

945P / 945PL Neo5 Series

MS-7236 v2.X Mainboard



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Revision History

Revision	Revision History	Date
v2.3	First release	December 2006

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://www.msi.com.tw/program/service/faq/faq/esc_faq_list.php
- 🔍 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. Rating: 100-127/200-240V~, 4/2A, 60/50Hz.
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 service personnel:
 - † The power cord or plug is damaged.
 - † Liquid has penetrated into the equipment.
 - † The equipment has been exposed to moisture.
 - † The equipment does 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 équipements 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 proizvođači koje vodi računa o okolini i prirodnoj sredini, MSI mora da vas podestiti da...

Po Direktivi Evropske unije ("EU") o odbačenoj električnoj i električnoj opremi, Direktiva 2002/96/EC, koja stupa na snagu od 13. Avgusta 2005, proizvodi koji spadaju pod "elektronsku i električnu opremu" ne mogu više biti odbačeni kao običan otpad i proizvođači ove opreme biće prinudeni 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 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 výrobu elektronických výrobků, na které se tato směrnice vztahuje, budou povinni odebrat 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 márkanév 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 adeguerà 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 945P / 945PL Neo5 (MS-7236 v2.X) ATX mainboard. The 945P / 945PL Neo5 mainboard is based on Intel® 945P / 945PL and Intel® ICH7 chipset for optimal system efficiency. Designed to fit the advanced Intel® Pentium 4 LGA775 processor, the 945P / 945PL Neo5 mainboard delivers a high performance and professional desktop platform solution.

Mainboard Specifications

Processor Support

- Supports Intel® Core 2 Duo / Pentium D / Pentium 4 / Celeron processors in LGA775 package
 - Supports 2004 Performance FMB CPU Design
 - Supports 3/4 pin CPU Fan Pin-Header with Fan Speed Control
 - Supports Intel Hyper-Threading Technology
- (For the latest information about CPU, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_cpu_support.php)

Supported FSB

- Intel® 945P: 800 / 1066 MHz
- Intel® 945PL: 533 / 800 MHz

Chipset

- North Bridge: Intel® 945P / 945PL chipsets
- South Bridge: Intel® ICH7 chipset

Memory Support

- Intel® 945P: DDR II 400 / 533 / 667 SDRAM (4GB Max)
- Intel® 945PL: DDR II 400 / 533 SDRAM (2GB Max)
- 4 DDR II DIMMs (240-pin / 1.8V)

LAN (Optional)

- 10/100 Mb/s supported by Realtek® RTL8100C
- 10/100/1000 Mb/s supported by Realtek® RTL8110SC
- Compliance with PCI 2.2
- Supports ACPI Power Management

Audio

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

IDE

- 1 Ultra DMA 66/100 IDE controller integrated in Intel® ICH7
- Supports PIO, Bus Master operation modes
- Can connect up to 2 Ultra ATA drives

SATA

- SATA II controller integrated in Intel® ICH7
- Supports 4 SATA II Device
- Supports storage and data transfers at up to 300MB/s

Floppy

- 1 floppy port
- Supports 1 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes

Connectors

● **Back panel**

- 1 PS/2 mouse port
- 1 PS/2 keyboard port
- 1 serial port
- 1 parallel port
- 4 USB 2.0 ports
- 1 RJ-45 LAN jack
- 6 flexible audio jacks

● **On-Board Pinheaders**

- 2 USB 2.0 pinheaders
- 1 CD-In pinheader
- 1 SPDIF-Out pinheader (for HDMI function, optional)

Slots

- One PCI Express x16 slot
- Two PCI Express x1 slots
- Three 32-bit v2.3 Master PCI bus slots
- Support 3.3v/5v PCI bus interface

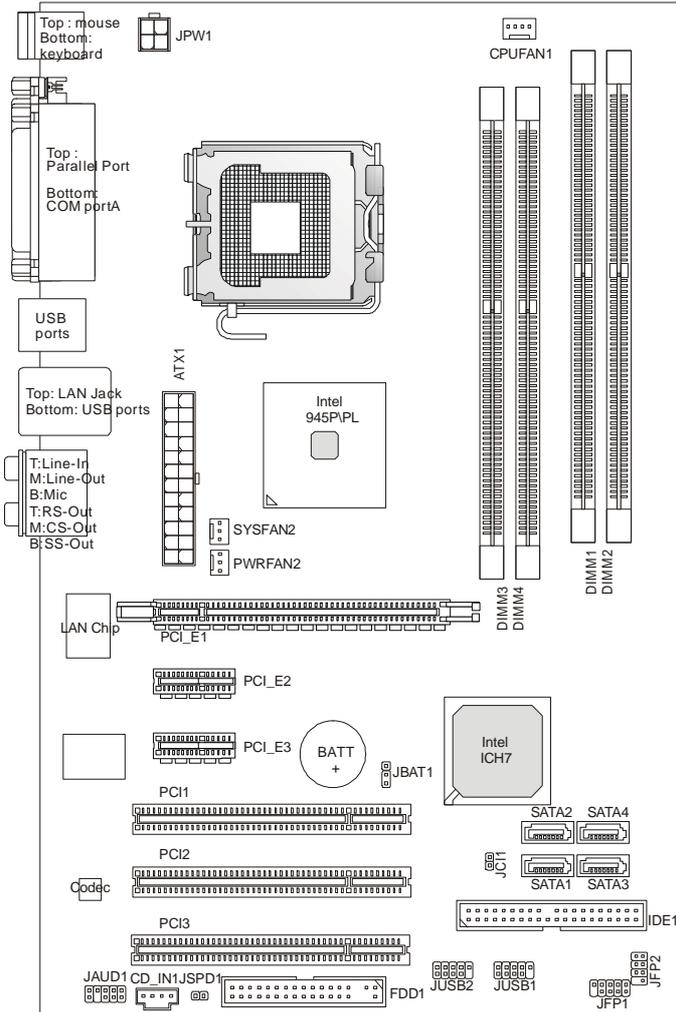
Form Factor

- ATX (30.5cm X 19.7 cm)

Mounting

- 6 mounting holes

Mainboard Layout



**945P / 945PL Neo5 Series
(MS-7236 v2.X) ATX Mainboard**

Packing Checklist



* These pictures are for your reference only. Your packing contents may vary depending on the model you purchased.

Core Center

Click on the **Core Center** icon in the main menu and the **Core Center** program will be enabled.

CoreCenter is just like your PC doctor that can detect, view and adjust the PC hardware and system status during real time operation.

In the left side it shows the current system status including the Vcore, 3.3V, +5V and 12V. In the right side it shows the current PC hardware status such as the CPU & system temperatures and all fans speeds.



When you click the red triangles in the left and right sides, two sub-menus will open for users to adjust the thresholds of system to send out the warning messages.



Left-wing: Current system status

In the left sub-menu, you can configure the settings of FSB, Vcore, Memory Voltage and AGP Voltage by clicking the radio button next to each item and make it available (the radio button will be lighted as yellow when selected), use the “+” and “-” buttons to adjust, then click “**OK**” to apply the changes. Then you can click “**Save**” to save the values you just configured.

Also you may click “**Auto**” to start testing the maximum CPU overclocking value. The CPU FSB will automatically increase the testing value until the PC reboots. Or you may click “**Default**” to restore the default values.

Right-wing: PC hardware status during real time operation

In the right sub-menu, here you can configure the PC hardware status such as CPU & system temperatures and fan speeds. You may use the scroll bars to adjust each item, then click “**OK**” to apply the changes. The values you set for the temperatures are the maximum thresholds for the system for warnings, and the value for fan speeds are the minimum thresholds.

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.

