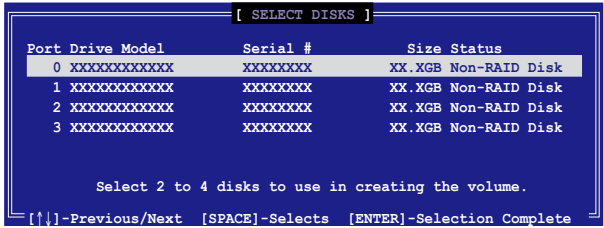
5.    Use the up/down arrow key to highlight the drive you want to set, then press
      <Space> to select.  A small triangle marks the selected drive. Press <Enter>
      after completing your selection.

6.    When the Stripe Size item is highlighted, press the up/down arrow key
      to select the stripe size for the RAID 5 array, then press <Enter>.
      The available stripe size values range from 4 KB to 128 KB. The default stripe
      size is 64 KB.

      TIP: We recommend a lower stripe size for server systems, and a higher stripe
      size for multimedia computer systems used mainly for audio and video editing.

7.    Key in the RAID volume capacity that you want, then press <Enter> when
      the Capacity item is highlighted. The default value indicates the maximum
      allowed capacity.

8.    Press <Enter> when the Create Volume item is highlighted. This warning
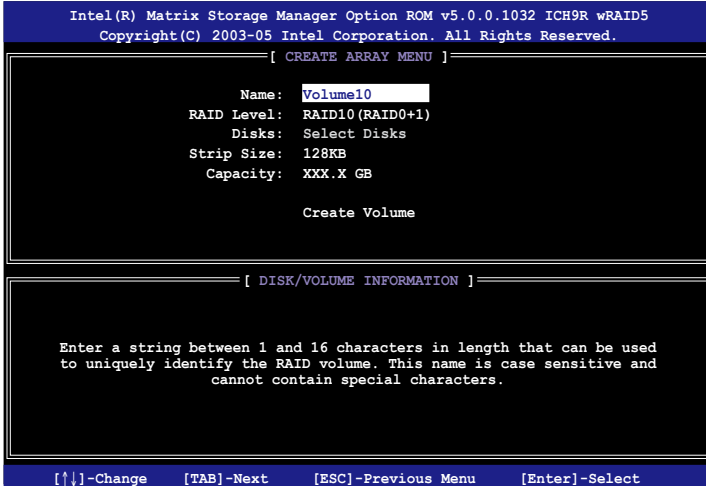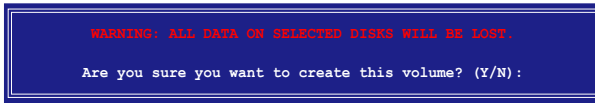      message appears.

```
╔═══════════════════════════════════════════════════════╗

          WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.

        Are you sure you want to create this volume? (Y/N):

╚═══════════════════════════════════════════════════════╝
```

9.    Press <Y> to create the RAID volume and return to the main menu or <N> to
      go back to the Create Volume menu.

## 5.4.4 JMicron® RAID Configuration

The JMicron® Serial ATA controller allows you to configure RAID 0, RAID 1 and JBOD sets on the external Serial ATA hard disk drives.

### Before creating a RAID set

Prepare the following items:

1. Two SATA HDDs, preferably with the same model and capacity.
2. A write-enabled floppy disk (Windows XP). A write-enabled floppy disk or a USB flash disk drive (Windows Vista)
3. Microsoft® Windows® OS installation disk (Windows XP/Windows Vista)
4. Motherboard support DVD with JMB363 driver

Complete the following steps before you create a RAID set:

1. Install two external Serial ATA hard disk drives on your system.
2. Set the **Controller Mode** item in the BIOS to [RAID]. See section **4.5.3 Onboard Devices Configuration** for details.

```
                        BIOS SETUP UTILITY
                  Advanced

  Onboard Device Configuration                        Enable or Disable
                                                      High Definition Audio
                                                      Controller
  High Definition Audio          [Enabled]
    Front Panel Type             [HD Audio]
  J-Micron PATA/SATA Controller  [Enabled]
    Controller Mode              [IDE]
    JMicron SATA/RAID OptRom     [Enabled]
  Marvell GigaBit LAN 1          [Enabled]
    LAN Boot ROM                 [Disabled]
  Marvell GigaBit LAN 2          [Enabled]
    LAN Boot ROM                 [Disabled]
  VIA 1394                       [Enabled]         ←→   Select Screen
  LCD Poster Backlight           [Disabled]        ↑↓   Select Item
  LCD Poster Off                 [Disabled]        +-   Change Option
  ROG LOGO LIGHT                 [Turn On]         F1   General Help
                                                   F10  Save and Exit
                                                   ESC  Exit

           v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.
```

3. Enter the JMB363 RAID BIOS utility to set up your RAID configuration.
4. Create a JMB363 RAID driver disk for Windows® OS installation. See section **5.5 Creating a RAID driver disk** for details.
5. Install the JMB363 driver after the Windows® OS had been installed.

Always install the JMB363 driver before creating RAID sets.

## Entering the JMB363 RAID BIOS utility

1.    During POST, press <Ctrl-J> to enter the JBM363 RAID BIOS menu.

```
JMicron Technology Corp. PCI-to-SATA II/IDE RAID Controller BIOS v0.97
Copyright (C) 2004-2005 JMicron Technology        http://www. jmicron.com


    HDD0 : HDS722516VLSA80                          164 GB Non-RAID
    HDD1 : HDS722516DLA380                          164 GB Non-RAID


Press <Ctrl-J> to enter RAID Setup Utility...
```

