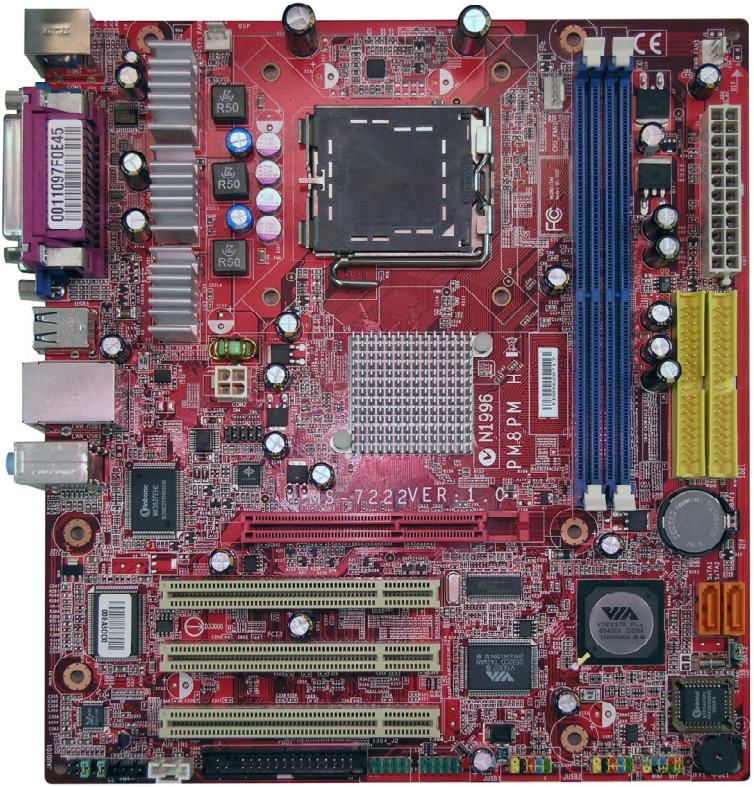
PM8PM

MS-7222 (v1.X) Micro-ATX Mainboard



G52-72221X1

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 instruction manual, 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.

CE N1996

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

FC **Micro-Star International**
MS-7222

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

Copyright Notice

Trademarks

Revision History

Revision	Revision History	Date
V1.0	First release for PCB 1.X with VIAP4M800 Pro & VIA8237R Plus	DEC. 2005
V1.1	Add Chapter5 for RAID Introduction	APR. 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 homepage & FAQ site for technical guide, BIOS updates, driver updates, and other information: **http://www.msi.com.tw** & **http://www.msi.com.tw/program/service/faq/faq/esc_faq_list.php**

† Contact our technical staff at: **support@msi.com.tw**

Safety Instructions

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

廢電池請回收

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

WEEE 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 termino de su periodo de vida. MSI estará comprometido con los términos de recogida de sus productos vendidos en la Unión Europea al final de su periodo 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 graan herinneren dat....

De richtlijn van de Europese Unie (EU) met betrekking tot Vervuiling van Electrische 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 preduzeće koje vodi računa o okolini i prirodnoj sredini, MSI mora da vas podesti da...

Po Direktivi Evropske unije ("EU") o odbačenoj ekektronskoj 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 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 produktów 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 śmieci 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 atılamayacak ve bu elektonik cihazların üreticileri, cihazların kullanım süreleri bittikten sonra ürünleri geri toplamakla yükümlü olacaktır. Avrupa Birliği'ne satılan MSI markalı ürünlerin kullanım sürcleri 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 odebírání 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 kezelhetőek 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.

CONTENTS

Getting Started

Thank you for choosing the **PM8PM**(MS-7222 v1.X) Series ATX mainboard. The **PM8PM** mainboard is based on **VIA® P4M800 Pro** and **VIA® VT8237R Plus** chipset for optimal system efficiency. Designed to fit the advanced **Intel® Pentium 4 Prescott LGA775** processor, the **PM8PM** mainboard delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU*
† Supports Intel® Pentium® 4/ Prescott (LGA 775) processor.
† FSB @ 1066/800/533MHz.
† Supports Intel P4 Prescott CPU up to 3.8GHz, and Intel P4 Prescott Celeron CPU.
† Supports Dual Core CPU (2.8G only)
† Supports Cedarmill CPU

Chipset
† VIA® P4M800Pro chipset
- Supports P4 processors FSB (1066/800MHz).
- Supports DDR SDRAM memory (DDRII 533/400).
- Supports AGP 8x.
- Supports 8X V-Link.

