

K9A2 Neo Series

MS-7388 (v1.X) Mainboard



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Revision History

Revision	Revision History	Date
V1.1	First release for PCB 1.X	January, 2008

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- 🔍 Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: <http://global.msi.com.tw/index.php?func=faqIndex>
- 🔍 Contact our technical staff at: <http://support.msi.com.tw/>

Safety Instructions

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



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



警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成無線電干擾，在這種情況下，使用者會被要求採取某些適當的對策。



廢電池請回收

For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part



15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the 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 measures listed below.

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

Notice 1

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

Notice 2

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

VOIR LANOTICE D'INSTALLATIONAVANT DE RACCORDERAU RESEAU.



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

- (1) this device may not cause harmful interference, and*
- (2) this device must accept any interference received, including interference that may cause undesired operation.*

WEEE (Waste Electrical and Electronic Equipment) Statement



ENGLISH

To protect the global environment and as an environmentalist, MSI must remind you that...

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life. MSI will comply with the product take back requirements at the end of life of MSI-branded products that are sold into the EU. You can return these products to local collection points.

DEUTSCH

Hinweis von MSI zur Erhaltung und Schutz unserer Umwelt

Gemäß der Richtlinie 2002/96/EG über Elektro- und Elektronik-Altgeräte dürfen Elektro- und Elektronik-Altgeräte nicht mehr als kommunale Abfälle entsorgt werden. MSI hat europaweit verschiedene Sammel- und Recyclingunternehmen beauftragt, die in die Europäische Union in Verkehr gebrachten Produkte, am Ende seines Lebenszyklus zurückzunehmen. Bitte entsorgen Sie dieses Produkt zum gegebenen Zeitpunkt ausschliesslich an einer lokalen Altgerätesammelstelle in Ihrer Nähe.

FRANÇAIS

En tant qu'écologiste et afin de protéger l'environnement, MSI tient à rappeler ceci...

Au sujet de la directive européenne (EU) relative aux déchets des équipement électriques et électroniques, directive 2002/96/EC, prenant effet le 13 août 2005, que les produits électriques et électroniques ne peuvent être déposés dans les décharges ou tout simplement mis à la poubelle. Les fabricants de ces équipements seront obligés de récupérer certains produits en fin de vie. MSI prendra en compte cette exigence relative au retour des produits en fin de vie au sein de la communauté européenne. Par conséquent vous pouvez retourner localement ces matériels dans les points de collecte.

РУССКИЙ

Компания MSI предпринимает активные действия по защите окружающей среды, поэтому напоминаем вам, что...

В соответствии с директивой Европейского Союза (ЕС) по предотвращению загрязнения окружающей среды использованным электрическим и электронным оборудованием (директива WEEE 2002/96/EC), вступающей в силу 13 августа 2005 года, изделия, относящиеся к электрическому и электронному оборудованию, не могут рассматриваться как бытовой мусор, поэтому производители вышеперечисленного электронного оборудования обязаны принимать его для переработки по окончании срока службы. MSI обязуется соблюдать требования по приему продукции, проданной под маркой MSI на территории ЕС, в переработку по окончании срока службы. Вы можете вернуть эти изделия в специализированные пункты приема.

ESPAÑOL

MSI como empresa comprometida con la protección del medio ambiente, recomienda:

Bajo la directiva 2002/96/EC de la Unión Europea en materia de desechos y/o equipos electrónicos, con fecha de rigor desde el 13 de agosto de 2005, los productos clasificados como "eléctricos y equipos electrónicos" no pueden ser depositados en los contenedores habituales de su municipio, los fabricantes de equipos electrónicos, están obligados a hacerse cargo de dichos productos al término de su período de vida. MSI estará comprometido con los términos de recogida de sus productos vendidos en la Unión Europea al final de su período de vida. Usted debe depositar estos productos en el punto limpio establecido por el ayuntamiento de su localidad o entregar a una empresa autorizada para la recogida de estos residuos.

NEDERLANDS

Om het milieu te beschermen, wil MSI u eraan herinneren dat....

De richtlijn van de Europese Unie (EU) met betrekking tot Vervuiling van Elektrische en Electronische producten (2002/96/EC), die op 13 Augustus 2005 in zal gaan kunnen niet meer beschouwd worden als vervuiling.

Fabrikanten van dit soort producten worden verplicht om producten retour te nemen aan het eind van hun levenscyclus. MSI zal overeenkomstig de richtlijn handelen voor de producten die de merknaam MSI dragen en verkocht zijn in de EU. Deze goederen kunnen geretourneerd worden op lokale inzamelingspunten.

SRPSKI

Da bi zaštitili prirodnu sredinu, i kao proizvođače koje vodi računa o okolini i prirodnoj sredini, MSI mora da vas podesti da...

Po Direktivi Evropske unije ("EU") o odbačenju elektonskoj i električnoj opremi. Direktiva 2002/96/EC, koja stupa na snagu od 13. Avgusta 2005, proizvodi koji spadaju pod "elektonsku i električnu opremu" ne mogu više biti odbačeni kao običan otpad i proizvođači ove opreme biće prinuđeni da uzmu natrag ove proizvode na kraju njihovog uobičajenog veka trajanja. MSI će poštovati zahtev o preuzimanju ovakvih proizvoda kojima je istekao vek trajanja, koji imaju MSI oznaku i koji su prodati u EU. Ove proizvode možete vratiti na lokalnim mestima za prikupljanje.

POLSKI

Aby chronić nasze środowisko naturalne oraz jako firma dbająca o ekologię, MSI przypomina, że...

Zgodnie z Dyrektywą Unii Europejskiej ("UE") dotyczącą odpadów produktyw elektrycznych i elektronicznych (Dyrektywa 2002/96/EC), która wchodzi w życie 13 sierpnia 2005, tzw. "produkty oraz wyposażenie elektryczne i elektroniczne" nie mogą być traktowane jako śmieć komunalne, tak więc producenci tych produktów będą zobowiązani do odbierania ich w momencie gdy produkt jest wycofywany z użycia. MSI wypełni wymagania UE, przyjmując produkty (sprzedawane na terenie Unii Europejskiej) wycofywane z użycia. Produkty MSI będzie można zwracać w wyznaczonych punktach zbiorczych.

TÜRKÇE

Çevreci özelliğiyle bilinen MSI dünyada çevreyi korumak için hatırlatır:

Avrupa Birliği (AB) Kararnamesi Elektrik ve Elektronik Malzeme Atığı, 2002/96/EC Kararnamesi altında 13 Ağustos 2005 tarihinden itibaren geçerli olmak üzere, elektrikli ve elektronik malzemeler diğer atıklar gibi çöpe atılmayacak ve bu elektronik cihazların üreticileri, cihazların kullanım süreleri bittikten sonra ürünleri geri toplamakla yükümlü olacaktır. Avrupa Birliği'ne satılan MSI markalı ürünlerin kullanım süreleri bittiğinde MSI ürünlerin geri alınması isteği ile işbirliği içerisinde olacaktır. Ürünlerinizi yerel toplama noktalarına bırakabilirsiniz.

ČESKY

Záleží nám na ochraně životního prostředí - společnost MSI upozorňuje...

Podle směrnice Evropské unie ("EU") o likvidaci elektrických a elektronických výrobků 2002/96/EC platné od 13. srpna 2005 je zakázáno likvidovat "elektrické a elektronické výrobky" v běžném komunálním odpadu a výrobci elektronických výrobků, na které se tato směrnice vztahuje, budou povinni odebírat takové výrobky zpět po skončení jejich životnosti. Společnost MSI splní požadavky na odebrání výrobků značky MSI, prodávaných v zemích EU, po skončení jejich životnosti. Tyto výrobky můžete odevzdat v místních sběrnách.

MAGYAR

Annak érdekében, hogy környezetünket megvédjük, illetve környezetvédőként fellépve az MSI emlékezteti Önt, hogy ...

Az Európai Unió („EU”) 2005. augusztus 13-án hatályba lépő, az elektromos és elektronikus berendezések hulladékairól szóló 2002/96/EK irányelve szerint az elektromos és elektronikus berendezések többé nem kezelhetők lakossági hulladékként, és az ilyen elektronikus berendezések gyártói kötelessé válnak az ilyen termékek visszavételére azok hasznos élettartama végén. Az MSI betartja a termékvisszavétellel kapcsolatos követelményeket az MSI márkánév alatt az EU-n belül értékesített termékek esetében, azok élettartamának végén. Az ilyen termékeket a legközelebbi gyűjtőhelyre viheti.

ITALIANO

Per proteggere l'ambiente, MSI, da sempre amica della natura, ti ricorda che....

In base alla Direttiva dell'Unione Europea (EU) sullo Smaltimento dei Materiali Elettrici ed Elettronici, Direttiva 2002/96/EC in vigore dal 13 Agosto 2005, prodotti appartenenti alla categoria dei Materiali Elettrici ed Elettronici non possono più essere eliminati come rifiuti municipali: i produttori di detti materiali saranno obbligati a ritirare ogni prodotto alla fine del suo ciclo di vita. MSI si adegnerà a tale Direttiva ritirando tutti i prodotti marchiati MSI che sono stati venduti all'interno dell'Unione Europea alla fine del loro ciclo di vita. È possibile portare i prodotti nel più vicino punto di raccolta.

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Chapter 1

Getting Started

Thank you for choosing the K9A2 Neo Series (MS-7388 v1.X) ATX mainboard. The K9A2 Neo Series mainboards are based on **AMD® 770 & SB600** chipsets for optimal system efficiency. Designed to fit the advanced **AMD®** Phenom/Athlon/Sempron series in Socket AM2/ AM2+, the K9A2 Neo Series deliver a high performance and professional desktop platform solution.

