

# **Crosshair III Formula**



# Motherboard

E4839

Second Edition

June 2009

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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.



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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.

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## 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.

## REACH

Complying with the REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulatory framework, we published the chemical substances in our products at ASUS website at <http://green.asus.com/english/REACH.htm>.

# 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 adapter or extension cord. These devices could interrupt the grounding circuit.
- Ensure 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.
- The optical S/PDIF is an optional component (may or may not be included in your motherboard) and is defined as a CLASS 1 LASER PRODUCT.



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INVISIBLE LASER RADIATION, AVOID EXPOSURE TO BEAM.

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- Never dispose of the battery in fire. It could explode and release harmful substances into the environment.
- Never dispose of the battery with your regular household waste. Take it to a hazardous material collection point.
- Never replace the battery with an incorrect battery type.



- 
- RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
  - DISPOSE OF USED BATTERIES ACCORDING TO THE ABOVE BATTERY-RELATED INSTRUCTIONS.
-

## 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, ensure 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.



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This motherboard should only be used in environments with ambient temperatures between 5oC (41oF) and 40oC (104oF).

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



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**DO NOT** throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

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**DO NOT** throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

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# 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: 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 4: Software support**  
This chapter describes the contents of the support DVD that comes with the motherboard package and the software.
- **Chapter 5: Multiple GPU technology support**  
This chapter describes how to install and configure multiple ATI® CrossFireX™ graphics cards.
- **Appendix: Debug code table**  
The Appendix lists 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 ensure 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 /iCRIIIIFOR.ROM**



## Crosshair III Formula specifications summary

<b>CPU</b>	AMD socket AM3 Phenom™ II / Athlon™ II / Sempron™ 100 Series processors Supports 45nm CPU AMD® Cool 'n' Quiet™ Technology
<b>Chipset</b>	AMD® 790FX / SB750
<b>System Bus</b>	Up to 5200 MT/s HyperTransport™ 3.0
<b>Memory</b>	Dual channel memory architecture 4 x DIMM, max. 16GB, DDR3 1600(O.C.) / <b>1333 / 1066 MHz, ECC and non-ECC, un-buffered memory</b> *Refer to <a href="http://www.asus.com">www.asus.com</a> or user manual for the Memory QVL (Qualified Vendors Lists) **Due to OS limitation, when installing total memory of 4GB capacity or more, Windows® 32-bit operation system may only recognize less than 3GB. Hence, a total installed memory of less than 3GB is recommended.
<b>Expansion Slots</b>	2 x PCIe2.0 x16 slots (@ dual x16) 3 x PCIe2.0 x1 ( the PCIe1_1 (black) is compatible with audio slot) 1 x PCI 2.2 slot
<b>Multi-GPU Technology</b>	Support ATI CrossFire™ X Technology graphics cards
<b>Storage</b>	SB750 South Bridge: <ul style="list-style-type: none"> <li>- 1 x Ultra DMA 133/100/66 for up to 2 PATA devices</li> <li>- 5 x SATA 3Gb/s ports with RAID 0, 1, 5, 10 and JBOD</li> <li>- 1 x External SATA 3Gb/s port on rear (SATA On-the-Go)</li> </ul> <p>* Due to the Windows XP/ Vista limitation, the RAID array with the total capacity over 2TB cannot be set as a boot disk. A RAID array over 2TB can only be set as a data disk only.</p>
<b>LAN</b>	Gigabit LAN controller, featuring AI NET 2
<b>High Definition Audio</b>	SupremeFX X-Fi <ul style="list-style-type: none"> <li>- 8-channel High Definition Audio CODEC</li> <li>- EAX® Advanced™ HD 4.0</li> <li>- X-Fi CMSS®-3D</li> <li>- X-Fi Crystalizer™</li> <li>- Creative ALchemy</li> <li>- Supports 1 x S/PDIF out header</li> <li>- Supports Coaxial/Optical S/PDIF out ports on rear</li> </ul>
<b>IEEE 1394</b>	2 x 1394a ports (1 port at back I/O, 1 port onboard)

(continued on the next page)

## Crosshair III Formula specifications summary

<b>USB</b>	max. 12 USB 2.0 ports (6 ports at mid-board, 6 ports at back panel)
<b>ROG Exclusive Overclocking Features</b>	<b>MemOK!</b> <b>Extreme Tweaker</b> <b>Power Design:</b> <ul style="list-style-type: none"> <li>- 8+2 phase CPU power design</li> </ul> <b>CPU Level Up</b> <b>Keyboard-TweakIt</b> <b>iROG</b> <b>Loadline Calibration</b> <b>Intelligent overclocking tools:</b> <ul style="list-style-type: none"> <li>- ASUS TurboV</li> <li>- O.C Profile</li> </ul> <b>Overclocking Protection:</b> <ul style="list-style-type: none"> <li>- COP EX (Component Overheat Protection - EX)</li> <li>- Voltiminder LED</li> <li>- ASUS C.P.R.(CPU Parameter Recall)</li> </ul>
<b>Other Special Features</b>	External LCD Poster ASUS Q-Connector ASUS Q-Shield ASUS Q-Fan 2 ASUS EZ Flash 3 ASUS CrashFree BIOS 3 ASUS MyLogo 3 AMD® OverDrive Support* ASUS TurboV
<b>BIOS Features</b>	16Mb AMI BIOS, PnP, DMI2.0, WfM2.0, SM BIOS 2.4, ACPI2.0a Multi-Language BIOS
<b>Manageability</b>	WOL by PME, WOR by PME, PXE
<b>Back Panel I/O Ports</b>	1 x PS/2 Keyboard port(purple) 1 x External SATA port 1 x LAN (RJ45) port 6 x USB 2.0/1.1 ports 1 x IEEE1394a port 1 x Clr CMOS switch

*(continued on the next page)*

## Crosshair III Formula specifications summary

Internal I/O Connectors	3 x USB 2.0 connectors supports additional 6 USB 2.0 ports 1 x IDE connector for two devices 5 x SATA connectors (Blue) 8 x Fan connectors: 1 x CPU / 1 x PWR / 3 x Chassis / 3 x Optional 3 x thermal sensor connectors 1 x IEEE1394a connector 1 x LCD Poster connector 24-pin ATX Power connector 8-pin ATX 12V Power connector System panel connector
Software	<b>Support DVD:</b> - Drivers and applications * ASUS PC Probe II * ASUS Update * ASUS AI Suite * AMD OverDrive Utility (AOD) * Sound Blaster X-Fi Utility * Futuremark® 3DMark® 06 Advanced Edition * Kaspersky® Anti-Virus
Form Factor	ATX Form Factor, 12"x 9.6" (30.5cm x 24.5cm)

\*Specifications are subject to change without notice.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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

# 1 Product introduction

# Chapter summary

# 1

1.1	Welcome! .....	1-1
1.2	Package contents.....	1-1
1.3	Special features.....	1-2

# 1.1 Welcome!

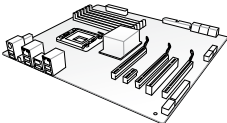
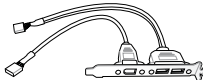


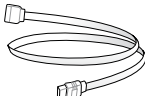
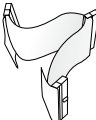
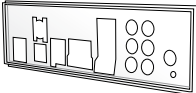
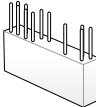



Thank you for buying an ROG Crosshair III Formula motherboard!

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.

		
ROG Crosshair III Formula Motherboard	1 x Multi-functional module (2-port USB 2.0 and 1-port IEEE 1394a)	
		
Supreme FX X-Fi Audio Card	External LCD Poster	
		
5 x Serial ATA signal cables	1 x Ultra DMA 133/100/66 cable	
		
1 x ASUS Q-Shield (I/O shield)	1 x ASUS Q-Connector Kit	
		
Cable ties	User Guide	ROG Support DVD



- If any of the above items is damaged or missing, contact your retailer.
- The item illustrations in above table are for reference only. Actual product specifications may vary with different models.

## 1.3 Special features

### 1.3.1 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.

#### 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.

#### AMD socket AM3 Phenom™ II / Athlon™ II / Sempron™ 100 Series processors support

This motherboard supports AMD® Socket AM3 multi-core processors with unique L3 cache and delivers better overclocking capabilities with less power consumption. It features dual-channel DDR3 1333 memory support and accelerates data transfer rate up to 5200MT/s via HyperTransport™ 3.0 based system bus. This motherboard also supports AMD® CPUs in the new 45nm manufacturing process.

#### AMD® 790FX Chipset

AMD® 790FX Chipset is designed to support up to 5200MT/s HyperTransport™ 3.0 (HT 3.0) interface speed and quad PCI Express™ 2.0 x16 graphics. It is optimized with AMD®'s latest AM3 and multi-core CPUs to provide excellent system performance and overclocking capabilities.

#### ATI CrossFireX™ Technology

ATI's CrossFireX™ boosts image quality along with rendering speed, eliminating the need to scale down screen resolution to get high quality images. CrossFireX™ 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.



## DDR3 1600 (O.C.) support

This motherboard supports DDR3 1600(O.C.) that provides faster data transfer rate and more bandwidth to increase memory computing efficiency, enhancing system performance in 3D graphics and other memory demanding applications

## PCIe 2.0

### Double Speed; Double Bandwidth

This motherboard supports the latest PCIe 2.0 device for double speed and bandwidth which enhances system performance.

### 100% high-quality Japan-made conductive polymer capacitors (VRM 5000hrs lifespan at 105°C, 500,000hrs at 65°C)

This motherboard uses all high-quality conductive polymer capacitors for durability, improved lifespan, and enhanced thermal capacity.

## 1.3.2 ROG Intelligent Performance & Overclocking features

### iROG



#### Intelligent multiple control at hand

iROG is a special IC which enables several ROG highlighted functions that give you full disposal of the motherboard at any stage! This design allows advanced user control and management to be processed at a hardware level. iROG greatly increases fun during overclocking for PC enthusiasts and it provides system maintenance and management with more control and efficiency.

### CPU Level Up



#### A simple click for instant upgrade!

Ever wish that you could have a more expansive CPU? Upgrade your CPU at no additional cost with ROG's CPU Level Up! Simply pick the processor you want to OC to, and the motherboard will do the rest for you. See the new CPU speed and enjoy the performance instantly! Overclocking is never as easy as this.



## **MemOK!**

### **Any memory is A-OK!**

Memory compatibility is among the top concerns when it comes to computer upgrades. Worry no more, MemOK! is the fastest memory booting solution today. This remarkable memory rescue tool requires nothing but a push of a button to patch memory issues and get you system up and running in no time. The technology is able to determine failsafe settings that can dramatically improve system booting success.



## **Extreme Tweaker**

### **One stop performance tuning shop**

Extreme Tweaker is the one stop shop to fine-tune your system to optimal performance. No matter if you are looking for frequency adjustment, over-voltage options, or memory timing settings, they are all here!



## **Voltiminder LED**

### **Friendly reminder on Voltage Settings**

In the pursuit 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.



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

### **Maximum OC with confidence with burn proof protection to chipsets and GPU!**

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.



## **Loadline Calibration**

### **Optimal power boost for extreme CPU overclocking!**

Maintaining ample voltage support for the CPU is critical during overclocking. The Loadline calibration ensures stable and optimal CPU voltage under heavy loading. It helps overclockers enjoy the motherboard's ultimate OC capabilities and benchmark scores.

### 1.3.3 ROG unique features

#### SupremeFX X-Fi features



**Listen with absolute HD**

**Play in extreme fidelity!**

SupremeFX X-Fi delivers an excellent high definition audio experience to the gamers of ROG. SupremeFX X-Fi features unique audio innovations for gamers to spot enemies in 3D environment during game play. SupremeFX X-Fi combines the technological quality design of SupremeFX and sound effect technology from Creative Labs® to offer games exceptional game sound with absolute quality.

#### Noise Filter

**Eliminate background noise while recording**

This feature detects repetitive and stationary noises like computer fans, air conditioners, and other background noises then eliminates it in the incoming audio stream while recording.

#### External LCD Poster



**Debug and read system problems with an new external look!**

The new LCD Poster now posts critical POST information in an ever friendly and flexible external display. When system malfunction occurs, the LCD Poster automatically detects device failure and translates the errors on the LCD during POST.

#### Onboard Switches



**No more shorting pins or moving jumpers**

With an easy press during overclocking, this exclusive onboard switch allows gamers to effortlessly fine-tune the performance without having to short the pins or moving jumpers.

#### Q-Fan2

ASUS Q-Fan2 technology intelligently adjusts both CPU fan and chassis fan speeds according to system loading to ensure quiet, cool and efficient operation.

## **Kaspersky® Anti-Virus**

### **The best protection from viruses and spyware**

Kaspersky® Anti-Virus Personal offers premium antivirus protection for individual users and home offices. It is based on advanced antivirus technologies. The product incorporates the Kaspersky® Anti-Virus engine, which is renowned for malicious program detection rates that are among the industry's highest.

## **1.3.4 ASUS special features**

### **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-Shield**

The specially designed ASUS Q-Shield does without the usual “fingers”—making it convenient and easy to install. With better electric conductivity, it ideally protects your motherboard against static electricity and shields it against Electronic Magnetic Interference (EMI).

#### **ASUS Q-Connector**

The ASUS Q-Connector allows you to connect or disconnect chassis front panel cables in one easy step with one complete module. This unique adapter eliminates the trouble of plugging in one cable at a time, making connection quick and accurate.

#### **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.

#### **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.

#### **ASUS EZ Flash 2**

EZ Flash 2 is a user-friendly BIOS update utility. Simply launch this tool and update BIOS using a USB flash disk without entering the OS. You can update your BIOS in a few clicks without preparing an additional floppy diskette or using an OS-based flash utility.

## TurboV

Feel the adrenaline rush of real-time OC—now a reality with the ASUS TurboV. This easy OC tool allows you to overclock without exiting or rebooting the OS; and its user-friendly interface makes overclock with just a few clicks away. Moreover, the ASUS OC profiles in TurboV provides the best O.C. settings in different scenarios.

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

When the system hangs due to overclocking failure, there is no need to open the system chassis to clear CMOS data. Simply reboot the system, and the BIOS automatically restores the CPU default settings for each parameter.



---

Due to the chipset behavior, AC power off is required before using C.P.R. function.

---

[illegible]

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.

# 2 Hardware information

## Chapter summary

# 2

2.1	Before you proceed .....	2-1
2.2	Motherboard overview .....	2-6
2.3	Central Processing Unit (CPU) .....	2-9
2.4	System memory .....	2-14
2.5	Expansion slots.....	2-21
2.6	Jumper .....	2-25
2.7	I/O shield, LCD Poster and Audio card Installation .....	2-26
2.8	Connectors .....	2-28
2.9	Starting up for the first time.....	2-43
2.10	Turning off the computer.....	2-44



## 2.1 Before you proceed

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



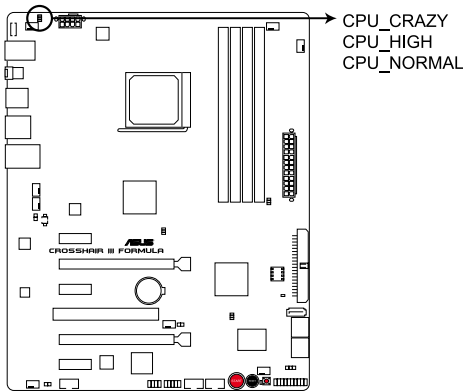
- 
- Unplug the power cord from the wall socket before touching any component.
  - Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.
  - Hold components by the edges 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, and southbridge. 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 about voltage adjustment, refer to **3.3 Extreme Tweaker menu**.

1. CPU LED

The CPU LED has three voltage displays: CPU Voltage, VDDNB, and VDDA 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.

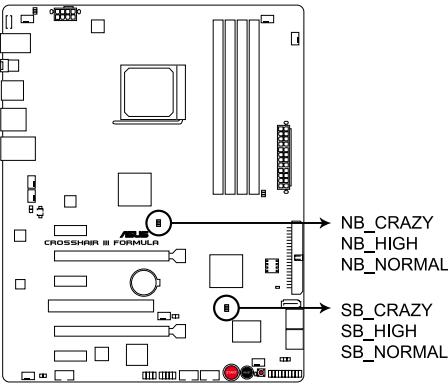


CROSSHAIR III FORMULA CPU LED

	Normal (green)	High (yellow)	Crazy (red)
CPU Voltage (default)	0.85000–1.3625	1.3750–1.4875	1.5000–
VDD NB	0.85000–1.3625	0.85000–1.3625	1.5000–
VDDA Voltage	2.50425–2.75600	2.76925–3.00775	3.02100–3.20650

2. Northbridge/Southbridge LEDs

The northbridge and southbridge LEDs each have two different voltage displays. The northbridge LED displays either the NB Voltage or the NB 1.8 Voltage. The southbridge LED shows either the SB Voltage, SB 1.2V Voltage, or the HT. 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.

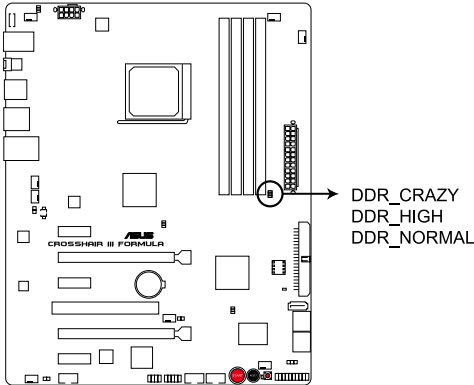


CROSSHAIR III FORMULA North/South Bridge LED

	Normal (green)	High (yellow)	Crazy (red)
NB Voltage	1.11300–1.59000	1.60325–1.84175	1.85500–2.05400
NB 1.8 Voltage	1.80200–1.89475	1.90800–1.94775	1.96100–3.00775
SB 1.1V Voltage	1.20575–1.59000	1.60325–1.84175	1.85500–2.00075
SB 1.2V Voltage	1.20575–1.35150	1.36475–1.49725	1.51050–1.60325
HT	1.20575–1.39125	1.40450–1.65625	1.66950–2.00075

3. Memory LED

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

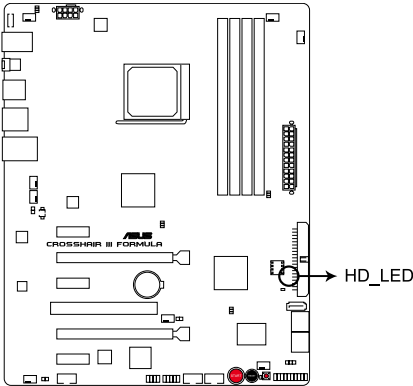


CROSSHAIR III FORMULA DDR LED

	Normal (green)	High (yellow)	Crazy (red)
DRAM Bus Voltage	1.51050–1.72250	1.73575–2.31875	2.33200–2.80900

4. Hard Disk LED

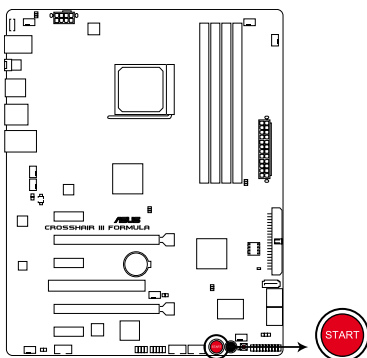
The hard disk LED is designed to indicate the hard disk activity. It blinks when data is being written into or read from the hard disk drive. The LED does not light up when there is no hard disk drive connected to the motherboard or when the hard disk drive does not function.



CROSSHAIR III FORMULA Hard Disk LED

## 5. Power LED

The motherboard comes with a power-on switch that 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.



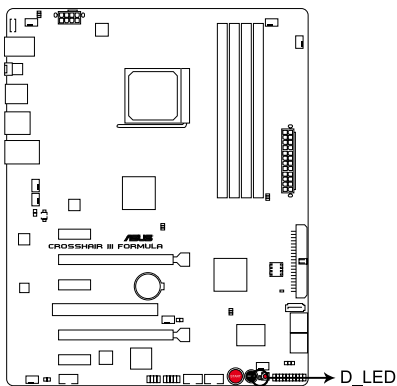
**CROSSHAIR III FORMULA Power on switch**



When you turn on the ATX power supply, the **Power LED** flashes three times to indicate that the system is ready to boot. Wait till the flash stops before you press the power-on switch.

## 6. MemOK! LED

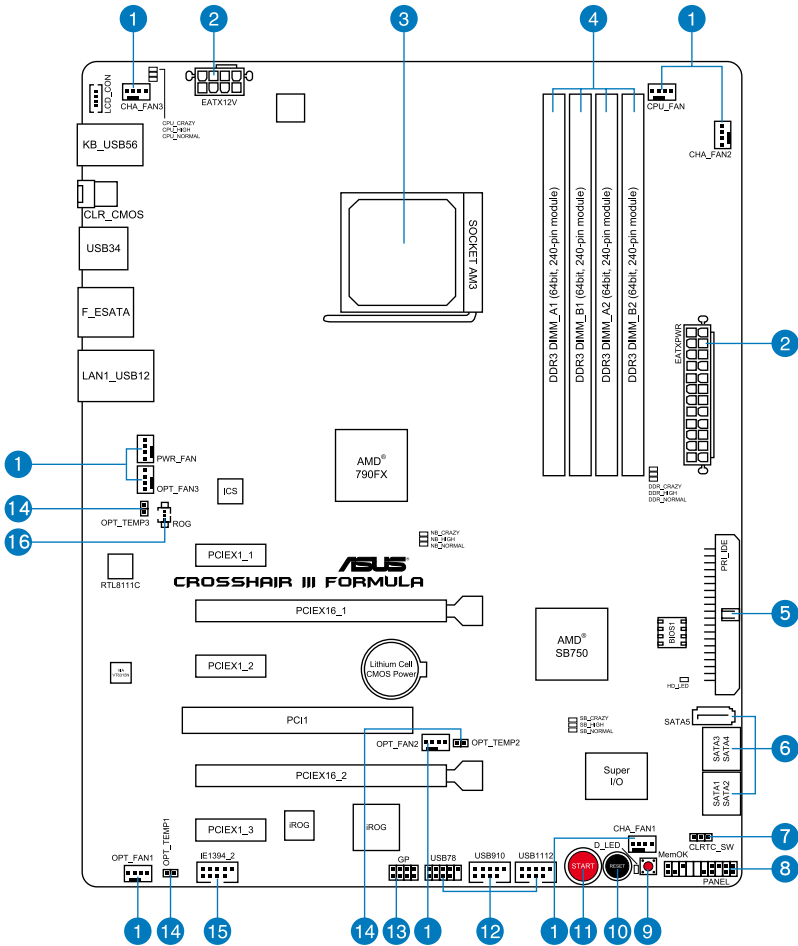
The MemOK! LED blinks while the system is loading failsafe settings for memory compatibility after pressing the MemOK! switch.



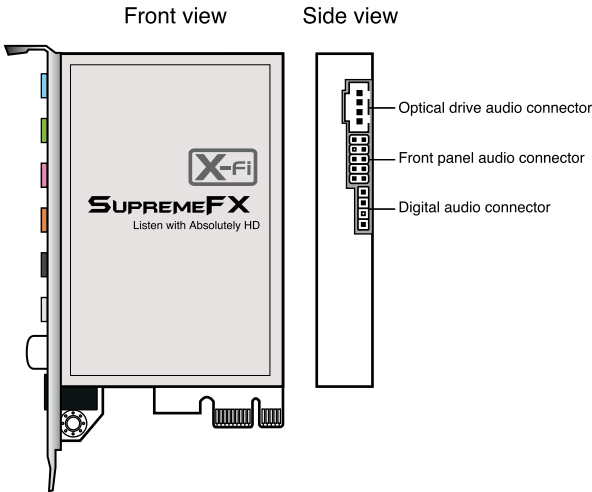
**CROSSHAIR III FORMULA D\_LED**

# 2.2 Motherboard overview

## 2.2.1 Motherboard layout



### 2.2.2 SupremeFX X-Fi audio card layout



### 2.2.3 Layout contents

Connectors/Jumpers/Switches/Slots		Page
1.	CPU, chassis, and optional fan connectors (4-pin CPU_FAN; 4-pin PWR_FAN; 4-pin CHA_FAN1–2; 4-pin OPT_FAN1–3)	2-35
2.	ATX power connectors (24-pin EATXPWR, 8-pin EATX12V)	2-37
3.	AMD® AM3 Socket	2-9
4.	DDR3 DIMM slots	2-14
5.	IDE connector (40-1 pin PRI_IDE)	2-30
6.	AMD® SB750 Southbridge Serial ATA connectors (7-pin SATA1–5)	2-31
7.	Clear RTC RAM (3-pin CLRTC_SW)	2-25
8.	System panel connector (20-8 pin PANEL)	2-38
9.	MemOK! switch	2-42
10.	Reset switch	2-41
11.	Power-on switch	2-41
12.	USB connectors (10-1 pin USB78; USB910; USB1112)	2-32
13.	GP connector (8-pin GP)	2-34
14.	Thermal sensor cable connectors (2-pin OPT_TEMP1–3)	2-36
15.	IEEE 1394a port connector (10-1 pin IE1394_2)	2-33
16.	ROG connector (3-pin ROG)	2-33



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

## 2.2.4 Placement direction

When installing the motherboard, ensure 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.