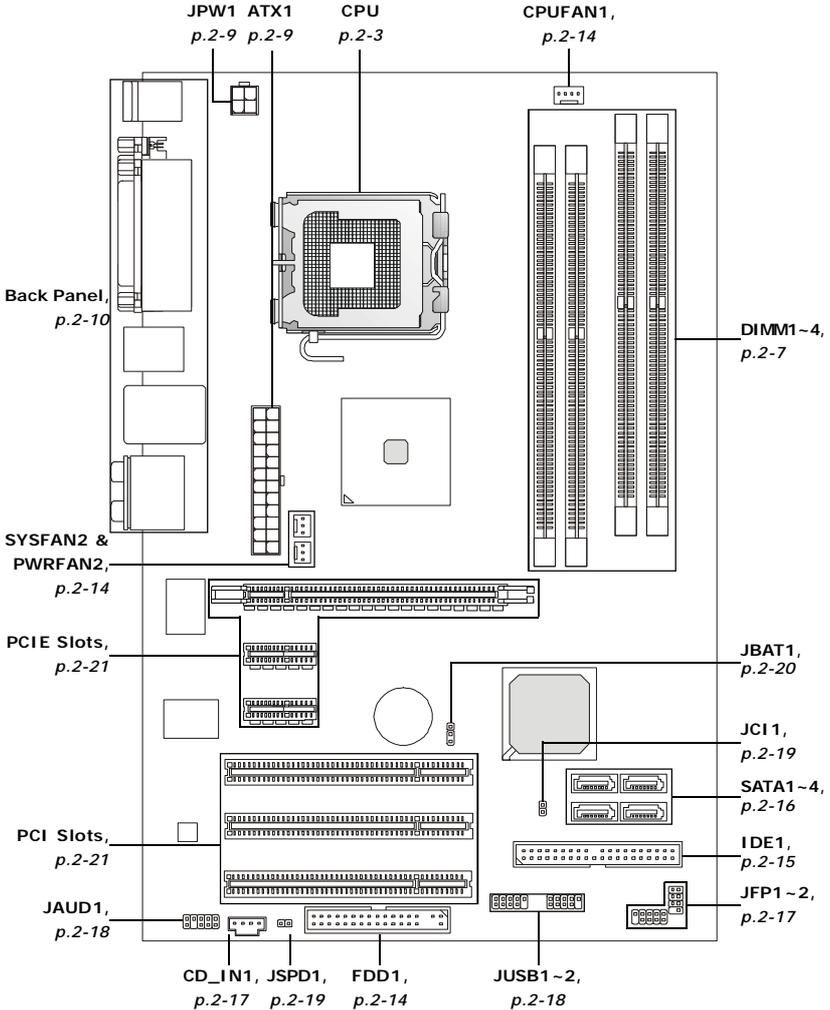
Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

ONLY FOR SERVICE PERSONEL



Always unplug the power cord before inserting any add-on card or module.

Quick Components Guide



**945P / 945PL Neo5 Series
(MS-7236 v2.X) ATX Mainboard**

Central Processing Unit: CPU

The mainboard supports Intel® Pentium 4 Series processor. The mainboard uses a CPU socket called LGA775. When you are installing the CPU, **make sure to install the cooler to prevent overheating**. If you do not have the CPU cooler, contact your dealer to purchase and install them before turning on the computer. (For the latest information about CPU, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_cpu_support.php)

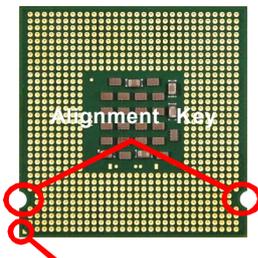


Important

1. *Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.*
2. *While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.*
3. *According to the Intel® North Bridge 945-family chipset spec, 945P mainboard supports CPU of FSB 1066 MHz at maximum and 945PL mainboard supports CPU of FSB 800 MHz at maximum. However, you may let 945PL mainboard running at FSB 1066 MHz (Core 2 Duo CPUs) by overclocking and adjusting the CPU FSB frequency in BIOS: Enter BIOS setup menu and go to [Frequency/Voltage Control] -> [Adjust CPU FSB Frequency]. There you can adjust the value to [266] for the Core 2 Duo series CPUs. **Please be noted that this is over-spec and this overclocking behavior is not recommended and guaranteed.***

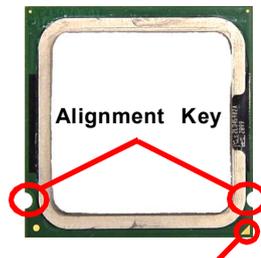
Introduction to LGA 775 CPU

The pin-pad side of LGA 775 CPU.



Yellow triangle is the Pin 1 indicator

The surface of LGA 775 CPU. Remember to apply some silicone heat transfer compound on it for better heat dispersion.

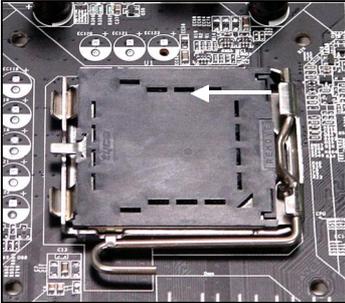


Yellow triangle is the Pin 1 indicator

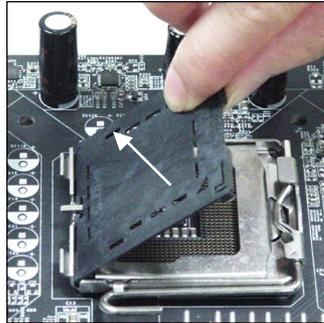
CPU & Cooler Installation

When you are installing the CPU, **make sure the CPU has a cooler attached on the top to prevent overheating.** If you do not have the cooler, contact your dealer to purchase and install them before turning on the computer. Meanwhile, do not forget to apply some silicon heat transfer compound on CPU before installing the heat sink/cooler fan for better heat dispersion. Follow the steps below to install the CPU & cooler correctly. Wrong installation will cause the damage of your CPU & mainboard.

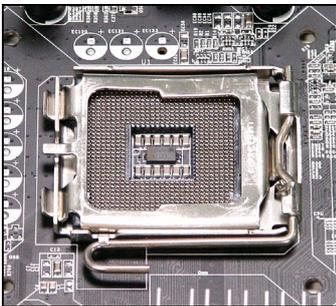
1. The CPU socket has a plastic cap on it to protect the contact from damage. Before you install the CPU, always cover it to protect the socket pin.



2. Remove the cap from lever hinge side (as the arrow shows).



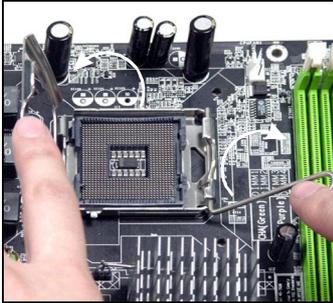
3. The pins of socket reveal.



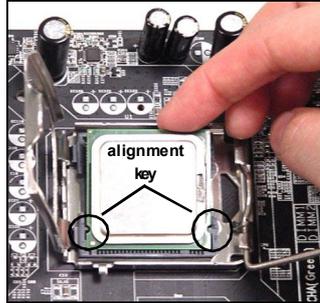
4. Open the load lever.



5. Lift the load lever up and open the load plate.



6. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Be sure to grasp on the edge of the CPU base. Note that the alignment keys are matched.



7. Visually inspect if the CPU is seated well into the socket. If not, take out the CPU with pure vertical motion and reinstall.