Mainboard Specifications

Processor Support

- AMD® Phenom/Athlon/Sempron series processors in AM2/ AM2+ package
- Supports 4 pin CPU Fan Pin-Header with Fan Speed Control
(For the latest information about CPU, please visit <http://global.msi.com.tw/index.php?func=cpuform>)

Supported FSB

- AM2 CPU supports Hyper Transport 1.0
- AM2+ CPU supports Hyper Transport 3.0

Chipset

- North Bridge: AMD® 770 chipset
- South Bridge: AMD® SB600 chipset

Memory Support

- DDR2 800/667/533 DRAM (240pin/ 1.8V)
- 4 DDR2 DIMMs (8GB Max)
(For more information on compatible components, please visit <http://global.msi.com.tw/index.php?func=testreport>)

LAN

- Supports 10/100/1000 Fast Ethernet by Realtek 8111B

1394 (Optional)

- Transfer rate is up to 400Mbps
- Controlled by VIA VT6308P (optional)

Audio

- Chip integrated by Realtek® ALC888
- Flexible 8-channel audio with jack sensing
- Compliant with Azalia 1.0 spec

IDE

- 1 IDE port by SB600
- Supports Ultra DMA 66/100/133 mode
- Supports PIO, Bus Master operation mode

SATA

- 4 SATAII ports by SB600
- 1 eSATA port by Silicon Image Sil3531(optional)
- Supports storage and data transfers at up to 300MB/s

Floppy

- 1 floppy port
- Supports 1 FDD with 360KB, 720KB, 1.2MB, 1.44MB and 2.88MB

RAID

- SATA1~4 support RAID 0/ 1/ 0+1 mode

Connectors

● **Back panel**

- 1 PS/2 mouse port
- 1 PS/2 keyboard port
- 1 1394 port (optional)
- 1 COM port
- 1 LAN jack
- 4 USB 2.0 ports
- 1 eSATA port (optional)
- 6 flexible audio jacks

● **On-Board Pinheaders**

- 3 USB 2.0 pinheaders
- 1 1394 pinheader (optional)
- 1 Front Panel Audio pinheader
- 1 CD-in pinheader
- 1 TPM Module pinheader (optional)
- 1 SPDIF-out pinheader (optional)
- 1 Chassis Intrusion pinheader

TPM (optional)

- Supports TPM

Slots

- 1 PCI Express x16 slot compatible with PCIE 2.0 specification
- 2 PCI Express x 1 slot
- 2 PCI slots

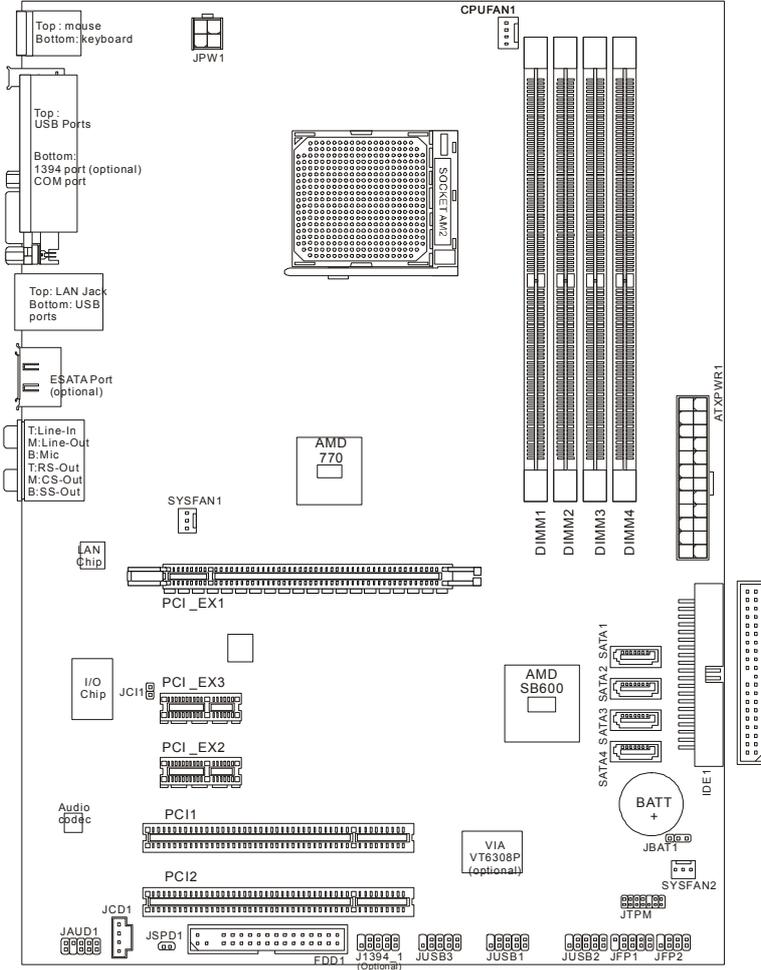
Form Factor

- ATX (30.5cm X 22.0 cm)

Mounting

- 6 mounting holes

Mainboard Layout



**K9A2 Neo Series (MS-7388 v1.X)
ATX Mainboard**

Packing Checklist



MSI motherboard



MSI Driver/Utility CD



SATA Cable



Power Cable



Standard Cable for
IDE Devices



Back IO Shield



User's Guide

* The pictures are for reference only and may vary from the packing contents of the product you purchased.

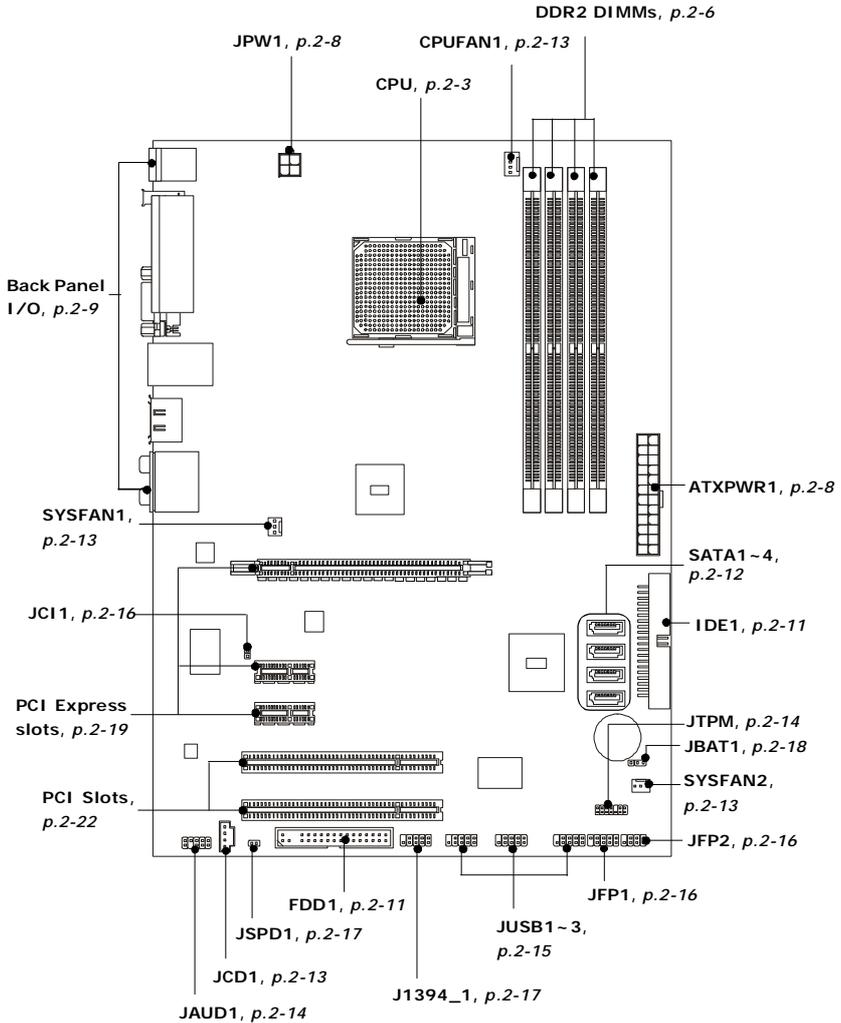
Chapter 2

Hardware Setup

This chapter provides you with the information about hardware setup procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.

Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

Quick Components Guide



CPU (Central Processing Unit)

The mainboard supports AMD® Athlon64 X2/ Athlon64/ Sempron processors in Socket AM2, and supports Phenom X4/X3, Athlon X2, Sempron processors in Socket AM2+. The Socket AM2/ AM2+ offer a easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not have the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

For the latest information about CPU, please visit:

<http://global.msi.com.tw/index.php?func=cpuform>



Important

Overheating

Overheating will seriously damage the CPU and system. Always make sure the cooling fan can work properly to protect the CPU from overheating. Make sure that you apply an even layer of thermal paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.

Replacing the CPU

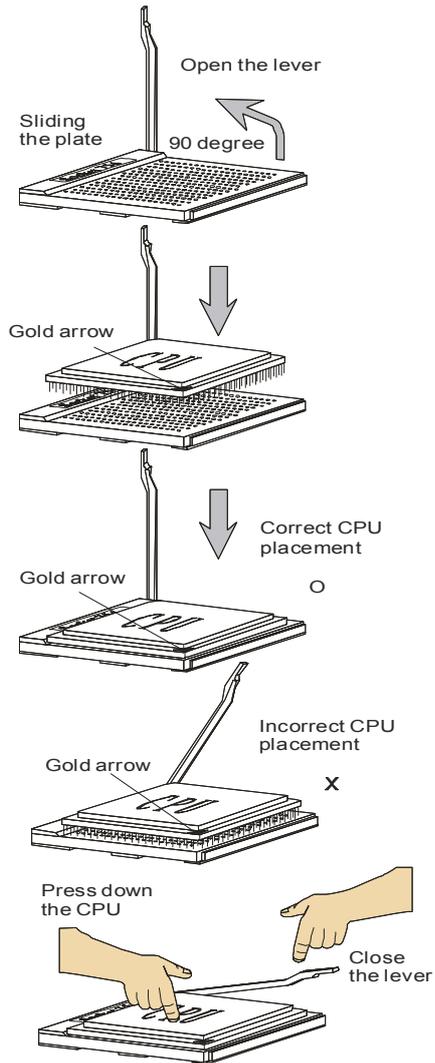
While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from the grounded outlet first to ensure the safety of CPU.

Overclocking

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

CPU Installation Procedures for Socket AM2/ AM2+

1. Please turn off the power and unplug the power cord before installing the CPU.
2. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.
3. Look for the gold arrow on the CPU. The gold arrow should point as shown in the picture. The CPU can only fit in the correct orientation. Lower the CPU down onto the socket.
4. If the CPU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your mainboard.
5. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



Installing CPU Cooler Set

When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not have the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.



Important

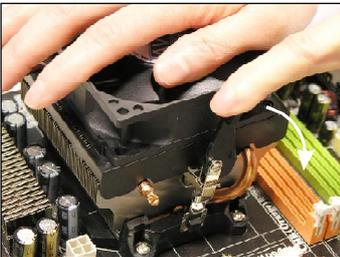
1. Read the CPU status in BIOS (Chapter 3).
2. Mainboard photos shown in this section are for demonstration of the CPU/cooler installation only. The appearance of your mainboard may vary depending on the model you purchase.

1. Position the cooling set onto the retention mechanism.

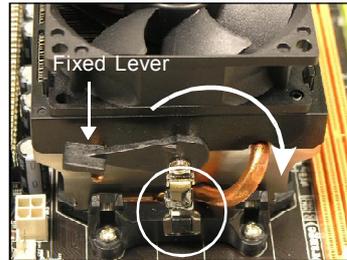
Hook one end of the clip to hook first.



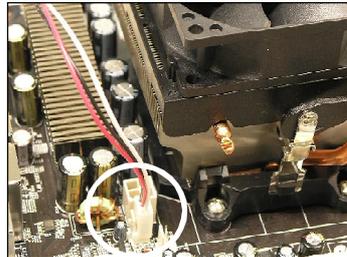
3. Fasten down the lever.



2. Then press down the other end of the clip to fasten the cooling set on the top of the retention mechanism. Locate the Fix Lever and lift up it .



4. Attach the CPU Fan cable to the CPU fan connector on the mainboard.

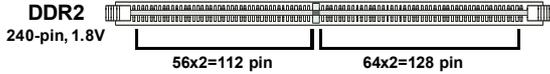


Memory

These DIMM slots are used for installing memory modules.