2.    The main JMB363 RAID BIOS menu appears.
3.    Use the arrow keys to move the color bar and navigate through the items.

```
JMicron Technology Corp. PCI-to-SATA II/IDE RAID Controller BIOS v0.97
  [Main Menu]                  [Hard Disk Drive List]
    Create RAID Disk Drive            Model Name     Capacity   Type/Status
    Delete RAID Disk Drive    HDD0: HDS722516VLSA80  164 GB     Non-RAID
    Revert HDD to Non-RAID    HDD1: HDS722516DLA380  164 GB     Non-RAID
    Solve Mirror Conflict
    Rebuild Mirror Drive
    Save and Exit Setup
    Exit Without Saving


  [RAID Disk Drive List]





  [←→ TAB]-Switch Window  [↑↓]-Select Item    [ENTER]-Action   [ESC]-Exit
```
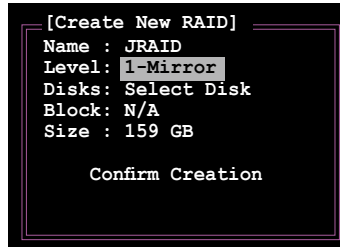
## Creating a RAID set
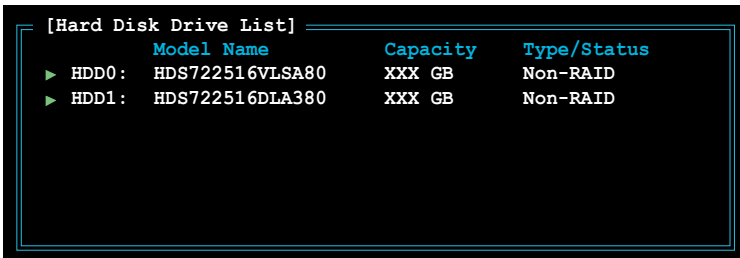
1.    In the main JMB363 RAID BIOS menu, highlight Create RAID Disk Drive
      using the up/down arrow key then press <Enter>.

```
    [Main Menu]
    Create RAID Disk Drive
    Delete RAID Disk Drive
    Revert HDD to Non-RAID
    Solve Mirror Conflict
    Rebuild Mirror Drive
    Save and Exit Setup
    Exit Without Saving
```
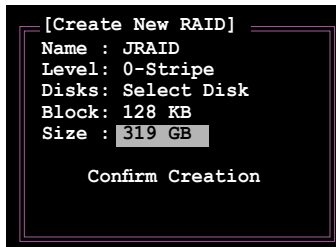
2. When the Level item is highlighted, use the up/down arrow key to select the RAID set that you want to create.

```
┌─[Create New RAID]─┐
│ Name : JRAID      │
│ Level: 0-Stripe   │
│ Disks: Select Disk│
│ Block: 128 KB     │
│ Size : 319 GB     │
│                   │
│    Confirm Creation│
│                   │
└───────────────────┘
```

```
┌─[Create New RAID]─┐
│ Name : JRAID      │
│ Level: 1-Mirror   │
│ Disks: Select Disk│
│ Block: N/A        │
│ Size : 159 GB     │
│                   │
│    Confirm Creation│
│                   │
└───────────────────┘
```

3. When the Disks item is highlighted, use the up/down arrow key to highlight an HDD that you want to belong to the RAID set, then press the space bar to confirm selection. Repeat the process until the HDDs are selected.

   A selected HDD shows a ▶ sign before it.

```
┌─[Hard Disk Drive List]─────────────────────────────┐
│          Model Name      Capacity    Type/Status    │
│  ▶ HDD0:  HDS722516VLSA80  XXX GB      Non-RAID      │
│  ▶ HDD1:  HDS722516DLA380  XXX GB      Non-RAID      │
│                                                      │
│                                                      │
│                                                      │
│                                                      │
│                                                      │
└──────────────────────────────────────────────────────┘
```

4. Key in the RAID volume capacity. Use the up/down arrow to choose the block size. The default value indicates the maximum allowed capacity.

```
┌─[Create New RAID]─┐
│ Name : JRAID      │
│ Level: 0-Stripe   │
│ Disks: Select Disk│
│ Block: 128 KB     │
│ Size : 319 GB     │
│                   │
│    Confirm Creation│
│                   │
└───────────────────┘
```

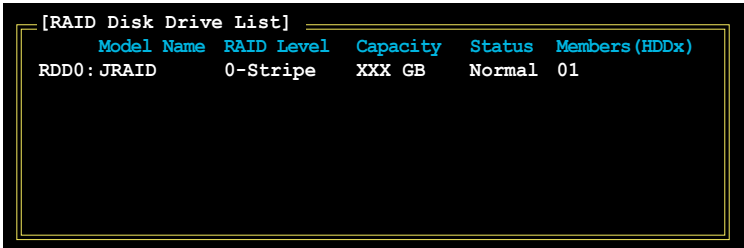5.    When done, press <Enter> to confirm the creation of the RAID set. A dialogue
      box appears to confirm the action. Press <Y> to confirm; otherwise, press
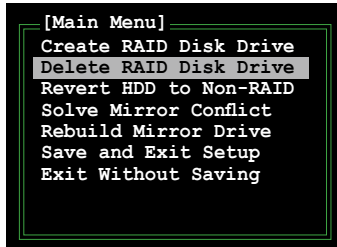      <N>.

```
  [Create New RAID]                [Hard Disk Drive List]

  Name: JRAID                         Model Name       Available    Type/Status
  Level: 0-Stripe               ► HDD0: HDS722516VLSA80  164 GB      Non-RAID
  Disks: Select Disk            ► HDD1: HDS722516DLA380  164 GB      Non-RAID
  Block: 128 KB
  Size : 319 GB

    Confirm Creation


  [RAID Disk Dr
                        Create RAID on the selected HDD (Y/N)? Y


                                         CONFIRM RAID CREATION
                                   ALL DATA ON THE SELECTED HARD DISK
                                   WILL BE LOST WHEN EXIT WITH SAVING



  [←→ TAB]-Switch Window  [↑↓]-Select Item       [ENTER]-Action    [ESC]-Exit
```
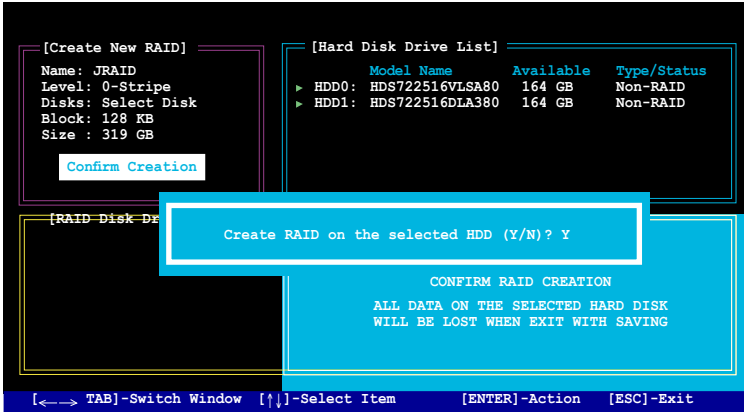
Pressing <Y> deletes all the data in the HDDs.