## 2.2.5 Screw holes

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

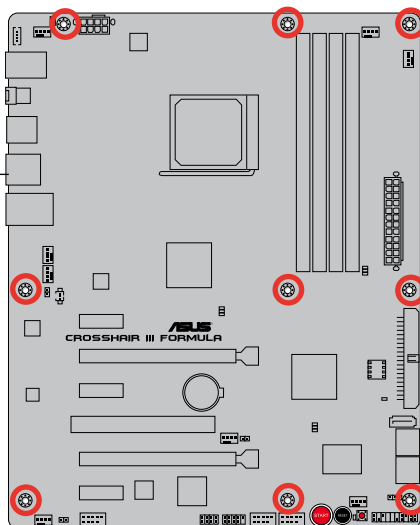


---

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

---

Place this side towards  
the rear of the chassis





## 2.3 Central Processing Unit (CPU)

The motherboard comes with an AMD® AM3 Socket for AMD socket AM3 Phenom™ II / Athlon™ II / Sempron™ 100 Series processors.

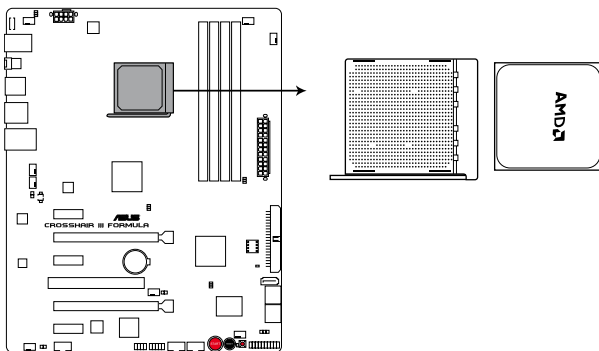


The AM3 socket has a different pinout from the AM2+/AM2 socket. Ensure you use a CPU designed for the AM3 socket. The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!

### 2.3.1 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.

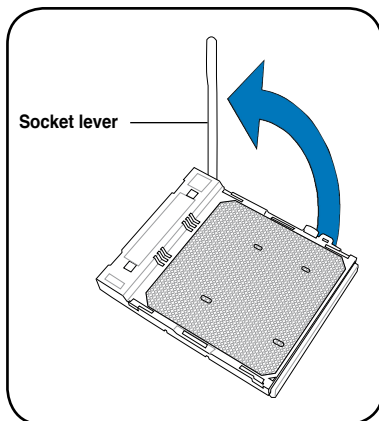


**CROSSHAIR III FORMULA CPU Socket AM3**

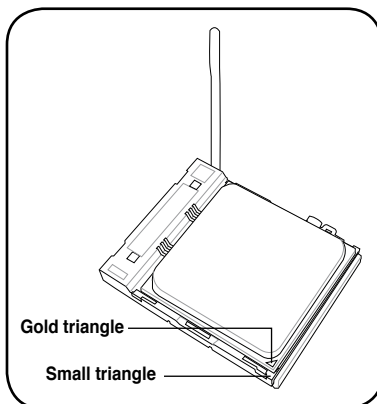
2. Press the lever sideways to unlock the socket, then lift it up to a 90° angle.



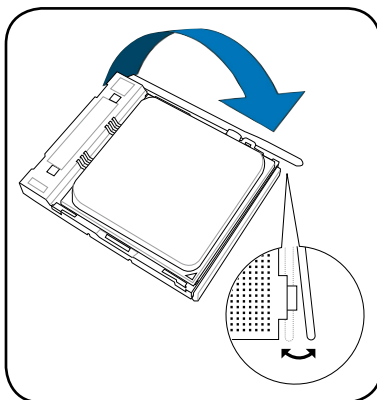
Ensure that the socket lever is lifted up to a 90° angle. Otherwise, the CPU will not fit in completely.



3. Position the CPU above the socket such that the CPU corner with the gold triangle matches the socket corner with a small triangle.
4. Carefully insert the CPU into the socket until it fits in place.



5. When the CPU is in place, push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.



6. Apply several drops of thermal interface material to the exposed area of the CPU that the heatsink will be in contact with, ensuring that it is spread in an even thin layer.



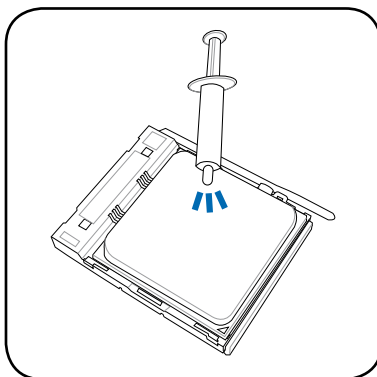
Some heatsinks come with pre-applied thermal interface material. If so, skip this step.



The thermal interface material is toxic and inedible. DO NOT eat it. If it gets into your eyes or touches your skin, wash it off immediately, and seek professional medical help.



To prevent contaminating the thermal interface material, DO NOT spread the thermal interface material with your finger.



## 2.3.2 Installing the heatsink and fan

The AMD socket AM3 Phenom™ II / Athlon™ II / Sempron™ 100 Series processors requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.



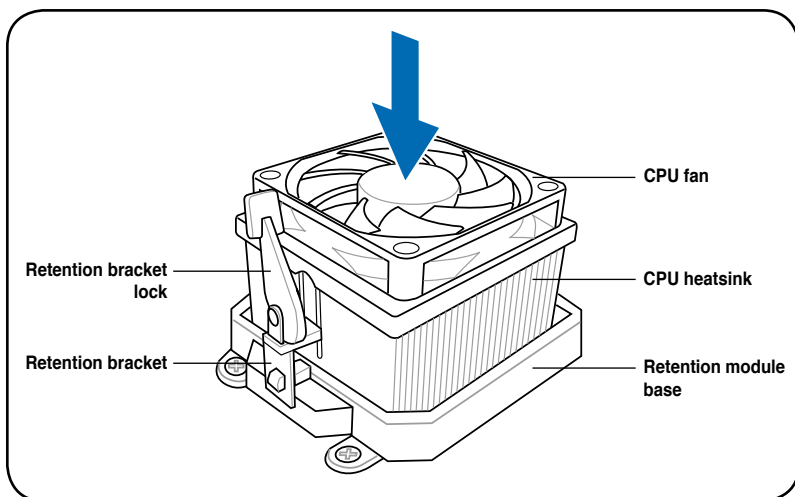
Ensure that you use only AMD-certified heatsink and fan assembly.

To install the CPU heatsink and fan:

1. Place the heatsink on top of the installed CPU, ensuring that the heatsink fits properly on the retention module base.

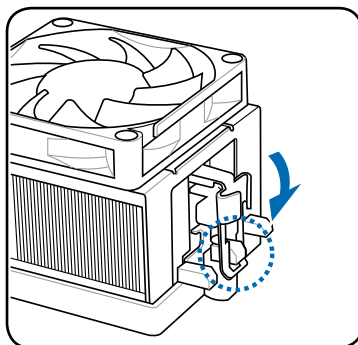


- The retention module base is already installed on the motherboard upon purchase.
- You do not have to remove the retention module base when installing the CPU or installing other motherboard components.
- If you purchased a separate CPU heatsink and fan assembly, ensure that a Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.



Your boxed CPU heatsink and fan assembly should come with installation instructions for the CPU, heatsink, and the retention mechanism. If the instructions in this section do not match the CPU documentation, follow the latter.

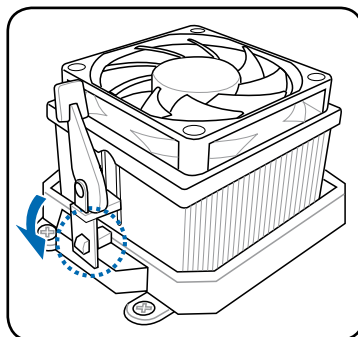
2. Attach one end of the retention bracket to the retention module base.



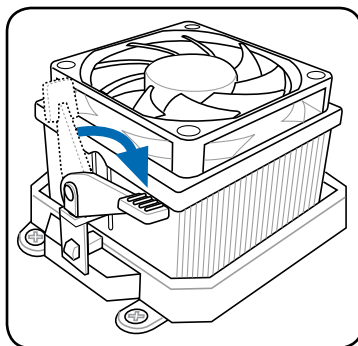
3. Align the other end of the retention bracket to the retention module base. A clicking sound denotes that the retention bracket is in place.



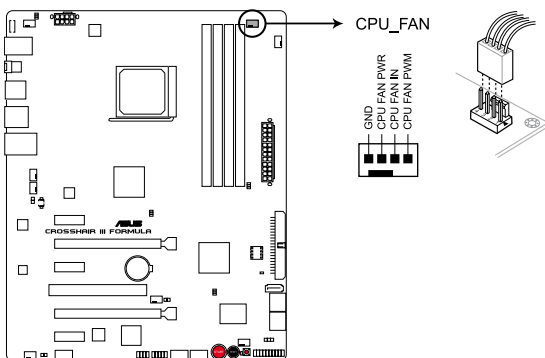
Ensure that the fan and heatsink assembly perfectly fits the retention mechanism module base, otherwise you cannot snap the retention bracket in place.



4. Push down the retention bracket lock on the retention mechanism to secure the heatsink and fan to the module base.



- When the fan and heatsink assembly is in place, connect the CPU fan cable to the connector on the motherboard labeled CPU\_FAN.



**CROSSHAIR III FORMULA CPU fan connector**



- DO NOT forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.
- This connector is backward compatible with old 3-pin CPU fan.

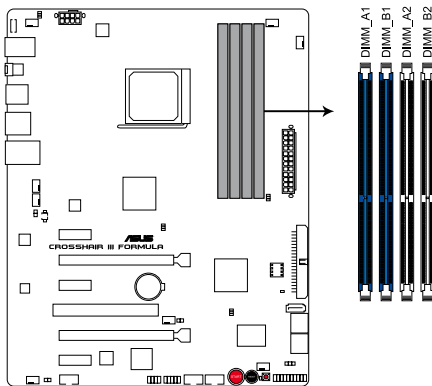
## 2.4 System memory

### 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 DDR2 DIMM but is notched differently to prevent installation on a DDR2 DIMM socket. DDR3 modules are developed for better performance with less power consumption.

The figure illustrates the location of the DDR3 DIMM sockets:



**CROSSHAIR III FORMULA 240-pin DDR3 DIMM sockets**

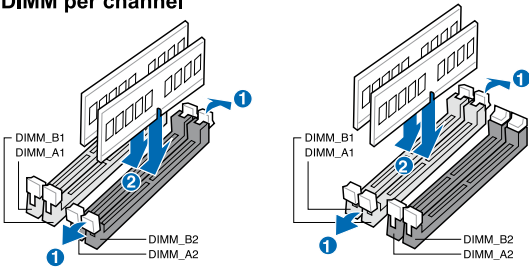
**Recommended memory configurations**

**One DIMM:**

You may install one memory module in any slot as a single-channel operation.

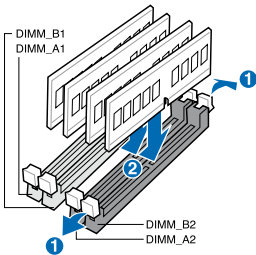
**Two DIMMs (dual-channel operation):**

**One DIMM per channel**



**Four DIMMs (dual-channel operation):**

**Two DIMMs per channel**



## 2.4.2 Memory configurations

You may install 512 MB, 1 GB, 2 GB and 4 GB unbuffered ECC and 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.
- It is recommended to install the memory modules from the orange slots for better overclocking capability.
- 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 the memory address limitation on 32-bit Windows OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you install a 64-bit Windows OS when having 4GB or more memory installed on the motherboard.
- This motherboard does not support DIMMs made up of 256 megabit (Mb) chips or less.



- The default memory operation frequency is dependent on its SPD. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value. To operate at the vendor-marked or at a higher frequency, see section **3.5 Advanced menu** for manual memory frequency adjustment.
- For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs) or overclocking condition.



# Crosshair III Formula Motherboard

## Qualified Vendors Lists (QVL) DDR3-1600MHz capability

Vendor	Part No.	Size	SS/ DS	Chip Brand	Chip NO.	Timing Dimm(Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
A-DATA	AD31600E001GMU	3072MB (Kit of 3)	SS	N/A	Heat-Sink Package	8-8-8-24 (1333-9-9-9-24)	1.65-1.85	.	.	
CORSAIR	BoxP/N:TW3X4G1600C9DHXNV (CM3X2G1600C9DHXNV)Ver4.1	4096MB (Kit of 2)	DS	N/A	Heat-Sink Package	(1333-9-9-9-24)	1.80	.	.	
G.SKILL	F3-12800CL7D-2GBHZ	2048MB (Kit of 2)	SS	N/A	Heat-Sink Package	(1601-7-7-7-18)	1.9		.	
G.SKILL	F3-12800CL9D-2GBNQ	2048MB (Kit of 2)	SS	N/A	Heat-Sink Package	(1333-9-9-9-24)	1.6	.	.	
G.SKILL	F3-12800CL9T-6GBNQ	6144MB (Kit of 3)	DS	N/A	Heat-Sink Package	9-9-9-24 (1601-9-9-9-24)	1.5-1.6	.	.	
KINGMAX	FLGD45F-B8KG9-NAES	1024MB	SS	KINGMAX	KFB8FNGXF-ANX-12A	9(1600-9-8-9-28)	1.5	.	.	
KINGMAX	FLGE85F-B8KG9-NEES	2048MB	DS	KINGMAX	KFB8FNGXF-ANX-12A	9(1600-9-8-9-28)	1.5	.	.	.
OCZ	OCZ3G1600LV3GK	3072MB (Kit of 3)	SS	N/A	Heat-Sink Package	8-8-8 (1066-7-7-7-20)	1.65	.		
OCZ	OCZ3P1600LV3GK	3072MB (Kit of 3)	SS	N/A	Heat-Sink Package	7-7-7 (1066-7-7-7-20)	1.65	.	.	.
Super Talent	WA160UX6G9	6144MB (Kit of 3)	DS	N/A	Heat-Sink Package	9(1333-9-9-9-28)		.		
Elixir	M2F2G64CB8HA4N-DG	2048MB	DS	Elixir	N2CB1G80AN-DG	9(1333-9-9-9-28)		.		

# Crosshair III Formula Motherboard

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

Vendor	Part No.	Size	SS/ DS	Chip Brand	Chip NO.	Timing Dimm(Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
A-DATA	AD133301GOU	1024MB	SS	A-DATA	AD30908C8D-15IG	1333-9-9-9-24		.	.	.
A-DATA	AD1333002GOU	2048MB	DS	A-DATA	AD30908C8D-15IG	1333-9-9-9-24		.	.	.
A-DATA	AD31333E002G0U	6144MB (Kit of 3)	DS	N/A	Heat-Sink Package	7-7-7-20 (1333-9-9-9-24)	1.65-1.85	.	.	.
Apacer	78.01GC6.420	1024MB	SS	ELPIDA	J1108BABG-DJ-E	(1333-9-9-9-24)		.	.	
Apacer	78.01GC6.9L0	1024MB	SS	Apacer	AM5D5808AEWSBG	9(1333-9-9-9-24)		.	.	.
Apacer	78.01GC8.422	1024MB	SS	ELPIDA	J1108BABG-DJ-E(ECC)	(1333-9-9-9-24)		.	.	.
Apacer	78.A1GC6.421	2048MB	DS	ELPIDA	J1108BABG-DJ-E	(1333-9-9-9-24)		.	.	.
Apacer	78.A1GC6.9L1	2048MB	DS	Apacer	AM5D5808AEWSBG	9(1333-9-9-9-24)		.	.	.
Apacer	78.A1GC8.423	2048MB	DS	ELPIDA	J1108BABG-DJ-E(ECC)	(1333-9-9-9-24)		.	.	.
CORSAIR	TR3X3G1333C9 (Ver2.1)	3072MB (Kit of 3)	SS	N/A	Heat-Sink Package	9-9-9-24 (1333-9-9-9-24)	1.5	.	.	
CORSAIR	CM3X1024-1333C9DHX	1024MB	DS	N/A	Heat-Sink Package	(1333-9-9-9-24)	1.1	.	.	.
CORSAIR	BoxP/N:TWIN3X2048-1333C9 (CM3X1024-1333C9)Ver1.1	2048MB (Kit of 2)	DS	N/A	Heat-Sink Package	9-9-9-24 (1066-7-7-7-20)	1.70	.	.	.
CORSAIR	BoxP/N:TW3X4G1333C9DHX (CM3X2048-1333C9DHX)Ver3.2	4096MB (Kit of 2)	DS	N/A	Heat-Sink Package	9-9-9-24 (1066-7-7-7-20)	1.70	.	.	.
CORSAIR	TR3X6G1333C9 (Ver2.1)	6144MB (Kit of 3)	DS	N/A	Heat-Sink Package	9-9-9-24 (1333-9-9-9-24)	1.5	.	.	

## Crosshair III Formula Motherboard

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

Crucial	CT12864BA1339.8SFD	1024MB	SS	MICRON	MT8JF12864AY-1G4D1	(1333-9-9-9-24)	• •
Crucial	CT25664BA1339.16SFD	2048MB	DS	MICRON	D9JNM	(1333-9-9-9-24)	• • •
Crucial	BL25664BA1336.16SFB1	4096MB (Kit of 2)	DS	NA	Heat-Sink Package	6-6-6-20(1333-9-9-9-24)	1.8 • • •
ELPIDA	EBJ10UE8BAW0-DJ-E	1024MB	SS	ELPIDA	J1108BABG-DJ-E	9(1333-9-9-9-24)	• • •
ELPIDA	EBJ21UE8BAW0-DJ-E	2048MB	DS	ELPIDA	J1108BABG-DJ-E	9(1333-9-9-9-24)	•
G.SKILL	F3-10600CL7D-2GBPI	2048MB (Kit of 2)	SS	N/A	Heat-Sink Package	(1337-7-7-7-18)	1.65 • • •
G.SKILL	F3-10600CL8D-2GBHK	2048MB (Kit of 2)	SS	N/A	Heat-Sink Package	(1337-8-8-8-22)	1.65 • •
G.SKILL	F3-10666CL9T-6GBNQ	6144MB (Kit of 3)	DS	N/A	Heat-Sink Package	9-9-9-24(1333-9-9-9-24)	1.5 • •
GEIL	GV34GB1333C7DC	4096MB (Kit of 2)	DS	N/A	Heat-Sink Package	7-7-7-24(1333-8-8-8-28)	1.5 • • •
Hynix	HMT112U6BF8C-H9	1024MB	SS	Hynix	H5TQ1G83BFR	9(1333-9-9-9-24)	• •
Hynix	HMT125U6BF8C-H9	2048MB	DS	Hynix	H5TQ1G83BFR	9(1333-9-9-9-24)	• •
Hynix	HMT125U6BF8C-H9	2048MB	DS	Hynix	H5TQ1G83BFRH9C	9(1333-9-9-9-24)	• •
KINGMAX	FLFD45F-B8EE9	1024MB	SS	ELPIDA	J1108BASE-DJ-E	(1333-9-9-9-24)	• •
KINGSTON	KVR1333D3N9/1G	1024MB	SS	ELPIDA	J1108BABG-DJ-E	1333-9-9-9-24	1.5 • •
MICRON	MT16JTF25664AY-1G4BYES	2048MB	DS	MICRON	Z9HWR	(1333-9-9-9-24)	• •
OCZ	OCZ3RPX1333EB2GK	1024MB	SS	N/A	Heat-Sink Package	(1066-6-5-5-20)	• •
OCZ	OCZ3G1333LV3GK	3072MB (Kit of 3)	SS	N/A	Heat-Sink Package	9-9-9(1066-7-7-7-20)	1.65 •
OCZ	OCZ3P1333LV3GK	3072MB (Kit of 3)	SS	N/A	Heat-Sink Package	7-7-7(1066-7-7-7-16)	1.65 • •
OCZ	OCZ3P13334GK	4096MB (Kit of 2)	DS	N/A	Heat-Sink Package	7(1333-7-7-7-20)	1.8 • • •
OCZ	OCZ3RPX1333EB4GK	4096MB (Kit of 2)	DS	N/A	Heat-Sink Package	(1066-6-5-5)	1.85 • •
OCZ	OCZ3G1333LV6GK	6144MB (Kit of 3)	DS	N/A	Heat-Sink Package	9-9-9(1066-7-7-7-20)	1.65 • •
OCZ	OCZ3P1333LV6GK	6144MB (Kit of 3)	DS	N/A	Heat-Sink Package	7-7-7(1066-7-7-7-20)	1.65 • • •
SAMSUNG	M378B2873DZ1-CH9	1024MB	SS	SAMSUNG	K4B1G0846D	9(1333-9-9-9-24)	•
SAMSUNG	M391B2873DZ1-CH9	1024MB	SS	SAMSUNG	K4B1G0846D(ECC)	9(1333-9-9-9-24)	• •
SAMSUNG	M378B5673DZ1-CH9	2048MB	DS	SAMSUNG	K4B1G0846D	9(1333-9-9-9-24)	• •
SAMSUNG	M391B5673DZ1-CH9	2048MB	DS	SAMSUNG	K4B1G0846D(ECC)	9(1333-9-9-9-24)	• • •
SAMSUNG	M378B5273BH1-CH9	4096MB	DS	SAMSUNG	K4B2G0846B-HCH9	9(1333-9-9-9-24)	• •
Transcend	TS128MLK64V3U	1024MB	SS	SAMSUNG	K4B1G0846D	9(1333-9-9-9-24)	• •
Transcend	TS256MLK64V3U	2048MB	DS	SAMSUNG	K4B1G0846D	9(1333-9-9-9-24)	• • •
Asint	SLY3128M8-EDJ	1024MB	SS	Asint	DDRIII1208-DJ	(9-9-9-24)	•
Asint	SLZ3128M8-EDJ	2048MB	DS	Asint	DDRIII1208-DJ	(9-9-9-24)	• •
ASUS	N/A	1024MB	DS	N/A	Heat-Sink Package	(1333-9-9-9-24)	• •
BUFFALO	FSX1333D3G-2G	2048MB	DS	N/A	Heat-Sink Package	(1066-7-7-7-20)	• •
Elixir	M2F2G64CB8HA4N-CG	2048MB	DS	Elixir	N2CB1G80AN-CG	(1333-9-9-9-24)	• •

Crosshair III Formula Motherboard

Qualified Vendors Lists (QVL) DDR3-1333MHz capability

Patriot	PDC32G1333LLK	1024MB	SS	PATRIOT	Heat-Sink Package	7(1337-7-7-7-20)	1.7	•	•
Patriot	PVT33G1333ELK	3072MB (Kit of 3)	SS	N/A	Heat-Sink Package	9-9-9-24(1066-7-7-7-20)	1.65	•	• •
Patriot	PVS34G1333ELK	4096MB (Kit of 2)	DS	N/A	Heat-Sink Package	9-9-9-24(1066-7-7-7-20)	1.5	•	• •
Patriot	PVS34G1333LLK	4096MB (Kit of 2)	DS	N/A	Heat-Sink Package	7-7-7-20(1066-7-7-7-20)	1.7	•	•
Patriot	PVT36G1333ELK	6144MB (Kit of 3)	DS	N/A	Heat-Sink Package	9-9-9-24(1066-7-7-7-20)	1.65	•	
Silicon Power	SP001GBTU133S02	1024MB	SS	S-POWER	I0YT3E0	9(1333-9-9-9-24)		•	
Silicon Power	SP002GBLTU133S02	2048MB	DS	S-POWER	I0YT3E0	9(1333-9-9-9-24)		•	•



SS - Single-sided    DS - Double-sided DIMM support:

- **A\*:** Supports one module inserted in any slot as single-channel memory configuration.
- **B\*:** Supports one pair of modules inserted into either the yellow slots or the black slots as one pair of dual-channel memory configuration.
- **C\*:** Supports four modules inserted into both the yellow and black slots as two pairs of dual-channel memory configuration.



Visit the ASUS website at [www.asus.com](http://www.asus.com) for the latest QVL.