8. Cover the load plate onto the package.



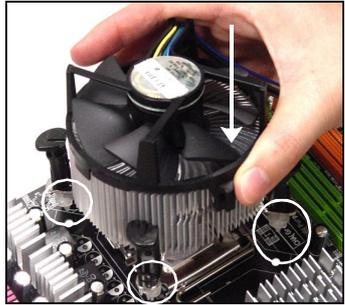
Important

1. Confirm if your CPU cooler is firmly installed before turning on your system.
2. Do not touch the CPU socket pins to avoid damaging.
3. The availability of the CPU land side cover depends on your CPU packing.

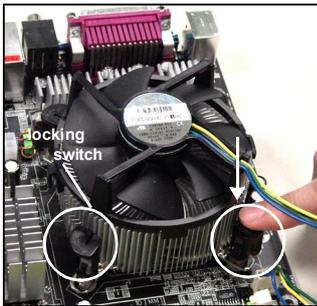
9. Press down the load lever lightly onto the load plate, and then secure the lever with the hook under retention tab.



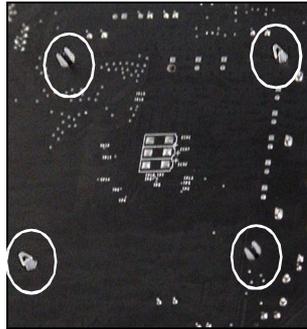
10. Align the holes on the mainboard with the heatsink. Push down the cooler until its four clips get wedged into the holes of the mainboard.



11. Press the four hooks down to fasten the cooler. Then rotate the locking switch (refer to the correct direction marked on it) to lock the hooks.



12. Turn over the mainboard to confirm that the clip-ends are correctly inserted.

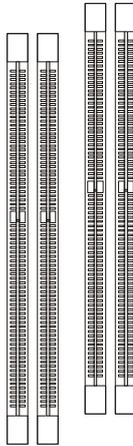


Important

1. Check the information in H/W Monitor in BIOS (Chapter 3) for the CPU temperature.
2. Whenever CPU is not installed, always protect your CPU socket pin with the plastic cap covered (shown in step 1) to avoid damaging.

Memory

The mainboard provides 4 DDR II DIMMs (240-pin / 1.8V). Since DDR II modules are not interchangeable with DDR and the DDR II standard is not backward compatible, you should always install DDR II memory module in the DDR II slot (DIMM1~DIMM4). Otherwise, you are not able to boot up your system and your mainboard might be damaged. (For the updated supporting memory modules, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_trp_list.php)



From left to right:
DIMM3 (Orange)
DIMM4 (Orange)
DIMM1 (Green)
DIMM2 (Green)

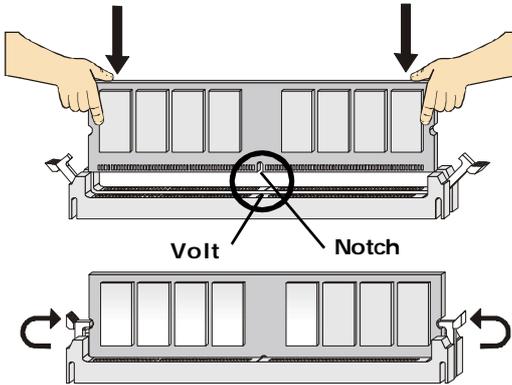


Important

- 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.

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



Important

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

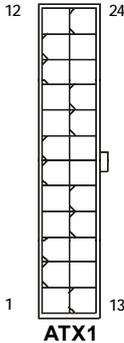
Power Supply

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

ATX 24-Pin Power Connector: ATX1

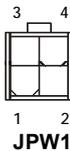
This connector allows you to connect an ATX 24-pin power supply. To connect the ATX 24-pin power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

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 12V power connector is used to provide power to the CPU.



Pin Definition

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

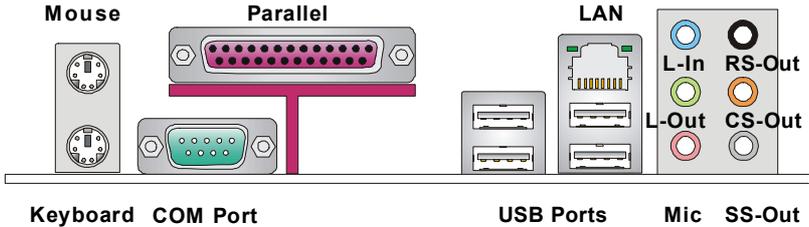


Important

1. These two connectors connect to the ATX power supply and have to work together to ensure stable operation of the mainboard.
2. Power supply of 350 watts (and above) is highly recommended for system stability.
3. ATX 12V power connection should be greater than 18A.

Back Panel

The back panel provides the following connectors:



Mouse/Keyboard Connector

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



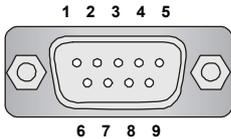
**PS/2 Mouse / Keyboard
(6-pin Female)**

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Mouse/Keyboard Data	Mouse/Keyboard data
2	NC	Noconnection
3	GND	Ground
4	VCC	+5V
5	Mouse/KeyboardClock	Mouse/Keyboardclock
6	NC	Noconnection

Serial Port Connector: COM Port

The mainboard offers one 9-pin male DIN connector COM Port. It's a 16550A high speed communication port that send/receive/ 16 bytes FIFOs. You can attach a serial mouse or other serial device directly to it.



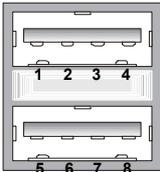
**COM Port
(9-Pin Male)**

Pin Definition

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

USB Connectors

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



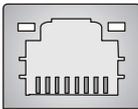
USB Ports

Port Description

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

LAN (RJ-45) Jack (1000Mbps is optional)

The mainboard provides 1 standard RJ-45 jack for connection to single Local Area Network (LAN). This LAN enables data to be transferred at 1000Mbps, 100Mbps or 10Mbps. You can connect a network cable to it.



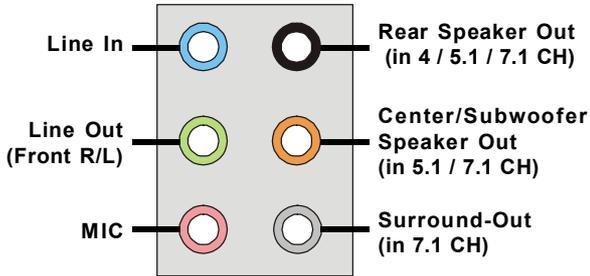
RJ-45 LAN Jack

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	D0P	Differential Pair 0+
2	D0N	Differential Pair 0-
3	D1P	Differential Pair 1+
4	D2P	Differential Pair 2+
5	D2N	Differential Pair 2-
6	D1N	Differential Pair 1-
7	D3P	Differential Pair 3+
8	D3N	Differential Pair 3-

Audio Port Connectors

The left 3 audio jacks are for 2-channel mode for stereo speaker output: **Line Out** is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones. However, there is an advanced audio application provided by Realtek ALC850 to offer support for **7.1-channel audio operation** and can turn rear audio connectors from 2-channel to 4-/5.1-/7.1- channel audio.

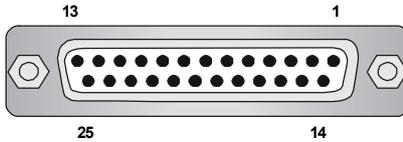


Important

*For the advanced functions of the audio codec, please refer to the chapter **Realtek ALC888 Audio** for details.*

Parallel Port Connector: LPT1

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



Pin Definition

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

Connectors

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

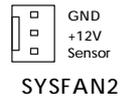
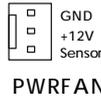
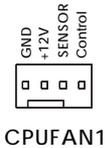
Floppy Disk Drive Connector: FDD1

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



Fan Power Connectors: CPUFAN1/SYSFAN2/PWRFAN2

The CPUFAN1 (processor fan), SYSFAN2 and PWRFAN2 support system cooling fan with +12V. It supports four/three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

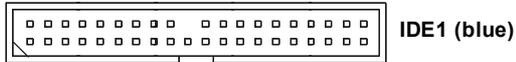


Important

1. Always consult the vendors for proper CPU cooling fan.
2. CPUFAN1 supports the fan control only with 4-pin CPU fan.
3. Please refer to the recommended CPU fans at Intel® official website.