6.    The following screen appears, displaying the relevant information about the
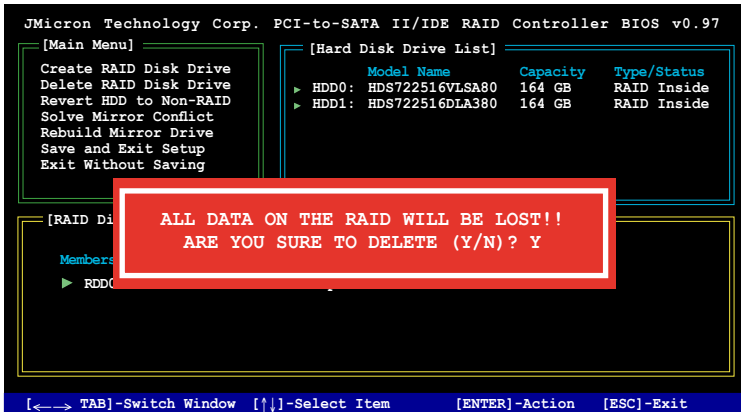      RAID set you created.

```
  [RAID Disk Drive List]

        Model Name   RAID Level   Capacity   Status   Members(HDDx)
  RDD0:JRAID          0-Stripe     XXX GB    Normal    01
```

## Deleting a RAID set

1. In the main JMB363 RAID BIOS menu, highlight Delete RAID Disk Drive using the up/down arrow key then press <Enter>.

```
┌─[Main Menu]─────────────┐
│ Create RAID Disk Drive  │
│ Delete RAID Disk Drive  │
│ Revert HDD to Non-RAID  │
│ Solve Mirror Conflict   │
│ Rebuild Mirror Drive    │
│ Save and Exit Setup     │
│ Exit Without Saving     │
└─────────────────────────┘
```

2. Use the space bar to select the RAID set you want to delete.

   A selected set shows a ▶ sign before it. Press the <Del> key to delete the set.

3. A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N>.

```
JMicron Technology Corp. PCI-to-SATA II/IDE RAID Controller BIOS v0.97
┌─[Main Menu]──────────┐ ┌─[Hard Disk Drive List]────────────────────────────┐
│ Create RAID Disk Drive│ │         Model Name        Capacity    Type/Status │
│ Delete RAID Disk Drive│ │ ► HDD0: HDS722516VLSA80   164 GB      RAID Inside │
│ Revert HDD to Non-RAID│ │ ► HDD1: HDS722516DLA380   164 GB      RAID Inside │
│ Solve Mirror Conflict │ │                                                    │
│ Rebuild Mirror Drive  │ │                                                    │
│ Save and Exit Setup   │ │                                                    │
│ Exit Without Saving   │ │                                                    │
└──────────────────────┘ └───────────────────────────────────────────────────┘
┌─[RAID Di┌──────────────────────────────────────────────┐
│         │   ALL DATA ON THE RAID WILL BE LOST!!         │
│  Members│    ARE YOU SURE TO DELETE (Y/N)? Y            │
│  ► RDD0 └──────────────────────────────────────────────┘
│
│
└──────────────────────────────────────────────────────────────────────────────┘
[◄──► TAB]-Switch Window  [↑↓]-Select Item      [ENTER]-Action    [ESC]-Exit
```

> Pressing <Y> deletes all the data in the HDDs.

## Resetting disks to non-RAID

⚠️

· An HDD that has been previously configured as part of another RAID set in another platform is called a broken RAID HDD. When you install a broken RAID HDD, you cannot select this HDD when configuring a RAID set through the JMB363 utility.

· If you still want to use this broken RAID HDD as part of the RAID set configured through the JMB363, you may do so by resetting the disk to non-RAID. You will, however, lose all data and previous RAID configurations.

To reset disks to non-RAID:

1. In the main JMB363 RAID BIOS menu, highlight Revert HDD to non-RAID using the up/down arrow key then press <Enter>.

```
         [Main Menu]
   Create RAID Disk Drive
   Delete RAID Disk Drive
   Revert HDD to Non-RAID
   Solve Mirror Conflict
   Rebuild Mirror Drive
   Save and Exit Setup
   Exit Without Saving
```

2. Use the space bar to select the HDD that you want to reset to non-RAID.

   A selected HDD shows a ▶ sign before it.

3. A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N>.

✎

Pressing <Y> deletes all the data in the HDD.

## Solving a Mirror conflict

A Mirror conflict occurs when both disks in a RAID 1 (Mirror) configuration are unplugged from the system in turn, then plugged in again. Since both disks contain exactly the same data, the system will be unable to determine which of the two is the source drive. This option allows you to set the source drive and rebuild the Mirror drive according to the contents of the source drive.
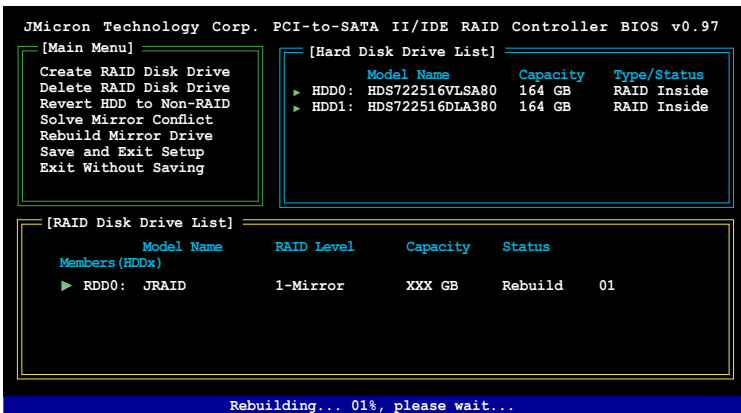
To solve a Mirror conflict:

1.  In the main JMB363 RAID BIOS menu, highlight Solve Mirror Conflict using the up/down arrow key then press <Enter>.

```
┌─ [Main Menu] ────────────┐
│ Create RAID Disk Drive   │
│ Delete RAID Disk Drive   │
│ Revert HDD to Non-RAID   │
│ Solve Mirror Conflict    │
│ Rebuild Mirror Drive     │
│ Save and Exit Setup      │
│ Exit Without Saving      │
│                          │
└──────────────────────────┘
```
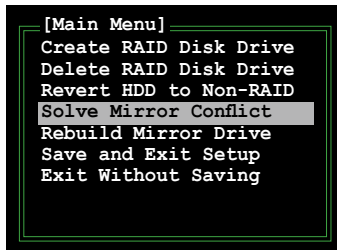
2.  Use the space bar to select the HDD that you want to set as source drive.

    The selected HDD shows a ▶ sign before it.

3.  Using the <TAB>, move to the RAID Disk Drive List menu and highlight the RAID set that you want to rebuild. Press <Del> to begin rebuilding the Mirror configuration.

    A status bar at the bottom of the screen shows the progress of the rebuilding.

```
 JMicron Technology Corp. PCI-to-SATA II/IDE RAID Controller BIOS v0.97
┌─ [Main Menu] ────────┐  ┌─ [Hard Disk Drive List] ──────────────────────┐
│ Create RAID Disk Drive│  │       Model Name      Capacity   Type/Status  │
│ Delete RAID Disk Drive│  │▶ HDD0: HDS722516VLSA80  164 GB   RAID Inside   │
│ Revert HDD to Non-RAID│  │▶ HDD1: HDS722516DLA380  164 GB   RAID Inside   │
│ Solve Mirror Conflict │  │                                               │
│ Rebuild Mirror Drive  │  │                                               │
│ Save and Exit Setup   │  │                                               │
│ Exit Without Saving   │  │                                               │
└───────────────────────┘  └───────────────────────────────────────────────┘

┌─ [RAID Disk Drive List] ──────────────────────────────────────────────────┐
│         Model Name     RAID Level    Capacity    Status                    │
│  Members(HDDx)                                                             │
│  ▶ RDD0: JRAID         1-Mirror      XXX GB      Rebuild    01             │
│                                                                            │
│                                                                            │
│                                                                            │
└────────────────────────────────────────────────────────────────────────────┘
          Rebuilding... 01%, please wait...
```
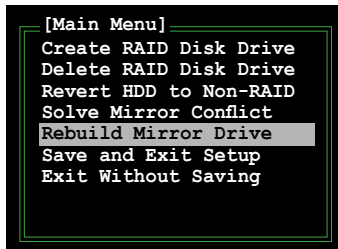
## Rebuilding a Mirror Drive

When one of the disks in a RAID 1 (Mirror) configuration is unplugged from the system, then plugged in again, a dialogue box appears to ask you to rebuild the Mirror drive. Press <Y> to confirm; otherwise, press <N>.

This option allows you to rebuild the Mirror drive later and synchronize the data between two hard disks.
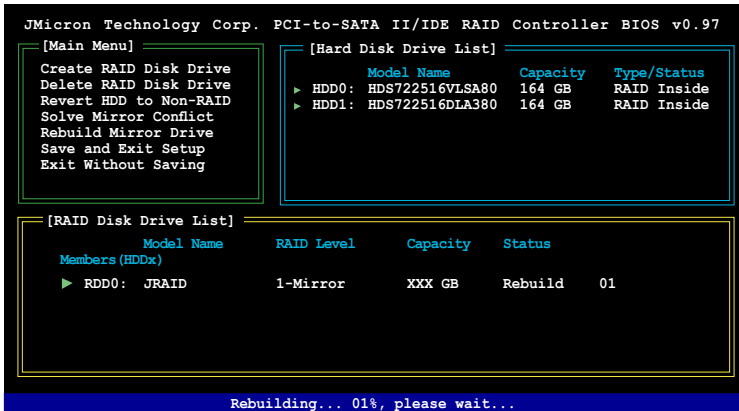
To rebuild a Mirror drive:

1.    In the main JMB363 RAID BIOS menu, highlight Rebuild Mirror Drive using the up/down arrow key then press <Enter>.

```
┌─[Main Menu]──────────────┐
│ Create RAID Disk Drive   │
│ Delete RAID Disk Drive   │
│ Revert HDD to Non-RAID   │
│ Solve Mirror Conflict    │
│ Rebuild Mirror Drive     │
│ Save and Exit Setup      │
│ Exit Without Saving      │
└──────────────────────────┘
```

2.    Using the <TAB>, move to the RAID Disk Drive List menu and highlight the RAID set that you want to rebuild. Press <Del> to begin rebuilding the Mirror configuration.

   A status bar at the bottom of the screen shows the progress of the rebuilding.

```
 JMicron Technology Corp.  PCI-to-SATA II/IDE RAID Controller BIOS v0.97
┌─[Main Menu]──────────────┐  ┌─[Hard Disk Drive List]──────────────────────┐
│ Create RAID Disk Drive   │  │       Model Name      Capacity    Type/Status │
│ Delete RAID Disk Drive   │  │ ► HDD0: HDS722516VLSA80  164 GB    RAID Inside │
│ Revert HDD to Non-RAID   │  │ ► HDD1: HDS722516DLA380  164 GB    RAID Inside │
│ Solve Mirror Conflict    │  │                                              │
│ Rebuild Mirror Drive     │  │                                              │
│ Save and Exit Setup      │  │                                              │
│ Exit Without Saving      │  │                                              │
└──────────────────────────┘  └──────────────────────────────────────────────┘

┌─[RAID Disk Drive List]──────────────────────────────────────────────────────┐
│          Model Name      RAID Level      Capacity     Status                 │
│   Members(HDDx)                                                              │
│  ► RDD0:  JRAID          1-Mirror        XXX GB       Rebuild    01           │
│                                                                              │
│                                                                              │
└──────────────────────────────────────────────────────────────────────────────┘
            Rebuilding... 01%, please wait...
```

## Saving the settings and exiting setup

When you have finished, highlight Save & Exit Setup using the up/down arrow key then press <Enter> to save the current RAID configuration and exit the JMB363 RAID BOS utility.