† VIA® VT8237R plus chipset
- Integrated Hardware Sound Blaster/Direct Sound AC97 audio
- Ultra DMA 66/100/133 master mode PCI EIDE controller
- ACPI & PC2001 compliant enhanced power management
- Supports USB2.0 up to 8 ports

Main Memory**
† Advanced 64-bit SDRAM controller supporting DDRII.
† Supports up to 2GB memory size.
† Supports DDRII 533/400 memory interface.

Slots
† One AGP (Accelerated Graphics Port) 8x slot.
† Three PCI 2.2 32-bit PCI bus slots (support 3.3v/5v PCI bus interface).

On-Board IDE
† An IDE controller on the VIA® VT8237R plus Chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA 33/66/100/133 operation modes.
† Can connect up to four IDE devices.

On-Board Peripherals
† On-Board Peripherals include:
- 1 floppy port supports 1 FDDs with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
- 1 serial port (COM A)
- 1 parallel port supports SPP/EPP/ECP mode
- 8 USB 2.0 ports (Rear * 4/ Front * 4)
- 1 audio (Line-In/Line-Out/Mic) port
- 1 RJ45 LAN jack
- 1 VGA port
- 1 COM 2 pin header
- 2 SATA 150 (support RAID 0, RAID 1, JBOD)
- 2 front IEEE 1394 pinheaders

Audio

† AC97 link controller integrated in VT8237R plus.
† Realtek ALC655 6-channel software audio codec.
- Compliance with AC'97 v2.2 spec.

LAN(optional)

† Realtek® 8100C / 8110SB (optional).
- Supports 10Mb/s, 100Mb/s and 1000Mb/s(1000Mb/s for 8110SB only).
- Compliance with PCI 2.2.
- Supports ACPI Power Management.

1394 (optional)

† Support two IEEE 1394 on board pinheaders transfer rate is up to 400Mbps.
† Controlled by VIA6307 chipset.

BIOS

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

Dimension

† Micro-ATX Form Factor: 245mm x 220mm.