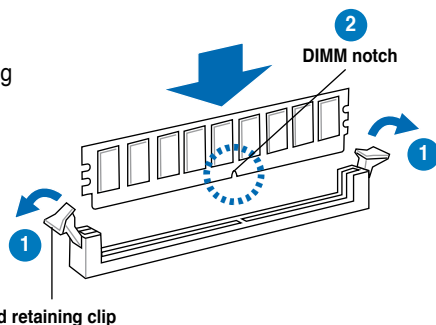
## 2.4.3 Installing a DIMM



Ensure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

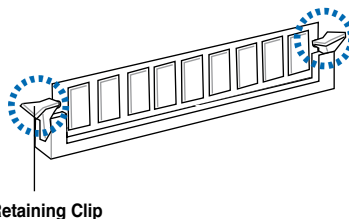
To install a DIMM

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.



A 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.

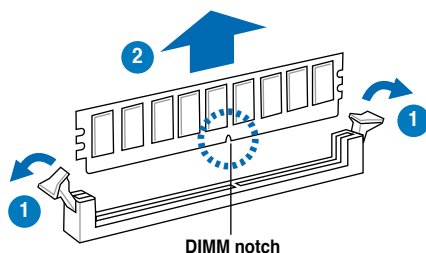
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



## 2.5.4 Removing a DIMM

To remove a DIMM

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



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

## 2.5 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.



---

Ensure 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 3 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	–	Redirect to IRQ#9
4	12	Communications Port (COM1)*
5	13	IRQ Holder for PCI Steering*
6	14	Reserved
7	15	Reserved
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	Reserved
13	8	Numeric Data Processor
14	9	Primary IDE Channel

\* These IRQs are usually available for PCI devices.

### IRQ assignments for this motherboard


	A	B	C	D	E	F	G	H
PCIEX1_1	–	shared	–	–	–	–	–	–
PCIEX16_1	–	–	shared	–	–	–	–	–
PCIEX1_2	–	–	shared	–	–	–	–	–
PCI_1	–	–	–	–	shared	–	–	–
PCIEX16_2	–	–	–	shared	–	–	–	–
PCIEX1_3	–	–	–	shared	–	–	–	–
USB1 controller 0	–	–	–	shared	–	–	–	–
USB1 controller 1	–	–	–	–	shared	–	–	–
USB1 2.0 controller	–	–	–	–	–	shared	–	–
USB2 controller 0	–	–	–	–	–	shared	–	–
USB2 controller 1	–	–	–	–	–	–	–	shared
USB2 2.0 controller	–	–	–	shared	–	–	–	–
USB3 controller	–	–	shared	–	–	–	–	–
IDE Controller	shared	–	–	–	–	–	–	–
SATA controller	–	–	–	–	–	–	shared	–
LAN	shared	–	–	–	–	–	–	–
1394	–	shared	–	–	–	–	–	–
Audio	shared	–	–	–	–	–	–	–

### 2.5.4 PCI slot

The PCI slot supports cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. Refer to the figure below for the location of the slot.

### 2.5.5 PCI Express x1 slots

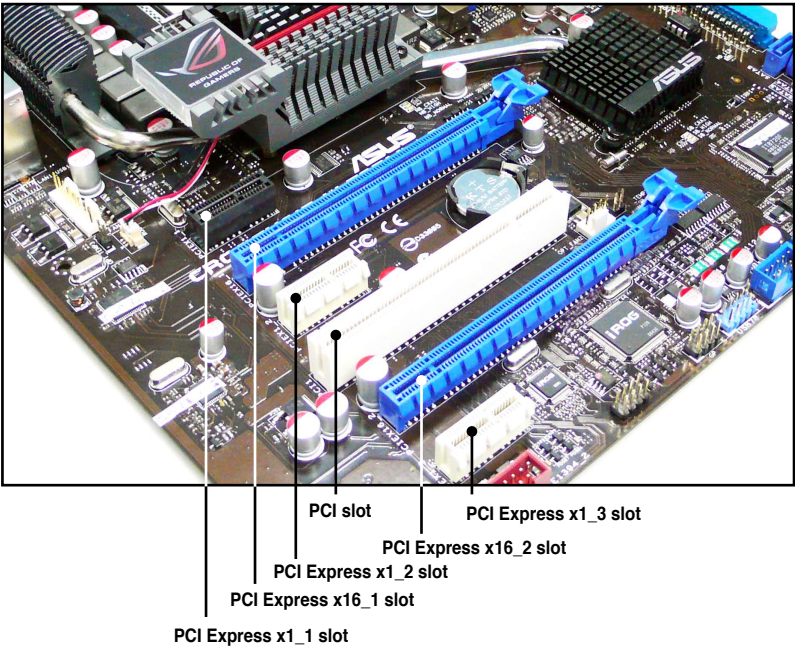
This motherboard supports PCI Express x1 network cards, SCSI cards and other cards that comply with the PCI Express specifications.



Install a PCIe x1 device to a PCIe x1 slot prior to a PCIe x16 slot.

### 2.5.6 PCI Express 2.0 x16 slots

This motherboard has two PCI Express 2.0 x16 slots that support PCI Express x16 2.0 graphic cards complying with the PCI Express specifications. Refer to the figure below for the location of the slots.





- 
- In single VGA card mode, use first the PCIe 2.0 x16\_1 slot for a PCI Express x16 graphics card to get better performance.
  - In CrossFireX™ mode, use the PCIe 2.0 x16\_1 and PCIe 2.0 x16\_2 (blue) slots for PCI Express x16 graphics cards to get better performance.
  - We recommend that you provide sufficient power when running CrossFireX™ mode. See page 2-37 for details.
  - Connect a chassis fan to the motherboard connector labeled CHA\_FAN1/2/3 when using multiple graphics cards for better thermal environment.
-



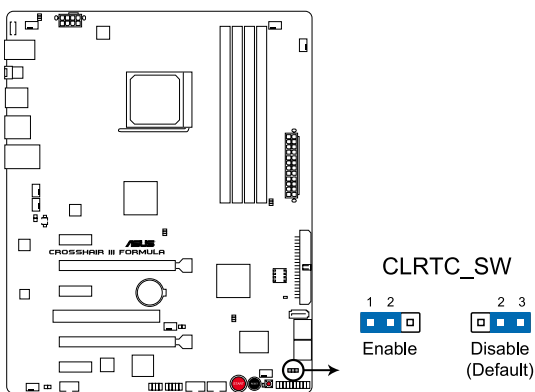
## 2.6 Jumper

### Clear RTC RAM (3-pin CLRTC\_SW)

This jumper 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 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.



### CROSSHAIR III FORMULA Clear RTC RAM



- The clr CMOS switch will not function if the CLRTC\_SW jumper is moved to the Disable position.
- Ensure 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.

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

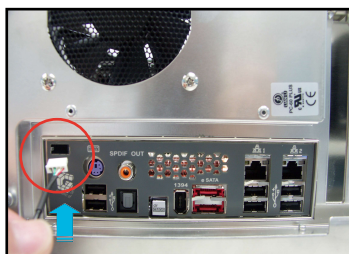
### 2.7.1 I/O shield and LCD Poster Installation

1. Install the I/O shield to the chassis by snapping 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.

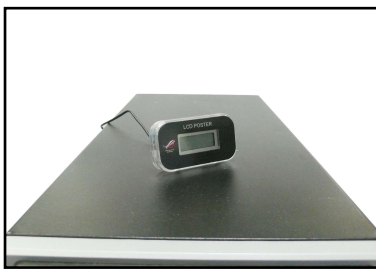
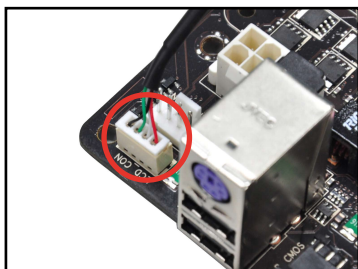


Be cautious when installing the motherboard. The I/O shield edge springs may damage the I/O ports.

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



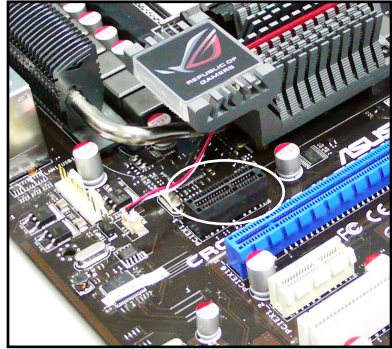
4. Locate and connect the LCD Poster cable to the **LCD\_CON** connector.
5. Place the LCD Poster on the chassis or to wherever you like.



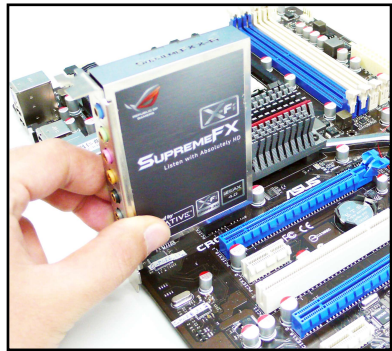
The the photos above are for reference only, the actual I/O shield may differ by models.

## 2.7.2 Audio card Installation

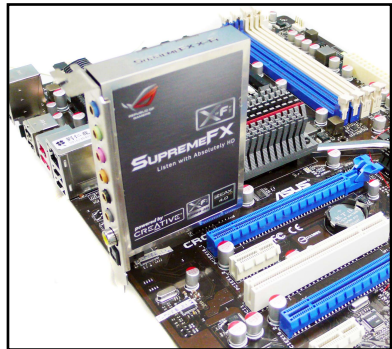
1. Take out the Audio card from the package.
2. Locate the audio slot on the motherboard.



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

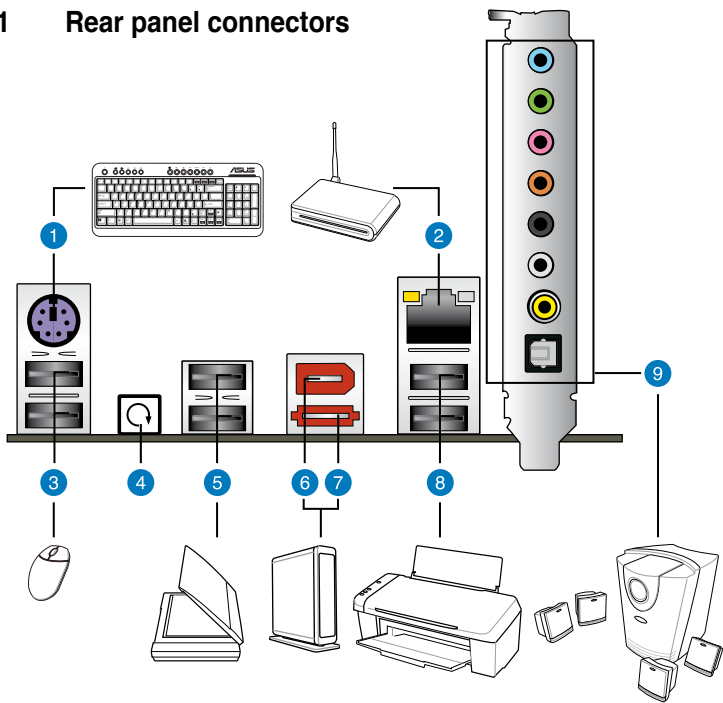


4. The photo below shows the audio card installed on the motherboard.



# 2.8 Connectors

## 2.8.1 Rear panel connectors



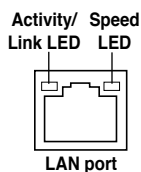
Rear panel connectors	
1. PS/2 keyboard port (purple)	6. IEEE 1394a port
2. LAN (RJ-45) port*	7. External SATA port
3. USB 2.0 ports 5 and 6	8. USB 2.0 ports 1 and 2
4. Clear CMOS switch	9. Audio Ports**
5. USB 2.0 ports 3 and 4	



To use hot-plug, set the **Controller Mode** in the BIOS settings to [AHCI] mode. See section 3.5.3 Onboard Devices Configuration for details.

### \* LAN port LED indications

Activity/Link	Speed LED	Description
OFF	OFF	Soft-off Mode
Yellow Blinking	OFF	During Power ON/OFF
Yellow Blinking	ORANGE	100 Mbps connection
Yellow Blinking	GREEN	1 Gbps connection



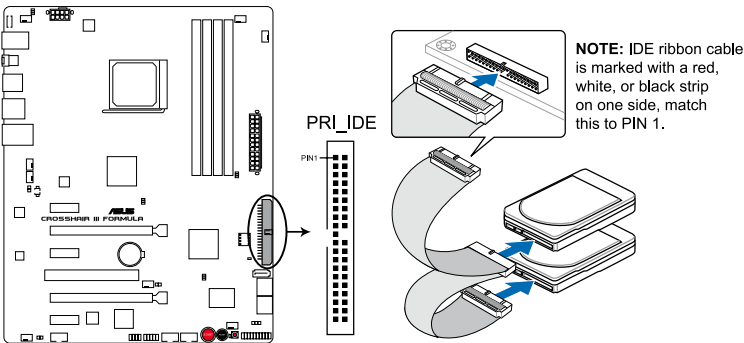
### \*\*Audio 2, 4, 6, or 8-channel configuration

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 Out	Rear Speaker Out
Gray	–	–	–	Side Speaker Out

## 2.7.2 Internal connectors

### 1. 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.



**CROSSHAIR III FORMULA EIDE connector**

	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," ensure all other device jumpers have the same setting.

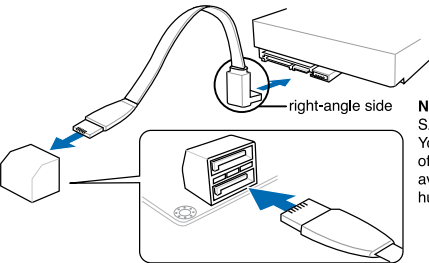
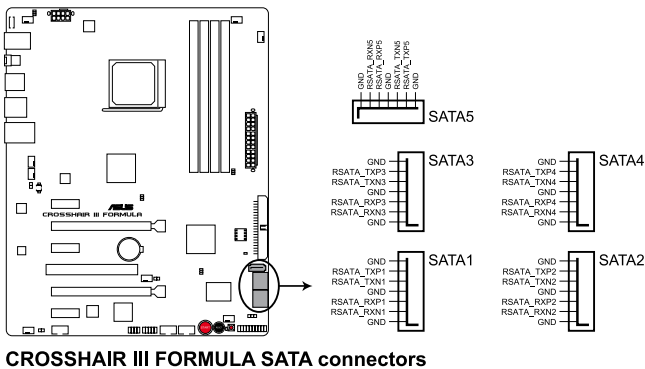
2. **AMD® SB750 Southbridge Serial ATA connectors (7-pin SATA1–5)**

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

If you install SATA hard disk drives to the SATA1–5 connectors, you can create a RAID 0, RAID 1, RAID 5, RAID 10 or JBOD configuration through the onboard AMD® SB750 controller.



These connectors are set to [IDE] by default. If you intend to create a Serial ATA RAID set using these connectors, set the Onchip SATA Type item in the BIOS to [RAID].



**NOTE:** Connect the right-angle side of SATA signal cable to SATA device. You may also connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.



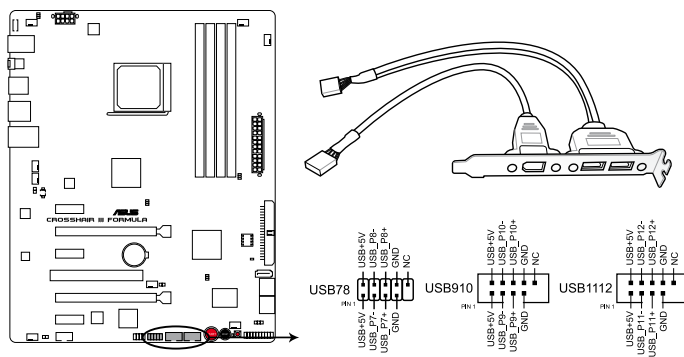
Install the Windows® XP Service Pack 2 or later version before using Serial ATA.



- For detailed instructions on how to configure RAID 0, RAID 1, RAID 5 and RAID 10, refer to the RAID manual in the support DVD.
- If you intend to create a Serial ATA RAID set using these connectors, set the **OnChip SATA Type** item in the BIOS to [RAID].

### 3. USB connectors (10-1 pin USB78; USB910; USB1112)

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.



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

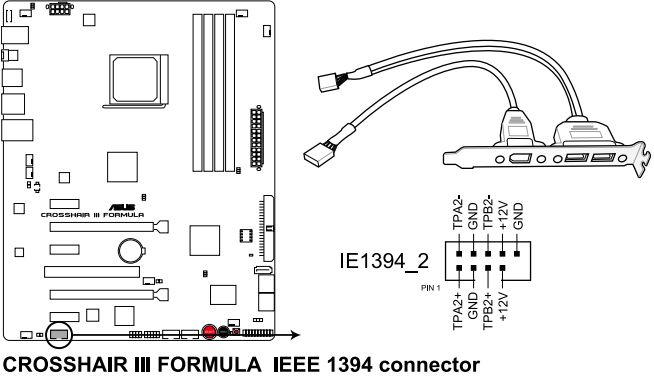


You can connect the USB cable to ASUS Q-Connector (USB, blue) first, and then install the Q-Connector (USB) to the USB connector onboard.



4. **IEEE 1394a port connector (10-1 pin IE1394\_2)**

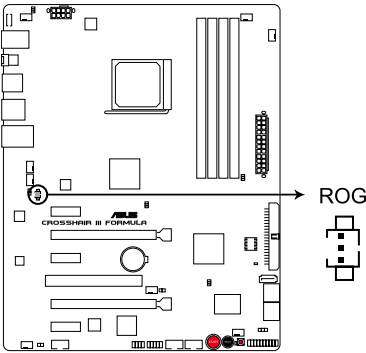
This connector is for an IEEE 1394a port. Connect the IEEE 1394a module cable to this connector, then install the module to a slot opening at the back of the system chassis.



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

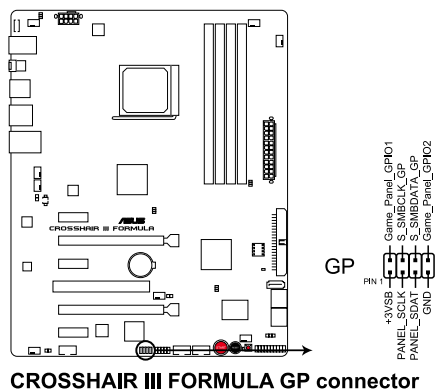
5. **ROG connector (3-pin ROG)**

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.



## 6. GP connector (8-pin GP)

This connector is for ASUS OC Station connection only. Connect one end of the supplied data cable to the GP connector on the OC Station and the other end to this connector and USB78 on the motherboard to enjoy easier overclocking.



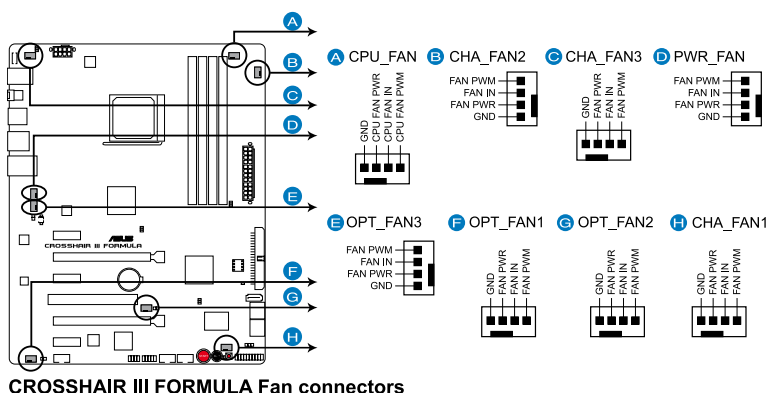
**CROSSHAIR III FORMULA GP connector**

## 7. CPU, chassis, and optional fan connectors (4-pin CPU\_FAN, 4-pin PWR\_FAN, 4-pin CHA\_FAN1–3, 4-pin OPT\_FAN1–3)

The fan connectors support cooling fans of 350 mA–2000 mA (24 W max.) or a total of 1 A–7 A (84 W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.



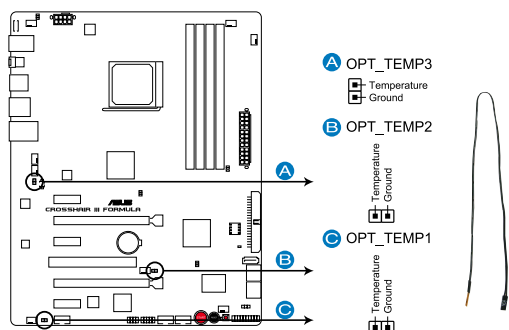
DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!



If you install two VGA cards, we recommend that you plug the chassis fan cable to the motherboard connector labeled OPT\_FAN1/2/3 for better thermal environment.

## 8. Thermal sensor cable connectors (2-pin OPT\_TEMP1/2/3)

These connectors are for temperature monitoring. Connect the thermal sensor cables to these connectors and place the other ends to the devices which you want to monitor temperature. The optional fan1/2/3 can work with the temperature sensors for a better cooling effect.



**CROSSHAIR III FORMULA Thermal sensor cable connectors**



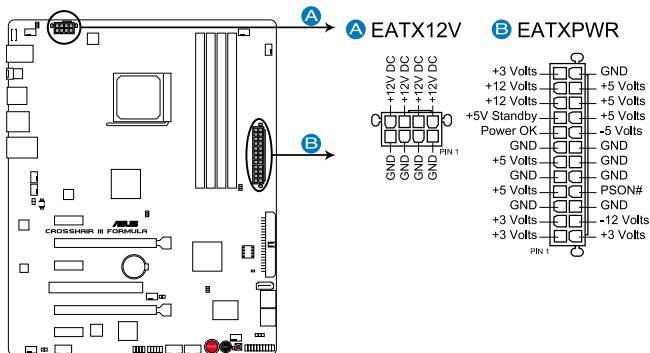
Enable **OPT FAN1/2/3 overheat protection** in BIOS if you connect thermal sensor cables to these connectors.



The thermal sensor cable is purchased separately.

## 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.



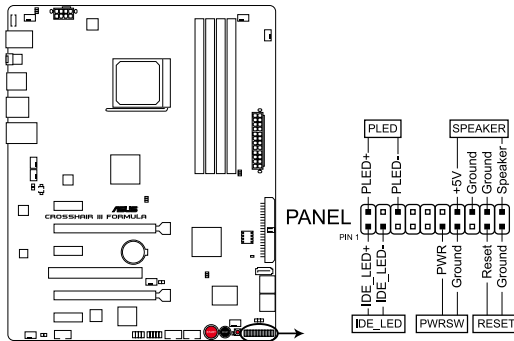
**CROSSHAIR III FORMULA ATX power connectors**



- Ensure 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 600 W.
- Do not forget to connect the 8-pin EATX12 V 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.

## 10. System panel connector (20-8 pin PANEL)

This connector supports several chassis-mounted functions.



**CROSSHAIR III FORMULA System panel connector**

- **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 PWR SW)**

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.

## 11. Audio connectors

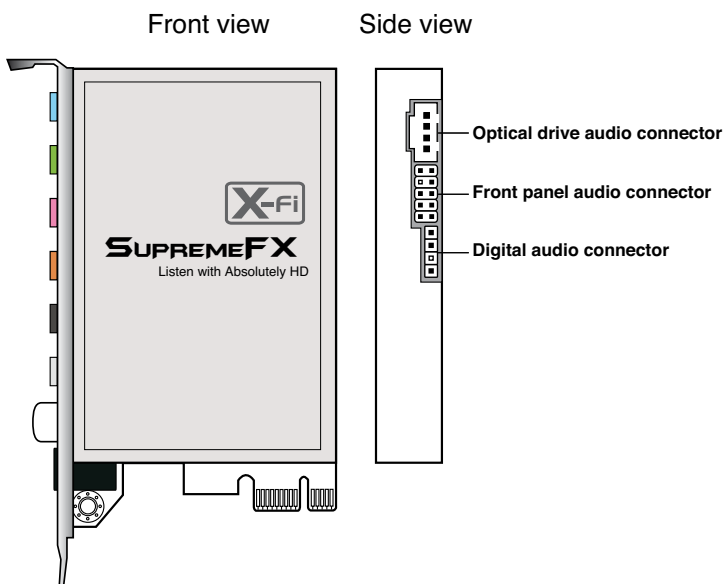
**Optical drive audio connector:** This connector allows you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.

**Front panel audio connector:** This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.



We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

**Digital audio connector:** This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s).



## 12. ASUS Q-Connector (system panel)

Use the ASUS Q-Connector to connect/disconnect the chassis front panel cables.