A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N> to return to the JMB RAID BIOS menu.

# 5.5 Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing Windows® XP operating system on a hard disk drive that is included in a RAID set. For Windows® Vista™ operating system, use either a floppy disk or a USB device with the RAID driver.

## 5.5.1 Creating a RAID driver disk without entering the OS

To create a RAID/SATA driver disk without entering the OS:

1. Boot your computer.
2. Press <Del> during POST to enter the BIOS setup utility.
3. Set the optical drive as the primary boot device.
4. Insert the support CD into the optical drive.
5. Save changes and exit BIOS.
6. Press any key when the system prompts "Press any key to boot from the optical drive."
7. When the menu appears, press <1> to create a RAID driver disk.
8. Insert a formatted floppy disk into the floppy drive then press <Enter>.
9. Follow succeeding screen instructions to complete the process.

## 5.5.2 Creating a RAID/SATA driver disk in Windows®

To create a RAID driver disk in Windows®:

1. Start Windows®.
2. Place the motherboard support DVD into the optical drive.
3. Go to the Make Disk menu, then click **Intel ICH9R 32/64bit RAID Driver** to create an Intel® ICH9R RAID driver disk.
4. Insert a floppy disk/USB device into the floppy disk drive/USB port.
5. Follow succeeding screen instructions to complete the process.

> Write-protect the floppy disk to avoid computer virus infection.

To install the RAID driver in Windows® XP:

1. During the OS installation, the system prompts you to press the F6 key to install third-party SCSI or RAID driver.
2. Press <F6> then insert the floppy disk with RAID driver into the floppy disk drive.
3. When prompted to select the SCSI adapter to install, make sure you select **ICH9R**.
4. Follow the succeeding screen instructions to complete the installation.

To install the RAID driver in Windows® Vista™:

1.	Insert the floppy disk/USB device with RAID driver into the floppy disk drive/USB port.

2.	During the OS installation, select **Intel ICH9R**.

3.	Follow the succeeding screen instructions to complete the installation.

This chapter tells how to install ATI®
CrossFire™ graphics cards to avail of
ATI's Multi-Video Processing technology.

# ATI® CrossFire™ technology support

# Chapter summary

**6**

# 6.1 Overview

The motherboard supports the ATI® CrossFire™ technology that allows you to install multi-graphics processing units (GPU) graphics cards. Follow the installation procedures in this section.

## 6.1.1 Requirements

- CrossFire™ Edition graphics card (Master)
- CrossFire™-ready graphics card (Slave)
- CrossFire™-ready motherboard
- Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. See **9. ATX Power connectors** on page 2-30 for details.

---

- Visit the ATI website or download the Radeon® X850 Crossfire™ Edition User's Guide from the support CD for detailed hardware requirements and installation procedures.

- The ATI CrossFire™ technology supports only the following operating systems:
    - Windows® XP 32-bit  (Home or Professional) with Service Pack 2 (SP2)
    - Windows® XP Professional 64-bit Edition.

- Make sure that your graphics card driver supports the ATI® CrossFire™ Technology. Download the latest driver from the ATI website (www.ati.com)

- The maximum resolution of Radeon™ X850 CrossFire™ Edition is 1600 x 1200 at 65 MHz when you use DVI output.

---

## 6.1.2 Before you begin

**Uninstall other graphics card drivers in your system**

To uninstall other graphics card drivers:

1. Close all current applications.
2. Go to **Control Panel** > **Add/Remove Programs**.
3. Select your current graphics card driver/s.
4. Select **Add/Remove**.
5. Restart your system.

# 6.2 Installing CrossFire™ graphics cards

Before installing a CrossFire™ system, refer to the user guide that came with the ATI® CrossFire™ Edition graphics card.

To install the graphics cards:

1. Prepare one CrossFire™ Edition (Master) graphics card and one CrossFire™-ready (Slave) graphics card.
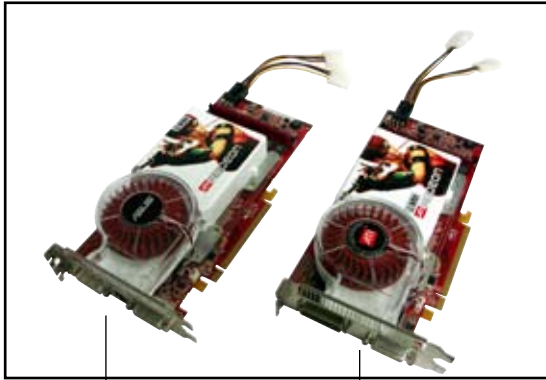


**Slave graphics card**        **Master graphics card**

2. Insert the CrossFire™ Edition (Master) graphics card into the PCI Express x16 <u>blue</u> slot. Make sure that the card is properly seated on the slot.
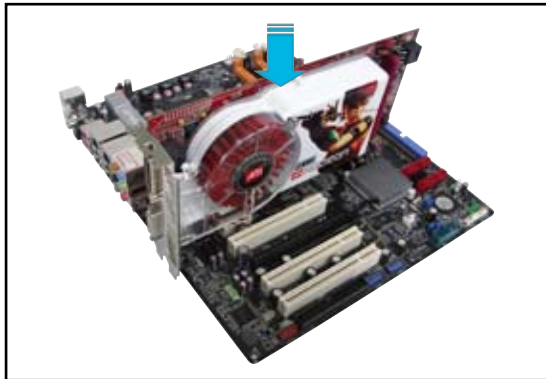
3. Insert the CrossFire™-ready (Slave) graphics card into the PCI Express x16 blue slot. Make sure that the card is properly seated on the slot.
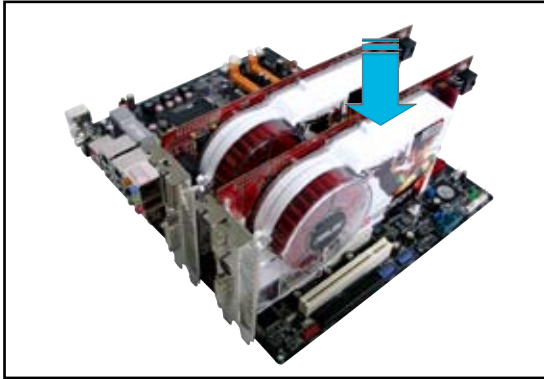