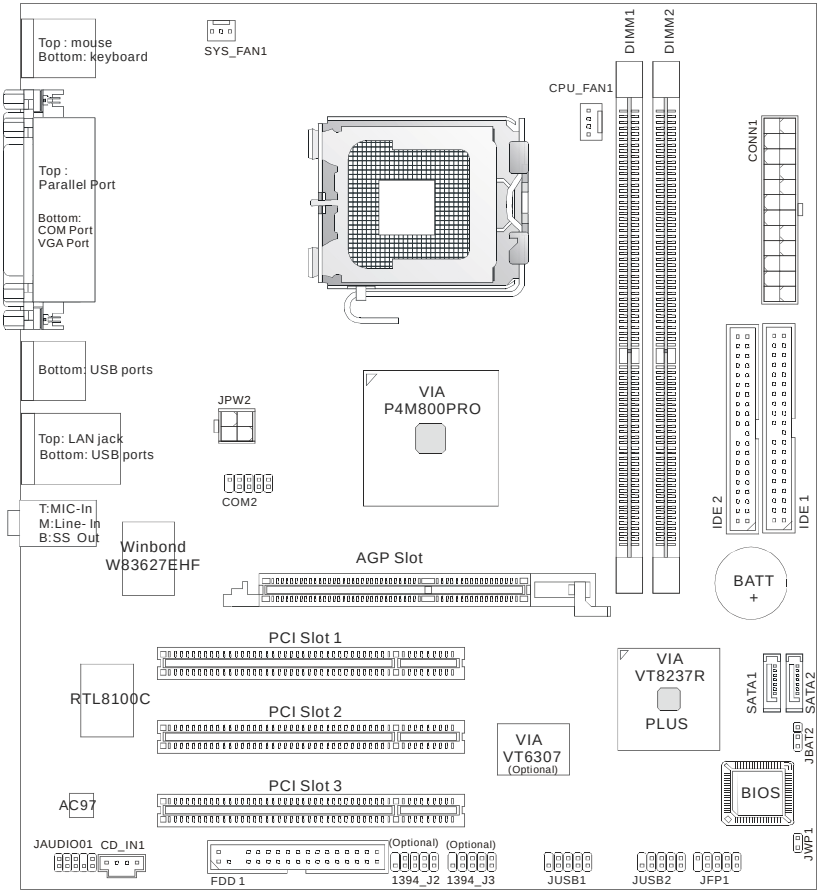
Mounting

† 6 standard mounting holes.

**For the latest information about CPU, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_cpu_support.php*

*** For the updated supporting memory modules, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_trp_list.ph*

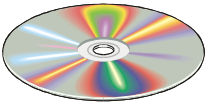
Mainboard Layout



PM8PM (MS-7222 v1.X) Micro-ATX Mainboard

Packing Contents

MSI motherboard



MSI Driver/Utility CD

SATA Cable

Power Cable

COM2 Bracket
(Optional)

Round Cable for
IDE Devices
(Optional)

User's Guide

Back IO Shield

Round Cable for
Floppy Disk
(Optional)

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

MSI Special Feature

The Core Center is a new utility you can find in the CD-ROM disk. The utility 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.

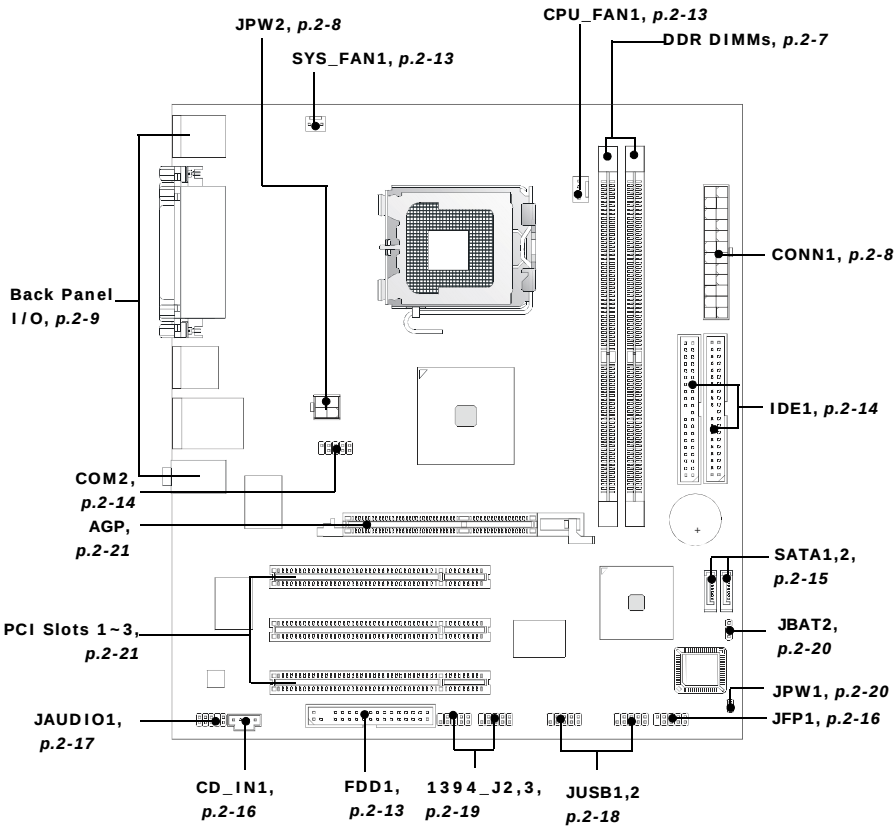
MSI Reminds You...
Items shown on Core Center vary depending on your system status.

Hardware Setup

This chapter tells you how to install the CPU, memory modules, and expansion cards, as well as how to setup the jumpers on the mainboard. Also, it provides the instructions on connecting the peripheral devices, such as the mouse, keyboard, etc.