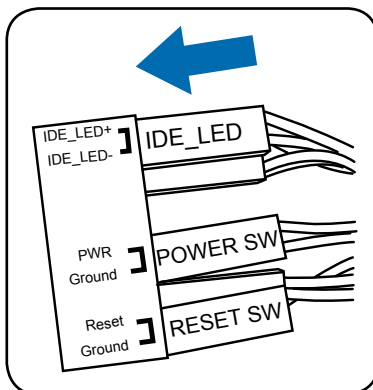
To install the ASUS Q-Connector:

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

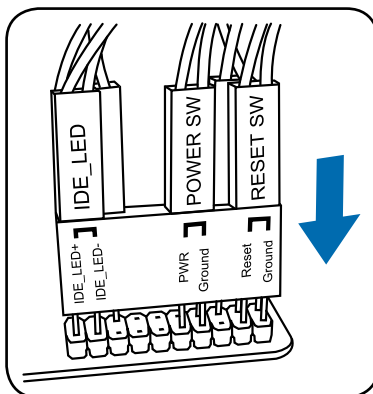
Refer to the labels on the Q-Connector to know the detailed pin definitions, and then match them to their respective front panel cable labels.



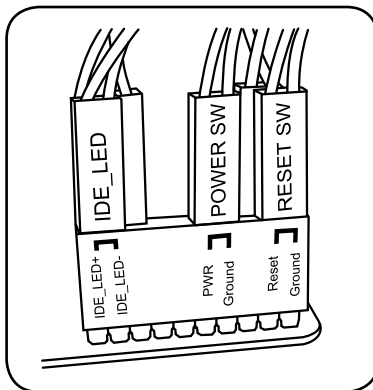
The labels on the front panel cables may vary depending on the chassis model.



2. Install the ASUS Q-Connector to the system panel connector, ensuring the orientation matches the labels on the motherboard.



3. The front panel functions are now enabled. The figure shows the Q-Connector is properly installed on the motherboard.



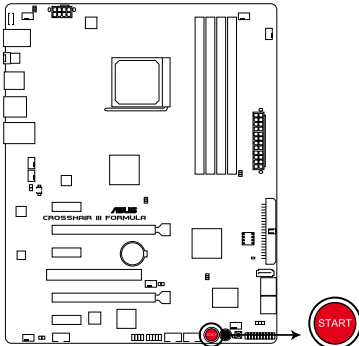


### 2.8.3 Onboard switches

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

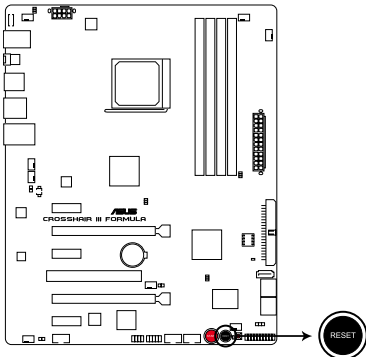
Press the power-on switch to wake/power up the system.



**CROSSHAIR III FORMULA Power on switch**

#### 2. Reset switch

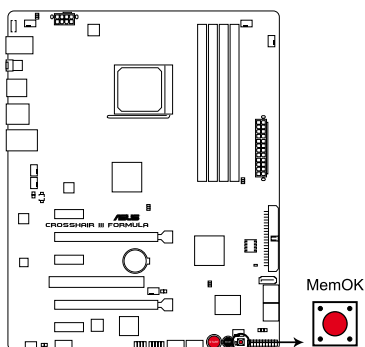
Press the reset switch to reboot the system.



**CROSSHAIR III FORMULA Reset switch**

### 3. MemOK! switch

Press the MemOK! switch to load failsafe settings for memory compatibility and improving system boot success.



**CROSSHAIR III FORMULA MEMOK switch**

## 2.9 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 Quick boot set to disabled 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 3.

## 2.10 Turning off the computer

### 2.10.1 Using the OS shut down function

If you are using Windows® Vista™:

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

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.

### 2.10.2 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 **3.6 Power Menu** in Chapter 3 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 3

## Chapter summary

# 3

3.1	Managing and updating your BIOS .....	3-1
3.2	BIOS setup program .....	3-6
3.3	Extreme Tweaker menu .....	3-9
3.4	Main menu .....	3-18
3.5	Advanced menu .....	3-23
3.6	Power menu .....	3-33
3.7	Boot menu .....	3-39
3.8	Tools menu .....	3-43
3.9	Exit menu .....	3-47

## 3.1 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 CrashFree BIOS 3 utility:** Restores the BIOS using the motherboard support DVD or a USB flash drive 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 USB flash drive in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the **ASUS Update** utility.

---

### 3.1.1 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.



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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.

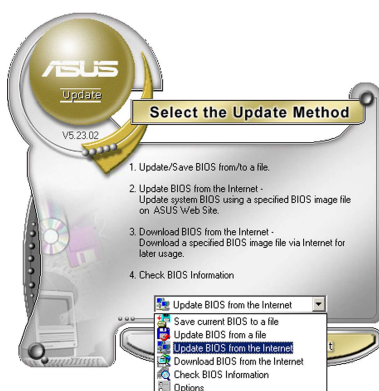
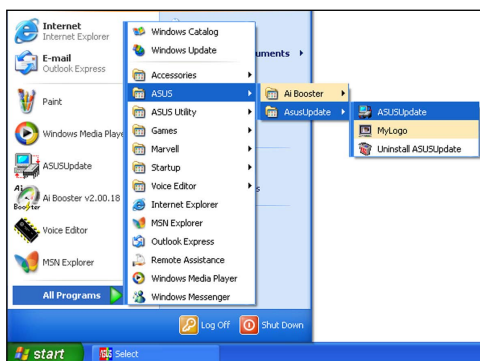


Quit all Windows® applications before you update the BIOS using this utility.

## 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**.



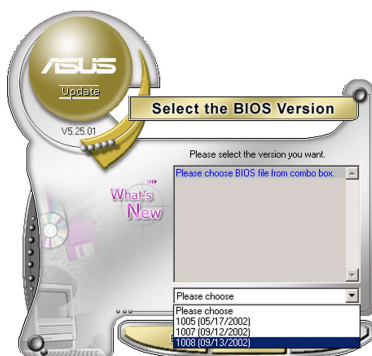
3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.



- From the FTP site, select the BIOS version that you wish to download. Click **Next**.
- Follow the screen instructions to complete the update process.



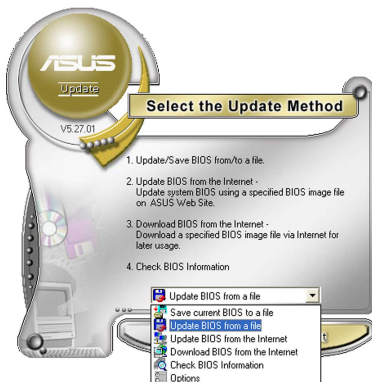
The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail all its features.



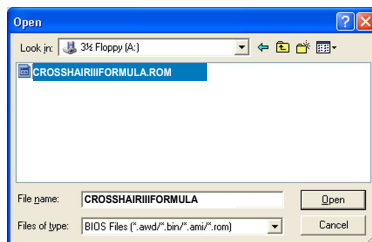
## Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

- Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.
- Select **Update BIOS** from a file option from the drop-down menu, then click **Next**.



- Locate the BIOS file from the Open window, then click **Open**.
- Follow the screen instructions to complete the update process.



### 3.1.2 ASUS EZ Flash 2 utility

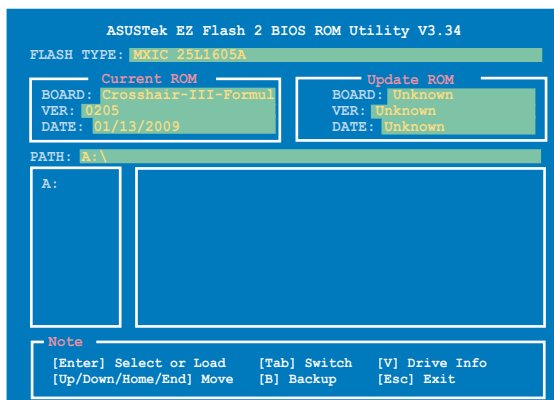
The ASUS EZ Flash 2 feature allows you to update the BIOS without having to use a DOS-based utility. The EZ Flash 2 utility is built in the BIOS chip so it is accessible by pressing <Alt> + <F2> during the Power-On Self Tests (POST).



Before you start using this utility, download the latest BIOS from the ASUS website at [www.asus.com](http://www.asus.com).

To update the BIOS using EZ Flash 2

1. Insert the USB flash disk that contains the latest BIOS file to the USB port, and then launch EZ Flash 2 in any of these two ways:
  - Press <Alt> + <F2> during POST to display the following.
  - Enter the BIOS setup program. Go to the **Tools** menu to select **EZ Flash 2** and press <Enter> to enable it.



2. Press <Tab> to switch between drives until the correct BIOS file is found. When found, EZ Flash 2 performs the BIOS update process and automatically reboots the system when done.



- This function can support devices such as a USB flash 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!



Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the **Exit** menu. See section **3.9 Exit Menu** for details.

### 3.1.3 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 utility 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 restore a corrupted BIOS file using the motherboard support DVD or a USB flash drive that contains the BIOS file.



---

The BIOS file in the motherboard support DVD may be older than the BIOS file published on the ASUS official website. If you want to use the newer BIOS file, download the file at [support.asus.com](http://support.asus.com) and save it to a USB flash drive.

---

### Recovering the BIOS

To recover the BIOS

1. Turn on the system.
2. Insert the motherboard support DVD to the optical drive, or the USB flash drive containing the BIOS file to the USB port.
3. The utility automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.
4. Turn off the system after the utility completes the updating process and power on again.
5. The system requires you to enter BIOS Setup to recover BIOS setting. To ensure system compatibility and stability, we recommend that you press <F2> to load default BIOS values.



---

**DO NOT** shut down or reset the system while recovering the BIOS! Doing so can cause system boot failure!

---

## 3.2 BIOS setup program

This motherboard supports two programmable firmware chips that you can update using the provided utility described in section 3.1 **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 firmware chip.

The firmware 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.

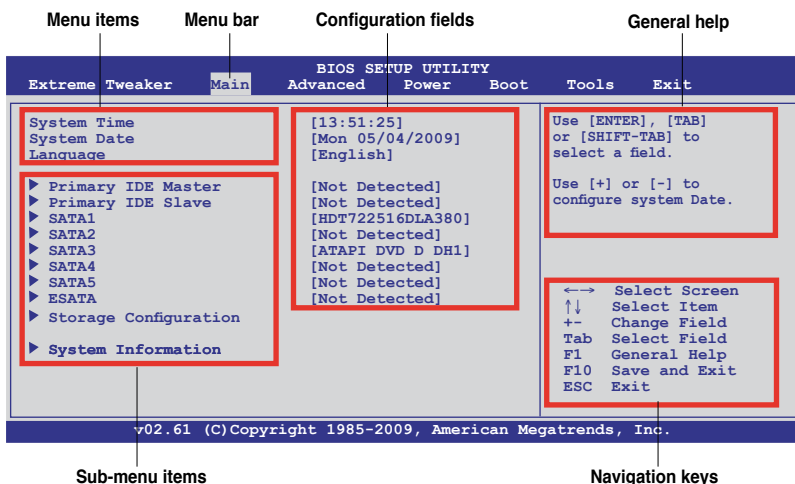
If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

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 3.9 **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 at [www.asus.com](http://www.asus.com) to download the latest BIOS file for this motherboard.

### 3.2.1 BIOS menu screen



### 3.2.2 Menu bar

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

- Extreme Tweaker** For changing the overclocking settings
- Main** For changing the basic system configuration
- 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.

### 3.2.3 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.

### 3.2.4 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.

### 3.2.5 Submenu items

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

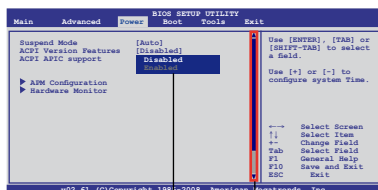
### 3.2.6 Configuration fields

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 **3.2.7 Pop-up window**.

### 3.2.7 Pop-up window

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



Scroll bar  
Pop-up window

### 3.2.8 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.

### 3.2.9 General help

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

## 3.3 Extreme Tweaker menu

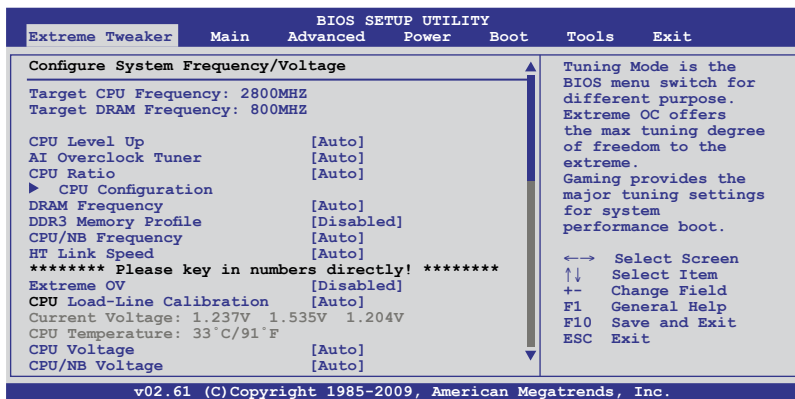
The Extreme Tweaker menu items allow you to configure overclocking-related items.



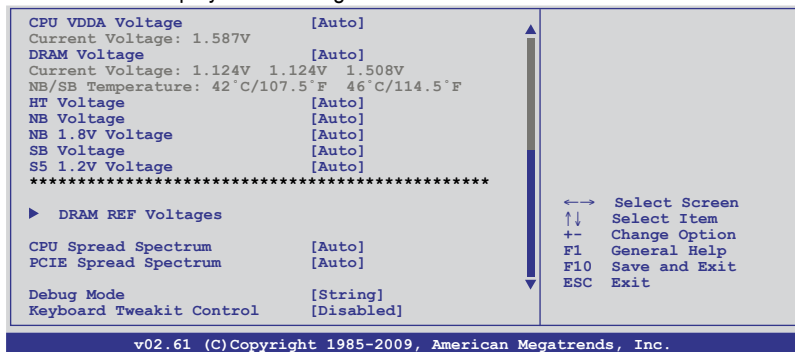
Take caution when changing the settings of the **Extreme Tweaker** menu items. Incorrect field values can cause the system to malfunction.



The default values of the following items vary depending on the CPU and memory modules you install on the motherboard.



Scroll down to display the following items:



### 3.3.1 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.

Configuration options: [Auto] [Phenom II-925] [Phenom II-945] [Phenom II-955]

### 3.3.2 Ai Overclock Tuner [Auto]

Allows selection of CPU/memory overclocking options to achieve desired CPU/memory internal frequency. Select any of the preset overclocking configuration options:

<b>Manual</b>	Allows you to individually set overclocking parameters.
<b>Auto</b>	Loads the standard settings for the system.
<b>CPU Level Up</b>	Allows you to select a CPU level, and the related parameters will be adjusted automatically.

### 3.3.3 FSB Frequency [XXX]

Displays the frequency sent by the clock generator to the system bus and PCI bus. The value of this item is auto-detected by the BIOS. Use the <+> and <-> keys to adjust the FSB frequency. You can also type in the desired frequency using the numeric keypad. The values range from 200 to 600. **This item appears when you set Ai Overclock Tuner to [Manual].**

### 3.3.4 PCIE Frequency [XXX]

Allows you to set the PCI Express frequency. Use the <+> and <-> keys to adjust the PCIE frequency. You can also type in the desired value using the numeric keypad. The values range from 100 to 150. **This item appears when you set Ai Overclock Tuner to [Manual].**

### 3.3.5 CPU Ratio [Auto]

Allows you to adjust the ratio between CPU Core Clock and FSB Frequency. Use the <+> and <-> keys to adjust the value. **The valid value ranges differently according to your CPU model.**

### 3.3.6 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects. Refer to **section 3.5.1** for details.

### 3.3.7 DRAM Frequency [Auto]

Allows you to set the DDR3 operating frequency.

Configuration options: [Auto] [800MHz] [1067MHz] [1333MHz] [1600MHz]

### 3.3.8 DDR3 Memory Profile [Disabled]

[Enabled] Enables the DDR3 memory profile function.

[Disabled] Disables this function.



### 3.3.9 CPU/NB Frequency [Auto]

Sets the ratio between northbridge (in CPU) and the FSB frequency.

Configuration options: [Auto] [800MHz] [1000MHz] [1200MHz]—[2000MHz]

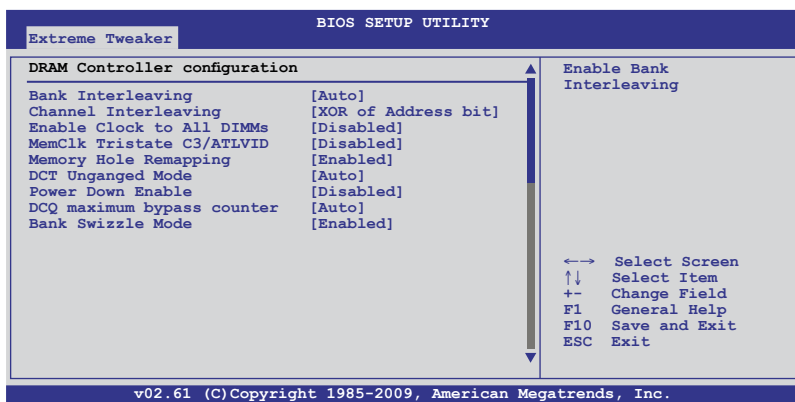
### 3.3.10 HT Link Speed [Auto]

Allows you to set the HyperTransport link speed.

Configuration options: [Auto] [200MHz] [400MHz]—[2400MHz] [2000MHz]

### 3.3.11 DRAM Controller configuration

This item appears only when you set **Ai Overclock Tuner** to [Manual] or [CPU Level Up]



#### Bank Interleaving [Auto]

[Enabled] Enables the bank memory interleaving.

[Disabled] Disables this function.

#### Channel Interleaving [Auto]

Enables or disables the channel memory interleaving.

Configuration options: [Disabled] [Address bits 6] [Address bits 12]

[XOR of Address bits [20:16, 6]] [XOR of Address bits [20:16, 9]]

#### Enable Clock to All DIMMs [Disabled]

Allows you to enable unused clocks to DIMMs that are not populated.

Configuration options: [Disabled] [Enabled]

#### MemClk Tristate C3/ATLVID [Disabled]

[Enabled] Enables MemClk Tri-Stating during C3 and Alt VID

[Disabled] Disables this function.

### Memory Hole Remapping [Enabled] (M3A)

[Enabled] Enables memory remapping around memory hole.

[Disabled] Disables this function.

### DCT Unganged Mode [Auto]

[Auto] Selects the DRAM mode by DRAM setting.

[Enabled] Selects the ganged DRAM mode.

[Disabled] Selects the unganged DRAM mode.

### Power Down Enable [Disabled]

[Enabled] Enables DDR power down mode.

[Disabled] Disables this function.

### DCQ maximum bypass counter [Auto]

Configuration options: [Auto] [9x] [10x] [11x] [12x] [13x] [14x] [15x]

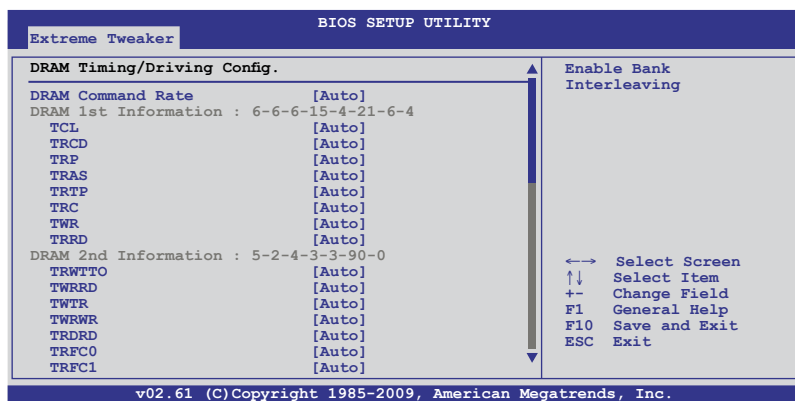
### Bank Swizzle Mode [Enabled]

[Disabled] Disables this function.

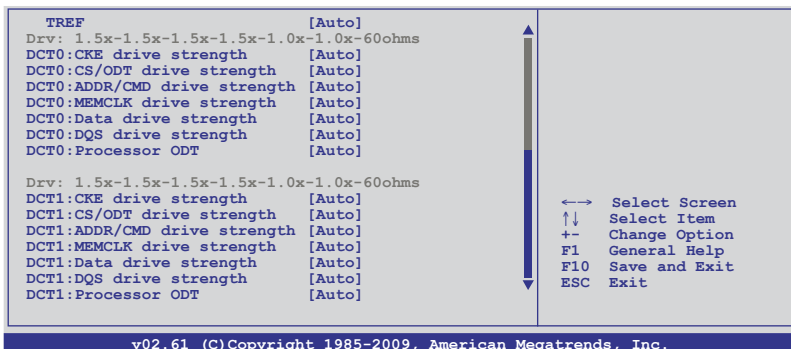
[Enabled] Enables bank swizzle mode.

## 3.3.12 DRAM Timing/Driving Config.

This item appears only when you set **Ai Overclock Tuner** to [Manual] or [CPU Level Up]



Scroll down to display the following items:



## DRAM Command Rate [Auto]

Allows you to adjust the DRAM performance.

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

## DRAM 1st Information: 6-6-6-15-4-21-6-4

The values vary depending on your settings of the following sub-items:

TCL [Auto]

Configuration options: [Auto] [4 CLK] [5 CLK]—[11 CLK] [12 CLK]

TRCD [Auto]

Configuration options: [Auto] [5 CLK] [6 CLK]—[11 CLK] [12 CLK]

TRP [Auto]

Configuration options: [Auto] [5 CLK] [6 CLK]—[11 CLK] [12 CLK]

TRAS [Auto]

Configuration options: [Auto] [15 CLK] [16 CLK]—[28 CLK] [29 CLK]

TRTP [Auto]

Configuration options: [Auto] [4 CLK] [5 CLK] [6 CLK] [7 CLK]

TRC [Auto]

Configuration options: [Auto] [11 CLK] [12 CLK]—[24 CLK] [25 CLK]

TWR [Auto]

Configuration options: [Auto] [5 CLK] [6 CLK] [7 CLK] [8 CLK] [10 CLK]  
[12 CLK]

TRRD [Auto]

Configuration options: [Auto] [4 CLK] [5 CLK] [6 CLK] [7 CLK]

## DRAM 2nd Information: 5-2-4-3-3-90-0

The values vary depending on your settings of the following sub-items:

### TRWTT0 [Auto]

Configuration options: [Auto] [3 CLK] [4 CLK]—[16 CLK] [17 CLK]

### TWRPD [Auto]

Configuration options: [Auto] [2 CLK] [3 CLK]—[9 CLK] [10 CLK]

### TWTR [Auto]

Configuration options: [Auto] [4 CLK] [5 CLK] [6 CLK] [7 CLK]

### TWRWR [Auto]

Configuration options: [Auto] [3 CLK] [4 CLK]—[9 CLK] [10 CLK]

### TRDRD [Auto]

Configuration options: [Auto] [2 CLK] [3 CLK]—[9 CLK] [10 CLK]

### TRFC0 [Auto]

Configuration options: [Auto] [90ns] [110ns] [160ns] [300ns] [350ns]

### TRFC1 [Auto]

Configuration options: [Auto] [90ns] [110ns] [160ns] [300ns] [350ns]

### TREF [Auto]

Configuration options: [Auto] [Every 7.8ms] [Every 3.9ms]

## DCT0/1:CKE drive strength [Auto]

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

## DCT0/1:CS/ODT drive strength [Auto]

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

## DCT0/1:ADDR/CMD drive strength [Auto]

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

## DCT0/1:MEMCLK drive strength [Auto]

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

## DCT0/1:Data drive strength [Auto]

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

## DCT0/1:DQS drive strength [Auto]

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

## DCT0/1:Processor ODT [Auto]

Configuration options: [Auto] [240 ohms +/- 20%] [120 ohms +/- 20%]  
[60 ohms +/- 20%]

### 3.3.13 Extreme OV [Disabled]

[Enabled] Enables the Extreme OV function.

[Disabled] Disables this function.

### 3.3.14 CPU Load-Line Calibration [Auto]

Allows you to select the CPU Load-Line mode.

[Auto] BIOS automatically adjust the voltage.

[Disabled] Follows Intel specifications.

[Enabled] Improve CPU VDrop directly.

### 3.3.15 CPU Voltage [Auto]

Allows you to set the CPU VCore voltage.



---

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

---

### 3.3.16 CPU/NB Voltage [Auto]

Allows you to set the CPU/NB voltage. The values start from 0.8V with a 0.0125V interval. The maximum supported voltage differs by CPU. The text color in the configuration field indicates voltage condition. When you set the **NB LED Selection** item to [North Bridge Voltage], the onboard northbridge LED displays northbridge voltage condition.

### 3.3.17 DRAM VDDA Voltage [Auto]

Allows you to set the DRAM voltage. The values range from 2.50425V to 3.20650V with a 0.01325V interval.