4. Connect an auxiliary power source from the power supply to the graphics cards.
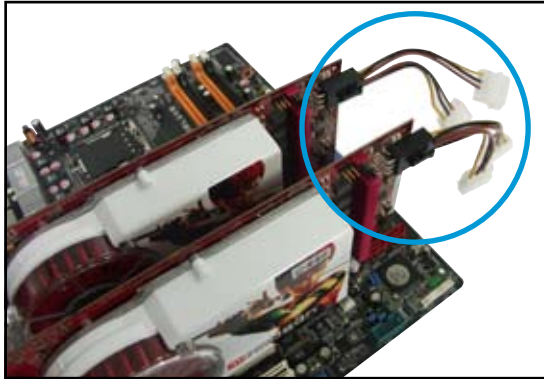
5. Connect one end of the external cable to the Master graphics card.
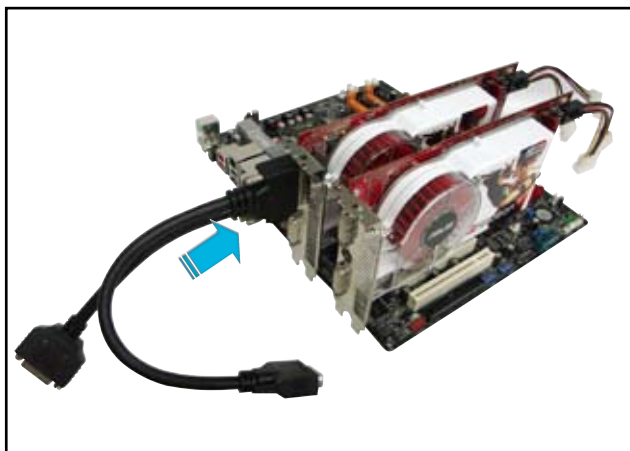


6. Connect the other end of the external cable to the Slave graphics card.
7. Connect the loose end to the corresponding port on your monitor.
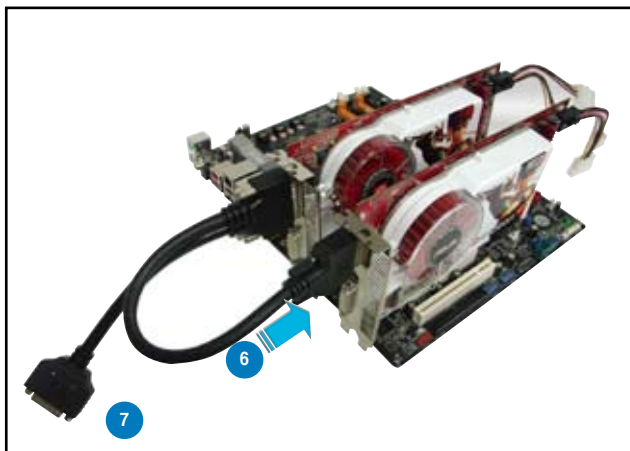
# 6.3 Software information

## 6.3.1 Installing the device drivers

Refer to the documentation that came with your graphics card package to install the device drivers.

The ATI CrossFire™ technology supports only the following operating systems:
- Windows® XP 32-bit (Home or Professional) with Service Pack 2 (SP2)
- Windows® XP Professional 64-bit Edition.
- Windows® Vista 32/64 bit Edition. (Will be ready later. Visit the ATI website (www.ati.com)

1. Turn on your system and log in with administrator rights.

2. Windows® auto-detects the CrossFire™ graphics cards and displays the Found New Hardware Wizard window. Click **Cancel**.

3. Place the CrossFire™ installation CD in your optical drive and install drivers from the opening menu.
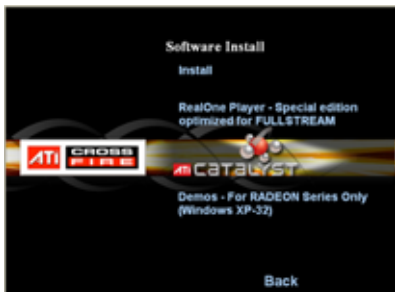
4. Click **Next** to continue from the installation window that appears.
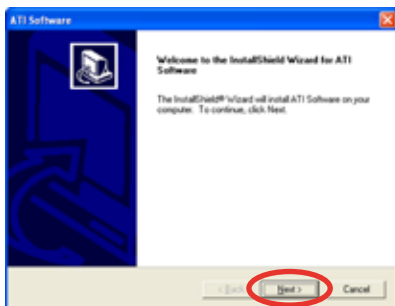
5. Read the License Agreement, then click **Yes**.

6.  Select the components that you want to install, then click **Next**.
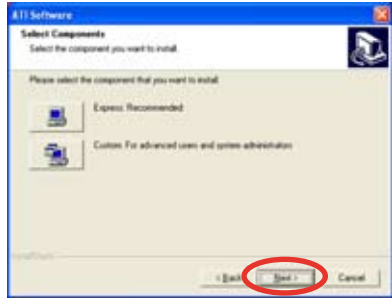


- Select Express to install the HydraVision™ multi-monitor and desktop management software, as well as the ATI driver.

- Select Custom to individually choose desired software components.

Setup prepares the installation wizard that will guide you to setup process.