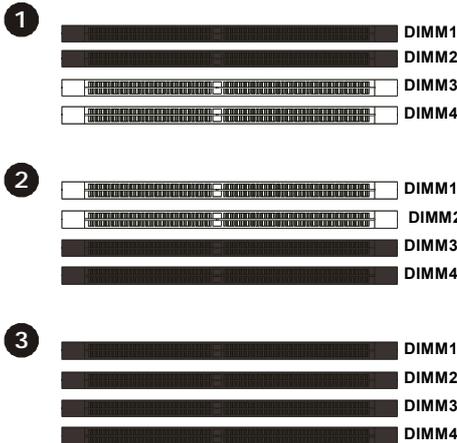
For more information on compatible components, please visit:

<http://global.msi.com.tw/index.php?func=testreport>



Dual-Channel Memory Population Rules

In Dual-Channel mode, the memory modules can transmit and receive data with two data bus lines simultaneously. Enabling Dual-Channel mode can enhance the system performance. Please refer to the following illustrations for population rules under Dual-Channel mode.



Installing Memory Modules

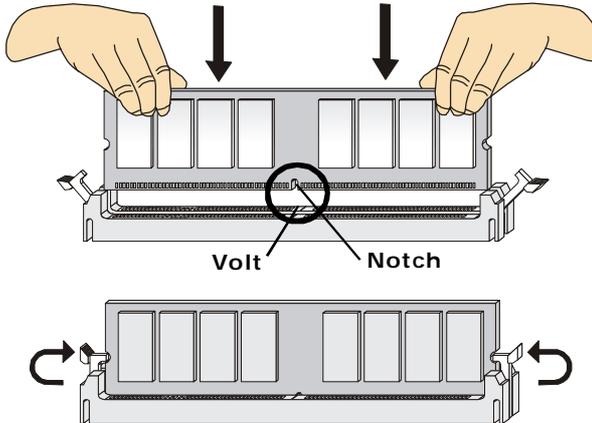
1. The memory module has only one notch on the center and will only fit in the right orientation.
2. Insert the memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the DIMM slot.



Important

You can barely see the golden finger if the memory module is properly inserted in the DIMM slot.

3. The plastic clip at each side of the DIMM slot will automatically close.



Important

- DDR2 memory modules are not interchangeable with DDR and the DDR2 standard is not backwards compatible. You should always install DDR2 memory modules in the DDR2 DIMM slots.
- In Dual-Channel mode, make sure that you install memory modules of **the same type and density** in different channel DIMM slots.
- To enable successful system boot-up, always insert the memory modules into the **DIMM1** first.
- Due to the chipset resource deployment, the system density will only be detected up to 7+GB (not full 8GB) when each DIMM is installed with a 2GB memory module.

Power Supply

ATX 24-Pin Power Connector: ATXPWR1

This connector allows you to connect an ATX 24-pin power supply. To connect the ATX 24-pin power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

You may use the 20-pin ATX power supply as you like. If you'd like to use the 20-pin ATX power supply, please plug your power supply along with pin 1 & pin 13 (refer to the image at the right hand). There is also a foolproof design on pin 11, 12, 23 & 24 to avoid wrong installation.



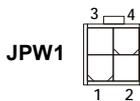
Pin Definition

ATXPWR1		Pin Definition			
PIN	SIGNAL	PIN	SIGNAL		
1	+3.3V	13	+3.3V		
2	+3.3V	14	-12V		
3	GND	15	GND		
4	+5V	16	PS-ON#		
5	GND	17	GND		
6	+5V	18	GND		
7	GND	19	GND		
8	PWROK	20	Res		
9	5VSB	21	+5V		
10	+12V	22	+5V		
11	+12V	23	+5V		
12	+3.3V	24	GND		

ATX 12V Power Connector: JPW1

This power connector JPW1 is used to provide power to the CPU.

Pin Definition



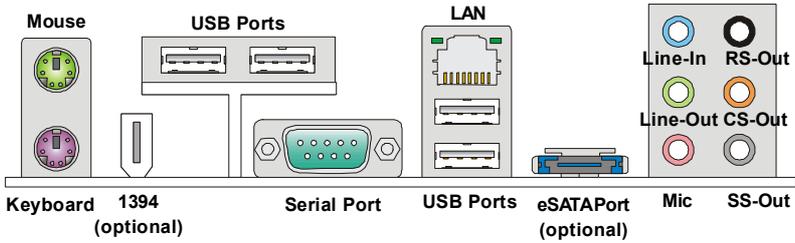
PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V



Important

1. Make sure that all the connectors are connected to proper ATX power supplies to ensure stable operation of the mainboard.
2. Power supply of 350 watts (and above) is highly recommended for system stability.

Back Panel



► Mouse/Keyboard

The standard PS/2® mouse/keyboard DIN connector is for a PS/2® mouse/keyboard.

► IEEE 1394 Port (optional)

The 1394 port on the back panel provides connection to 1394 devices.

► Serial Port

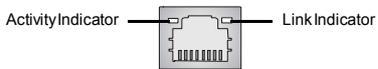
The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

► USB Port

The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

► LAN

The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it.



LED	Color	LED State	Condition
Left	Orange	Off	LAN link is not established.
		On (steady state)	LAN link is established.
		On (brighter & pulsing)	The computer is communicating with another computer on the LAN.
Right	Green	Off	10 Mbit/sec data rate is selected.
	Green	On	100 Mbit/sec data rate is selected.
	Orange	On	1000 Mbit/sec data rate is selected.

► eSATA Port (optional)

The eSATA port is for attaching the eSATA external hard drive.

► Audio Ports

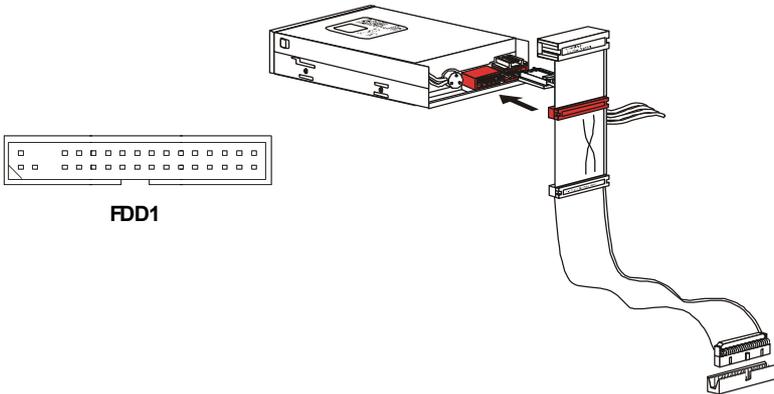
These audio connectors are used for audio devices. You can differentiate the color of the audio jacks for different audio sound effects.

- **Line-In (Blue)** - Line In, is used for external CD player, tapeplayer or other audio devices.
- **Line-Out (Green)** - Line Out, is a connector for speakers or headphones.
- **Mic (Pink)** - Mic, is a connector for microphones.
- **RS-Out (Black)** - Rear-Surround Out in 4/ 5.1/ 7.1 channel mode.
- **CS-Out (Orange)** - Center/ Subwoofer Out in 5.1/ 7.1 channel mode.
- **SS-Out (Gray)** - Side-Surround Out 7.1 channel mode.

Connectors

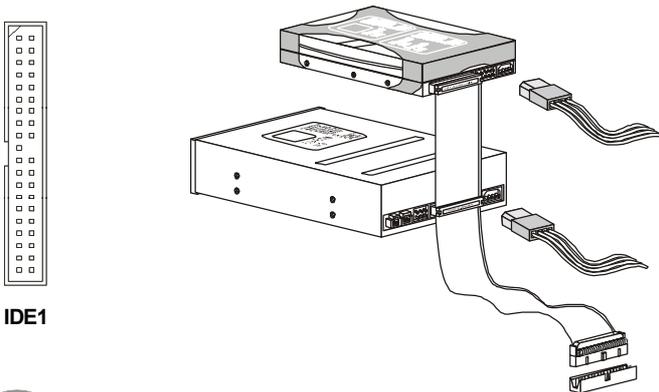
Floppy Disk Drive Connector: FDD1

This connector supports 360KB, 720KB, 1.2MB, 1.44MB or 2.88MB floppy disk drive.



IDE Connector: IDE1

This connector supports IDE hard disk drives, optical disk drives and other IDE devices.

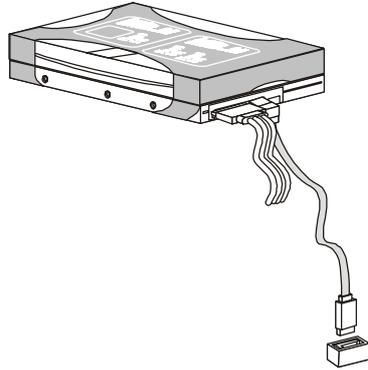
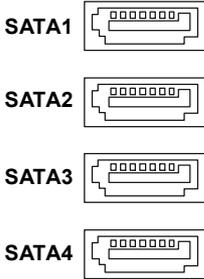


Important

If you install two IDE devices on the same cable, you must configure the drives separately to master / slave mode by setting jumpers. Refer to IDE device's documentation supplied by the vendors for jumper setting instructions.

Serial ATA Connector: SATA1/ SATA2/ SATA3/ SATA4

This connector is a high-speed Serial ATA interface port. Each connector can connect to one Serial ATA device.

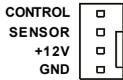


Important

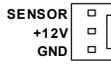
Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, data loss may occur during transmission.

Fan Power Connectors: CPUFAN1, SYSFAN1, SYSFAN2

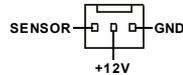
The fan power connectors support system cooling fan with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset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



CPUFAN1



SYSFAN1



SYSFAN2

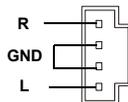


Important

1. Please refer to the recommended CPU fans at processor's official website or consult the vendors for proper CPU cooling fan.
2. CPUFAN1 supports fan control. You can install **Dual Core Center** utility that will automatically control the CPU fan speed according to the actual CPU temperature.
3. Fan/heatsink with 3 or 4 pins are both available for CPUFAN1.

CD-In Connector: JCD1

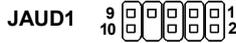
This connector is provided for external audio input..



JCD1

Front Panel Audio Connector: JAUD1

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

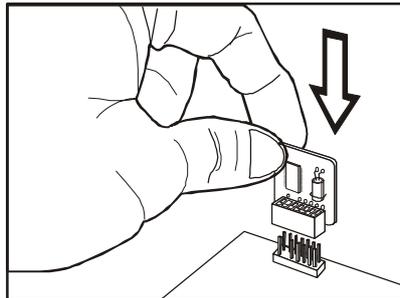


Pin Definition

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

TPM Module Connector: JTPM (optional)

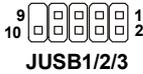
This connector connects to a TPM (Trusted Platform Module) module (optional). Please refer to the TPM security platform manual for more details and usages.