### 3.3.18 DRAM Voltage [Auto]

Allows you to set the DRAM voltage. The values range from 1.51050V to 2.80900V with a 1.51050V interval.

### 3.3.19 HT Voltage [Auto]

Allows you to set the HT voltage. The values range from 1.20575V to 2.0075V with a 1.20575V interval.

### 3.3.20 NB Voltage [Auto]

Allows you to set the NB voltage. The values range from 1.11300V to 2.00075V with a 0.01325V interval. The text color in the configuration field indicates voltage condition. When you set the **NB LED Selection** item to [North Bridge Voltage], the onboard northbridge LED displays northbridge voltage condition.



- The value [2.21V] of the **NB Voltage** item is supported only if the **OV\_NB** jumper is enabled, otherwise the maximum voltage supported is [1.91V].
- Setting the **CPU Voltage**, **CPU/NB Voltage**, **CPU VDDA Voltage**, **DRAM Voltage** and **NB Voltage** items to a high level may damage the chipset, memory module and CPU permanently. Proceed with caution.
- Some values of the **CPU PLL Voltage**, **FSB Termination Voltage**, **DRAM Voltage** and **NB Voltage** items are labeled in different color, indicating the risk levels of high voltage settings. Refer to the table below for details.
- The system may need better cooling system to work stably under high voltage settings.

### 3.3.21 NB 1.8V Voltage [Auto]

Allows you to set the NB 1.8 voltage. The values range from 1.180200V to 3.00775V with a 0.01325V interval. The text color in the configuration field indicates voltage condition.

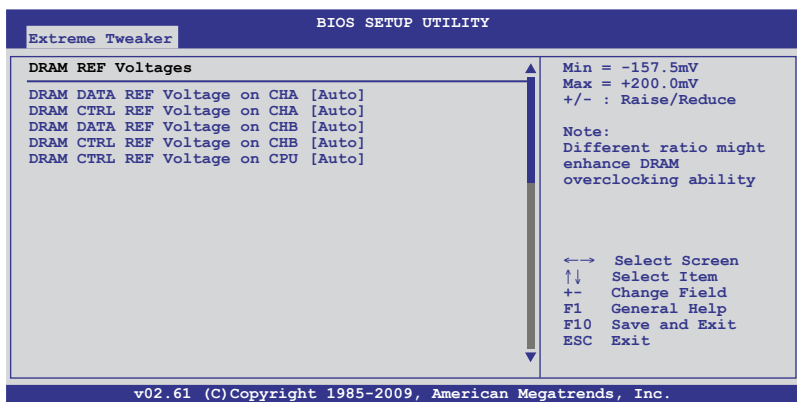
### 3.3.22 SB Voltage [Auto]

Allows you to set the SB voltage. The values range from 1.20575V to 2.00075V with a 0.01325V interval. The text color in the configuration field indicates voltage condition.

### 3.3.23 S5 1.2V Voltage [Auto]

Allows you to set the S5 1.2V voltage. The values range from 1.20575V to 1.60325V with a 0.01325V interval. The text color in the configuration field indicates voltage condition.

### 3.3.24 DRAM REF Voltages



**DRAM DATA REF Voltage on CHA, DRAM CTRL REF Voltage on CHA, DRAM DATA REF Voltage on CHB, DRAM CTRL REF Voltage on CHB, DRAM CTRL REF Voltage on CPU [Auto]**

Allows you to set different voltage on channel A and B and CPU, or you can set to [Auto] for the safe mode. Different ratio might enhance CPU overclocking ability. The values range from -157.5mV to +200.0V.

### 3.3.25 CPU Spread Spectrum [Auto]

[Disabled] Enhances FSB overclocking ability  
[Auto] Sets to [Auto] for EMI control.

### 3.3.26 PCIE Spread Spectrum [Auto]

[Disabled] Enhances the PCIE overclocking ability  
[Auto] Sets to [Auto] for EMI control.

### 3.3.27 Debug Mode [String]

Allows you to select the debug mode. Configuration options: [String] [Code]

### 3.3.28 Keyboard TweakIt Control [Disabled]

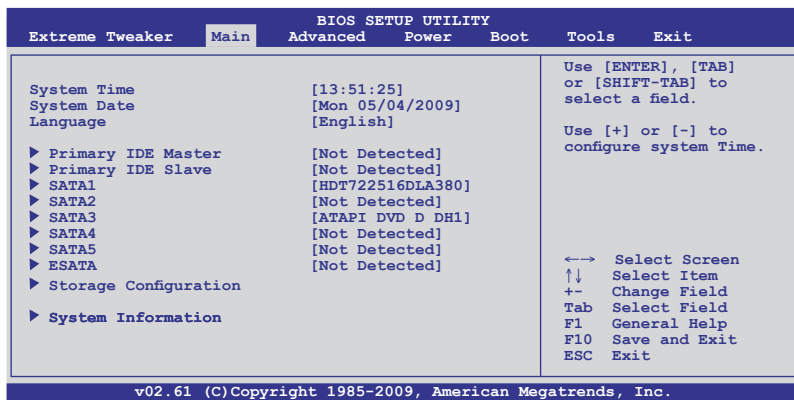
Allows you to enable or disable the keyboard TweakIt control. Configuration options: [Disabled] [Enabled]

## 3.4 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 3.2.1 **BIOS menu screen** for information on the menu screen items and how to navigate through them.



### 3.4.1 System Time [xx:xx:xx]

Allows you to set the system time.

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

Allows you to set the system date.

### 3.4.3 Language [English]

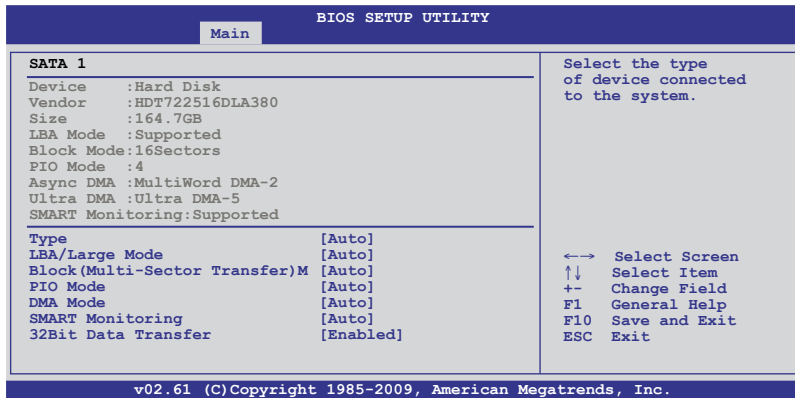
Allows you to choose the BIOS language version from the options.

Configuration options: [繁體中文] [簡體中文] [日本語] [Français] [Deutsch] [English]



### 3.4.4 Primary IDE Master/Slave; SATA 1-5; ESATA

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.



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 [Auto] if no IDE device is installed in the system.

#### Type [Auto]

Allows you to select the type of IDE drive installed.

[Not Installed] Select this option if no IDE drive is installed.

[Auto] Allows automatic selection of the appropriate IDE device type.

[CDROM] Select this option if you are specifically configuring a CD-ROM drive.

[ARMD] Select [ARMD] (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.

#### LBA/Large Mode [Auto]

Enables or disables the LBA (Logical Block Addressing) mode.

[Auto] Select [Auto] to enable the LBA mode (Logical Block Addressing mode) if the device supports this mode, and if the device was not previously formatted with LBA mode disabled.

[Disabled] Disable this function.

### **Block (Multi-Sector Transfer) M [Auto]**

Enables or disables data multi-sectors transfers.

[Auto] 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.

[Disabled] When set to [Disabled], the data transfer from and to the device occurs one sector at a time.

### **PIO Mode [Auto]**

[Auto] Allows automatic selection of the PIO (Programmed input/output) modes, which correspond to different data transfer rates.

[0] [1] – [4] Set the PIO mode to Mode 0, 1, 2, 3, or 4.

### **DMA Mode [Auto]**

DMA (Direct Memory Access) allows your computer to transfer data to and from the hardware devices installed with much less CPU overhead.

The DMA mode consists of SDMA (single-word DMA), MDMA (multi-word DMA), and UDMA (Ultra DMA). Setting to [Auto] allows automatic selection of the DMA mode, or you can select from the following options: [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5]

### **SMART Monitoring [Auto]**

[Auto] Allows automatic selection of the S.M.A.R.T (Smart Monitoring, Analysis, and Reporting Technology).

[Enabled] Enable the S.M.A.R.T feature.

[Disabled] Disable the S.M.A.R.T feature.

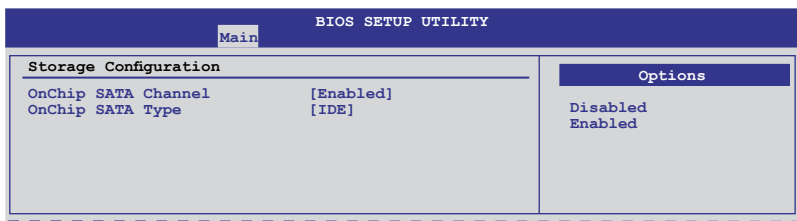
### **32Bit Data Transfer [Enabled]**

[Enabled] Sets the IDE controller to combine two 16-bit reads from the hard disk into a single 32-bit double word transfer to the processor. This makes more efficient use of the PCI bus as fewer transactions are needed for the transfer of a particular amount of data.

[Disabled] Disable this function.

### 3.4.5 Storage 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.



#### OnChip SATA Channel [Enabled]

Configuration options: [Disabled] [Enabled]

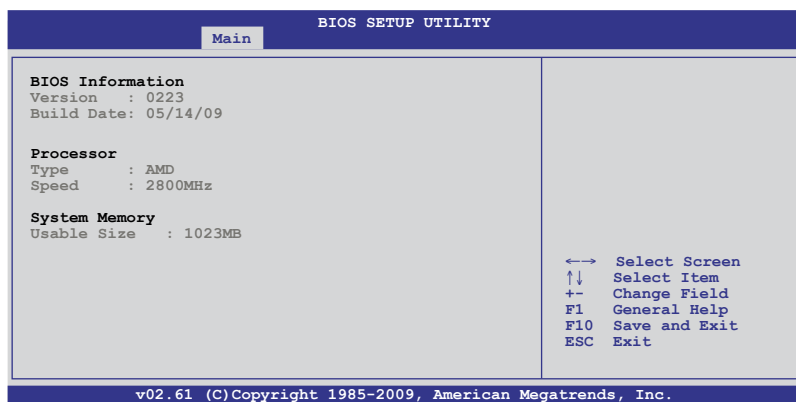
#### OnChip SATA Type [IDE]

Allows you to set the SATA configuration. This item appears only when you set the **OnChip SATA Channel** item to [Enabled].

- [IDE] Set to [IDE] when you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices.
- [RAID] Set to [RAID] when you want to create a RAID configuration from the SATA hard disk drives.
- [AHCI] Set to [AHCI] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). 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.

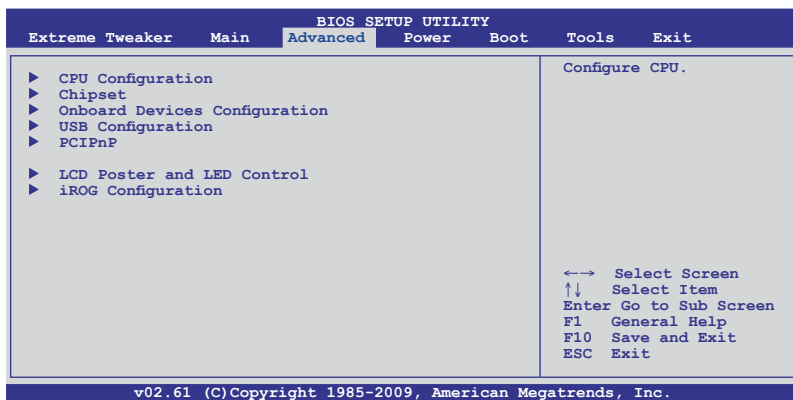
### 3.4.6 System Information

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



## 3.5 Advanced menu

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

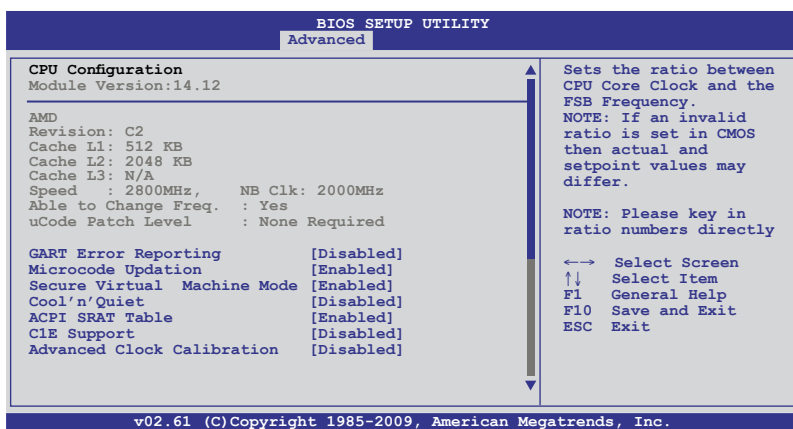


### 3.5.1 CPU Configuration

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



The items shown in this screen may be different due to the CPU you installed.



### **GART Error Reporting [Disabled]**

[Enabled] This option should remain disabled for the normal operation. The driver developer may enable it for testing purpose.

[Disabled] Disables this function.

### **Microcode Updation [Enabled]**

[Enabled] Enables the microcode updation.

[Disabled] Disables this function.

### **Secure Virtual Machine [Enabled]**

[Enabled] Enables the AMD Secure Virtual Machine.

[Disabled] Disables this function.

### **Cool'n'Quiet [Disabled]**

[Enabled] Enables the AMD Cool'n'Quiet function.

[Disabled] Disables this function.

### **ACPI SRAT Table [Enabled]**

[Enabled] Enables the building of ACPI SRAT table.

[Disabled] Disables this function.

### **C1E Support [Disabled]**

[Enabled] Enables the C1E support function. This item should be enabled in order to enable the Enhanced Halt State.

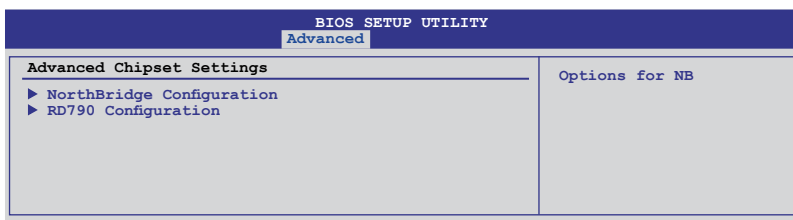
[Disabled] Disables this function.

### **Advanced Clock Calibration [Disabled]**

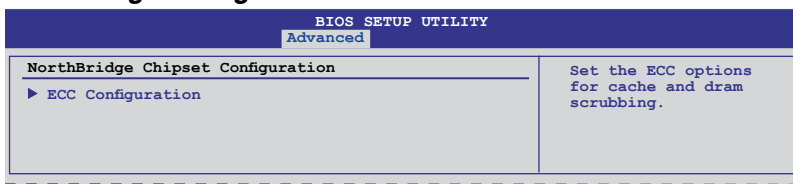
Configuration options: [Disabled] [Auto] [All Cores] [Per Core]

## 3.5.2 Chipset

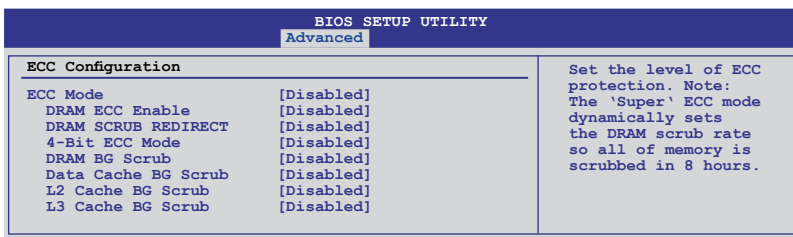
The Chipset menu allows you to change the advanced chipset settings. Select an item then press <Enter> to display the sub-menu.



### NorthBridge Configuration



### ECC Configuration



#### ECC Mode [Disabled]

Allows you to set the level of ECC protection.

Configuration options: [Disabled] [Basic] [Good] [Super] [Max] [User]



The following items become user-configurable when you set **ECC Mode** to [User]

#### **DRAM ECC Enable [Enabled]**

[Enabled] Enables the DRAM ECC that allows the hardware to report and correct memory errors automatically.

[Disabled] Disables this function.

**DRAM SCRUB REDIRECT [Disabled]**

[Enabled] Allows the system to correct the DRAM ECC errors immediately when they occur.

[Disabled] Disables this function.

**4-Bit ECC Mode [Disabled]**

[Enabled] Enables ECC chip kill feature.

[Disabled] Disables this function.

**DRAM BG SCRUB [Disabled]**

Disables or sets the DRAM BG Scrub.

Configuration options: [Disabled] [40ns] [80ns] [160ns] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]

**Data Cache BG Scrub [Disabled]**

Disables or sets the Data Cache BG Scrub. This item allows the data cache BG Scrub RAM to be corrected when idle.

Configuration options: [Disabled] [40ns] [80ns] [160ns] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]

**L2 Cache BG Scrub [Disabled]**

Disables or sets the L2 Cache BG Scrub. This item allows the cache RAM to be corrected when idle.

Configuration options: [Disabled] [40ns] [80ns] [160ns] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]

**L3 Cache BG Scrub [Disabled]**

Disables or sets the L3 Cache BG Scrub. This item allows the cache RAM to be corrected when idle.

Configuration options: [Disabled] [40ns] [80ns] [160ns] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]



## RD790 Configuration

BIOS SETUP UTILITY	
Advanced	
RD790 Configuration	PCI Express Configuration
▶ PCI Express Configuration	

## PCI Express Configuration

BIOS SETUP UTILITY	
Advanced	
RD790 Configuration	PCI Express Configuration
Peer-to-Peer among GFX/GFX2 [Disabled]	
GPP Slots Power Limit, W [25]	

Peer-to-Peer among GFX/GFX2 [Disabled]

Configuration options: [Enabled] [Disabled]

GPP Slots Power Limit, W [25]

Allows you to set the GPP slots power limit. Use <+> or <-> to adjust the power limit or key in the value directly.

### 3.5.3 Onboard Device Configuration

BIOS SETUP UTILITY	
Advanced	
Onboard Device Configuration	Enable / Disable Onboard Lan.
Onboard LAN	[Enabled]
Onboard LAN Boot ROM	[Disabled]
Firewire 1394	[Enabled]

#### Onboard Lan [Standard]

Allows you to enable or disable the LAN controller.

Configuration options: [Enabled] [Disabled]

##### Onboard LAN Boot ROM [Disabled]

This item appears only when you enable the previous item.

[Enabled] Enables the onboard LAN Boot ROM.

[Disabled] Disables the onboard LAN Boot ROM.

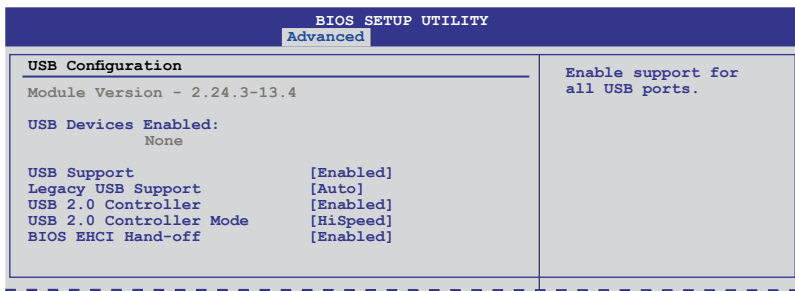
#### Firewire 1394 [Enabled]

[Enabled] Enables the 1394 controller.

[Disabled] Disables the controller.

### 3.5.4 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.



The **USB Devices Enabled** item shows the auto-detected values. If no USB device is detected, the item shows None.

#### USB Support [Enabled]

[Enabled] Enables the USB Host Controllers.

[Disabled] Disables the controllers.



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

#### Legacy USB Support [Auto]

[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.

[Enabled] Enables the support for USB devices on legacy operating systems (OS).

[Disabled] Disables the function.

#### USB 2.0 Controller [Enabled]

[Enabled] Enables the USB 2.0 controller.

[Disabled] Disables the controller.

#### USB 2.0 Controller Mode [HiSpeed]

[FullSpeed] Set the USB 2.0 controller mode to FullSpeed (12 Mbps).

[HiSpeed] Set the USB 2.0 controller mode to HiSpeed (480 Mbps).



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

## BIOS EHCI Hand-off [Enabled]

[Enabled] Enables the support for operating systems without an EHCI hand-off feature.

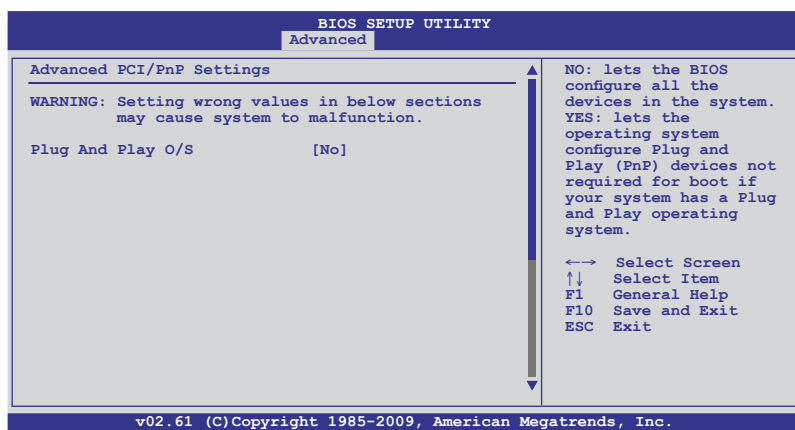
[Disabled] Disables the function.

## 3.5.5 PCI PnP

The PCI PnP 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.



### Plug And Play O/S [No]

[Yes] 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.

[No] When set to [No], BIOS configures all the devices in the system.

### 3.5.6 LCD Poster and LED Control

BIOS SETUP UTILITY		
Advanced		
LCD Poster and LED Control		Turn On/Turn Off LCD Poster when system is working
LCD Poster Backlight	[Turn Off]	
LCD Poster Backlight(S5)	[Turn Off]	
LCD Poster Mode	[Current Time]	
All LED Control	[Enabled]	
ROG Logo	[Enabled]	
Voltiminder LED	[Enabled]	
CPU LED Selection	[CPU]	
NB LED Selection	[NB]	
SB LED Selection	[ICH]	

#### LCD Poster Backlight [Turn Off]

Allows you to turn on/off the LCD Poster backlight when the system is working.

#### LCD Poster Backlight (S5) [Turn Off]

Allows you to turn on/off the LCD Poster backlight when the system is in soft-off state.

#### LCD Poster Mode [Current Time]

Allows the LCD Poster to display either hardware information or time.  
Configuration options: [Current Time] [HWM Information]



The following item becomes configurable when you set **LCD Poster Mode** to [HWM Information].

##### HWM Select Mode

Allows you to select which hardware information to display on the LCD Poster. Configuration options: [All Voltage] [All Temperature] [All Fan Speed]

#### All LED Control [Enabled]

Allows you to enable or disable the onboard LEDs control.  
Configuration options: [Enabled] [Disabled]



The following items appear only when you set **All LED Control** to [Enabled].

##### ROG Logo [Enabled]

Allows you to enable or disable the onboard ROG light box.  
Configuration options: [Disabled] [Enabled]

##### Voltiminder LED [Enabled]

Allows you to enable or disable the onboard Voltiminder LED.  
Configuration options: [Enabled] [Disabled]

#### CPU LED Selection [CPU]

Allows you to switch the onboard CPU LED display between CPU voltage [CPU], CPU/NB voltage [CPU/NB] and CPU VDDA voltage [CPU VDDA].

Configuration options: [CPU] [CPU/NB] [CPU VDDA]

#### NB LED Selection [NB]

Allows you to switch the onboard northbridge LED display.

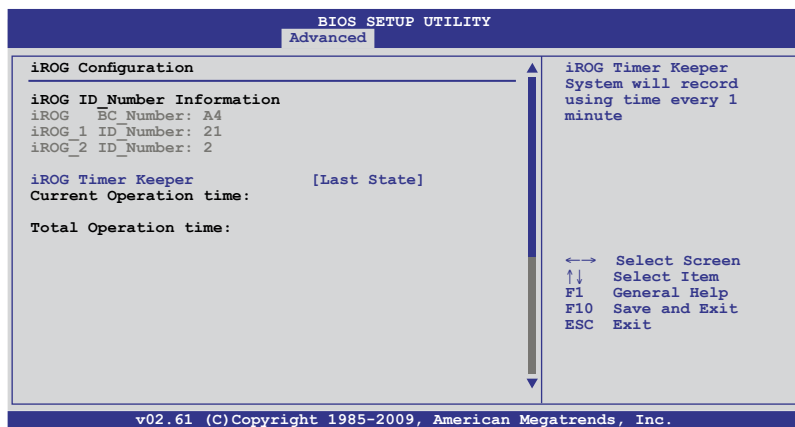
Configuration options: [NB] [NB 1.8V]

#### SB LED Selection [SB]

Allows you to switch the onboard southbridge LED display.