Windows automatically configures the ATI Catalyst Control Center. The status windows indicates the progress of the installation.
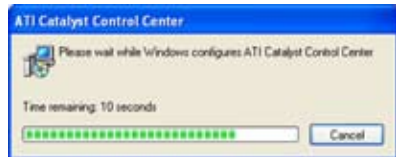


7.  The Setup Complete window appears, indicating that the driver files have been copied to your computer.

    Click **Yes** to restart your computer now or **No** to restart later

8.  Click **Finish**.
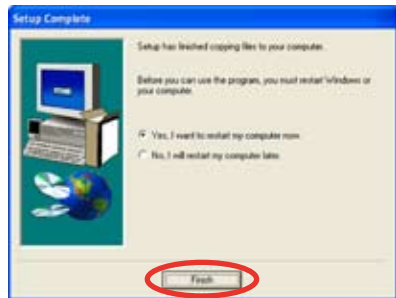
## 6.3.2    Using the Catalyst™ Control Center

The Catalyst™ Control Center allows you to access display features of the ATI hardware and software you installed. Use this application to adjust your graphic settings, enable/disable connected devices, and change your desktop orientation.

### Launching the Catalyst™ Control Center

There are several ways to launch the Catalyst™ Control Center:

- On the Windows® task bar, click **Start** > **ATI Catalyst™ Control Center** > **Catalyst™ Control Center**
- Double-click the Catalyst™ Control Center desktop shortcut.

- On the Windows® task bar, double-click the Catalyst™ Control Center icon.

## The Catalyst™ Control Center Dialog Box

*View*

The Catalyst™ Control Center provides two views:

**Standard** - simple view with wizards for beginners



**Advance** - allows advanced users to access and configure the complete features of the software



Set to **Advance** view to enable the CrossFire™ function.

To enable CrossFire™:

1. Set the view to **Advance**.

2. Click the Crossfire™ item in Graphics Settings.

3. In the CrossFire™ Settings dialog, tick the box opposite **Enable CrossFire™**.

4. Click **OK** to effect the setting.



*Hotkeys*

Click the Hotkeys tab on the Catalyst™ Control Center to access the Hotkeys Manager, which allows you to create key combinations as shortcuts for performing certain functions quickly.

*Profiles*

Click the **Profiles** tab on the Catalyst™ Control Center to access the Profiles Manager, which allows you to create customized environments for your desktop, video, and 3D applications.



*Preferences*

Click the **Preferences** tab on the Catalyst™ Control Center to select a language, restore defaults, change skins, or enable/disable the System Tray icon.

*Help*

Click the **Help** tab on the Catalyst™ Control Center to access the online help system, generate a Problem Report, and get the Catalyst™ Control Center version information.

Chapter 6: ATI® MVP technology support

The Appendix describes the CPU features
and technologies that the motherboard
supports as well as the debug code table
for the LCD Poster.

# CPU features

# Chapter summary

A

# A.1 Intel® EM64T

- The motherboard is fully compatible with Intel® LGA775 processors running on 32-bit operating systems.

- The motherboard comes with a BIOS file that supports EM64T. You can download the latest BIOS file from the ASUS website (www.asus.com/support/download/) if you need to update the BIOS file. See Chapter 4 for details.

- Visit www.intel.com for more information on the EM64T feature.

- Visit www.microsoft.com for more information on Windows® 64-bit OS.

## Using the Intel® EM64T feature

To use the Intel® EM64T feature:

1. Install an Intel® CPU that supports the Intel® EM64T.
2. Install a 64-bit operating system (Windows® Vista 64-bit Edition or Windows® XP Professional x64 Edition).
3. Install the 64-bit drivers for the motherboard components and devices from the support DVD.
4. Install the 64-bit drivers for expansion cards or add-on devices, if any.

Refer to the expansion card or add-on device(s) documentation, or visit the related website, to verify if the card/device supports a 64-bit system.

# A.2 Enhanced Intel SpeedStep® Technology (EIST)

- The motherboard comes with a BIOS file that supports EIST. You can download the latest BIOS file from the ASUS website (www.asus.com/support/download/) if you need to update the BIOS. See Chapter 4 for details.

- Visit www.intel.com for more information on the EIST feature.

## A.2.1 System requirements

Before using EIST, check your system if it meets the following requirements:

- Intel® processor with EIST support
- BIOS file with EIST support
- Operating system with EIST support (Windows® Vista, Windows® XP SP2/ Linux 2.6 kernel or later versions).

## A.2.2    Using the EIST

To use the EIST feature:

1.   Turn on the computer, then enter the BIOS Setup.

2.   Go to the Advanced Menu, highlight **CPU Configuration**, then press <Enter>.

3.   Set the **Intel(R) SpeedStep (TM) Tech.** item to [Enabled], then press <Enter>. See page 4-26 for details.

4.   Press <F10> to save your changes and exit the BIOS setup.

5.   After the computer restarts, right click on a blank space on the desktop, then select Properties from the pop-up menu.

6.   When the Display Properties window appears, click the Screen Saver tab.

7.   Click the Power button on the Monitor power section to open the Power Options Properties window.
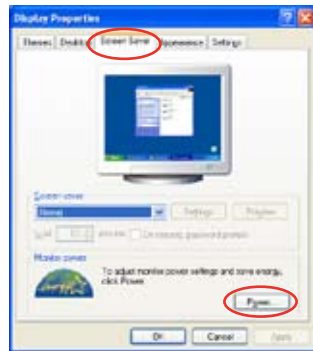


8.   On the Power schemes section, click ▼, then select any option except Home/Office Desktop or Always On.

9.   Click Apply, then click OK.

10.  Close the Display Properties window.

     After you adjust the power scheme, the CPU internal frequency slightly decreases when the CPU loading is low.
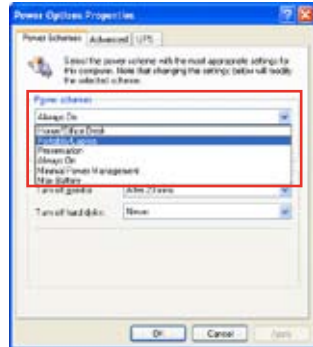


The screen displays and procedures may vary depending on the operating system.

# A.3 Intel® Hyper-Threading Technology

- • The motherboard supports Intel® Pentium® 4 LGA775 processors with Hyper-Threading Technology.

- • Hyper-Threading Technology is supported under Windows® Vista/XP and Linux 2.4.x (kernel) and later versions only. Under Linux, use the Hyper-Threading compiler to compile the code. If you are using any other operating systems, disable the Hyper-Threading Technology item in the BIOS to ensure system stability and performance.