Pin	Signal	Description	Pin	Signal	Description
1	LCLK	LPC clock	2	3V dual/3V_STB	3V dual or 3V standby power
3	LRST#	LPC reset	4	VCC3	3.3V power
5	LAD0	LPC address & data pin0	6	SIRQ	Serial IRQ
7	LAD1	LPC address & data pin1	8	VCC5	5V power
9	LAD2	LPC address & data pin2	10	KEY	No pin
11	LAD3	LPC address & data pin3	12	GND	Ground
13	LFRAME#	LPC Frame	14	GND	Ground

Front USB Connector: JUSB1 / JUSB2 / JUSB3

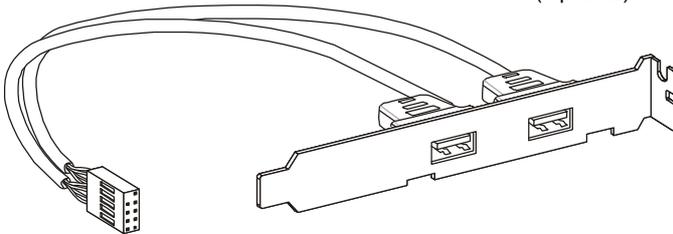
This connector, compliant with Intel® I/O Connectivity Design Guide, is ideal for connecting high-speed USB interface peripherals such as **USB HDD, digital cameras, MP3 players, printers, modems and the like.**



Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key (no pin)	10	USBOC

USB 2.0 Bracket
(Optional)



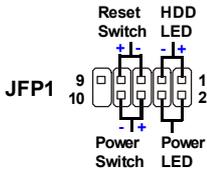
Important

Note that the pins of VCC and GND must be connected correctly to avoid possible damage.

Front Panel Connectors: JFP1, JFP2

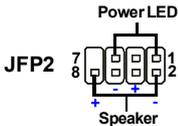
These connectors are for electrical connection to the front panel switches and LEDs. The JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

JFP1 Pin Definition



PIN	SIGNAL	DESCRIPTION
1	HD_LED +	Hard disk LED pull-up
2	FPPWR/SLP	MSG LED pull-up
3	HD_LED -	Hard disk active LED
4	FPPWR/SLP	MSG LED pull-up
5	RST_SW -	Reset Switch low reference pull-down to GND
6	PWR_SW +	Power Switch high reference pull-up
7	RST_SW +	Reset Switch high reference pull-up
8	PWR_SW -	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

JFP2 Pin Definition



PIN	SIGNAL	DESCRIPTION
1	GND	Ground
2	SPK-	Speaker-
3	SLED	Suspend LED
4	BUZ+	Buzzer+
5	PLED	PowerLED
6	BUZ-	Buzzer-
7	NC	No connection
8	SPK+	Speaker+

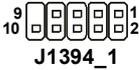
Chassis Intrusion Connector: JC11

This connector connects to the chassis intrusion switch cable. If the chassis is opened, the chassis intrusion mechanism will be activated. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.



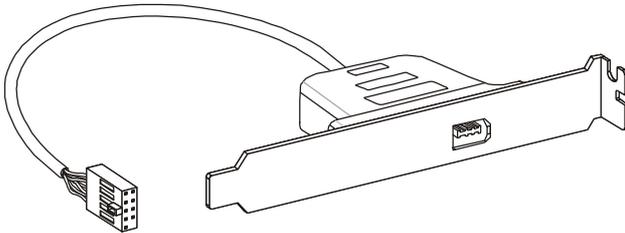
IEEE1394 Connector: J1394_1 (Optional)

This connector allows you to connect the IEEE1394 device via an optional IEEE1394 bracket.



Pin Definition

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



IEEE1394 Bracket (Optional)

S/PDIF-Out Connector: JSPD1 (Optional, for HDMI graphics card only)

This connector is used to connect S/PDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission to the HDMI graphics card.

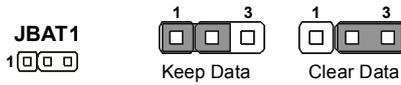


JSPD1

Jumpers

Clear CMOS Jumper: JBAT1

There is a CMOS RAM onboard that has a power supply from an external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, set the jumper to clear data.



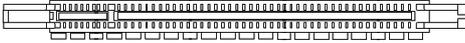
Important

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

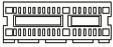
Slots

PCI (Peripheral Component Interconnect) Express Slot

The PCI Express slot supports the PCI Express interface expansion card.



**Mazarine PCI Express x16 Slot (PCI_EX1)
supports up to PCI Express 2.0x16 speed**



PCI Express x1 Slot

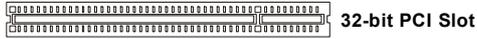


Important

The mainboard supports CrossFire technology with two PCI Express x16 slots.

PCI (Peripheral Component Interconnect) Slot

The PCI slot supports LAN card, SCSI card, USB card, and other add-on cards that comply with PCI specifications.



PCI Interrupt Request Routing

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

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INTA#	INTB#	INTC#	INTD#
PCI Slot 2	INTB#	INTC#	INTD#	INTA#



Important

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

Chapter 3

BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

You may need to run the Setup program when:

- ≈ An error message appears on the screen during the system booting up, and requests you to run SETUP.
- ≈ You want to change the default settings for customized features.

Entering Setup

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

Press DEL to enter SETUP

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



Important

- 1. The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.*
- 2. Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format:*

A7388AMS V1.0 083007 where:

1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX.

2nd - 5th digit refers to the model number.

6th digit refers to the chipset as I = Intel, N = NVIDIA, A = AMD and V = VIA.

7th - 8th digit refers to the customer as MS = all standard customers.

V1.0 refers to the BIOS version.

083007 refers to the date this BIOS was released.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F6>	Load Optimized Defaults
<F7>	Load Fail-Safe Defaults
<F10>	Save configuration changes and exit setup

Getting Help

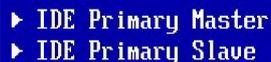
After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

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

Sub-Menu

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



```

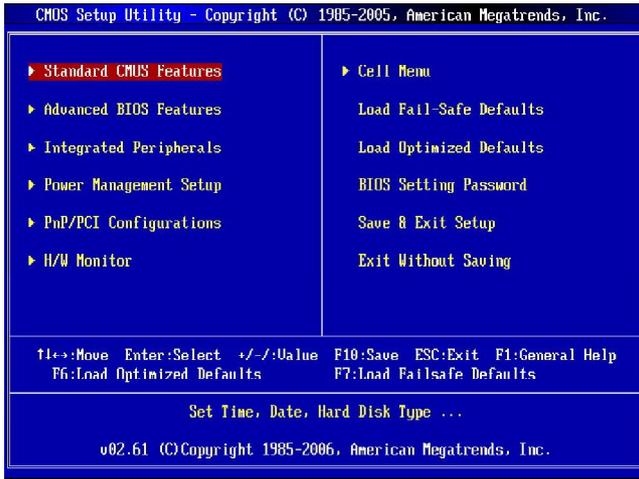
▶ IDE Primary Master
▶ IDE Primary Slave

```

General Help <F1>

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

The Main Menu



► Standard CMOS Features

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

► Advanced BIOS Features

Use this menu to setup the items of AMI® special enhanced features.

► Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

► Power Management Setup

Use this menu to specify your settings for power management.

► PNP/PCI Configurations

This entry appears if your system supports PnP/PCI.

► H/W Monitor

This entry shows your PC health status.

► Cell Menu

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

► Load Fail-Safe Defaults

Use this menu to load the default values set by the BIOS vendor for stable system performance.

▶ **Load Optimized Defaults**

Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

▶ **BIOS Setting Password**

Use this menu to set the password for BIOS.

▶ **Save & Exit Setup**

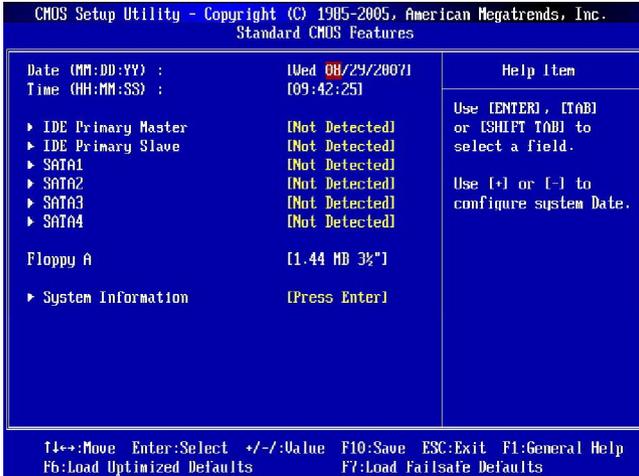
Save changes to CMOS and exit setup.

▶ **Exit Without Saving**

Abandon all changes and exit setup.

Standard CMOS Features

The items in Standard CMOS Features Menu includes some basic setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.



▶ Date (MM:DD:YY)

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

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

▶ Time (HH:MM:SS)

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

▶ IDE Primary Master/ Slave, SATA1/ 2/ 3/ 4

Press <Enter> to enter the sub-menu, and the following screen appears.



Important

IDE Primary Master/ Slave, SATA1/ 2/ 3/ 4 are appearing when you connect the HD devices to the IDE/ SATA connector on the mainboard.



► **Device/ Vender/ Size**

It will showing the device information that you connected to the IDE/SATA connector.

► **LBA/Large Mode**

This allows you to enable or disable the LBA Mode. Setting to Auto enables LBA mode if the device supports it and the devices is not already formatted with LBA mode disabled.

► **DMA Mode**

Select DMA Mode.

► **Hard Disk S.M.A.R.T.**

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

► **Floppy A**

This item allows you to set the type of floppy drives installed.

► **System Information**

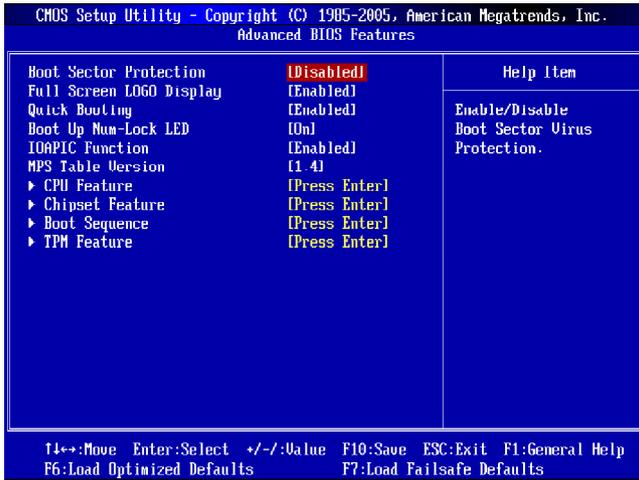
Press <Enter> to enter the sub-menu, and the following screen appears.



► **CPU Infromation/ BIOS Version/ Memory Information**

These items show the CPU information, BIOS version and memory status of your system (read only).

Advanced BIOS Features



▶ Full Screen LOGO Display

This item enables you to show the company logo on the bootup screen. Settings are:

- [Enabled] Shows a still image (logo) on the full screen at boot.
- [Disabled] Shows the POST messages at boot.

▶ Quick Booting

Setting the item to [Enabled] allows the system to boot within 5 seconds since it will skip some check items.