Configuration options: [SB] [HT]

### 3.5.7 iROG Configuration



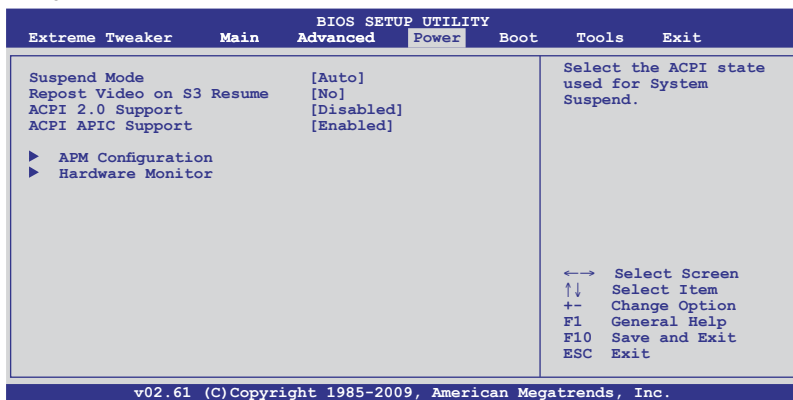
#### **iROG Timer Keeper [Last State]**

Allows you to set the iROG Time Keeper operation mode.

Configuration options: [Last State] [Disabled] [Enabled]

## 3.6 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.



### 3.6.1 Suspend Mode [Auto]

Allows you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend.

[Auto]

[S1 (POS) only]      In this state, your computer is technically in standby

[S3 only]

### 3.6.2 Repost Video on S3 Resume [Disabled]

Determines whether to invoke VGA BIOS POST on S3/STR resume.

[Disabled]      When set to [Disabled], the system will not invoke VGA BIOS POST on S3/STR resume.

[Enabled]      When set to [Enabled], the system invokes VGA BIOS POST on S3/STR resume.

### 3.6.3 ACPI 2.0 Support [Disabled]

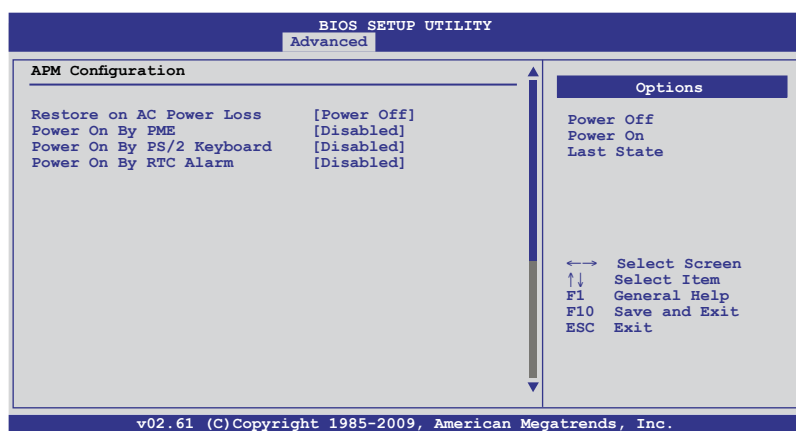
[Disabled]      When set to [Disabled], the system will not add additional tables as per ACPI 2.0 specifications.

### 3.6.4 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).

- [Disabled] When set to [Disabled], the system disable the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC).
- [Enabled] When set to [Enabled], the ACPI APIC table pointer is included in the RSDT pointer list.

### 3.6.5 APM Configuration



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

- [Power Off] The system goes into off state after an AC power loss.
- [Power On] The system goes into on state after an AC power loss.
- [Last State] The system goes into either off or on state, whatever the system state was before the AC power loss.



### **Power On By PME [Disabled]**

Allows you to enable or disable the PCI/PCIE onboard LAN devices to generate a wake event.

[Disabled] Disables the PCI/PCIE LAN devices to generate a wake event.

[Enabled] Enables the PCI/PCIE LAN devices to generate a wake event.

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

Allows you to disable or enable the Power On by PS/2 keyboard function.

[Disabled] Disables the Power On by PS/2 keyboard function.

[Enabled] Sets 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.

### **Power On By RTC Alarm [Disabled]**

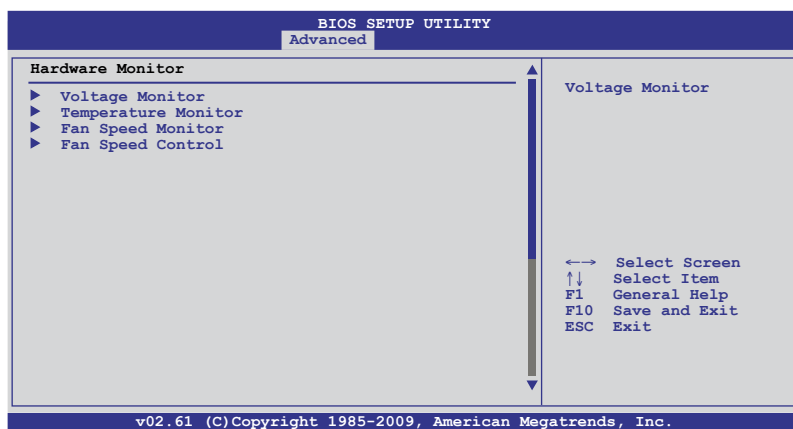
Allows you to enable or disable RTC to generate a wake event. When this item is set to [Enabled], the items **RTC Alarm Date/ RTC Alarm Hour/ RTC Alarm Minute/ RTC Alarm Second** will become user-configurable with set values.

Configuration options: [Disabled] [Enabled]

[Disabled] Disables RTC to generate a wake event.

[Enabled] When set to [Enabled], the items **RTC Alarm Date/ RTC Alarm Hour/ RTC Alarm Minute/ RTC Alarm Second** will become user-configurable with set values.

## 3.6.6 Hardware Monitor



### Voltage Monitor

CPU Voltage; CPU/NB Voltage; CPU VDDA Voltage; DRAM Voltage;  
HT Voltage; NB Voltage; NB 1.8V Voltage; SB Voltage; 3.3V Voltage;  
5V Voltage; 12V Voltage

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

### Temperature Monitor

CPU Temperature; MB Temperature; NB Temperature; SB Temperature;  
OPT FAN1/2/3 Temperature [xxx°C/xxx°F]

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

NB overhear protection; SB overhear protection [90°C]

The system automatically shuts down when the northbridge or southbridge chipset is heated over the set temperature to protect it from damage. Configuration options: [Disabled] [70°C] [80°C] [90°C] [100°C]

OPT FAN1/2/3 overhear protection [90°C]

Allows you to set the temperature over which the system automatically shuts down when any of the thermal sensor cables connected to the motherboard detects device overhear to protect the device from damage. Configuration options: [Disabled] [70°C] [80°C] [90°C] [100°C]

## Fan Speed Monitor

CPU Fan; POWER Fan; Chassis Fan1/2/3; OPT Fan1/2/3 Speed [xxxxRPM] or [Ignored] / [N/A]

The onboard hardware monitor automatically detects and displays the CPU fan, chassis fan, power fan, and optional fan speed in rotations per minute (RPM). If any of the fans is not connected to the motherboard, the field shows [N/A]. These items are not user-configurable.

## Fan Speed Control

BIOS SETUP UTILITY		
Power		
Fan Speed Control		
CPU Q-Fan Control	[Disabled]	Disable/Enable Q-Fan functions of CPU fan
Chassis Q-Fan Function	[Disabled]	
PWRFan Control	[Disabled]	
OPTFan1 Control	[Disabled]	
OPTFan2 Control	[Disabled]	
OPTFan3 Control	[Disabled]	

CPU Q-Fan Control [Disabled]

Allows you to enable or disable the CPU fan controller.

[Disabled] Disables the CPU Q-fan controller.

[Enabled] Enables the CPU Q-fan controller.



The **CPU Fan Mode** item appears when you enable the CPU Fan Control feature.

CPU Q-Fan Mode [Silent]

Allows you to set the appropriate performance level of the ASUS Q-Fan.

[Silent] Set to [Silent Mode] to minimize the fan speed for quiet CPU fan operation

[Optimal] Set to [Optimal] to achieve faster CPU fan speed.

[Performance] Set to [Performance] to achieve maximum CPU fan speed.

Chassis Q-Fan Function [Disabled]

Allows you to enable or disable the Chassis fan controller.

[Disabled] Disables the Chassis Q-fan controller.

[Enabled] Enables the Chassis Q-fan controller.



The **Chassis Fan Mode** item appears when you enable the **Chassis Q-Fan Function** feature.

### Chassis Q-Fan Mode [Silent]

Allows you to set the appropriate performance level of the ASUS Q-Fan.

[Silent]	Set to <b>[Silent Mode]</b> to minimize the fan speed for quiet CPU fan operation
[Optimal]	Set to <b>[Optimal]</b> to achieve faster CPU fan speed.
[Performance]	Set to <b>[Performance]</b> to achieve maximum CPU fan speed.

### PWRFan Control [Disabled]

Allows you to select the power fan control mode. When this item is set to [Duty Mode], you can configure the **PWRFan Duty** item.

#### **PWRFan Duty [50%]**

Allows you to set the fan duty cycle. This item appears when the **PWRFan Control** item is set to [Duty Mode].

Configuration options: [40%] [50%] [60%] [70%] [80%] [90%]

### OPTFan1/2/3 Control [Disabled]

Allows you to select the optional fan control mode. When this item is set to [Duty Mode], you can configure the **OPTFan1/2/3 Duty** item. If you set this item to [User Mode], you are allowed to configure the **OPTFan1/2/3 Low Speed Temp** and **OPTFan1/2/3 Full Speed Temp** item.

Configuration options: [Disabled] [Duty Mode] [User Mode]



---

You need to connect the thermal sensor cables to the OPT\_TEMP1/2/3 connectors to enable this function.

---

#### **OPTFan1/2/3 Duty [50%]**

Allows you to set the fan duty cycle. This item appears when the **OPTFan1/2 Control** item is set to [Duty Mode].

Configuration options: [40%] [50%] [60%] [70%] [80%] [90%]

#### **OPTFan1/2/3 Low Speed Temp [25°C]**

Allows you to set the temperature at which the power fan rotates at low speed. This item appears when the **OPTFan1/2 Control** item is set to [User Mode].

Configuration options: [25°C] [30°C] [35°C] [40°C]

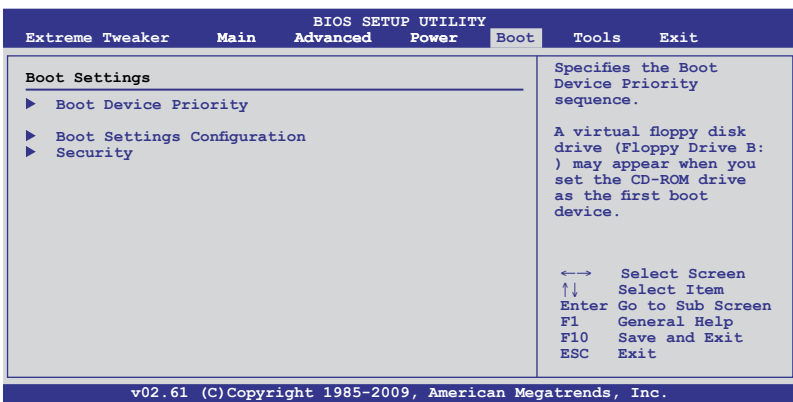
#### **OPTFan1/2/3 Full Speed Temp [60°C]**

Allows you to set the temperature at which the power fan rotates at full speed. This item appears when the **OPTFan1/2 Control** item is set to [User Mode].

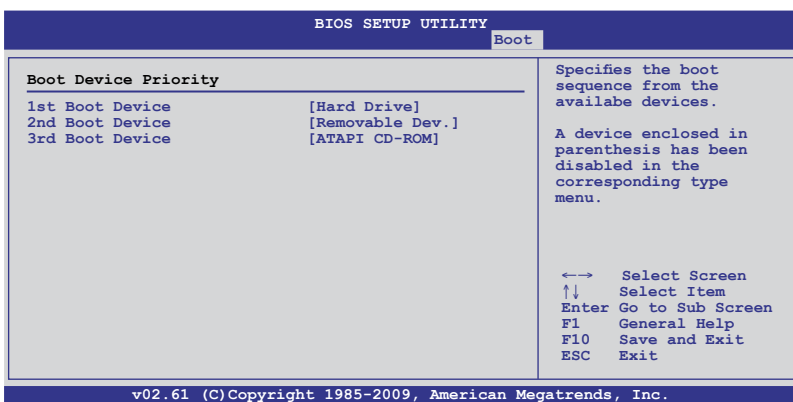
Configuration options: [60°C] [70°C] [80°C] [90°C]

## 3.7 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.



### 3.7.1 Boot Device Priority



#### 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]

## 3.7.2 Boot Settings Configuration

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

### Quick Boot [Enabled]

Allows you to enable or disable the **Quick Boot** function.

[Disabled] When set to [Disabled], BIOS performs all the POST items.

[Enabled] When set to [Enabled], BIOS skips some power on self tests (POST) while booting to decrease the time needed to boot the system.

### Full Screen Logo [Enabled]

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

[Enabled] Enables the full screen logo display feature.

[Disabled] Disables the full screen logo display feature.



Set this item to [Enabled] to use the ASUS MyLogo3™ feature.

### AddOn ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.

[Force BIOS]

[Keep Current] .

### Bootup Num-Lock [On]

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

[On] Sets the power-on state of the NumLock to [On].

[Off] Sets the power-on state of the NumLock to [Off].

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

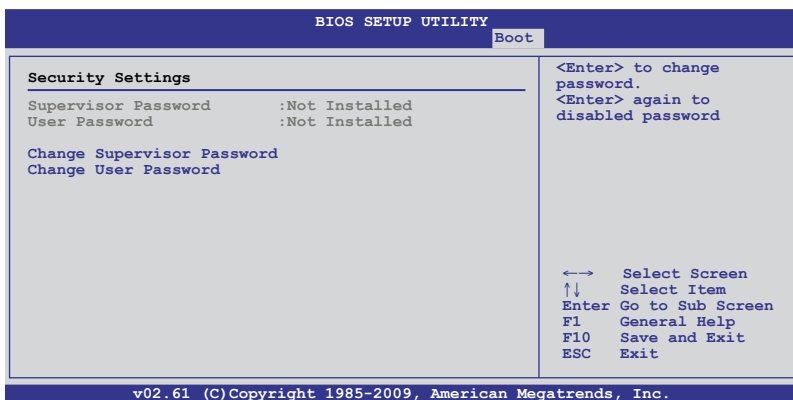
When set to [Enabled], the system waits for the <F1> key to be pressed when error occurs.

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

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

### 3.7.3 Security

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



#### 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 Jumper** 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
<b>Security Settings</b>		
Supervisor Password	: Installed	<Enter> to change password. <Enter> again to disabled password.
User Password	: Installed	
Change Supervisor Password		
User Access Level	[Full Access]	
Change User Password		
Password Check	[Setup]	

### 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.

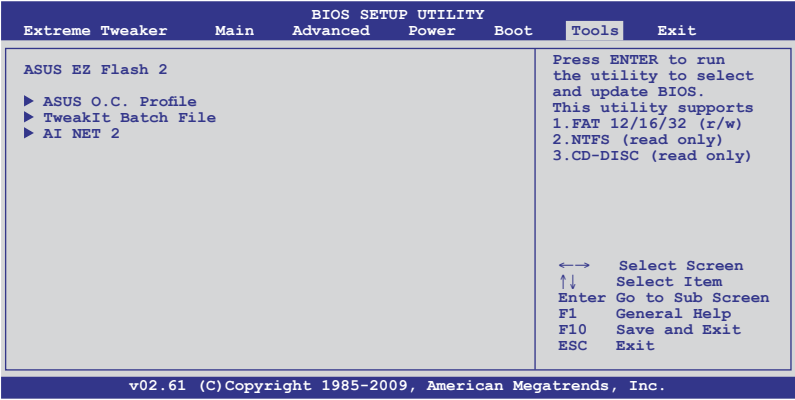
### Password Check [Setup]

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]



### 3.8 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.

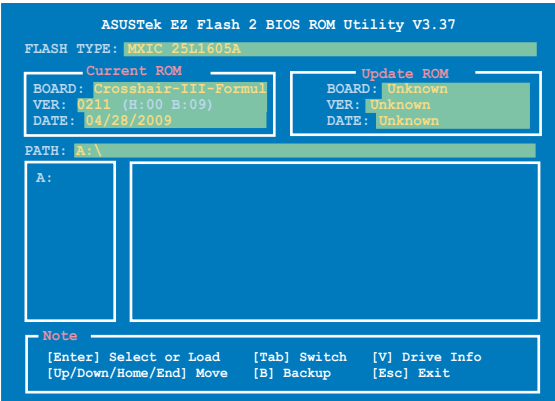


#### 3.8.1 ASUS EZ Flash 2

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.



For more details, refer to **section 3.1.2 ASUS EZ Flash 2 utility**.



## 3.8.2 ASUS O.C. Profile

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

BIOS SETUP UTILITY	
Tools	
<b>O.C. PROFILE Configuration</b> O.C. Profile 1 Status : Not Installed O.C. Profile 2 Status : Not Installed O.C. Profile 3 Status : Not Installed O.C. Profile 4 Status : Not Installed O.C. Profile 5 Status : Not Installed O.C. Profile 6 Status : Not Installed O.C. Profile 7 Status : Not Installed O.C. Profile 8 Status : Not Installed  <b>Add Your CMOS Profile.</b> Name: [Default-Profile] Save To: [Uninstalled]  <b>Load CMOS Profiles.</b> Load From: [Blank]  Start O.C. Profile	Typing your profile name, [0-9][a-z][A-Z] are acceptable.        ←→ Select Screen ↑↓ Select Item F1 General Help F10 Save and Exit ESC Exit
v02.61 (C)Copyright 1985-2009, American Megatrends, Inc.	

### Add Your CMOS Profile

Allows you to save the current BIOS file to the BIOS Flash. In the Name sub-item, type your profile name and press <Enter>, and then choose a profile number to save your CMOS settings in the Save to sub-item.

### Load CMOS Profiles

Allows you to load the previous BIOS settings saved in the BIOS Flash. Press <Enter>, and choose a profile to load.

### Start O.C. Profile

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

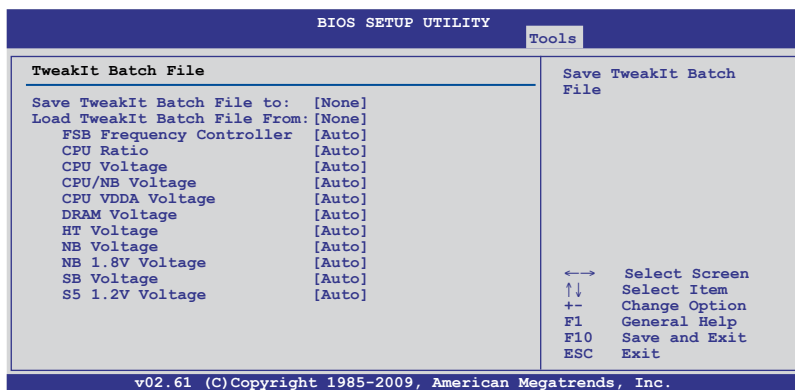
ASUSTek O.C. Profile Utility V1.34	
<b>Current CMOS</b> BOARD: [Crosshair-III-Formul VER: [0211 DATE: [04/28/2009	<b>Restore CMOS</b> BOARD: [Unknown VER: [Unknown DATE: [Unknown
PATH: [A:\	
A:	
<b>Note</b> [Enter] Select or Load [Tab] Switch [V] Drive Info [Up/Down/Home/End] Move [B] Backup [Esc] Exit	



- This function supports devices such as a USB flash disk (FAT 32/16 format) or a floppy disk with single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent the system boot failure!
- We recommend that you update the BIOS file only coming from the same memory/CPU configuration and BIOS version.
- Only the CMO file can be loaded.

### 3.8.3 TweakIt Batch File

This menu allows you to set the TweakIt batch files, and load the desired TweakIt



#### Save TweakIt Batch File to:

Allows you to save the adjusted values for specific items as a TweakIt batch file.  
Configuration options: [None] [File 1] [File 2]

#### Load TweakIt Batch File to:

Allows you to load the desired TweakIt batch file.  
Configuration options: [None] [File 1] [File 2]

#### FSB Frequency Controller; CPU Ratio; CPU Voltage; CPU/NB Voltage; CPU VDDA Voltage; DRAM Voltage; HT Voltage; NB Voltage; NB 1.8V Voltage; SB Voltage; S5 1.2V Voltage

Allows you to use the <+> and <-> keys to adjust the values for each item. Refer to 3.3 Extreme Tweaker Menu for details.

### 3.8.4 AI NET 2

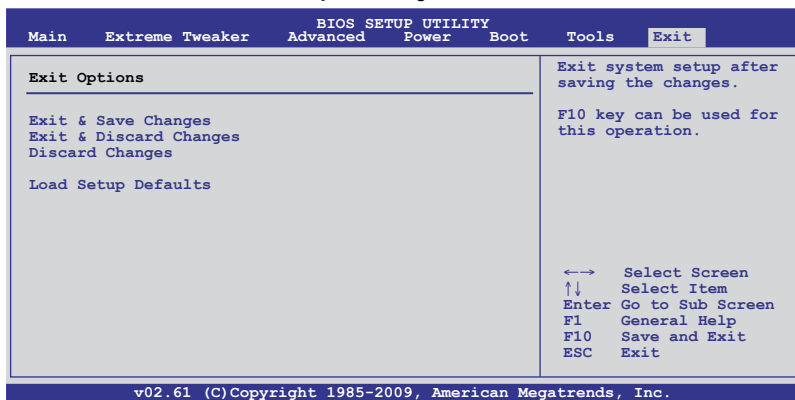
BIOS SETUP UTILITY			Tools
Ai Net 2			Check Realtek LAN cable during POST.  It will take 3 to 10 seconds to diagnose LAN cable.
Pair	Status	Length	
Check Realtek LAN cable			[Disabled]

#### Check Realtek LAN cable [Disabled]

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

## 3.9 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.



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 image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal grey lines across its entire width, providing a guide for handwriting or typing. The paper itself is a clean, off-white color.

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

# 4 Software support

4.1	Installing an operating system .....	4-1
4.2	Support DVD information .....	4-1
4.3	Software information .....	4-9
4.4	RAID configurations .....	4-27
4.5	Creating a RAID driver disk.....	4-34



## 4.1 Installing an operating system

This motherboard supports Windows® XP/64-bit XP/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.
- Ensure that you install Windows® XP Service Pack 2 or later versions before installing the drivers for better compatibility and system stability.

## 4.2 Support DVD information

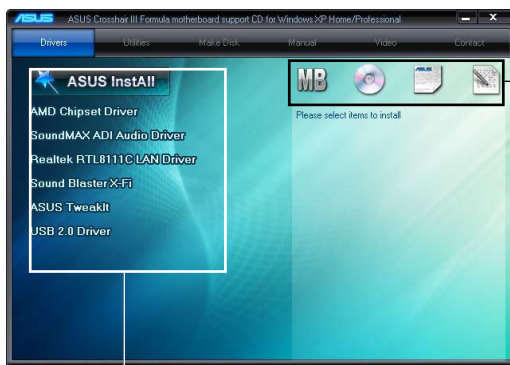
The support DVD that came with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.



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

### 4.2.1 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.

## 4.2.2 Drivers menu

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



### AMD Chipset Driver

Installs the AMD® chipset drivers.

### SoundMAX ADI Audio Driver

Installs the SoundMAX ADI Audio driver.

### Realtek RTL8111C LAN Driver

Installs the Realtek® Gigabit Ethernet Driver.

### Sound Blaster X-Fi

Installs the Sound Blaster X-Fi driver.

### ASUS TweakIt

Installs the ASUS TweakIt driver and utility.

### USB 2.0 Driver

Installs the USB 2.0 driver.

### 4.2.3 Utilities menu

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



#### 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).

#### ASUS PC Probe II

This smart utility monitors the fan speed, CPU temperature, and system voltage, 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 AI Direct Link**

The ASUS AI Direct Link provides up to 70% transferring speed improvement when compared to traditional USB 2.0 and is the easiest and fastest way for users to enjoy large-sized data exchange of files such as movies, music, etc.