While doing the installation, be careful in holding the components and follow the installation procedures.

Quick Components Guide



Central Processing Unit: CPU

The mainboard supports Intel® Pentium 4 Prescott 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.

MSI Reminds You...

Overheating

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

Replacing the CPU

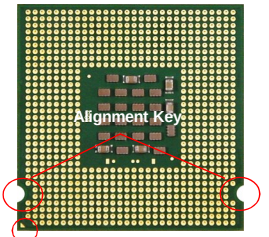
While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.

Overclocking

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

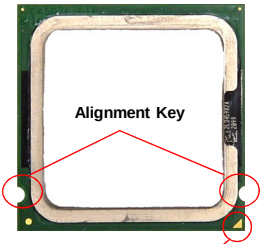
Introduction to LGA 775 CPU

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.



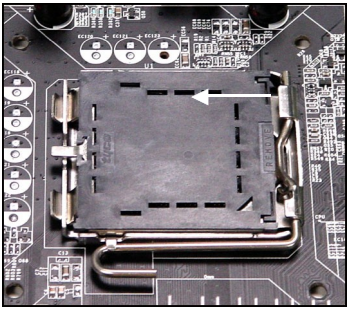
Yellow triangle is the Pin 1 indicator

CPU & Cooler Installation

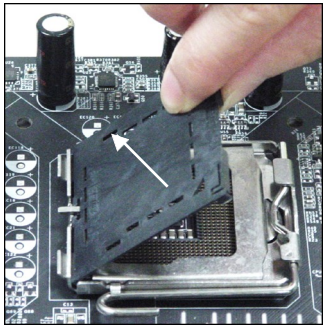
When you are installing the CPU, **make sure the CPU has a cooler attached on the top to prevent overheating.** If you do not have the cooler, contact your dealer to purchase and install them before turning on the computer. Meanwhile, do not forget to apply some silicon heat transfer compound on CPU 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.

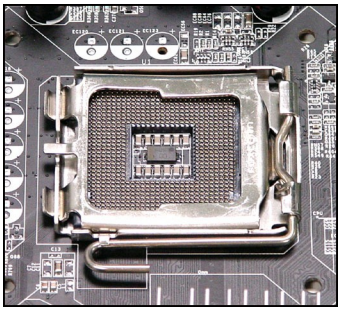
1. The CPU socket has a plastic cap on it to protect the contact from damage. Before you install the CPU, always cover it to protect the socket pin.



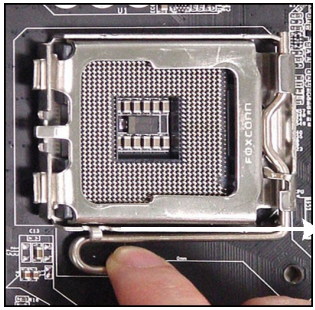
2. Remove the cap from lever hinge side (as the arrow shows).



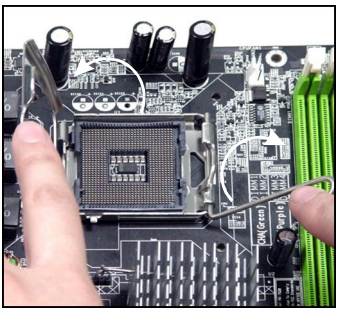
3. The pins of socket reveal.



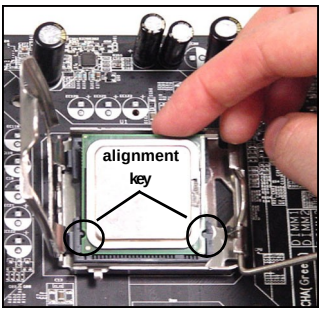
4. Open the load lever.



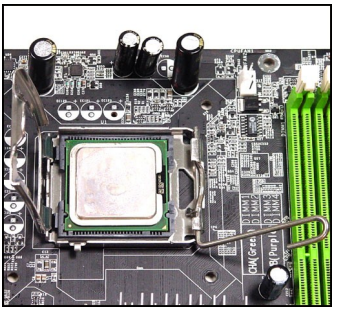
5. Lift the load lever up and open the load plate.