▶ Boot Up Num-Lock LED

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

► **IOAPIC Function**

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

► **MPS Table Version**

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

► **CPU Feature**

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

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.		
CPU Feature		
C1E Support	[Disabled]	Help Item
SVM Support	[Disabled]	

► **C1E Support**

When the C1E Support (Enhanced Halt Powerdown State) is enabled, the processor will transition to a lower core to bus ratio and lower voltage ID driven by the processor to the voltage regulator before entering Halt Powerdown State (C1). Not all processors support Enhanced Halt Powerdown State (C1E).

► **SVM Support**

SVM (Secure Virtual Machine) technology provides a set of hardware extensions designed to enable economical and efficient implementation of virtual machine systems. Generally speaking, hardware support falls into two complementary categories: *virtualization* support and *security* support. Not all processors support SVM.

► **Chipset Feature**

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

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.		
Chipset Feature		
HPET	[Disabled]	Help Item

► **HPET**

The HPET (High Precision Event Timers) is a component that is part of the chipset. You can to enable it, and will provide you with the means to get to it via the various ACPI methods.

► **Boot Sequence**

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

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.		
Boot Sequence		
1st Boot Device	[USB: TSL2871JFLA]	Help Item
Boot From Other Device	[Yes]	

► 1st Boot Device

The items allow you to set the first boot device where BIOS attempts to load the disk operating system.

► Boot From Other Device

Setting the option to [Yes] allows the system to try to boot from other device. if the system fails to boot from the 1st boot device.

► TPM Feature

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



The screenshot shows the BIOS TPM Feature menu. The title bar reads 'CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.' and the menu title is 'TPM Feature'. The menu is divided into two columns: 'TPM Feature' and 'Help Item'. The 'TPM Feature' column contains four items: 'TCG/TPM SUPPORT' with a value of '[Yes]', 'Execute TPM Command' with a value of '[Don't change]', 'TPM Enable/Disable Status' with a value of '[No State]', and 'TPM Owner Status' with a value of '[No State]'. The 'Help Item' column contains the text 'Enable/Disable TPM TCG (TPM 1.1/1.2) supp in BIOS'.

TPM Feature	Help Item
TCG/TPM SUPPORT [Yes]	Enable/Disable TPM TCG (TPM 1.1/1.2) supp in BIOS
Execute TPM Command [Don't change]	
TPM Enable/Disable Status [No State]	
TPM Owner Status [No State]	

► TCG/TPM SUPPORT

This field is used to enable or disable TPM (Trusted Platform Module).

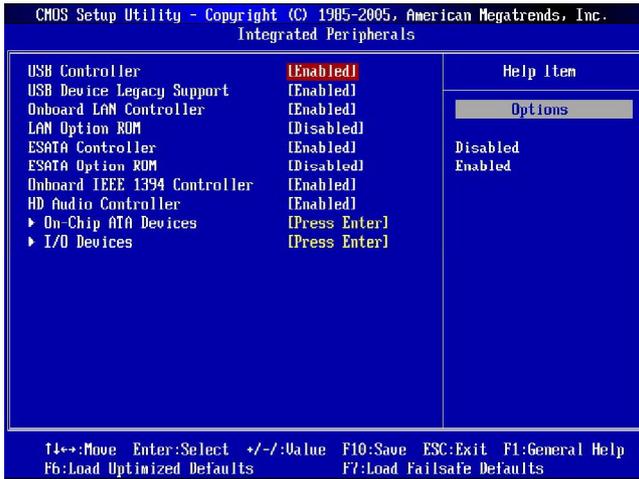
► Execute TPM Command

This field is used to enable(activate)/disable(deactivate) Command to TPM.

► TPM Enable/Disable status, TPM Owner Status

These items show the status of TPM (read only).

Integrated Peripherals



► USB Controller

This setting allows you to enable/disable the onboard USB 1.1/ 2.0 controller.

► USB Device Legacy Support

Select [Enabled] if you need to use a USB-interfaced device in the operating system.

► Onboard LAN Controller

This setting allows you to enable/disable the onboard LAN controller.

► LAN Option ROM

This item is used to decide whether to invoke the Boot ROM of the onboard LAN.

► ESATA Controller (optional)

This setting allows you to enable/disable the onboard ESATA controller.

► ESATA Option ROM (optional)

This item is used to decide whether to invoke the Boot ROM of the onboard ESATA.

► Onboard IEEE1394 Controller (optional)

This item allows you to enable/disable the onboard IEEE1394 controller.

► HD Audio Controller

This setting is used to enable/disable the HD audio controller.

► On-Chip ATA Devices

Press <Enter> to enter the sub-menu:



The screenshot shows the BIOS 'On-Chip ATA Devices' menu. The title bar reads 'CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.' and the subtitle is 'On-Chip ATA Devices'. The menu is a table with three columns: the item name, its current status, and a 'Help Item' column. The items listed are 'PCI IDE BusMaster' (Disabled), 'On-Chip SATA Controller' (Enabled), and 'RAID mode' (IDE). The 'Help Item' column contains 'ENABLED: BIOS uses' and 'PCI IDE Controller'.

		Help Item
PCI IDE BusMaster	[Disabled]	
On-Chip SATA Controller	[Enabled]	
RAID mode	[IDE]	ENABLED: BIOS uses PCI IDE Controller

► PCI IDE BusMaster

This item allows you to enable/ disable BIOS to used PCI busmastering for reading/ writing to IDE drives.

► On-Chip SATA Controller

These items allow users to enable or disable the SATA controller.

► RAID Mode

This item is used to enable/disable the RAID function for SATA devices.

► I/O Devices

Press <Enter> to enter the sub-menu:



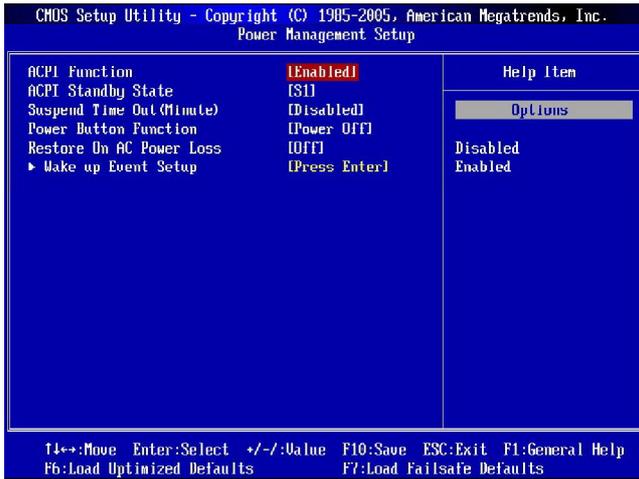
The screenshot shows the BIOS 'I/O Devices' menu. The title bar reads 'CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.' and the subtitle is 'I/O Devices'. The menu is a table with three columns: the item name, its current status, and a 'Help Item' column. The item listed is 'COM Port 1' with a status of '[3F8/IRQ4]'. The 'Help Item' column contains 'Help Item'.

		Help Item
COM Port 1	[3F8/IRQ4]	Help Item

► COM Port

This item specifies the base I/O port addresses of the onboard Serial Port.

Power Management Setup



Important

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

▶ ACPI Function

This item is to activate the ACPI (Advanced Configuration and Power Management Interface) Function. If your operating system is ACPI-aware, such as Windows 98SE/2000/ME/XP, select [Enabled].

▶ ACPI Standby State

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

- [S1] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system context.
- [S3] The S3 sleep mode is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a “wake up” event occurs.

► **Suspend Time Out (Minute)**

If system activity is not detected for the length of time specified in this field, all devices except CPU will be shut off.

► **Power Button Function**

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

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

► **Restore On AC Power Loss**

This item specifies whether your system will reboot after a power failure or interrupt occurs. Settings are:

- [Off] Always leaves the computer in the power off state.
- [On] Always leaves the computer in the power on state.
- [Last State] Restores the system to the status before power failure or interrupt occurred.

► **Wake up Event Setup**

Press <Enter> to enter the sub-menu:



► **Resume From S3 By USB Device**

The item allows the activity of the USB device to wake up the system from S3 (Suspend to RAM) sleep state.

► **Resume From S3 By PS/2 Keyboard**

This controls how the PS/2 keyboard is able to power on the system. If you choose *Specific Key*, the power button on the case will not function anymore and you must type the password to power on the system.

► **Resume from S3 By PS/2 Mouse**

This setting determines whether the system will be awakened from what power saving modes when input signal of the PS/2 mouse is detected.

► **Resume By PCI Device (PME#)**

When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PME (Power Management Event).

▶ Resume By PCI-E Device

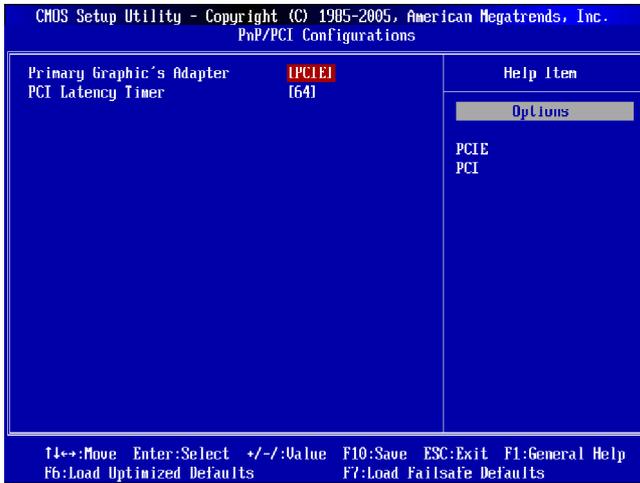
When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PCIE device.

▶ Resume By RTC Alarm

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

PNP/PCI Configurations

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



► Primary Graphic's Adapter

This setting specifies which graphic card is your primary graphics adapter.

► PCI Latency Timer

This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values.

► IRQ Resource Setup

Press <Enter> to enter the sub-menu and the following screen appears.



► IRQ 3/4/5/7/9/10/11/14/15

These items specify the bus where the specified IRQ line is used.

The settings determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the IRQ pool, the end user can use these settings to reserve the IRQ by assigning an [Reserved] setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as [Available]. If all IRQs are set to [Reserved], and IRQ 14/15 are allocated to the onboard PCI IDE, IRQ 9 will still be available for PCI and PnP devices.



Important

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

H/W Monitor



► Chassis Intrusion

The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to [Reset]. The setting of the field will automatically return to [Enabled] later.