### **ASUS Cool'n'Quiet Utility**

Installs ASUS Cool'n'Quiet utility.

### **Adobe Reader 8**

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

### **Microsoft DirectX 9.0c**

Installs Microsoft DirectX 9.0c.

### **Ulead Burn.Now**

Installs the Ulead Burn.Now application for Audio DVD, CD and data disc creation.

### **Corel MediaOne Starter**

Installs the Corel MediaOne Starter application to easily manage, edit share and protect your multimedia data.

### **Ulead PhotoImpact 12 SE**

Installs the Ulead PhotoImpact 12 SE software.

### **Winzip 11**

Installs the Winzip utility for easy file-compression and protection.

### **AMD OverDrive Utility**

Installs AMD OverDrive utility.

### **Anti-Virus Utility**

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

### **3DMark06 Software**

Installs the Futuremark® 3DMark06 system benchmark application.

### **ASUS TurboV**

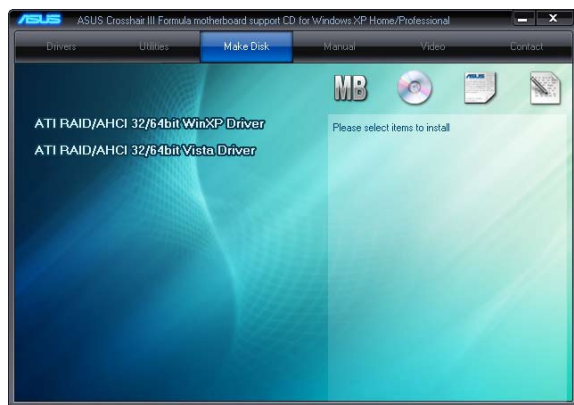
Installs ASUS TurboV, the advanced overclocking tool for extreme O.C. record.

### **ASUS EPU**

Installs the ASUS EPU driver and utility.

## 4.2.4 Make disk menu

The Make disk menu contains items to create the ATI RAID driver disk.



### ATI RAID/AHCI 32/64 bit WinXP Driver

Allows you to create an ATI RAID/AHCI 32/64 bit WinXP Driver disk.

### ATI RAID/AHCI 32/64 bit Vista Driver

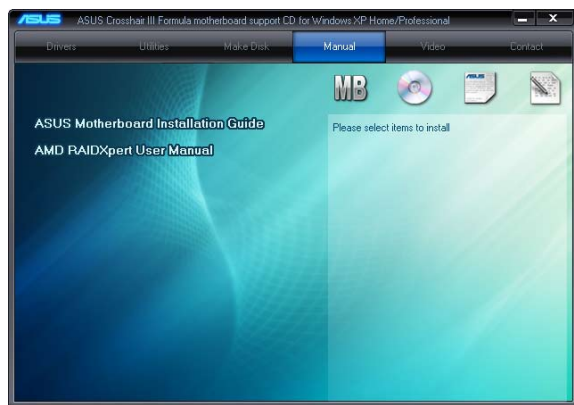
Allows you to create an ATI RAID/AHCI 32/64 bit Vista Driver disk.

## 4.2.5 Manual menu

The Manuals 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.



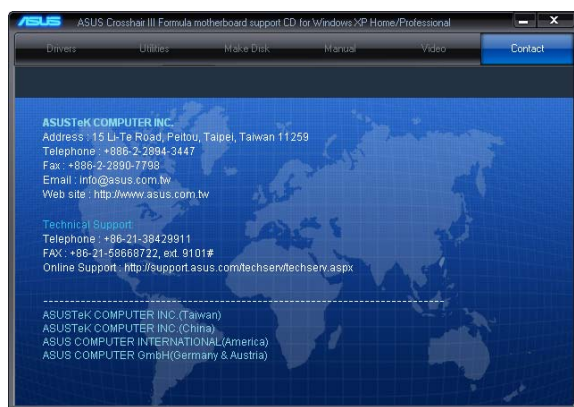
## 4.2.6 Video menu

Click the Video tab to display a list of video clips. Click the video titles to watch ROG users' outstanding performances with ROG motherboards.



## 4.2.7 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.



### 4.2.8 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.

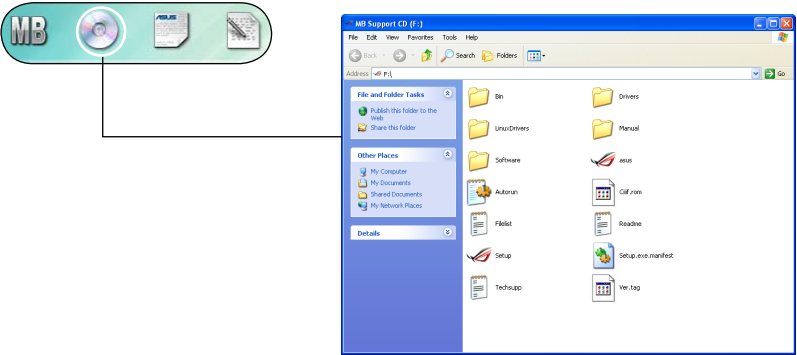
#### Motherboard Info

Displays the general specifications of the motherboard.



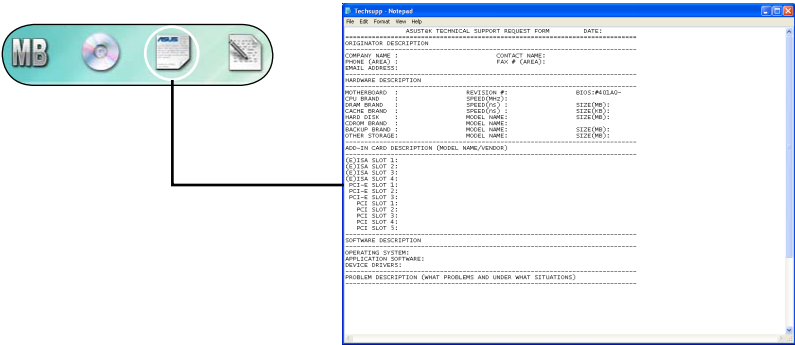
#### Browse this DVD

Displays the support DVD contents in graphical format.



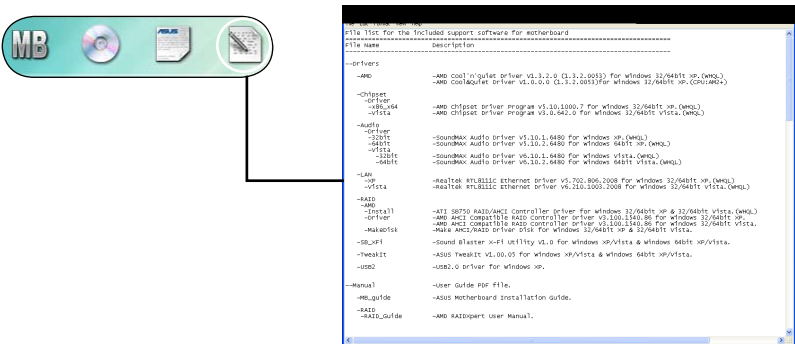
# Technical support form

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.





## 4.3 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.

### 4.3.1 ASUS MyLogo3™

The ASUS MyLogo3™ 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 MyLogo3™ is automatically installed when you install the ASUS Update utility from the support DVD. See section 4.2.3 Utilities menu for details.



- Before using the ASUS MyLogo3™, use the ASUS Update utility to make a copy of your original BIOS file, or obtain the latest BIOS version from the ASUS website. See section 3.1.1 **ASUS Update utility**.
- Ensure that the BIOS item Full Screen Logo is set to [Enabled] if you wish to use ASUS MyLogo3™. See section 3.7.2 **Boot Settings Configuration**.
- You can create your own boot logo image in GIF file formats.

To launch the ASUS MyLogo3™:

1. Launch the ASUS Update utility. Refer to section 3.1.1 **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.

### 4.3.2 Sound Blaster X-Fi audio utility

With the SupremeFX X-Fi technology supported, you will be able to enjoy excellent audio quality and experience realistic sound effects through the audio codec and Sound Blaster X-Fi interface. Activating X-Fi's CMSS3D, Crystalizer, and EAX will deliver accurate virtual surround sound and enhanced audio dynamics, which amount to ultimate gaming experience.

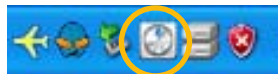
To install Sound Blaster X-Fi:

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 **Drivers** tab and click **VIA Audio Driver**.
3. Follow the screen instructions to complete installation.
4. Click the support DVD **Drivers** tab and click **Sound Blaster X-Fi**.
5. Follow the screen instructions to complete installation.



You need to install VIA Audio Driver to use Sound Blaster X-Fi audio utility.

If the Sound Blaster X-Fi audio utility is successfully installed, you will find the **Volume Panel** icon on the notification area.



Click the Volume Panel icon to display a list of Creative® media utilities that help you manage and play your media files. Click **Help** in each utility control panel to know more about them.



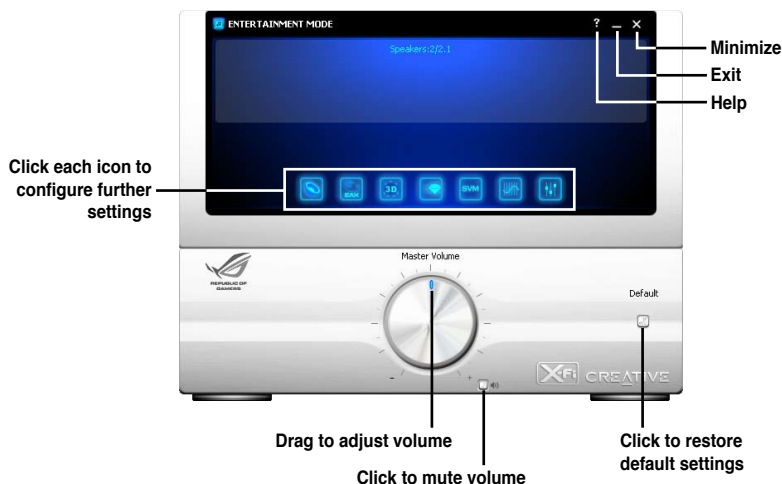
**Double-click** the Volume Panel icon to launch the Mixer control panel.

Click **Main Display**  to go to the Main Panel.



## Main Panel

The Main Panel displays all the features and functions the SupremeFX X-Fi supports. Click each icon to configure the following settings (from left to right): Speakers and Headphone, EAX Effects, X-Fi CMSS-3D, X-Fi Crystalizer, Smart Volume Management, Graphic Equalizer, and Mixer.



## Speakers and Headphone Panel



This panel allows you to configure speakers/headphone settings including bass management and speaker volume. You can also test each speaker channel.



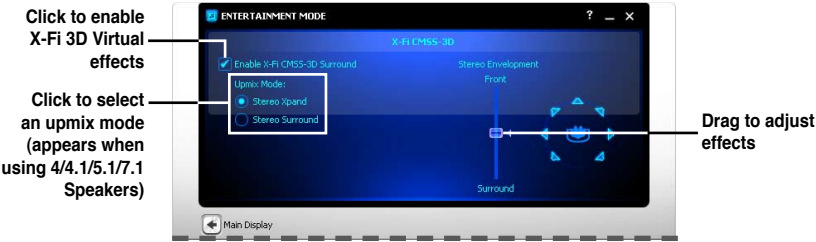
**EAX Effects Panel**

This panel contains environment effects that you can select to obtain a sense of realism during interactive 3D games.



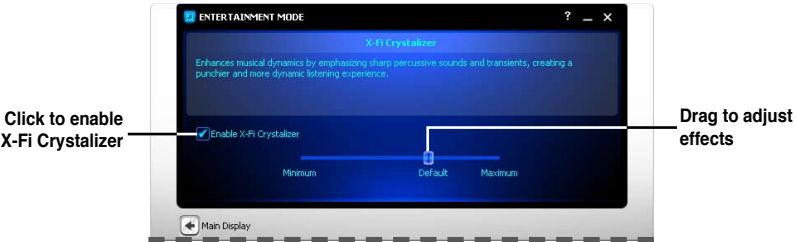
**X-Fi CMSS-3D Panel**

This panel allows you to configure 3D virtual surround effects.



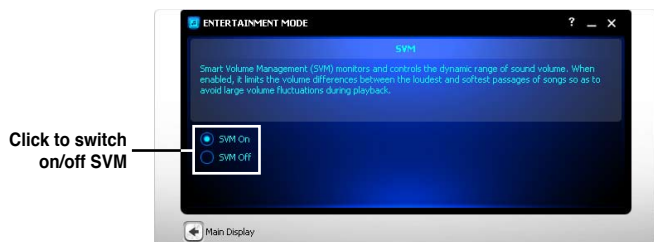
**X-Fi Crystalizer Panel**

Enable X-Fi Crystalizer to obtain more audio dynamics.



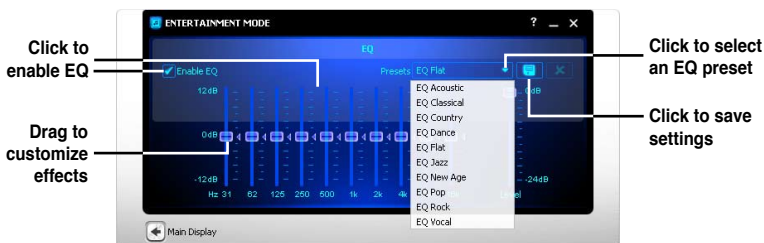
## Smart Volume Management Panel

Enable Smart Volume Management (SVM) to avoid large volume fluctuations.



## Graphic Equalizer Panel

This panel allows you to customize equalizer settings or select an EQ presets.



## Mixer Panel

This panel allows you to select a recording device and adjust recording/playback devices volume.



### 4.3.3 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.

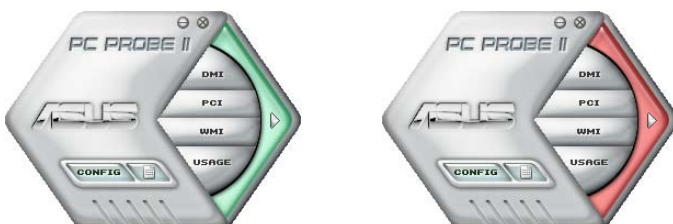


Click to close the Preference panel

Button	Function
	Opens the Configuration window
	Opens the Report window
	Opens the Desktop Management Interface window
	Opens the Peripheral Component Interconnect window
	Opens the Windows Management Instrumentation window
	Opens the hard disk drive, memory, CPU usage window
	Shows/Hides the Preference section
	Minimizes the application
	Closes the application

### Sensor alert

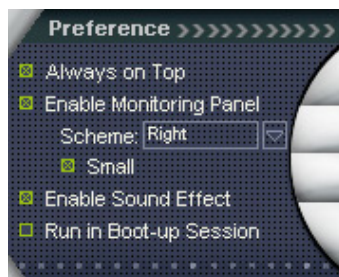
When a system sensor detects a problem, the main window right handle turns red, as the illustrations below show.



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

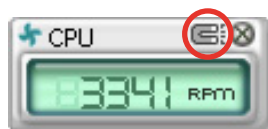
### Changing the monitor panels position

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

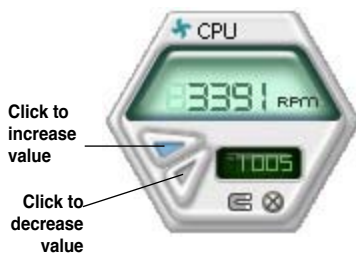
All monitor panels move together using a magnetic effect. If you want to detach a monitor panel from the group, click the horseshoe magnet icon. You can now move or reposition the panel independently.



### 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.



### 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.



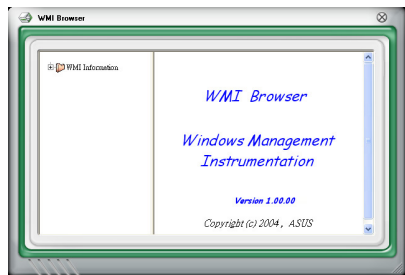
Large display



Small display

## WMI browser

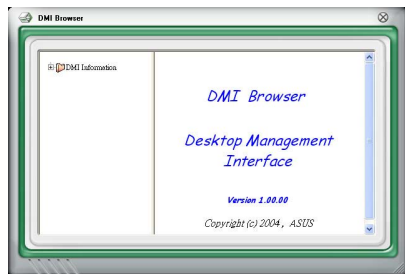
Click **WMI** to display the WMI (Windows Management Instrumentation) browser. This browser displays various Windows® management information. Click an item from the left panel to display on the right panel. Click the plus sign (+) before WMI Information to display the available information.



You can enlarge or reduce the browser size by dragging the bottom right corner of the browser.

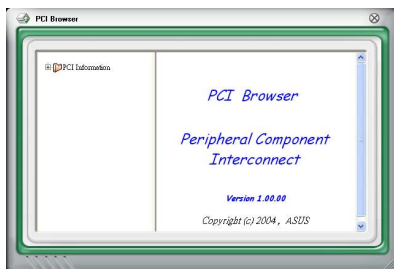
## DMI browser

Click **DMI** 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.

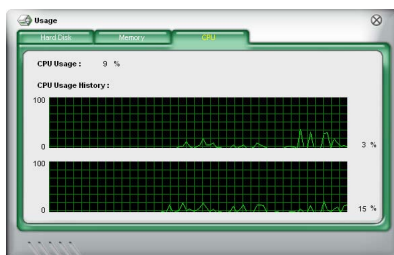


## Usage

The Usage browser displays real-time information on the CPU, hard disk drive space, and memory usage. Click **USAGE** to display the Usage browser.

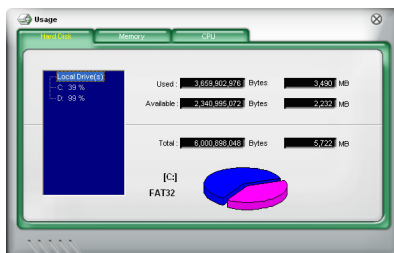
### CPU usage

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.



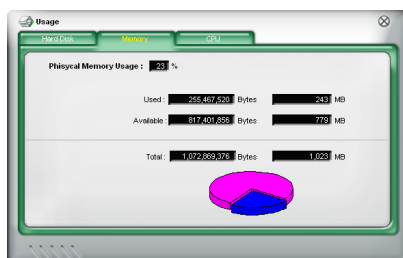
### Hard disk drive space usage

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

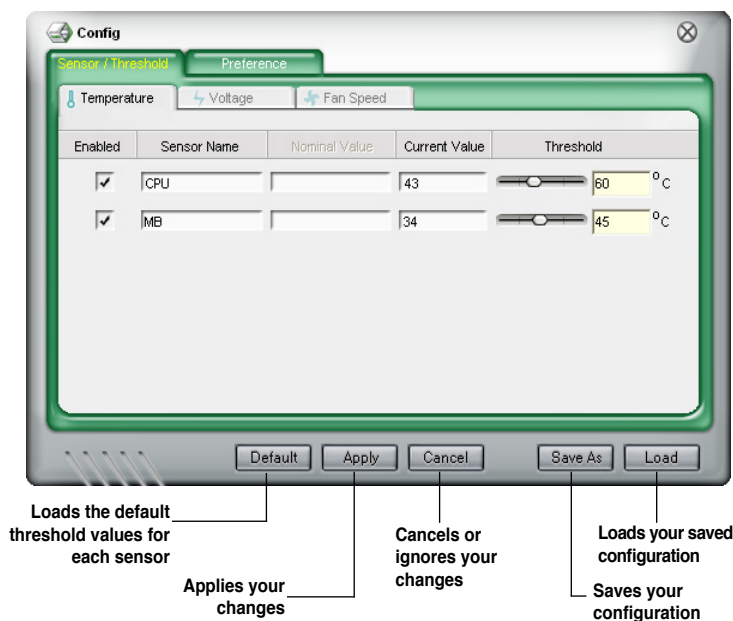
The Memory tab shows both used and available physical memory. The pie chart at the bottom of the window represents the used (blue) and the available physical memory.



## Configuring PC Probe II

Click  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.



### 4.3.4 ASUS AI Suite

ASUS AI Suite allows you to launch EPU, TurboV, CPU Level Up, and Q-Fan 2 utilities easily.

#### 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

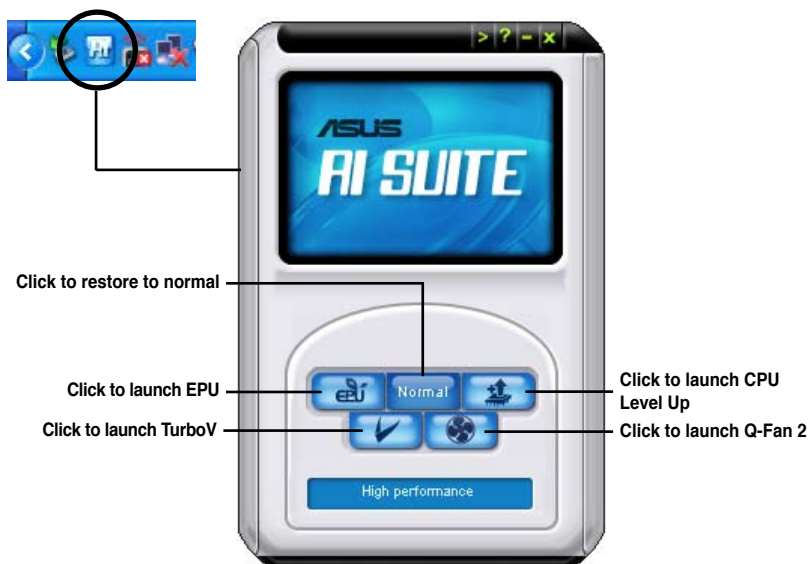
You can launch AI Suite right after installation or anytime from the Windows® desktop.

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® notification area. Click this icon to close or restore the application.

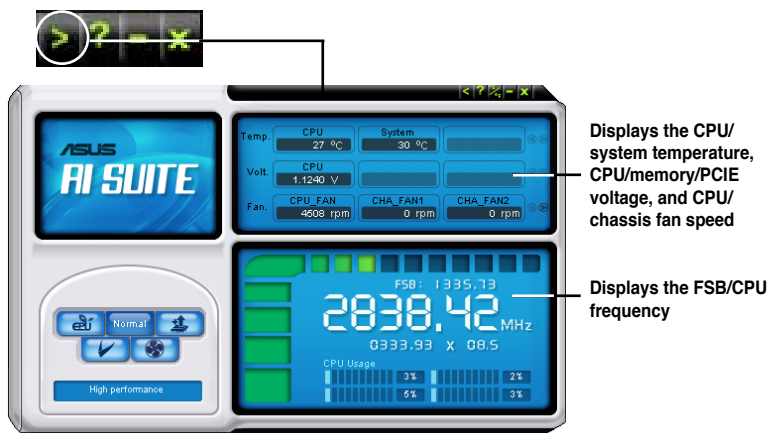
#### Using AI Suite


Click the EPU, TurboV, CPU Level Up, or Q-Fan 2 icon to launch the utility, or click the Normal icon to restore the system to normal state.



## Other feature buttons

Click  on right corner of the main window to open the monitor window.



Click  on right corner of the expanded window to switch the temperature from degrees Centigrade to degrees Fahrenheit.

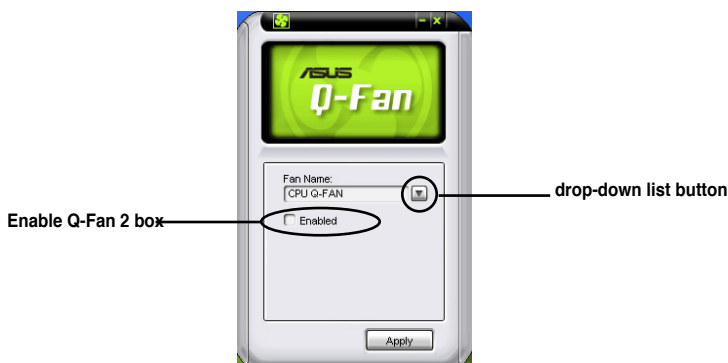


### 4.3.5 ASUS Q-Fan 2

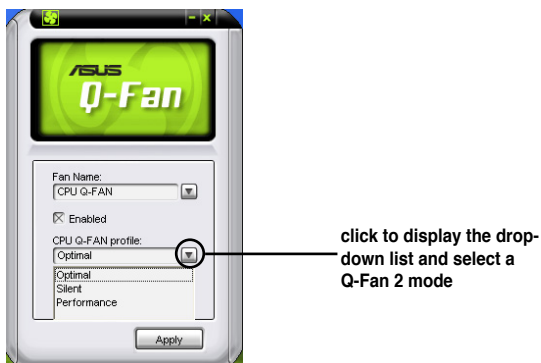
This ASUS Q-Fan 2 Control feature allows you to set the appropriate performance level of the CPU Q-Fan 2 or the Chassis Q-Fan 2 for more efficient system operation. After enabling the Q-Fan 2 function, the fans can be set to automatically adjust depending on the temperature, to decrease fan speed, or 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 in the Windows® notification area 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 2** or **CHASSIS Q-Fan 2**. Click the box of **Enable Q-Fan 2** to activate this function.