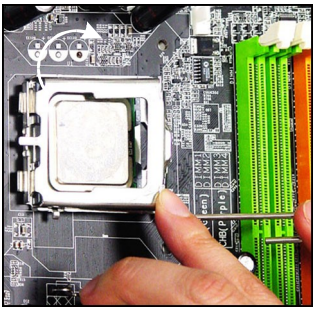
6. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Be sure to grasp on the edge of the CPU base. Note that the alignment keys are matched.



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.



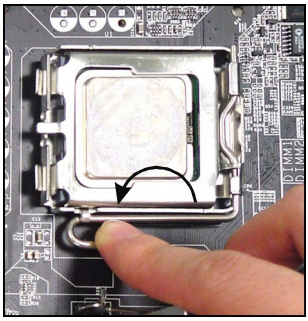
MSI Reminds You...

1. Confirm if your CPU cooler is firmly installed before turning on your system.

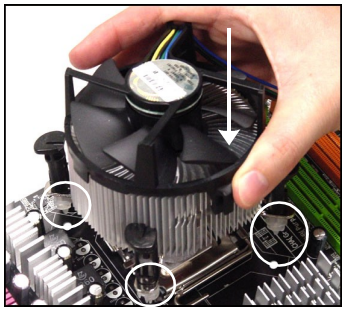
2. Do not touch the CPU socket pins to avoid damaging.

3. The availability of the CPU land side cover depends on your CPU packing.

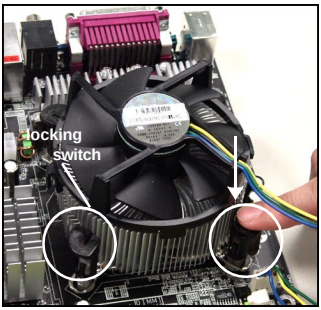
9. Press down the load lever lightly onto the load plate, and then secure the lever with the hook under retention tab.



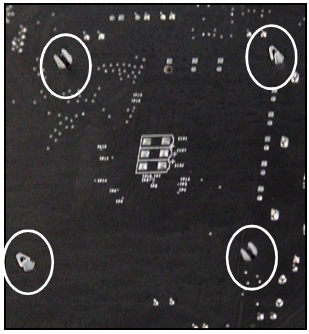
10. Align the holes on the mainboard with the heatsink. Push down the cooler until its four clips get wedged into the holes of the mainboard.



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.



MSI Reminds You...

1. *Check the information in **PC Health Status** 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.*
3. *Please note that the mating/unmating durability of the CPU is 20 cycles. Therefore we suggest you do not plug/unplug the CPU too often.*

Memory

The mainboard provides 2 slots for 240-pin DDR2 DIMM, which supports the memory size up to 2GB.

Since DDR2 modules are not interchangeable with DDR1 and the DDR2 standard is not backward compatible, you should always install DDR2 memory module in the DDR2 slot. Otherwise, you are not able to boot up your system and your mainboard might be damaged.

Introduction to DDR2 SDRAM

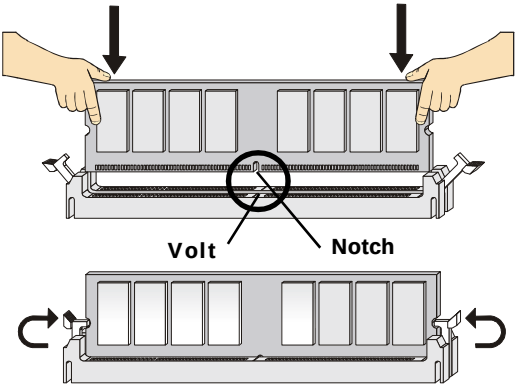
DDR2 is a new technology of memory module, and its speed is the top limit of current DDR1 technology. DDR2 uses a 1.8V supply for core and I/O voltage, compared to 2.5V for DDR1, and requires 28% less power than DDR1 chips. DDR2 truly is the future of memory, but will require some changes as the technology is not backwardly compatible and only motherboards specifically designed for DDR2 memory will be able to support these chips.

DDR2 incorporates new features at the chip level that give it better signal integrity, thereby enabling higher clock speeds.