► CPU Smart FAN Target

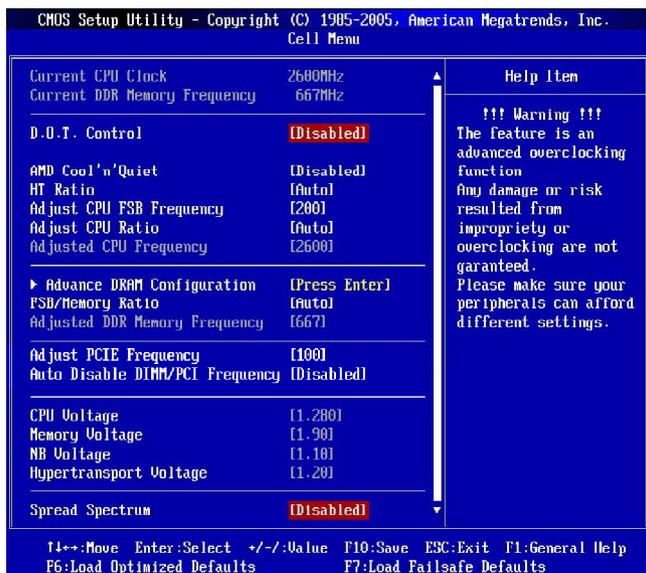
The mainboard provides the Smart Fan function which can control the CPU fan speed automatically depending on the current temperature to keep it with in a specific range. You can select a fan target value here. If the current CPU fan temperature reaches to the target value, the smart fan function will be activated. It provides several sections to speed up for cooling down automatically.

► PC Health Status

► CPU/ System Temperature, CPU FAN/ SYS FAN1/ SYS FAN2 Speed, CPU Vcore, 3.3V, 5V, 12V, 5V SB

These items display the current status of all of the monitored hardware devices/ components such as CPU voltage, temperatures and all fans' speeds.

Cell Menu



Important

Change these settings only if you are familiar with the chipset.

▶ Current CPU Clock/ DRAM Frequency

These items show the current clocks of CPU and Memory frequency. Read-only.

▶ D.O.T. Control

This item allows users to select either/both of CPU and PCIE to be controlled under D. O.T. The D.O.T. (Dynamic Overlocking Technology) is an automatic overlocking function, included in the MSI™'s newly developed Dual CoreCell™ Technology. It is designed to detect the load balance of CPU and PCIE while running programs, and to adjust the best frequency automatically. When the motherboard detects system is running programs, it will speed up automatically to make the program run smoothly and faster. When the system is temporarily suspending or staying in the low load balance, it will restore the default settings instead. Usually the Dynamic Overlocking Technology will be powered only when users' PC need to run huge amount of data like 3D games or the video process, and the CPU and PCIE frequency need to be boosted up to enhance the overall performance.

► **AMD Cool'n'Quiet**

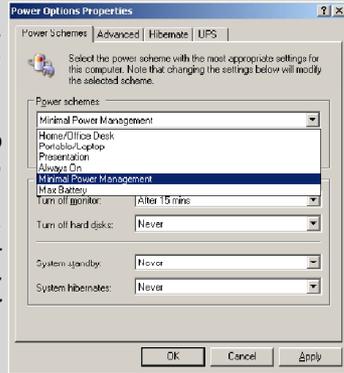
The Cool'n' Quiet technology can effectively and dynamically lower CPU speed and power consumption.



Important

To ensure that Cool'n'Quiet function is activated and will be working properly, it is required to double confirm that:

1. Run BIOS Setup, and select **Cell Menu**. Under **Cell Menu**, find **AMD Cool'n'Quiet**, and set this item to "Enable."
2. Enter Windows, and select [Start]-> [Settings]->[Control Panel]->[Power Options]. Enter **Power Options Properties** tag, and select **Minimal Power Management** under **Power schemes**.



► **HT Ratio**

This item allows you to set the Hyper Transport ratio.

► **Adjust CPU FSB Frequency**

This item allows you to set the CPU FSB frequency (in MHz).

► **Adjust CPU Ratio**

This item allows you to set the CPU ratio.

► **Adjusted CPU Frequency**

It shows the adjusted CPU frequency (FSB x Ratio). Read-only.

► **Advance DRAM Configuration**

Press <Enter> to enter the sub-menu and the following screen appears.



► **DRAM Timing Mode**

Setting to [Auto] enables DRAM CAS# Latency automatically to be determined by BIOS based on the configurations on the SPD (Serial Presence Detect) EEPROM on the DRAM module.

► FSB/Memory Ratio

This item will allow you to adjust the FSB/Ratio of the memory.

► Adjusted DDR Memory Frequency

It shows the adjusted DDR Memory frequency. Read-only.

► Adjust PCIE Frequency

This item allows you to set the PCI Express frequency (in MHz).

► Auto Disable DIMM/PCI Frequency

When set to [Enabled], the system will remove (turn off) clocks from empty DIMM and PCI slots to minimize the electromagnetic interference (EMI).

► CPU Voltage / Memory Voltage / NB Voltage / Hypertransport Voltage

These items display the power status of CPU, Memory, FSB and chipset. Read-only.

► Spread Spectrum

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

**Important**

- 1. If you do not have any EMI problem, leave the setting at [Disabled] for optimal system stability and performance. But if you are plagued by EMI, select the value of Spread Spectrum for EMI reduction.*
- 2. The greater the Spread Spectrum value is, the greater the EMI is reduced, and the system will become less stable. For the most suitable Spread Spectrum value, please consult your local EMI regulation.*
- 3. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clock speed which may just cause your overclocked processor to lock up.*

Load Fail-Safe/ Optimized Defaults

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

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



Selecting Ok and pressing Y loads the BIOS default values for the most stable, minimal system performance.

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



Selecting Ok and pressing Y loads the default factory settings for optimal system performance.

BIOS Setting Password

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



Enter New Password

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

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

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

Appendix A

Realtek ALC888 Audio

The Realtek ALC888 provides 10-channel DAC that simultaneously supports 7.1 sound playback and 2 channels of independent stereo sound output (multiple streaming) through the Front-Out-Left and Front-Out-Right channels.

Installing the Realtek HD Audio Driver

You need to install the driver for Realtek ALC888 codec to function properly before you can get access to 2-, 4-, 6-, 8- channel or 7.1+2 channel audio operations. Follow the procedures described below to install the drivers for different operating systems.

Installation for Windows 2000/ XP/ Vista

For Windows® 2000, you must install Windows® 2000 Service Pack4 or later before installing the driver. For Windows® XP, you must install Windows® XP Service Pack1 or later before installing the driver.

The following illustrations are based on Windows® XP environment and could look slightly different if you install the drivers in different operating systems.

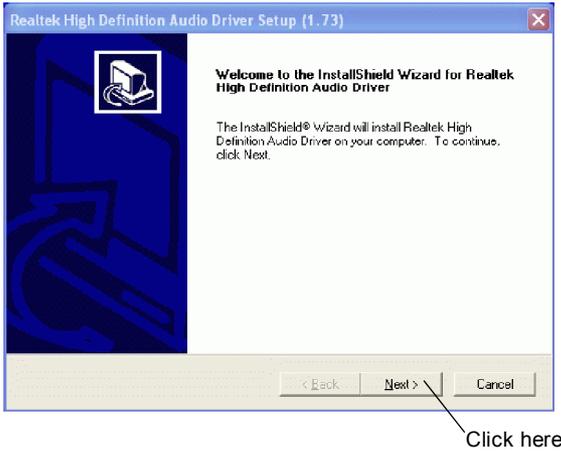
1. Insert the application CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click **Realtek HD Audio Driver**.



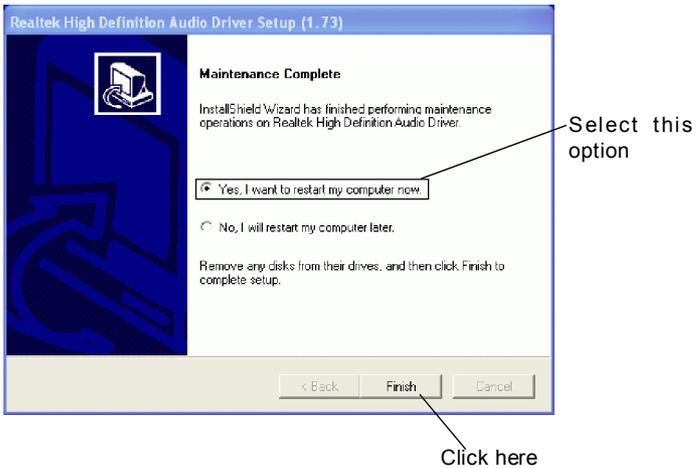
Important

The **HD Audio Configuration**  software utility is under continuous update to enhance audio applications. Hence, the program screens shown here in this section may be slightly different from the latest software utility and shall be held for reference only.

3. Click **Next** to install the Realtek High Definition Audio Driver.



4. Click **Finish** to restart the system.

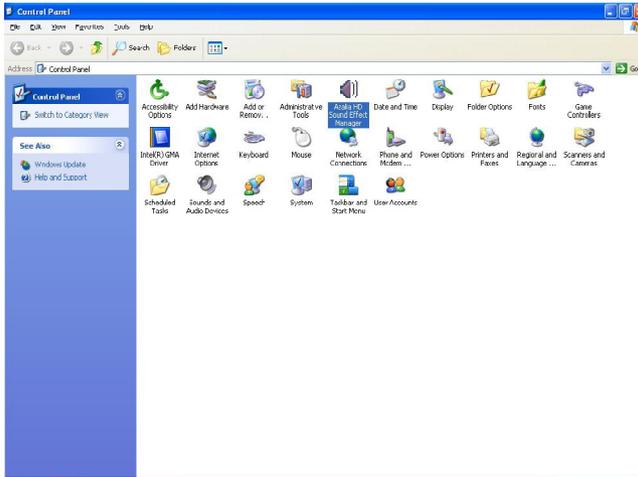


Software Configuration

After installing the audio driver, you are able to use the 2-, 4-, 6- or 8- channel audio feature now. Click the audio icon  from the system tray at the lower-right corner of the screen to activate the **HD Audio Configuration**. It is also available to enable the audio driver by clicking the **Realtek HD Audio Manager** from the **Control Panel**.



Double click



Sound Effect

Here you can select a sound effect you like from the **Environment** list.



Environment Simulation

You will be able to enjoy different sound experience by pulling down the arrow, totally 23 kinds of sound effect will be shown for selection. Realtek HD Audio Sound Manager also provides five popular settings “Stone Corridor”, “Bathroom”, “Sewer pipe”, “Arena” and “Audio Corridor” for quick enjoyment.

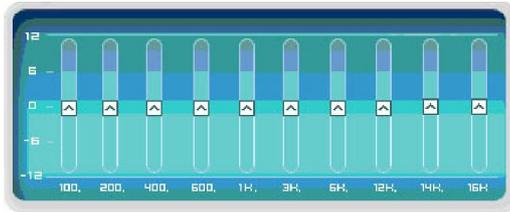
You may choose the provided sound effects, and the equalizer will adjust automatically. If you like, you may also load an equalizer setting or make an new equalizer setting to save as a new one by using the **“Load EQ Setting”** and **“Save Preset”** button, click **“Reset EQ Setting”** button to use the default value, or click **“Delete EQ Setting”** button to remove a preset EQ setting.

There are also other pre-set equalizer models for you to choose by clicking **“Others”** under the **Equalizer** part.

Equalizer Selection

Equalizer frees users from default settings; users may create their own preferred settings by utilizing this tool.

10 bands of equalizer, ranging from 100Hz to 16KHz.