Hard Disk Connector: IDE1

The mainboard has 32-bit Ultra DMA 66/100 IDE controllers integrated in the chips Intel ICH7, which supports PIO & Bus Master operation modes and it can connect up to two Ultra ATA drives.



IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

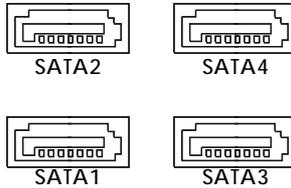


Important

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

Serial ATA II Connectors controlled by Intel ICH7: SATA1~SATA4

The SouthBridge of this mainboard is Intel ICH7 which supports four serial ATA II connectors SATA1~SATA4. SATA1~SATA4 are dual high-speed Serial ATA II interface ports. Each supports Serial ATA II data rates of 300MB/s. Both connectors are fully compliant with SATA 1.0 and 2.0 specifications. Each Serial ATA connector can connect to 1 hard disk device.



► Serial ATA cable

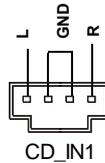


Important

Please do not fold the serial ATA cable in a 90-degree angle, since this might cause the loss of data during the transmission.

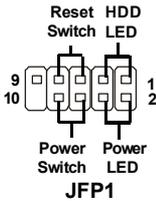
CD-In Connector: CD_IN1

The connector is for CD-ROM audio connector.



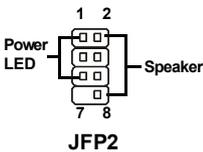
Front Panel Connectors: JFP1~JFP2

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



Pin Definition

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



Pin Definition

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

Front USB Connectors: JUSB1~JUSB2

The mainboard provides two standard USB 2.0 pin headers JUSB1 & JUSB2. USB 2.0 technology increases data transfer rate up to a maximum throughput of 480Mbps, which is 40 times faster than USB 1.1, and is ideal for connecting high-speed USB interface peripherals such as **USB HDD, digital cameras, MP3 players, printers, modems and the like.**



Pin Definition

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

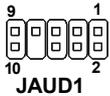


Important

Note that the pins of VCC and GND must be connected correctly, or it may cause some damage.

Front Panel Audio Connector: JAUD1

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



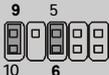
Pin Definition

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



Important

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



Chassis Intrusion Switch Connector: JCI1

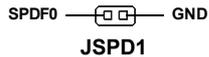
This connector is connected to a 2-pin chassis switch. If the chassis is opened, the switch will be short. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.



SPDIF-Out Connector: JSPD1

(Optional, for HDMI graphics card only)

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

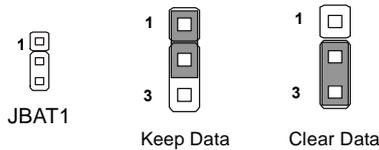


Jumper

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

Clear CMOS Jumper: JBAT1

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



Important

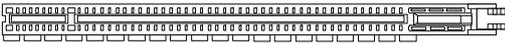
You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Slots

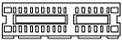
The mainboard provides one PCI Express x16 slot, two PCI Express x1 slots and three 32-bit PCI bus slots.

PCI Express Slots

The PCI Express slots, as a high-bandwidth, low pin count, serial, interconnect technology, support Intel highest performance desktop platforms utilizing the Intel Pentium 4 processor with HT Technology. PCI Express architecture provides a high performance I/O infrastructure for Desktop Platforms with transfer rates starting at 2.5 Giga transfers per second over a PCI Express x1 lane for Gigabit Ethernet, TV Tuners, 1394 controllers, and general purpose I/O. Also, desktop platforms with PCI Express Architecture will be designed to deliver highest performance in video, graphics, multimedia and other sophisticated applications. Moreover, PCI Express architecture provides a high performance graphics infrastructure for Desktop Platforms doubling the capability of existing AGP 8x designs with transfer rates of 4.0 GB/s over a PCI Express x16 lane for graphics controllers. You can insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first.



PCI Express x16 slot



PCI Express x1 slot

PCI (Peripheral Component Interconnect) Slots

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



PCI Slots

PCI Interrupt Request Routing

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

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

Chapter 3

BIOS Setup

This chapter provides the 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:

A7236IMS V7.0 061109 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, and V= VIA.
- ▶ 7th - 8th digit refers to the customer as MS= all standard customers.
- ▶ V7.0 refers to the BIOS version.
- ▶ 061109 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
<F1>	General Help
<F2>	Change Colour
<F6>	Optimized Defaults
<F7>	Fail-Safe Defaults
<F10>	Save & 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

```

> IDE Channel 0 Master [ None]
> IDE Channel 0 Slave [ None]
> IDE Channel 1 Master [ None]
> IDE Channel 1 Slave [ None]

```

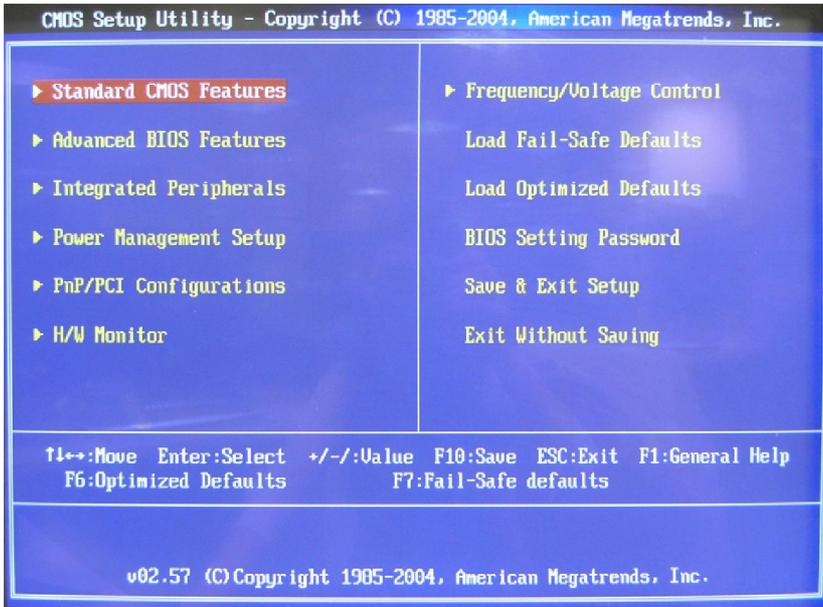
use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc>.

General Help <F1>

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

The Main Menu

Once you enter AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to move among the items and press <Enter> to enter the sub-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 the status of your CPU, fan, warning for overall system status.

► **Frequency/Voltage Control**

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

► **Load Fail-Safe Defaults**

Use this menu to load the 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 these two menus to set the passwords for BIOS.