DDR2 modules have 240 pins, versus 184 pins on a DDR1 module, and the length of DDR2 module is 5.25". DDR2 modules have smaller and tighter spaced pins. The height of DDR2 modules varies, but they will typically be less than 1.3" in height.

Installing DDR2 Modules

1. The DDR2 DIMM has only one notch on the center of module. The module will only fit in the right orientation.
2. Insert the DIMM memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the socket.
3. The plastic clip at each side of the DIMM slot will automatically close.



MSI Reminds You...

You can barely see the golden finger if the module is properly inserted in the socket.

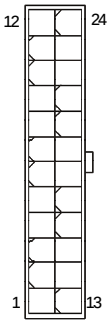
Power Supply

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

ATX 24-Pin Power Connector: CONN1

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.

ATX1



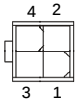
Pin Definition

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	NC	24	GND

ATX 12V Power Connector: JPW2

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

JPW2



JPW1 Pin Definition

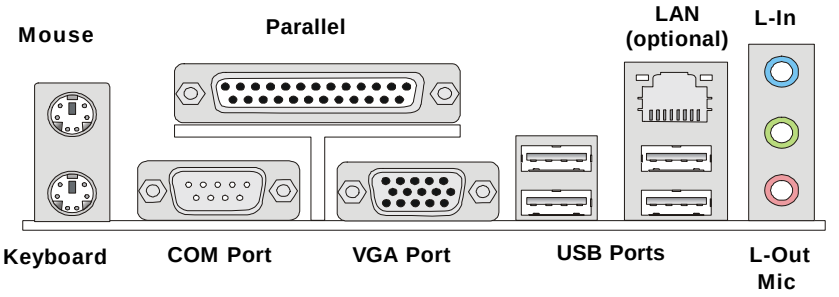
PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

MSI Reminds You...

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.*

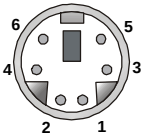
Back Panel

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:



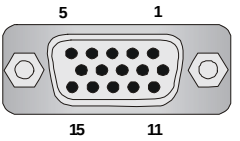
PS/2 Mouse / Keyboard (6-pin Female)

Pin Definition

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

VGA Connector

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

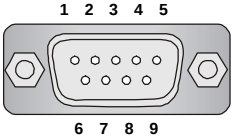


VGA Connector
(DB 15-pin)

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

Serial Port Connector

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



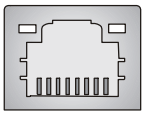
9-Pin Male DIN Connector

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

LAN (RJ-45) Jack (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 1000(8110SB), 100 or 10Mbps. You can connect a network cable to it.



RJ-45 LAN Jack

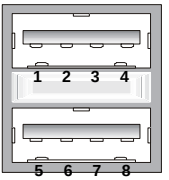
Pin Definition

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-

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.
		On	100 Mbit/sec data rate is selected.
	Orange	On	1000 Mbit/sec data rate is selected.

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.



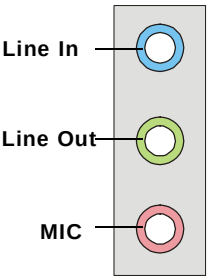
USB Ports

USB 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

Audio Port Connectors

These 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.

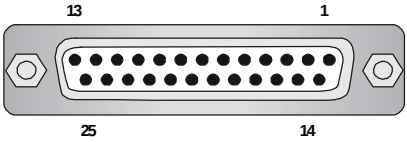


MSI Reminds You...

*For the advanced functions of the audio codec, please refer to **Chapter 4: Introduction to Realtek ALC655** 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

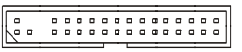
PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select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

Connectors

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

Floppy Disk Drive Connector: FDD1

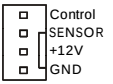
The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.



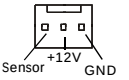
FDD1 (Black)

Fan Power Connectors: CPU_FAN1/ SYS_FAN1

The CPU_FAN1(processor fan) and SYS_FAN1 (system fan) 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.