Save

The settings are saved permanently for future use

Reset

10 bands of equalizer would go back to the default setting

Enable / Disable

To disable, you can temporarily stop the sound effect without losing the settings

Load

Whenever you would like to use preload settings, simply click this, the whole list will be shown for your selection.

Delete

To delete the pre-saved settings which are created from previous steps.



Frequently Used Equalizer Setting

Realtek recognizes the needs that you might have. By leveraging our long experience at audio field, Realtek HD Audio Sound Manager provides you certain optimized equalizer settings that are frequently used for your quick enjoyment.

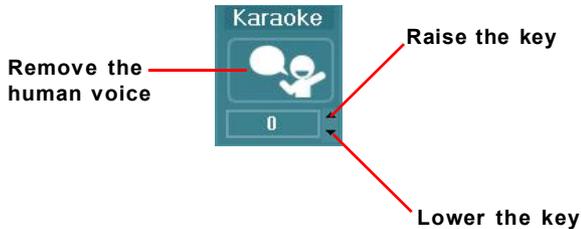
[How to Use It]

Other than the buttons “Pop” “Live” “Club” & “Rock” shown on the page, to pull down the arrow in “Others”, you will find more optimized settings available to you.

Karaoke Mode

Karaoke mode brings Karaoke fun back home. Simply using the music you usually play, Karaoke mode can help you eliminate the vocal of the song or adjust the key to accommodate your range.

- 1.Vocal Cancellation: Single click on “Voice Cancellation”, the vocal of the song would be eliminated, while the background music is still in place, and you can be that singer!
- 2.Key Adjustment: Using “Up / Down Arrow” to find a key which better fits your vocal range.



Mixer

In the **Mixer** part, you may adjust the volumes of the rear and front panels individually.

1. Adjust Volume

You can adjust the volume of the speakers that you plugged in front or rear panel by select the **Realtek HD Audio rear output** or **Realtek HD Audio front output** items.



Important

*Before set up, please make sure the playback devices are well plugged in the jacks on the rear or front panel. The **Realtek HD Audio front output** item will appear after you plugging the speakers into the jacks on the front panel.*

2. Multi-Stream Function

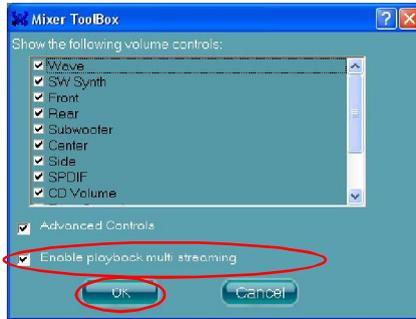
ALC888 supports an outstanding feature called Multi-Stream, which means you may play different audio sources simultaneously and let them output respectively from the indicated rear panel or front panel. This feature is very helpful when 2 people are using the same computer together for different purposes.

Click the  button and the Mixer **ToolBox** menu will appear. Then check the **Enable playback multi-streaming** and click **OK** to save the setup.



Important

*If you use **AC97 front panel**, the device have to be plugged into the jacks on the panel before enable the multi-stream function.*



When you are playing the first audio source (for example: use Windows Media Player to play DVD/VCD), the output will be played from the rear panel, which is the default setting.

Then you **must** to select the **Realtek HD Audio front output** from the scroll list **first**, and use a different program to play the second audio source (for example: use Winamp to play MP3 files). You will find that the second audio source (MP3 music) will come out from the Line-Out audio jack of Front Panel.



3. Playback control



Tool **Mute**

Playback device
This function is to let you freely decide which ports to output the sound. And this is essential when multi-streaming playback enabled.
- Realtek HD Audio Rear Output
- Realtek HD Audio Front Output

Mute

You may choose to mute single or multiple volume controls or to completely mute sound output.

Tool

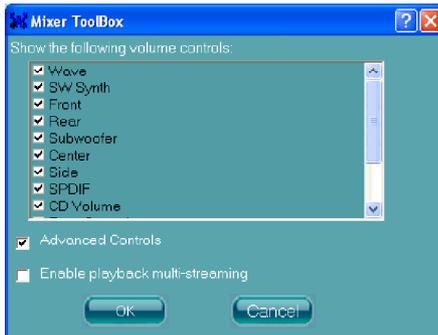
- Show the following volume controls

This is to let you freely decide which volume control items to be displayed.

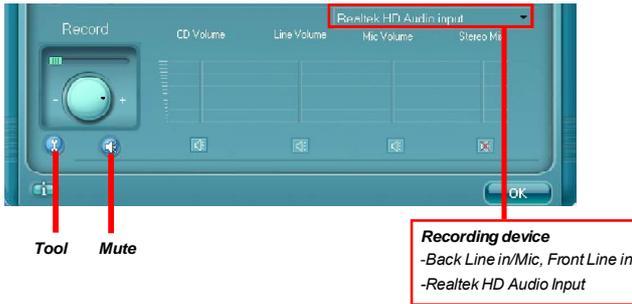
- Advanced controls

- Enable playback multi-streaming

With this function, you will be able to have an audio chat with your friends via headphone (stream 1 from front panel) while still have music (stream 2 from back panel) in play. At any given period, you can have maximum 2 streams operating simultaneously.



4. Recording control



Mute

You may choose to mute single or multiple volume controls or to completely mute sound input.

Tool

- Show the following volume controls

This is to let you freely decide which volume control items to be displayed.

- Enable recording multi-streaming



Important

ALC888 allows you to record the CD, Line, Mic and Stereo Mix channels simultaneously, frees you from mixing efforts. At any given period, you may choose 1 of the following 4 channels to record.

Audio I/O

In this tab, you can easily configure your multi-channel audio function and speakers. You can choose a desired multi-channel operation here.

- a. **Headphone** for the common headphone
- b. **2CH Speaker** for Stereo-Speaker Output
- c. **4CH Speaker** for 4-Speaker Output
- d. **6CH Speaker** for 5.1-Speaker Output
- e. **8CH Speaker** for 7.1-Speaker Output



Speaker Configuration:

1. Plug the speakers in the corresponding jack.
2. Dialogue "connected device" will pop up for your selection. Please select the device you have plugged in.
 - If the device is being plugged into the correct jack, you will be able to find the icon beside the jack changed to the one that is same as your device.
 - If not correct, Realtek HD Audio Manager will guide you to plug the device into the correct jack.

Connector Settings

Click  to access connector settings.



Disable front panel jack detection (option)

Find no function on front panel jacks? Please check if front jacks on your system are so-called AC'97 jacks. If so, please check this item to disable front panel jack detection.

Mute rear panel output when front headphone plugged in.

Enable auto popup dialogue, when device has been plugged in

Once this item checked, the dialog "Connected device" would automatically pop up when device plugged in.

S/PDIF

Short for Sony/Philips Digital Interface, a standard audio file transfer format. S/PDIF allows the transfer of digital audio signals from one device to another without having to be converted first to an analog format. Maintaining the viability of a digital signal prevents the quality of the signal from degrading when it is converted to analog.



Output Sampling Rate

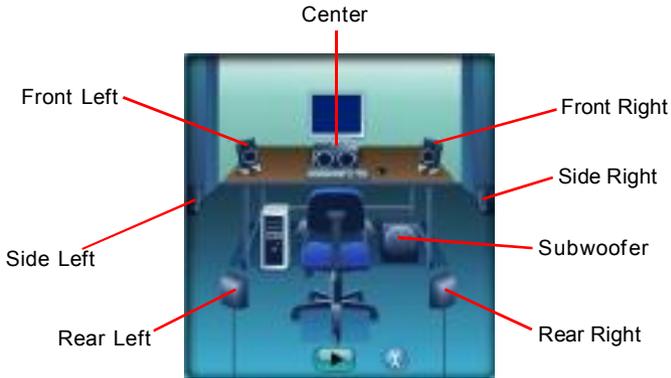
- 44.1KHz: This is recommend while playing CD.
- 48KHz: This is recommended while playing DVD or Dolby.
- 96KHz: This is recommended while playing DVD-Audio.
- 192KHz: This is recommended while playing High quality Audio.

Output Source

Output digital audio source: The digital audio format (such as .wav, .mp3,.midi etc) will come out through S/PDIF-Out.

Test Speakers

You can select the speaker by clicking it to test its functionality. The one you select will light up and make testing sound. If any speaker fails to make sound, then check whether the cable is inserted firmly to the connector or replace the bad speakers with good ones. Or you may click the **auto test**  button to test the sounds of each speaker automatically.



Microphone

In this tab you may set the function of the microphone. Select the **Noise Suppression** to remove the possible noise during recording, or select **Acoustic Echo Cancellation** to cancel the acoustic echo during recording.

Acoustic Echo Cancellation prevents playback sound from being recorded by microphone together with your sound. For example, you might have chance to use VOIP function through Internet with your friends. The voice of your friend will come out from speakers (playback). However, the voice of your friend might also be recorded into your microphone then go back to your friend through Internet. In that case, your friend will hear his/her own voice again. With AEC(Acoustic Echo Cancellation) enabled at your side, your friend can enjoy the benefit with less echo.



3D Audio Demo

In this tab you may adjust your 3D positional audio before playing 3D audio applications like gaming. You may also select different environment to choose the most suitable environment you like.



Information

In this tab it provides some information about this HD Audio Configuration utility, including Audio Driver Version, DirectX Version, Audio Controller & Audio Codec. You may also select the language of this utility by choosing from the **Language** list.



Also there is a selection **Show icon in system tray**. Switch it on and an icon  will show in the system tray. Right-click on the icon and the **Audio Accessories** dialogue box will appear which provides several multimedia features for you to take advantage of.