**Profile** list appears after clicking the **Enable Q-Fan 2** 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.

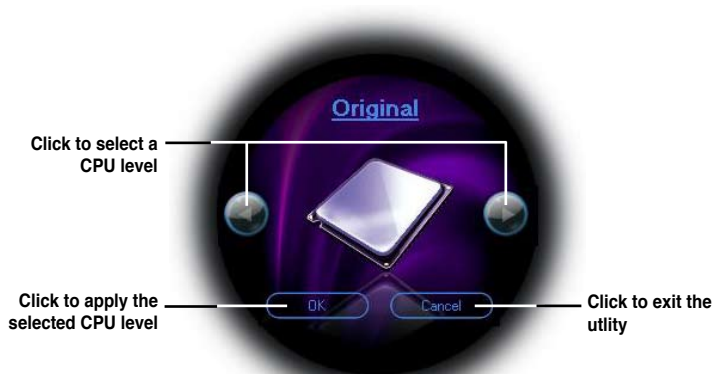


Click **Apply** at the bottom to save the setup.

### 4.3.6 CPU Level Up

The CPU Level Up allows you to overclock immediately with OC profile presets in Windows® environment without the hassle of entering BIOS.

After installing AI Suite from the bundled Support DVD, launch the utility by double-clicking the AI Suite icon in the Windows® notification area and click the CPU Level Up button on the AI Suite main window.





### 4.3.7 ASUS TurboV

ASUS TurboV allows you to overclock the CPU frequency, CPU voltage, QPI/ Memory controller voltage, and DRAM voltage in Windows® environment and takes effect in real-time without exiting and rebooting the OS.



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



- For system stability, all changes made in ASUS TurboV will not be saved to BIOS settings and will not be kept on the next system boot. Use the **Save Profile** function to save your customized overclocking settings and manually load the profile after Windows starts.
- For system stability, set ASUS EPU to **High Performance Mode** while using ASUS TurboV.

To launch ASUS TurboV

1. Install the ASUS TurboV utility from the motherboard support DVD.
2. Click **start > All Programs > ASUS > TurboV > TurboV**.

Save the current settings as a profile

Profiles : [dropdown] [Save Profile]

	Default	Target
CPU Frequency	267	267 (MHz)
CPU Voltage	1.28750	1.28750 (V)
DRAM Voltage	1.87950	1.87950 (V)
FSB Term.Volt.	1.20600	1.20600 (V)

[More Setting] [Apply] [Undo]

Shows more settings

Default settings

Target settings

Applies all changes immediately

Undoes all changes without applying

Voltage Adjustment bars



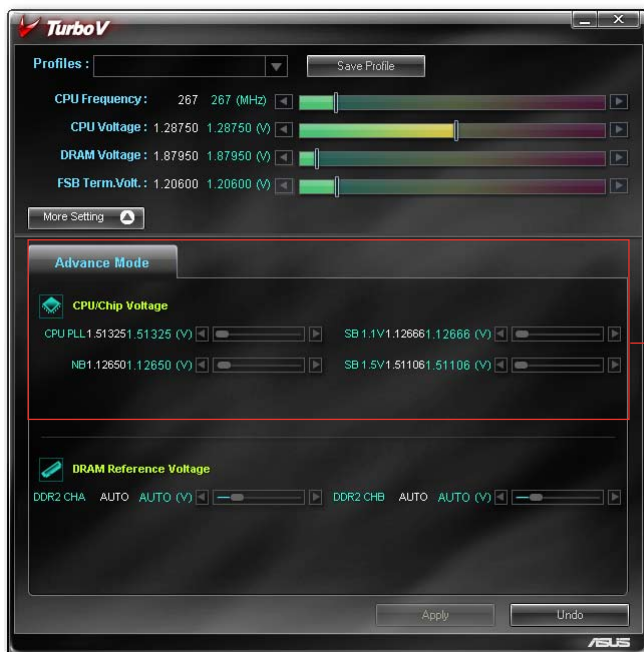
#### Overclocking tips:

- For advanced overclockability, adjust first the **Extreme Tweaker** items in BIOS, and then proceed more detailed adjustments using TurboV.
- The **CPU Frequency** setting in BIOS affects the adjustable range of CPU Frequency in TurboV.  
*For advanced overclocking:* Set CPU Frequency in BIOS to 200MHz or above for an adjustment range from 200MHz to 500MHz in TurboV.  
*For general overclocking:* Set CPU Frequency in BIOS below 200MHz for an adjustment range from 100MHz to 250MHz in TurboV.

## Advanced settings menu

Click **More Setting** from the TurboV main screen to display detailed configuration options for CPU/chip voltage, DRAM Reference voltage, and CPU ratio.

### Advance Mode



Advanced  
CPU and  
DRAM voltage  
settings

## 4.4 RAID configurations

The motherboard comes with the AMD SB750 chipset that allows you to configure Serial ATA hard disk drives as RAID volumes. The motherboard supports the following RAID configurations: RAID 0, RAID 1, RAID 5, and RAID 10.



- You must install Windows® XP Service Pack 2 or later versions before using Serial ATA hard disk drives. The Serial ATA RAID feature is available only if you are using Windows® XP SP2 or later versions.
- Due to Windows® XP / Vista limitation, a RAID array with the total capacity over 2TB cannot be set as a boot disk. A RAID array over 2TB can only be set as a data disk only.
- If you want to install a Windows® operating system to a hard disk drive included in a RAID set, you have to create a RAID driver disk and load the RAID driver during OS installation. Refer to section 4.5 Creating a RAID driver disk for details.

### 4.4.1 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 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.

**RAID 10** is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 0+1 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.

## 4.4.2 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.

## 4.4.3 Setting the RAID item in BIOS

You must enable the RAID function in the BIOS Setup before creating RAID volume(s) using SATA HDDs. To do this:

1. Enter the BIOS Setup during POST.
2. Go to the Main menu > Storage Configuration, and then press <Enter>.
3. Set the OnChip SATA Type item to [RAID].
4. Save your changes, and then exit the BIOS Setup.



Refer to Chapter 3 for details on entering and navigating through the BIOS Setup.

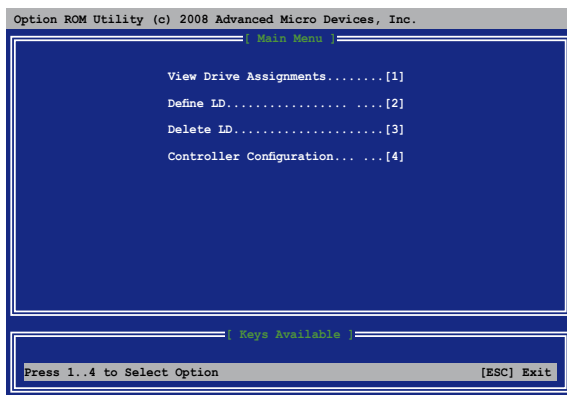


Due to chipset limitation, when set any of SATA ports to RAID mode, all SATA ports run at RAID mode together.

### 4.4.4 AMD® Option ROM Utility®

To enter the AMD® Option ROM utility®

1. Boot up your computer.
2. During POST, press <Ctrl> + <F> to display the utility main menu.



The Main Menu allows you to select an operation to perform. The Main Menu options include:

- **View Drive Assignments:** shows the status of the hard disk drives.
- **Define LD:** creates a RAID 0, RAID 1, RAID 5 or RAID 10 configuration.
- **Delete LD:** deletes a selected RAID volume and partition.
- **Controller Configuration:** Shows the system resources configuration.

Press <1>, <2>, <3>, or <4> to enter the option you need; press <ESC> to exit the utility.



The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.



The utility supports maximum four hard disk drives for RAID configuration.

## Creating a RAID volume

To create a RAID volume

1. In the Main Menu, press <2> to enter the **Define LD** function.
2. Press <Enter>, and the following screen appears.

Option ROM Utility (c) 2008 Advanced Micro Devices, Inc.

Define LD Menu

LD No	RAID Mode	Total Drv
LD 1	RAID 0	0

Strip Block: 64 KB      Fast Init: ON  
Gigabyte Boundary: ON      Cache Mode: WriteThru

Drives Assignments

Channel	ID	Drive Model	Capabilities	Capacity(GB)	Assignment
1:	Mas	ST3160812AS	SATA 3G	160.04	N
2:	Mas	ST3160812AS	SATA 3G	160.04	N
3:	Mas	ST3160812AS	SATA 3G	160.04	N
4:	Mas	ST3160812AS	SATA 3G	160.04	N

Keys Available

[↑] Up [↓] Down [ESC] Exit [Space] Change [Ctrl-Y] Save [PgUp/Dn] Page Change

3. Use the Up/Down arrow key to highlight the **LD1** item and press <Space> to select a RAID mode you would like to create.
4. Move to the **Assignment** item by using the down arrow key and press <Space> to set **Y** to the drives you would like to include in the RAID volume.
5. Press <Ctrl> + <Y> to save the setting. The utility prompts the following messages:

Fast Initialization Option has been selected  
It will erase the MBR data of the disks.  
<Press Ctrl-Y Key if you are sure to erase it>  
<Press any other key to ignore this option>

To continue, press <Ctrl> + <Y> to erase MBR and all data on the selected drives. To cancel, press any other key to ignore this option. The utility prompts the following messages:

Press Ctrl-Y to Modify Array Capacity or press any other key to use maximum capacity...

Press <Ctrl> + <Y> to key in the desired capacity, or press any other key to use the maximum capacity.

6. The utility displays the following screen on the next page.

Option ROM Utility (c) 2008 Advanced Micro Devices, Inc.

[ Define LD Menu ]

LD No	RAID Mode	Total Drv	Capacity(GB)	Status
LD 1	RAID 0	2	317.99	Functional
LD 2	----	----	-----	----
LD 3	----	----	-----	----
LD 4	----	----	-----	----
LD 5	----	----	-----	----
LD 6	----	----	-----	----
LD 7	----	----	-----	----
LD 8	----	----	-----	----
LD 9	----	----	-----	----
LD 10	----	----	-----	----

[ Keys Available ]

[ ] Up [ ] Down [ESC] Exit [Enter] Select

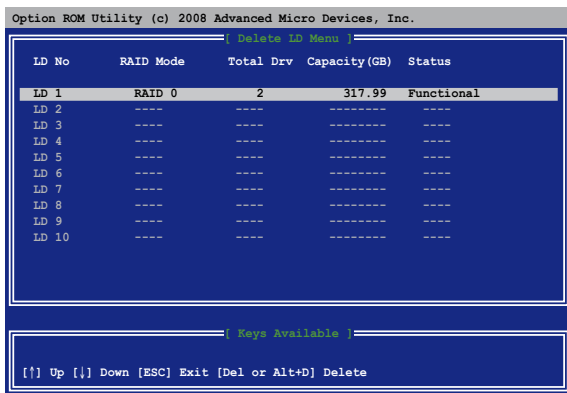
## Deleting a RAID configuration



Take caution when deleting a RAID volume. You will lose all data on the hard disk drives when you delete a RAID volume.

To delete a RAID volume

1. In the Main Menu, press <3> to enter the **Delete LD** function.
2. Select the RAID item you want to delete and press <Del> or <Alt> + <D>.



3. The utility prompts the following messages:

Press Ctrl-Y to delete the data in the disk!  
or press any other key to abort...

Press <Ctrl> + <Y> to delete the RAID volume.

## 4.5 Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing a Windows® operating system on a hard disk drive that is included in a RAID set.



- **The motherboard does not provide a floppy drive connector.** You have to use a USB floppy disk drive when creating a **SATA** RAID driver disk.
- Windows® XP may not recognize the USB floppy disk drive due to Windows® XP limitation. To work around this OS limitation, refer to section 4.5.3 Using a USB floppy disk drive.

### 4.5.1 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 DVD into the optical drive.
5. Save changes and exit BIOS.
6. When the **Make Disk** menu appears, press <a> or <b> to create a 32/64bit **ATI RAID/AHCI controller driver disk for Windows XP/Vista**.
7. Insert a formatted floppy disk into the floppy drive then press <Enter>.
8. Follow the succeeding screen instructions to complete the process.

### 4.5.2 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, and then click **ATI RAID/AHCI 32/64bit WinXP/Vista Driver** to create a RAID driver disk.
4. Insert a floppy disk into the floppy disk drive.
5. Follow the succeeding screen instructions to complete the process.



Write-protect the floppy disk to avoid a computer virus infection.

### 4.5.3 Installing the RAID driver during Windows® OS installation

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>, and then insert the floppy disk with RAID driver into the floppy disk drive.



3. When prompted to select the SCSI adapter to install, ensure that you select **SB 750**.
4. Follow the succeeding screen instructions to complete the installation.

To install the RAID driver in Windows® Vista

1. Insert the floppy disk with RAID driver into the floppy disk drive.
2. During the OS installation, select **SB 750**.
3. Follow the succeeding screen instructions to complete the installation.

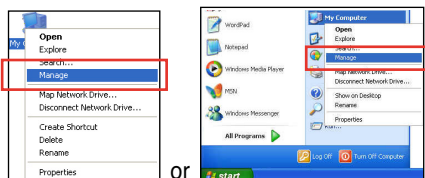
#### 4.5.4 Using a USB floppy disk drive

Due to OS limitation, Windows® XP may not recognize the USB floppy disk drive when you install the RAID driver from a floppy disk during the OS installation.

To solve this issue, add the USB floppy disk drive's Vendor ID (VID) and Product ID (PID) to the floppy disk containing the RAID driver. Refer to the steps below:

1. Using another computer, plug the USB floppy disk drive, and insert the floppy disk containing the RAID driver.

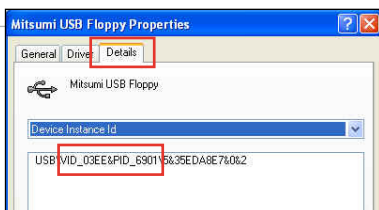
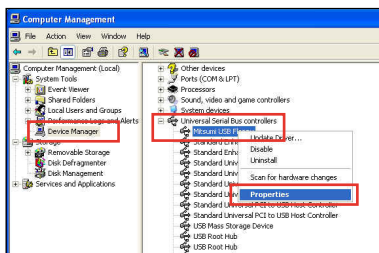
2. Right-click **My Computer** on the Windows® desktop or **start** menu, and then select **Manage** from the pop-up window.



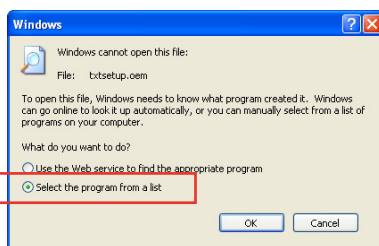
3. Select **Device Manager**. From the **Universal Serial Bus controllers**, right-click **xxxxxx USB Floppy**, and then select **Properties** from the pop-up window.



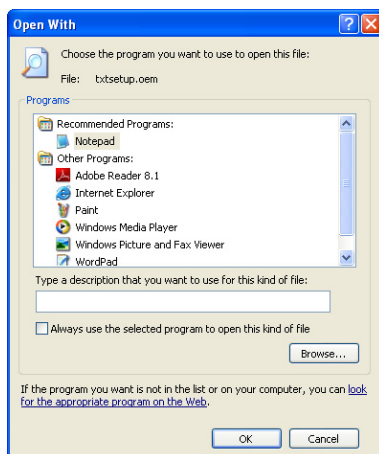
The name of the USB floppy drive varies with different vendors.



5. Browse the contents of the RAID driver disk to locate the file **txtsetup.oem**.
6. Double-click the file. A window appears, allowing you to select the program for opening the oem file.



7. Use Notepad to open the file.



8. Find the **[HardwareIds.scsi.iaAHCI\_ICH10R]** and **[HardwareIds.scsi.iastor\_ICH8RICH9RICH10RDO]** sections in the **txtsetup.oem** file.
9. Type the following line to the bottom of the two sections:  
**id = "USB\VID\_xxxx&PID\_xxxx", "usbstor" #--Mitsumi**

```
[HardwareIds.scsi.iaAHCI_ICH10R]
id = "PCI\VEN_8086&DEV_3A22&CC_0106", "iastor"
id = "USB\VID_03EE&PID_6901", "usbstor" #--Mitsumi

[HardwareIds.scsi.iastor_ICH8RICH9RICH10RDO]
id = "PCI\VEN_8086&DEV_2822&CC_0104", "iastor"
id = "USB\VID_03EE&PID_6901", "usbstor" #--Mitsumi
```



Add the same line to both sections.

The VID and PID vary with different vendors.

This chapter describes how to install and  
configure ATI® CrossFireX™ graphics  
cards.

# 5 ATI® CrossFireX™ technology support

**Chapter summary**

5

5.1    **ATI® CrossFireX™ technology ..... 5-1**

## 5.1 ATI® CrossFireX™ technology

The motherboard supports the ATI® CrossFireX™ technology that allows you to install multi-graphics processing units (GPU) graphics cards. Follow the installation procedures in this section.

### 5.1.1 Requirements

- You should have two identical CrossFireX-ready graphics cards or one CrossFireX-ready dual-GPU graphics card that are ATI® certified.
- Ensure that your graphics card driver supports the ATI CrossFireX technology. Download the latest driver from the AMD website at [www.amd.com](http://www.amd.com).
- Ensure that your power supply unit (PSU) can provide at least the minimum power required by your system. See page 2-41 for details.



- 
- We recommend that you install additional chassis fans for better thermal environment.
  - Visit the ATI Game website at <http://game.amd.com> for the latest certified graphics card and the supported 3D application list.
- 

### 5.1.2 Before you begin

For ATI CrossFireX to work properly, you have to uninstall all existing graphics card drivers before installing ATI CrossFireX graphics cards to your system.

To uninstall existing graphics card drivers

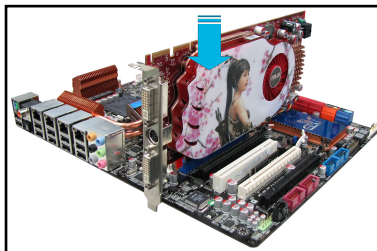
1. Close all current applications.
2. For Windows XP, go to **Control Panel > Add/Remove Programs**.  
For Windows Vista, go to **Control Panel > Programs and Features**.
3. Select your current graphics card driver/s.
4. For Windows XP, select **Add/Remove**.  
For Windows Vista, select **Uninstall**.
5. Turn off your computer.

## 5.1.3 Installing CrossFireX graphics cards

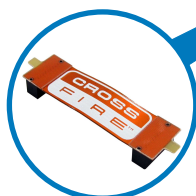
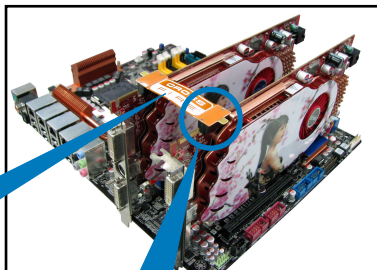


The following pictures are for reference only. The graphics cards and the motherboard layout may vary with models, but the installation steps remain the same.

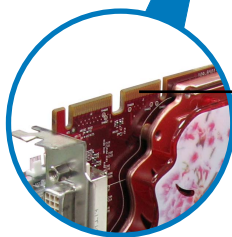
1. Prepare two CrossFireX-ready graphics cards.
2. Insert the two graphics card into the PCIEX16 slots.
3. Ensure that the cards are properly seated on the slots.



4. Align and firmly insert the CrossFireX bridge connector to the goldfingers on each graphics card. Ensure that the connector is firmly in place.

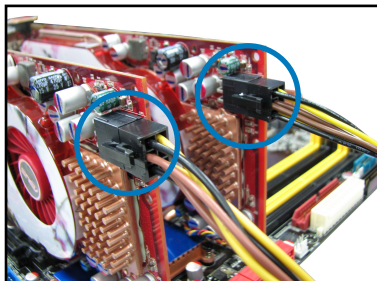


CrossFireX bridge



Goldfingers

5. Connect two independent auxiliary power sources from the power supply to the two graphics cards separately.
6. Connect a VGA or a DVI cable to the graphics card.



### 5.1.4 Installing the device drivers

Refer to the documentation that came with your graphics card package to install the device drivers.



Ensure that your PCI Express graphics card driver supports the ATI® CrossFireX™ technology. Download the latest driver from the AMD website ([www.amd.com](http://www.amd.com)).

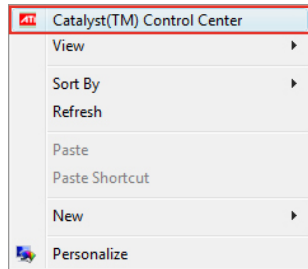
### 5.1.5 Enabling the ATI® CrossFireX™ technology

After installing your graphics cards and the device drivers, enable the CrossFireX™ feature through the ATI Catalyst™ Control Center in Windows environment.

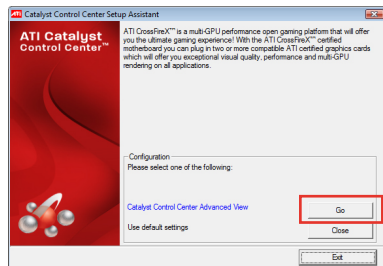
#### Launching the ATI Catalyst Control Center

To launch the ATI Catalyst Control Center

1. Right-click on the Windows® desktop and select **Catalyst(TM) Control Center**. You can also right-click the ATI icon in the Windows notification area and select **Catalyst Control Center**.

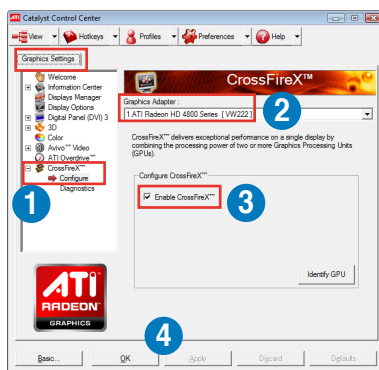


2. The **Catalyst Control Center Setup Assistant** appears when the system detects the existence of multi-graphics cards. Click **Go** to continue to the **Catalyst Control Center Advanced View** window.



## Enabling CrossFireX settings

1. In the Catalyst Control Center window, click **Graphics Settings > CrossFireX > Configure**.
2. From the Graphics Adapter list, select the graphics card to act as the display GPU.
3. Select **Enable CrossFireX**.
4. Click **Apply**, and then click **OK** to exit the window.





The Appendix lists the debug code table  
for the LCD Poster.

# Debug code table

## Chapter summary



Debug code table.....	A-1
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## Debug code table

Code	Description
CPU INIT	CPU Initiation
DET CPU	Test CMOS R/W functionality.
CHIPINIT	Early chipset initialization: -Disable shadow RAM -Disable L2 cache -Program basic chipset registers
DET DRAM	Detect memory -Auto-detection of DRAM size, type and ECC. -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 2. Clear CMOS error flag
INIT8042	1. Clear 8042 interface 2. Initialize 8042 self-test
ENABLEKB	1. Test special keyboard controller for Super I/O chips. 2. Enable keyboard interface.
DIS MS	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 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. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed. 5. Invoke video BIOS.
VGA BIOS	Initialize VGA BIOS
TESTVRAM	1. Initialize multi-language 2. Put information on screen display, including BIOS logo, CPU type, CPU speed .
RESET KB	Reset keyboard.

## Debug code table

Code	Description
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	<ol style="list-style-type: none"> <li>1. Program MTRR of M1 CPU</li> <li>2. Initialize L2 cache for P6 class CPU &amp; program CPU with proper cacheable range.</li> <li>3. Initialize the APIC for P6 class CPU.</li> <li>4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.</li> </ol>
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	<ol style="list-style-type: none"> <li>1. Initialize floppy controller</li> <li>2. Set up floppy related fields in 40:hardware.</li> </ol>
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

## Debug code table

Code	Description
<b>PASSWORD</b>	Clear EPA or customization logo. 1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
<b>USB FINAL</b>	Initialize PnP boot devices 1. USB final Initialization 2. NET PC: Build SYSID structure 3. Switch screen back to text mode 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs 6. Assign IRQs to PCI devices 7. Initialize APM 8. Clear noise of IRQs.
<b>INIT ROM</b>	Initialize device option ROMs.
<b>NUM LOCK</b>	1. Program daylight saving 2. Update keyboard LED & typematic rate
<b>UPDT DMI</b>	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
<b>INT 19H</b>	Boot attempt (INT 19h)

Manufacturer	ASUSTek COMPUTER INC.
Address, City	No. 150, LI-TE RD., PEITOU, TAIPEI 112, TAIWAN R.O.C
Country	TAIWAN
Authorized Representative in Europe	ASUS COMPUTER GmbH
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