► **Save & Exit Setup**

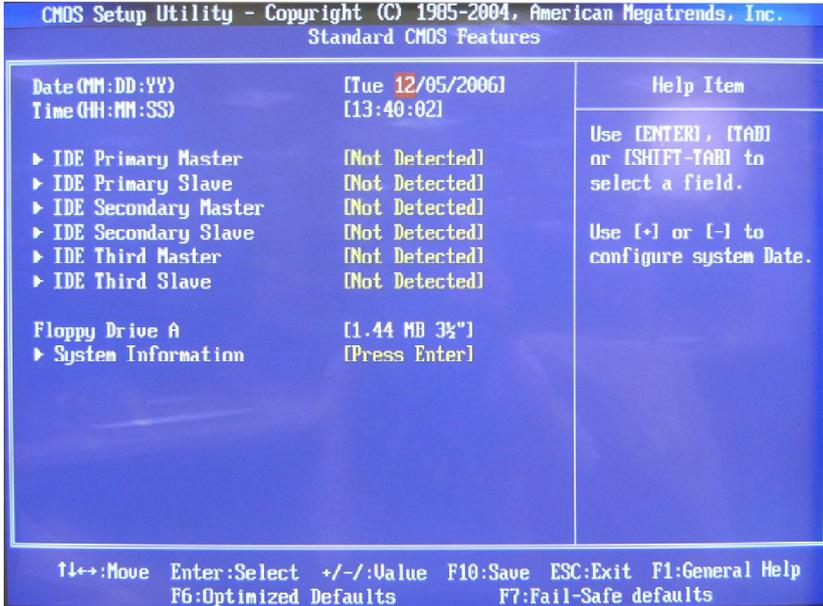
Save changes to CMOS and exit setup.

► **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 <+> or <-> keys to select the value you want in each item.



▶ System 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.

▶ System 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/Secondary/Third Master/Slave

Press <+> or <-> to select the hard disk drive type. The specification of hard disk drive will show up on the right hand according to your selection. Press <Enter> for the sub-menu of each item:

► Floppy Drive A

This item allows you to set the type of the floppy drives installed. Available options: [Disabled], [360 KB, 5^{1/4}], [1.2 MB, 5^{1/4}], [720 KB, 3^{1/2}], [1.44 MB, 3^{1/2}], [2.88MB, 3^{1/2}].

► System Information

Press <Enter> to for the sub-menu of each item:

CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.	
System Information	
CPU Type	:Intel
CPUID	:0F64h
CPU Frequency	:3.00GHz (200x15)
BIOS Version	:A7236IMS V8.088
Build Date	:11/29/06
Physical Memory	:256MB
	Help Item

CPU Type, CPU ID, CPU Frequency

These items show the CPU related information of your system (read only).

BIOS Version, Build Date

These items show the BIOS related information of your system (read only).

Physical Memory

This item shows the physical memory of your system (read only).

► **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. Setting options: [On], [Off].

► **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. Setting options: [Enabled], [Disabled].

► **MPS Table Version**

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

► **CPU Feature**

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



Execute Bit Support

Execute Bit Support is a robust hardware feature, detectable using the CPUID instruction, that protects against malicious software executing code on IA-32 systems.

Set Limit CPUID MaxVal to 3

The item allows you to enable and disable the CPU ID maximum value.

[Enabled] Set to [Enabled] only when you have Prescott CPU and NT4.0 operating system.

[Disabled] Set to [Disabled] if you have operating system other than NT4.0.

► Chipset Feature

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

CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.		
Chipset Feature		
HPET	[Disabled]	Help Item
PEG Force x1	[Disabled]	High Performance Event Timer: Don't change the option to "Enable", except for testing HCT for Vista.

HPET

The High Precision Event Timer (HPET) was developed by Intel and Microsoft to meet the timing requirements of multimedia and other time-sensitive applications. Setting options: [Enabled], [Disabled].

PEG Force X1

This BIOS feature allows you to convert a PCI Express X16 slot into a PCI Express X1 slot. When [Enabled], the PCI Express X16 slot will be forced to run in the PCI Express X1 mode. When [Disabled], the PCI Express X16 slot will be allowed to run in its normal PCI Express X16 mode.

If you have a PCI Express X16 graphics card installed in your system, you should disable this BIOS feature. This allows for optimal performance of the card by ensuring maximum transfer rates between the graphics card and the motherboard.

But if you need to install a PCI Express X1 card into the PCI Express X16 slot, you should enable this BIOS feature to ensure maximum compatibility.

► Boot Sequence

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

CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.		
Boot Sequence		
Boot Sequence		Help Item
1st Boot Device	[1st FLOPPY DRIVE]	Specifies the boot sequence from the available devices. A device enclosed in parenthesis has been disabled in the corresponding type menu.

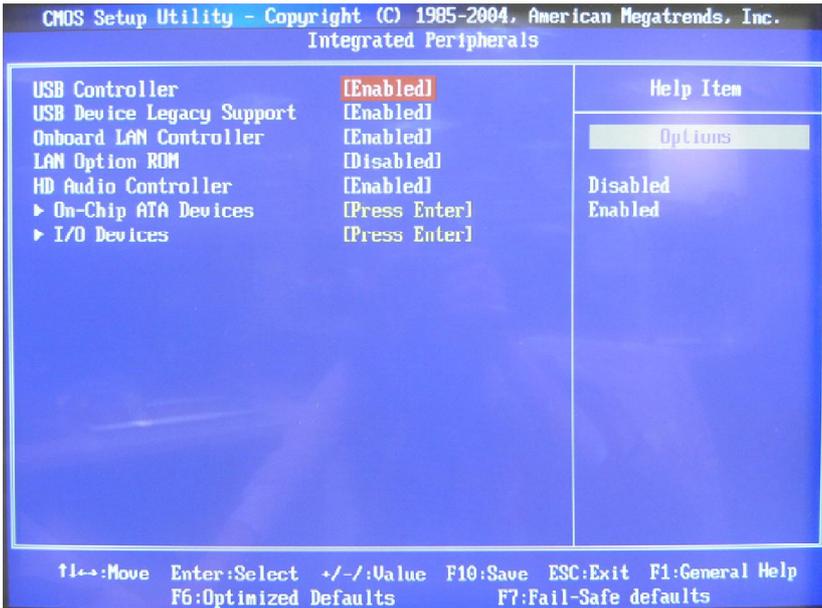
Boot Sequence

The original IBM PCs loaded the DOS operating system from drive A (floppy disk), so IBM PC-compatible systems are designed to search for an operating system first on drive A, and then on drive C (hard disk). However, modern computers usually load the operating system from the hard drive, and may even load it from a CD-ROM drive.

1st Boot Device

The item allows you to set the sequence of boot devices where BIOS attempts to load the disk operating system.

Integrated Peripherals



▶ USB Controller

Select [Enabled] if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.

▶ USB Device Legacy Support

Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix. Set to [Disabled] only if you want to use any USB device other than the USB mouse.

▶ Onboard LAN Controller

This setting allows you to enable/disable the onboard LAN controller. Setting options: [Enabled], [Disabled].

▶ LAN Option ROM

The item enables or disables the initialization of the onboard LAN Boot ROMs during bootup. Selecting [Disabled] will speed up the boot process. Setting options: [Enabled], [Disabled].

▶ HD Audio Controller

The field enables or disables the HD Audio controller. Setting options:[Enabled], [Disabled].

► On-Chip ATA Device

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



On-Chip IDE Controller

The integrated peripheral controller contains a IDE interface with support for two IDE channels. Select [Enabled] to activate the IDE interface.

PCI IDE BusMaster

Set this option to [Enabled] to specify that the IDE controller on the PCI local bus has bus mastering capability.

► On-Chip ATA Device

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



COM Port 1

This item specifies the base I/O port addresses of the onboard Serial Port 1 (COM 1). Selecting [Auto] allows AMIBIOS to automatically determine the correct base I/O port address.