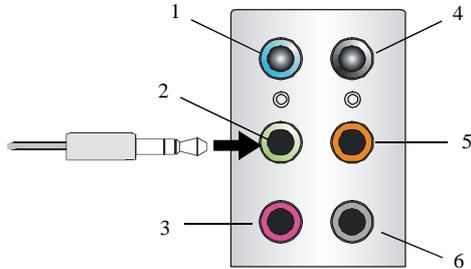


Hardware Setup

Connecting the Speakers

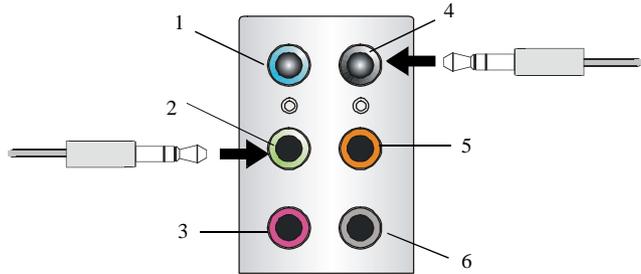
When you have set the Multi-Channel Audio Function mode properly in the software utility, connect your speakers to the correct phone jacks in accordance with the setting in software utility.

n 2-Channel Mode for Stereo-Speaker Output



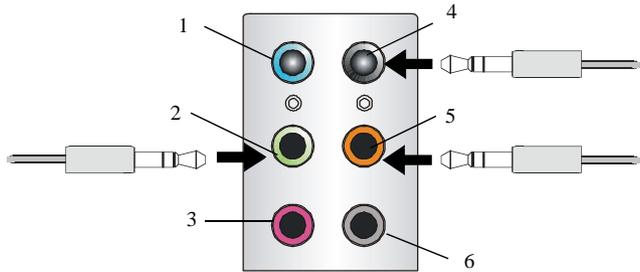
- 1 Line In
- 2 Line Out (*Front channels*)
- 3 MC
- 4 No function
- 5 No function
- 6 No function

n 4-Channel Mode for 4-Speaker Output



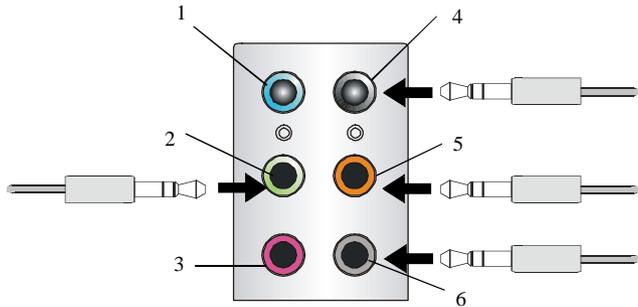
- 1 Line In
- 2 Line Out (*Front channels*)
- 3 MIC
- 4 Line Out (*Rear channels*)
- 5 No function
- 6 No function

n 6-Channel Mode for 6-Speaker Output



- 1 Line In
- 2 Line Out (*Front channels*)
- 3 MIC
- 4 Line Out (*Rear channels*)
- 5 Line Out (*Center and Subwoofer channel*)
- 6 No function

n 8-Channel Mode for 8-Speaker Output



- 1 Line In
- 2 Line Out (Front channels)
- 3 MIC
- 4 Line Out (Rear channels)
- 5 Line Out (Center and Subwoofer channel)
- 6 Line Out (Side channels)



Important

To enable 7.1 channel audio-out function on Vista operating system, you have to install the Realtek Audio Driver. Or, the mainboard will support 5.1 channel audio-out only.

Appendix B

SATA RAID

The south bridge SB600 integrate SATA host controller that supports four SATA ports and RAID function for performance and reliability.

SATA RAID provides support for RAID 0 (Striping), RAID 1 (Mirroring), RAID 0+1 (Striping & Mirroring). RAID 0 greatly improves hard disk I/O performance by concurrently striping data across multiple drives. RAID 1 makes sure data is not lost if a drive fails as data is simultaneously written to two drives. Drives configured for RAID Striping are said to form a RAID 0 set, while drives configured for RAID Mirroring are said to form a RAID 1 set. RAID 0+1 is implemented as a mirrored array whose segments are RAID 0 arrays. RAID 0+1 has same fault tolerance as mirroring and reduces overhead by striping. It needs at least four drives to form a RAID 0+1.

RAID Configuration

Creating and deleting RAID set and performing other RAID setting up operations are done in the RAID BIOS. During bootup, a screen similar to the one below will appear for about few seconds. Press <Ctrl-F> to enter the FastBuild utility.

RAID BIOS Version 2.5.1540.33-A
(c) 2006 ATI Technology, Inc. All right reserved.

No Array is defined...

Press <Ctrl-F> to enter Fastbuild (tm) Utility



Important

*Be sure to set the **SATA Mode** to "RAID" in BIOS (the path is : **Intergrated Peripherals => On-Chip ATA Devices => OnChip SATA Controller**) before configuting the RAID BIOS.*

The Fast Build Utility menu screen will appear. The Main Menu is used to choose the operation to be performed.



View Drives Assignments

This window displays the model number, capacities and assignment of the drives physically attached to the SATA host adapter.

Channel:ID	Drive Model	Capacity (MB)	Assignment
1: Mas	WDC WD800JD-00HKA0	80027	
	Extent 1	79960	Free
2: Mas	WDC WD800JD-00HKA0	80027	
	Extent 1	79960	Free

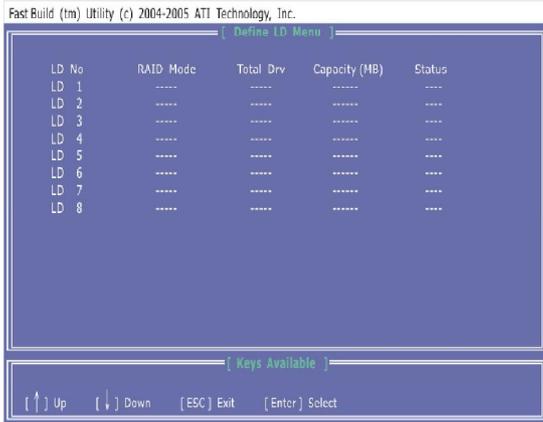
[Keys Available]

[↑] Up [↓] Down [ESC] Exit

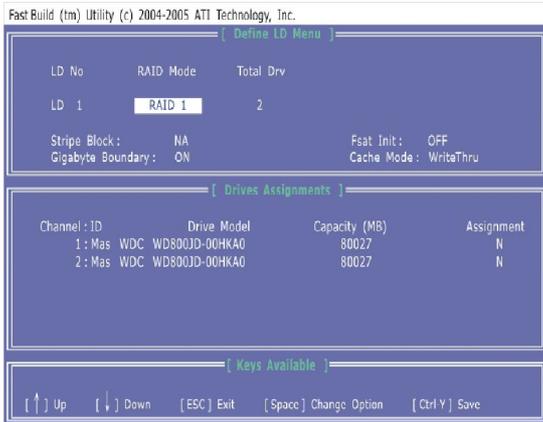
Define LD (Creating RAID)

The selection of the RAID configuration should be based upon factors including performance, data security, and the number of drives available. It is best to carefully consider the long-term role of the system and plan the data storage strategy. RAID sets can be created either automatically, or to allow the greatest flexibility, manually.

1. Press **2** on the Main Menu screen to enter the Define LD Menu.
2. Press the arrow keys to highlight an logical drive number you want to define and press Enter to select it.



3. On the next screen, use the space key to choose a RAID mode (RAID 0/ 1/ 0+1) and use the arrow key to move to the *Drives Assignments* window.
 - Initialize logical drive, zero the disk drives. RAID 1 or 10 only.



- Stripe Block Size, the default 64KB is best for most applications. RAID 0 or 10 only.
 - Gigabyte Boundary, allows use of slightly smaller replacement drives.
 - Cache Mode, WriteThru or WriteBack.
4. On the *Drives Assignments* window, use the arrow key to choose the hard drives which you want to make part of the LD, use the space key to change the assignment to “Y”. Then press [Ctrl+Y] to save the configuration.



5. A message will show up on the bottom, press any key to save the configuration or press [Ctrl-Y] to allocate the RAID capacity manually.

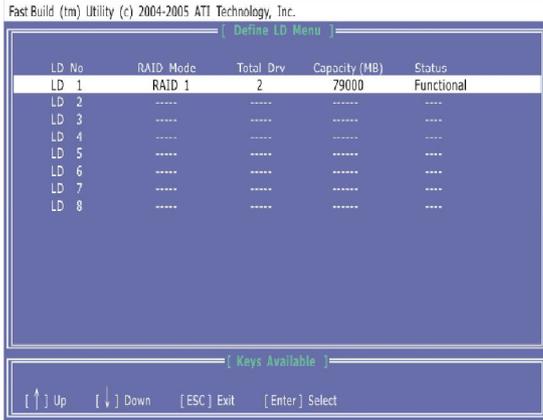
Press Ctrl-Y to Modify Array Capacity or press any other key to use maximum capacity...



Important

1. The default capacity is the full capacity of the selected hard drives.
2. If you allocate the first LD capacity manually, you can create second LD with remaining capacity of the selected hard drives.

6. The LD creation is done, the screen shows the LD information as below. Press ESC key to the main screen.

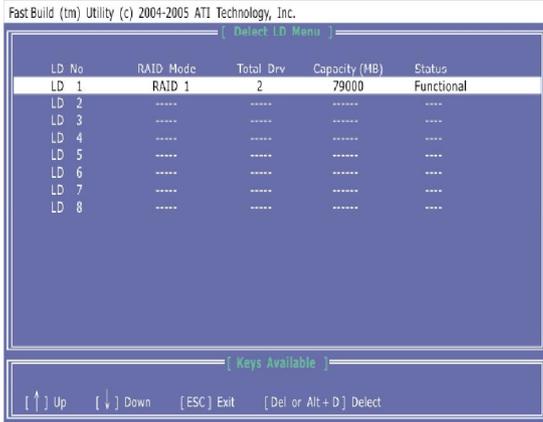


7. Press ESC key to exit the utility, a message “System is going to REBOOT! Are You Sure?” will display, answer “Y” to exit it and the system will reboot.



Delete LD (Deleting RAID)

1. Select "Delete LD" on the main screen.
2. Choose a LD No you want to delete and press "Del" or "Alt+D" delete the RAID set.



3. On the next screen, a message will display to inform you, press "Ctrl+Y" to delete the RAID set or other key to abort it. Press "Ctrl+Y" to complete the deletion.



Installing the RAID Driver (for bootable RAID Array)

1. After you complete the RAID BIOS setup, boot from the Windows CD, and the Windows XP Setup program starts.
2. Press **F6** and wait for the Windows Setup screen to appear.



Important

Please follow the instruction below to make a SATA RAID driver for yourself.

1. Insert the MSI CD into the CD-ROM drive.
2. Click the "Browse CD" on the Setup screen.
3. Copy all the contents in the :
for Windows XP driver CD
\\ATI\\ATI\\Drv\\SBDrv\\RAID
for Windows Vista driver CD
\\ChipSet\\ATI\\Packages\\Drivers\\SBDrv\\RAID\\x86 and
\\ChipSet\\ATI\\Packages\\Drivers\\SBDrv\\RAID\\x64 to a formatted floppy disk.
4. The driver disk for RAID controller is done.

3. Insert the floppy that contains the RAID driver, Press the "S" key to select "Specify Additional Device".
4. For Windows Vista:
During the Operating system installation, after selecting the location to install Vista click on "Load Driver" button to install a third party SCSI or RAID driver.
5. When prompted, insert the floppy disk or media (Floppy, CD/DVD Or USB) and press Enter.
6. You should be shown a list of available SCSI Adapters.
7. Select "**ATI AHCI Compatible RAID Controller -x86 platform**" when the system is 32-bit version or "**ATI AHCI Compatible RAID Controller -x64 platform**" when the system is 64-bit version and then press ENTER.
8. The next screen should confirm that you have selected the ATI RAID controller. Press ENTER again to continue.
9. You have successfully installed the ATI RAID driver, and Windows setup should continue.
10. Leave the disk in the floppy drive until the system reboots itself. Windows setup will need to copy the files from the floppy again after the RAID volume is formatted, and Windows setup starts copying files.

Installing the RAID Driver Under Windows (for Non-bootable RAID Array)

1. Insert the MSI CD into the CD-ROM drive.
2. The CD will auto-run and the setup screen will appear.
3. Under the Driver tab, click on **ATI System Driver**. The ATI System Driver includes RAID Driver.
4. The driver will be automatically installed.



Important

You **must** install the RAID driver to enable RAID.