- • Installing Windows® XP Service Pack 1 or later version is recommended.

- • Make sure to enable the Hyper-Threading Technology item in BIOS before installing a supported operating system.

- • For more information on Hyper-Threading Technology, visit www.intel.com/info/hyperthreading.

## Using the Hyper-Threading Technology

To use the Hyper-Threading Technology:

1. Install an Intel® Pentium® 4 CPU that supports Hyper-Threading Technology.

2. Power up the system and enter the BIOS Setup. Under the Advanced Menu, make sure that the item **Hyper-Threading Technology** is set to [Enabled].

   The BIOS item appears only if you installed a CPU that supports Hyper-Threading Technology.

3. Restart the computer.

# A.4    Debug code table

| Code | Description |
|------|-------------|
| **CPU INIT** | CPU Initiation |
| **DET CPU** | Test CMOS R/W functionality. |
| **CHIPINIT** | Early chipset initialization:<br>-Disable shadow RAM<br>-Disable L2 cache<br>-Program basic chipset registers |
| **DET DRAM** | Detect memory<br>-Auto-detection of DRAM size, type and ECC.<br>-Auto-detection of L2 cache |
| **DC FCODE** | Expand compressed BIOS code to DRAM |
| **EFSHADOW** | Call chipset hook to copy BIOS back to E000 & F000 shadow RAM. |
| **INIT IO** | Initialize IO devices. |
| **INIT HWM** | Initialize Hardware Monitor. |
| **CLR SCRN** | 1. Blank out screen<br>2. Clear CMOS error flag |
| **INIT8042** | 1. Clear 8042 interface<br>2. Initialize 8042 self-test |
| **ENABLEKB** | 1. Test special keyboard controller for Super I/O chips.<br>2. Enable keyboard interface. |
| **DIS MS** | 1. Disable PS/2 mouse interface (optional).<br>2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional).<br>3. Reset keyboard for Super I/O chips. |
| **R/W FSEG** | Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker. |
| **DET FLASH** | Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support. |
| **TESTCMOS** | Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override. |
| **PRG CHIP** | Program chipset default values into chipset. |
| **INIT CLK** | Initialize clock generator. |
| **CHECKCPU** | Detect CPU information including brand, type and CPU level (586 or 686). |
| **INTRINIT** | Initial interrupts vector table. |
| **INITINT9** | Initialize INT 09 buffer |
| **CPUSPEED** | 1. Program CPU internal MTRR (Pentium class CPU) for 0-640K memory address.<br>2. Initialize the APIC for Pentium class CPU.<br>3. Program early chipset according to CMOS setup. Example: onboard IDE controller.<br>4. Measure CPU speed.<br>5. Invoke video BIOS. |
| **VGA BIOS** | Initialize VGA BIOS |
| **TESTVRAM** | 1. Initialize multi-language<br>2. Put information on screen display, including BIOS logo, CPU type, CPU speed . |
| **RESET KB** | Reset keyboard. |

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| **8254TEST** | Test 8254 |
| **8259MSK1** | Test 8259 interrupt mask bits for channel 1. |
| **8259MSK2** | Test 8259 interrupt mask bits for channel 2. |
| **8259TEST** | Test 8259 functionality. |
| **COUNTMEM** | Calculate total memory by testing the last double word of each 64K page. |
| **MP INIT** | 1. Program MTRR of M1 CPU<br>2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range.<br>3. Initialize the APIC for P6 class CPU.<br>4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical. |
| **USB INIT** | Initialize USB |
| **TEST MEM** | Test all memory (clear all extended memory to 0) |
| **SHOW MP** | Display number of processors (multi-processor platform) |
| **PNP LOGO** | Display PnP logo |
| **ONBD IO** | Initialize Onboard IO devices. |
| **EN SETUP** | Okay to enter Setup utility. |
| **MSINSTAL** | Initialize PS/2 Mouse |
| **CHK ACPI** | Prepare memory size information for function call: INT 15h ax=E820h |
| **EN CACHE** | Turn on L2 cache |
| **SET CHIP** | Program chipset registers according to items described in Setup & Auto-configuration table. |
| **AUTO CFG** | Assign resources to devices. |
| **INIT FDC** | 1. Initialize floppy controller<br>2. Set up floppy related fields in 40:hardware. |
| **DET IDE** | Detect & install all IDE devices: HDD, LS120, ZIP, CDROM. |
| **COM/LPT** | Detect serial ports & parallel ports. |
| **DET FPU** | Detect & install co-processor |
| **CPU CHG** | New CPU installed |
| **EZ FLASH** | Execute EZ Flash |
| **CPR FAIL** | CPR error |
| **FAN FAIL** | Fan error |
| **UCODEERR** | UCODE error |
| **FLOPYERR** | Floppy error |
| **KB ERROR** | Keyboard error |
| **HD ERR** | HDD error |
| **CMOS ERR** | CMOS error |
| **MS ERROR** | Mouse error |
| **SMARTERR** | HDD smart function error |
| **HM ERROR** | Hard monitor error |
| **AINETERR** | AI NET error |
| **CASEOPEN** | Case open |
| **PASSWORD** | Clear EPA or customization logo.<br>1. Call chipset power management hook.<br>2. Recover the text fond used by EPA logo (not for full screen logo)<br>3. If password is set, ask for password. |

| | |
|---|---|
| **USB FINAL** | Initialize PnP boot devices<br>1. USB final Initialization<br>2. NET PC: Build SYSID structure<br>3. Switch screen back to text mode<br>4. Set up ACPI table at top of memory.<br>5. Invoke ISA adapter ROMs<br>6. Assign IRQs to PCI devices<br>7. Initialize APM<br>8. Clear noise of IRQs. |
| **INIT ROM** | Initialize device option ROMs. |
| **NUM LOCK** | 1. Program daylight saving<br>2. Update keyboard LED & typematic rate |
| **UPDT DMI** | 1. Build MP table<br>2. Build & update ESCD<br>3. Set CMOS century to 20h or 19h<br>4. Load CMOS time into DOS timer tick<br>5. Build MSIRQ routing table. |
| **INT 19H** | Boot attempt (INT 19h) |