Parallel Port

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

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

Parallel Port Mode

To operate the onboard parallel port in the EPP mode simultaneously, choose [EPP]. By choosing [ECP], the onboard parallel port will operate in ECP mode only. Choosing [ECP + EPP] will allow the onboard parallel port to support both the ECP and EPP modes simultaneously. Setting options:

[Normal]	Uni-direction operation at normal speed
[Bi-Direction]	Bi-direction operation at normal speed
[ECP]	Extended Capability Port
[EPP]	Enhanced Parallel Port
[ECP+EPP]	Extended Capability Port + Enhanced Parallel Port

Parallel Port IRQ

This item allows you to set parallel port IRQ. Setting options: [IRQ5], [IRQ7].

Power Management Setup

CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
Power Management Setup

	[Enabled]	Help Item
ACPI Function	[S1]	Enabled / Disabled ACPI support for Operating System. ENABLED: If OS supports ACPI. DISABLED: If OS does not support ACPI.
ACPI Standby State	[Disabled]	
Suspend Time Out (Minute)	[Power Off]	
Power Button Function	[Off]	
Restore on AC Power Loss	[Press Enter]	
▶ Wakeup Event Setup		

↑↓←→:Move Enter:Select +/-:Value F10:Save ESC:Exit F1:General Help
F6:Optimized Defaults F7:Fail-Safe defaults

▶ 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]. Settings: [Enabled] and [Disabled].

▶ ACPI Standby State

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows ME and Windows 2000, you can choose to enter the Standby mode in S1 or S3 fashion through the setting of this field. Options 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. Settings: [Disabled], [1], [2], [3], [4], [5], [6], [7], [8], [9], [10].

► **Power Button Function**

This feature allows users to configure the Power Button function. Settings are:

- [Power Off] The power button functions as a 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 setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

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

► **Wakeup Event Setup**

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



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

The item specifies how the system will be awakened from power saving mode when input signal of the PS2 keyboard is detected. Use the <PageUp> & <PageDown> keys to select the options. When selecting [Password], enter the desired password.

Resume From S3 By PS/2 Mouse

This setting only works *Resume From S3 By PS/2 Keyboboard* is set to [Hot Key]. 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 setting to [Enabled], this setting allows your system to be awakened from the power saving modes through any event on PME (Power Management Event).

Resume By PCIE Device

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

Resume By RTC Alarm

This is used to enable or disable the feature of booting up the system on a scheduled time/date from the S3, S4, and S5 state. Setting options: [Disabled], [Enabled]. Select [Enabled] to adjust the date & time for RTC Alarm.

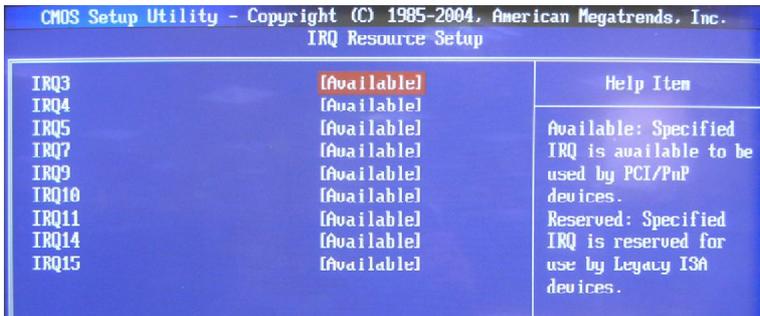
► **PCI Slot 1~3 IRQ**

These items specify the IRQ line for each PCI slot. Setting options: [1], [2], [3] and [Auto]. Selecting [Auto] allows BIOS to automatically determine the IRQ line for each PCI slot.

► **IRQ Resources Setup**

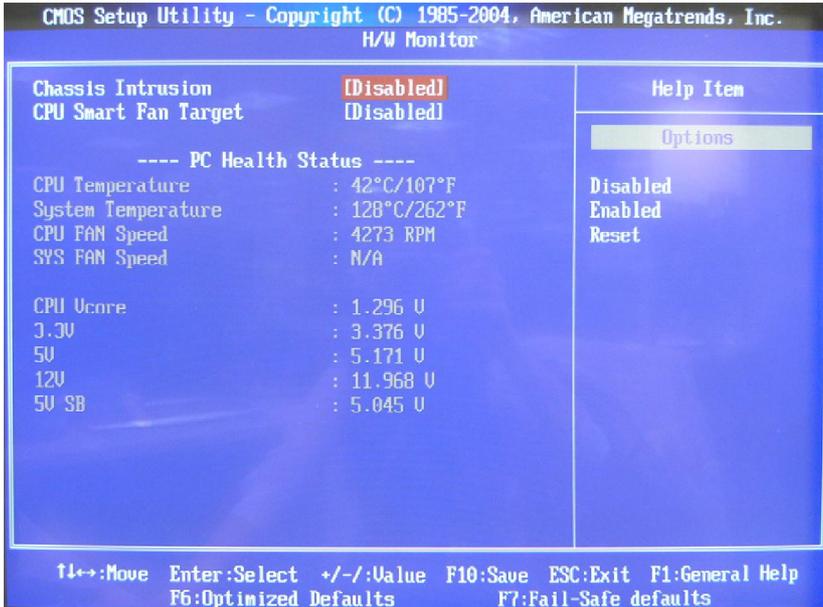
The items are adjustable only when Resources Controlled By is set to Manual. Press <Enter> and you will enter the sub-menu of the items. IRQ Resources list IRQ 3/4/5/7/9/10/11/14/15 for users to set each IRQ a type depending on the type of device using the IRQ. Settings are:

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



H/W Monitor

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



► 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. Setting options: [Disabled], [Enabled], [Reset].

► CPU Smart Fan Target

The mainboard provides the CPU Smart Fan system which can control the fan speed automatically depending on the current temperature to keep it with in a specific range.

---- PC Health Status ----

► CPU/System Temperature, CPU/SYS FAN Speed, CPU Vcore, 3.3V, 5V, 12V, 5V SB (read only)

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

Frequency/Voltage Control

The items here includes some important settings of CPU and PCI functions. Change these settings only if you are familiar with the chipset.

CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
Frequency/Voltage Control

Current CPU Frequency	1862MHz	▲	Help Item
Current DRAM Frequency	667MHz		
D.O.T Control [Disabled]		▼	!!! Warning !!! The feature is an advanced overclocking function. Any damage or risk resulted from impropriety or overclocking are not guaranteed. Please make sure your peripherals can afford different settings.
Intel EIST	[Enabled]		
Adjust CPU FSB Frequency	[266]	▼	
Adjusted CPU Frequency	[1862]		
Adjust DRAM Frequency [Auto]		▼	
Adjusted DDR Memory Frequenc	[667]		
Adjust AGP/PCI Frequency	[33.3]	▼	
Adjust PCIE Frequency	[100]		
Auto Disable DIMM/PCI Freque	[Enabled]	▼	
CPU Volatge	[0%]		
Memory Volatge	[1.90]	▼	
NB Voltage	[1.55]		
FSB Volatge	[0%]	▼	
Spread Spectrum	[Enabled]		
Configure DRAM Timing by SPD	[Enabled]	▼	

↑↓←→:Move Enter:Select +/-:Value F10:Save ESC:Exit F1:General Help
F6:Optimized Defaults F7:Fail-Safe defaults

► Current CPU/DRAM Frequency

These two items show the current frequency of CPU & DRAM. (read only)

► D.O.T Control

Dynamic Overclocking Technology (D.O.T) is the automatic overclocking function, included in the MSI™'s newly developed CoreCell™ Technology. It is designed to detect the load balance of CPU while running programs, and to adjust the best CPU frequency automatically. When the motherboard detects CPU is running programs, it will speed up CPU automatically to make the program run smoothly and faster. When the CPU is temporarily suspending or staying in the low load balance, it will restore the default settings instead. Usually the Dynamic Overclocking 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 frequency need to be boosted up to enhance the overall performance.