CPU_FAN1



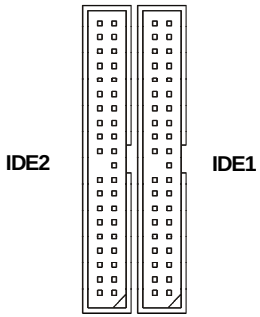
SYS_FAN1

MSI Reminds You...

1. *Always consult the vendors for proper CPU cooling fan.*
2. *CPU_FAN1 supports the fan control. Fan/heatsink with 3 or 4 fins are both available.*
3. *Please refer to the recommended CPU fans at Intel® official website.*

Hard Disk Connectors: IDE1, IDE2

The mainboard has one 32-bit Ultra DMA 66/100 IDE controller integrated in ICH6, which supports PIO & Bus Master operation modes and it can connect up to two Ultra ATA drives.



IDE1 (Primary IDE Connector)

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

IDE2 (Secondary IDE Connector)

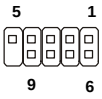
IDE2 can also connect a Master and a Slave drive.

MSI Reminds You...

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

Serial Port Header: COM2

The mainboard offers one 9-pin header as serial port. The port is a 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial mouse or other serial device directly to it.



COM2

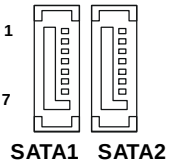
Pin Definition

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

Serial ATA: SATA1,SATA2

The SouthBridge of this mainboard supports two serial ATA connectors SATA1, SATA2.

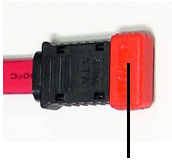
SATA1, SATA2 are dual high-speed Serial ATA interface ports. Each supports 1st generation serial ATA data rates of 150 MB/s. Both connectors are fully compliant with Serial ATA 1.0 specifications. Each Serial ATA connector can connect to 1 hard disk device.



SATA Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	TXP
3	TXN	4	GND
5	RXN	6	RXP
7	GND		

Serial ATA cable



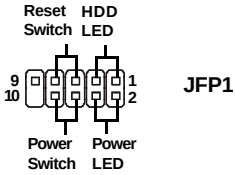
Take out the dust cover and connect to the hard disk devices

MSI Reminds You...

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

Front Panel Connectors: JFP1

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



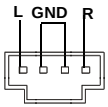
JFP1

JFP1 Pin Definition

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

CD-In, AUX_In Connector: CD_IN1

The connector is for CD-ROM and AUX audio connector.



CD_IN1

Front Panel Audio Connector: JAUDIO1

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.

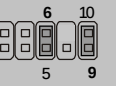
JAUD1

Pin Definition

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

MSI Reminds You...

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



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**.

JUSB1, JUSB2
(USB 2.0)

JUSB1 & JUSB2 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

MSI Reminds You...
Note that the pins of VCC and GND must be connected correctly, or itmay cause some damage.

IEEE 1394 Connectors (optional): 1394_J2/ 1394_J3

The mainboard provides two 1394 pin headers that allows you to connect IEEE 1394 ports via an external IEEE1394 bracket (optional).

1394_J2,1394_J3

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)

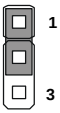
Jumpers

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

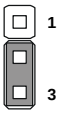
Clear CMOS Jumper: JBAT2

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 JBAT2 (Clear CMOS Jumper) to clear data. Follow the instructions below to clear the data:

JBAT2



Keep Data



Clear Data

MSI Reminds You...

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

BIOS Flash Jumper: JWP1

This jumper is used to lock or unlock the boot block area on BIOS. When unlocked, the BIOS boot block area can be updated. When locked, the BIOS boot block area cannot be updated.

BIOS Flash Locked

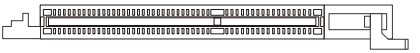
BIOS Flash Unlocked

Slots

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

AGP (Accelerated Graphics Port) Slot

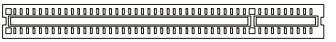
The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory. The slot supports 8x/4x AGP card.



AGP Slot

PCI (Peripheral Component Interconnect) Slots

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



PCI Slots

PCI Interrupt Request Routing

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

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

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 boot up, and requests you to run SETUP.
- You want to change the default settings for customized features.