Setting options:

- [Disabled] Disable Dynamic Overclocking.
- [Private 1%] 1st level of overclocking, increasing the CPU frequency by 1%.
- [Sergeant 3%] 2nd level of overclocking, increasing the CPU frequency by 3%.
- [Captain 5%] 3rd level of overclocking, increasing the CPU frequency by 5%.
- [Colonel 7%] 4th level of overclocking, increasing the CPU frequency by 7%.
- [General 10%] 5th level of overclocking, increasing the CPU frequency by 10%.
- [Commander 15%] 6th level of overclocking, increasing the CPU frequency by 15%.

► **Intel EIST**

The Enhanced Intel SpeedStep technology allows you to set the performance level of the microprocessor whether the computer is running on battery or AC power. This field will appear after you installed the CPU which support speedstep technology.

► **Adjust CPU FSB Frequency**

This item allows you to select the CPU Front Side Bus clock frequency (in MHz) and overclock the processor by adjusting the FSB clock to a higher frequency. Setting options: For CPU FSB200: [200]~[500]

► **Adjusted CPU Frequency**

This item shown the CPU frequency after you adjusted. You need to restart the system to load the new CPU frequency you choose. (read only)

► **Adjust DRAM Frequency**

Adjusting the DRAM voltage can increase the DDR speed.

► **Adjusted DDR Memory Frequenc**

This item shown the DDR memory frequency after you adjusted. You need to restart the system to load the new memory frequency you choose. (read only)

► **Adjust AGP/PCI Frequency**

This item allows you to select the AGP/PCI frequency (in MHz). In default this value will change automatically in accordance with the setting of Adjust CPU FSB Frequency. However, you may adjust the desired fixed AGP/PCI frequency you like by using the <+> & <-> key. Setting option: [33.3].

► **Adjust PCIE Frequency**

This item allows you to select the PCI Express frequency (in MHz). Select the number between [100]~[150] for needed frequency.

► **Auto Disable DIMM/PCI Frequency**

This item is used to auto detect the DIMM/PCI frequency. Settings: [Enabled], [Disabled].

► **CPU Voltage**

This item is used to adjust the incremental percentage of CPU corevoltage (Vcore). The item has eight options, the Min Value is 0% and the Max Value is 18%. This setting offers users a tool to overclock the system.

► Memory Voltage

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

► NB voltage

This item is used to adjust the North Bridge Voltage. This setting offers users a tool to overclock the system.

► FSB Voltage

This item is used to adjust the incremental percentage of FSB voltage. The item has eight options, the Min Value is 0% and the Max Value is 20%. This setting offers users a tool to overclock the system.

► Spread Spectrum

When the motherboard's clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at [Disabled] for optimal system stability and performance. But if you are plagued by EMI, select the desired range for EMI reduction. Remember to disable Spread Spectrum function 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.*

► Configure DRAM Timing by SPD

Selects whether DRAM timing is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to [Enabled] enables DRAM timings and the following related items to be determined by BIOS based on the configurations on the SPD. Selecting [Disabled] allows users to configure the DRAM timings and the following related items manually. Setting options: [Enabled], [Disabled].

Load Fail-Safe/Optimized Defaults

The two options on the main menu allow users to restore all of the BIOS settings to the default Fail-Safe or Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard. The Fail-Safe Defaults are the default values set by the BIOS vendor for stable system performance. When you select Load Fail-Safe Defaults, a message as below appears:



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

Pressing Y loads the BIOS default values for the most stable, minimal system performance. When you select Load Optimized Defaults, a message as below appears:



Load Optimized Defaults (Y/N)? N

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

BIOS Setting Password

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



Enter Password:

Type the password, up to 6 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 supports 8-channel audio output, including 2 Front, 2 Rear, 2 Side, 1 Center and 1 Subwoofer channel. It enables connection to 2, 4, 6 or 8 speakers for better surround sound effect. This section tells you how to install and use 2-, 4-, 6- or 8-channel audio function on the board.

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

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**.



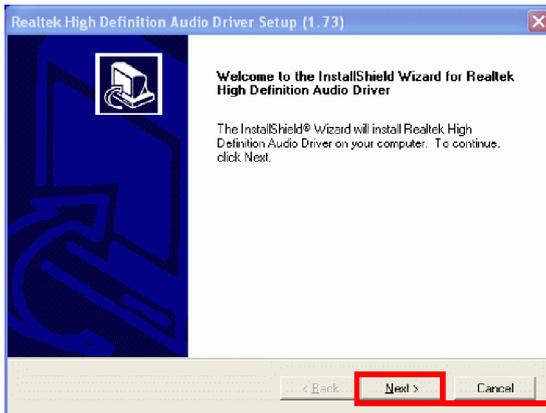
Click here



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.



Click here

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



Select this option

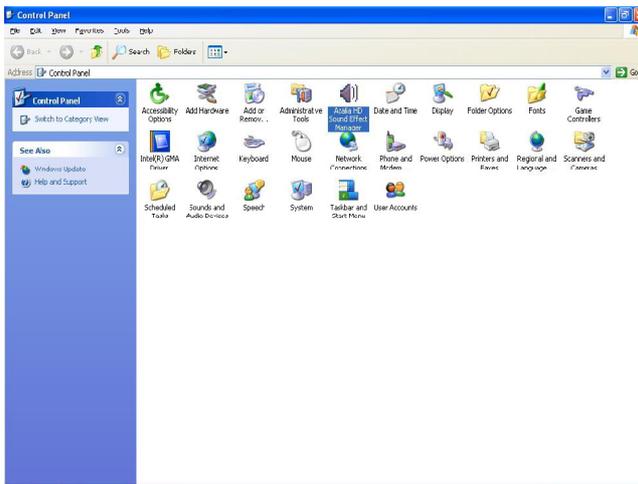
Click here

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.

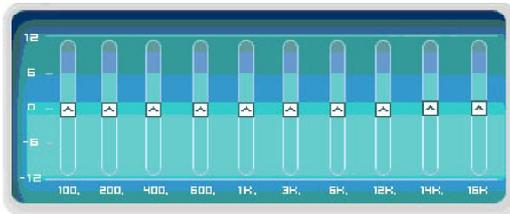
You may choose the provided sound effects, and the equalizer will adjust automatically. If you like, you may also load an equalizer setting or make an new equalizer setting to save as an new one by using the **“Load EQ Setting”** and **“Save Preset”** button, click **“Reset EQ Setting”** button to use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

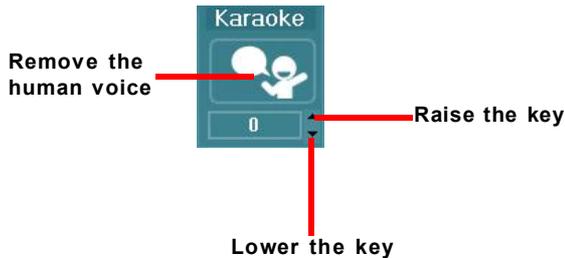
[How to Use It]

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

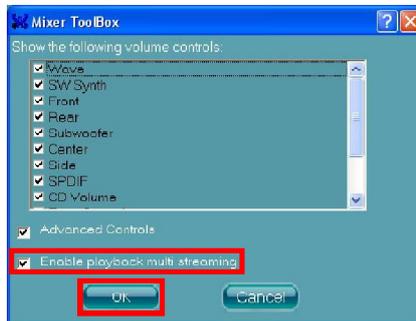
ALC888 supports an outstanding feature called Multi-Stream, which means you may play different audio sources simultaneously and let them output respectively from the indicated real panel or front panel. This feature is very helpful when 2 people are using the same computer together for different purposes.

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

You have to plug audio device into the jacks on the rear and front panel first 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



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

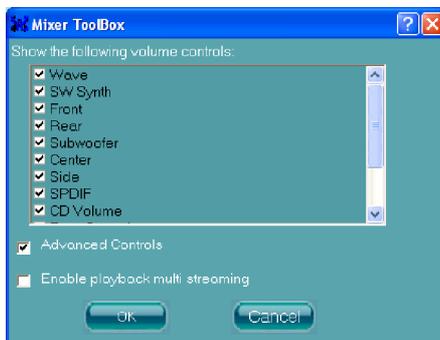
- Show the following volume controls

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.

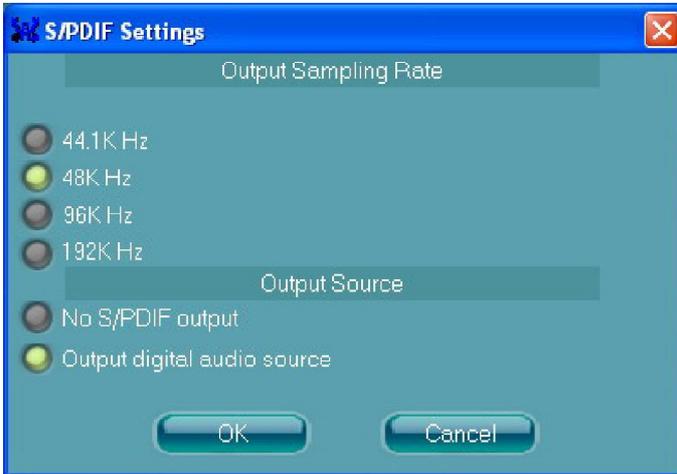
Mute rear panel output when front headphone plugged in.

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

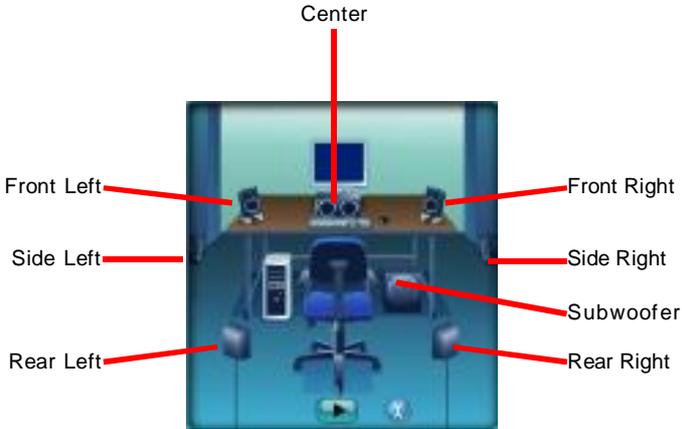
- 44.1KHz: This is recommend while playing CD.
- 48KHz: This is recommended while playing DVD or Dolby.
- 96KHz: This is recommended while playing DVD-Audio.
- 192KHz: This is recommended while playing High quality Audio.

Output Source

- Output digital audio source: The digital audio format (such as .wav, .mp3,. midi etc) will come out through S/PDIF-Out.
- S/PDIF-in to S/PDIF -out pass though mode: The data from S/PDIF-In can be real-time played from 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.



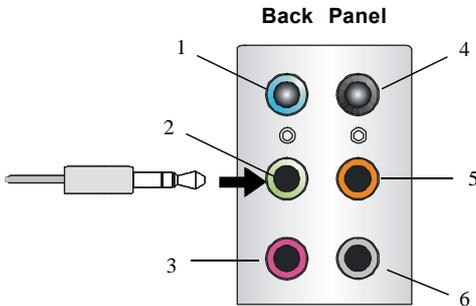
Hardware Setup

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.

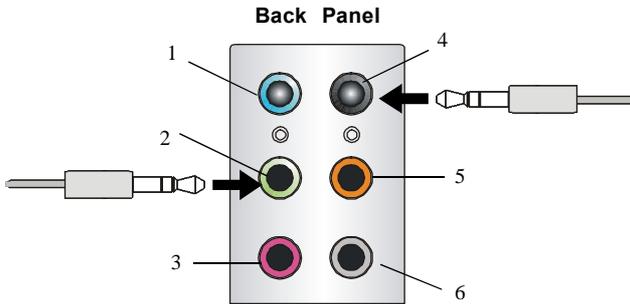
n 2-Channel Mode for Stereo-Speaker Output

Refer to the following diagram and caption for the function of each phone jack on the back panel when 2-Channel Mode is selected.



- 1 Line In
- 2 Line Out (*Front channels*)
- 3 MIC
- 4 Line Out (*Rear surround channels, but no functioning in this mode*)
- 5 Line Out (*Center and Subwoofer channel, but no functioning in this mode*)
- 6 Line Out (*Side surround channels, but no functioning in this mode*)

n 4-Channel Mode for 4-Speaker Output



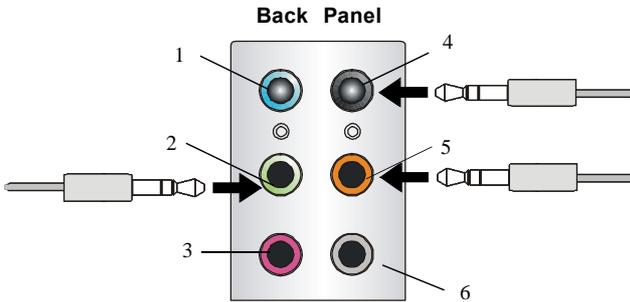
Description:

Connect two speakers to back panel's front-channel Line Out connector and two speakers to the rear-channel Line Out connector.

4-Channel Analog Audio Output

- 1 Line In
- 2 Line Out (*Front channels*)
- 3 MIC
- 4 Line Out (*Rear surround channels*)
- 5 Line Out (*Center and Subwoofer channel, but no functioning in this mode*)
- 6 Line Out (*Side surround channels, but no functioning in this mode*)

n 6-Channel Mode for 6-Speaker Output



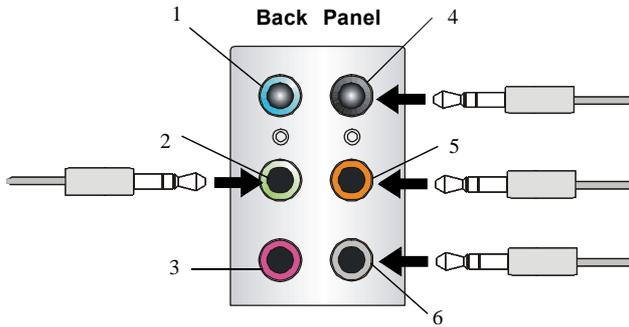
Description:

Connect two speakers to back panel's Line Out connector, two speakers to the rear-channel Line out connector and two speakers to the center/subwoofer-channel Line Out connector.

6-Channel Analog Audio Output

- 1 Line In
- 2 Line Out (*Front channels*)
- 3 MIC
- 4 Line Out (*Rear surround channels*)
- 5 Line Out (*Center and Subwoofer channel*)
- 6 Line Out (*Side surround channels, but no functioning in this mode*)

n 8-Channel Mode for 8-Speaker Output



Description:

Connect two speakers to back panel's Line Out connector, two speakers to the rear-channel Line out connector, two speakers to the center/subwoofer-channel Line Out connector and two speakers to the side-channel Line Out connector.

8-Channel Analog Audio Output

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