MSI Reminds You...

1. The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.

2. While booting up, the BIOS version is shown in the 1st line appearing after the memory count. It is usually in the format:
example: A7222IMS 12.0 102305

where:

1st digit refers to BIOS maker as A=AMI(R); W=AWARD(R)
2nd - 5th digit refers to the model number.
6th digit refers to the chipset vendor.
7th-8th digit refers to the customer, MS=all standard customers.
V2.0 refers to the BIOS version.
10/23/05 refers to the date this BIOS is released.

Entering Setup

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

```
Press F1 to continue, DEL to enter SETUP
```

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

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+>	Increase the numeric value or make changes
<->	Decrease the numeric value or make changes
<F10>	Save and Exit Setup

Getting Help

After entering the Setup utility, the first screen you see is the Main Menu.

Main Menu

The main menu displays the setup categories the BIOS supplies. You can use the arrow keys (↑↓) to select the item. The on-line description for the selected setup category is displayed at the bottom of the screen.

Default Settings

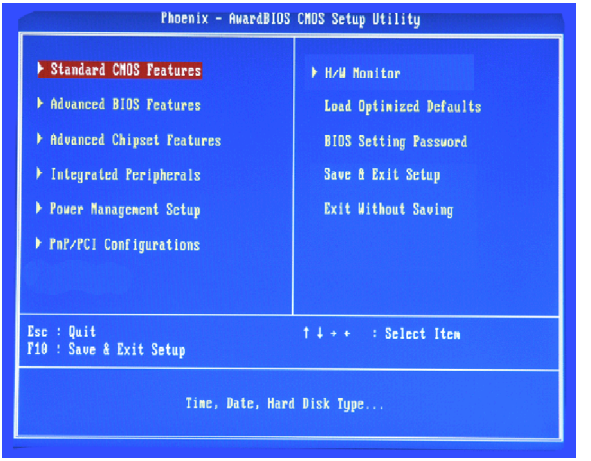
The preset Optimal Defaults of the BIOS setup program provide optimal performance settings for all devices and the system.

MSI Reminds You...

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.

The Main Menu

Once you enter BIOS 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.

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

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

Power Management Features
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.

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

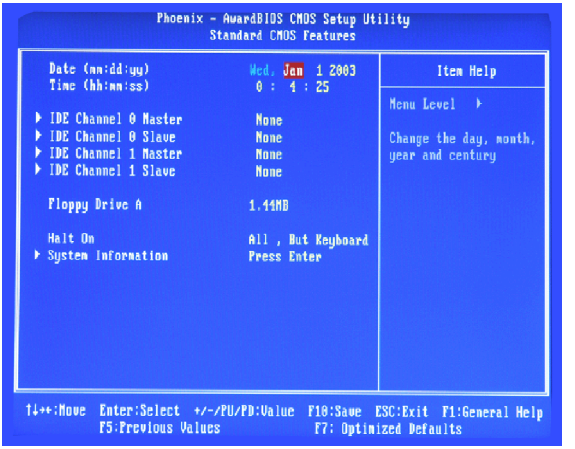
BIOS Setting Password
Use this menu to set the password for BIOS.

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 <+> or <-> 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 Channel 0/1 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:

Device

This item shows the information about the specified item. Read-only.

LBA/Large Mode

This item allows you to enable or disable the LBA (Logical Block Address, the logical block size in hard disk) mode. Setting options: [Auto], [Disabled].

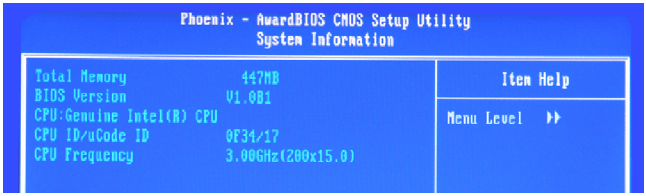
DMA Mode
This item allows you to enable or disable the DMA (Direct Memory Access) mode. Setting options: [Auto], [Disabled], [UDMA0], [UDMA1], [UDMA2], [UDMA3], [UDMA4], [UDMA5].

Floppy 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].

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

[No Errors]	The system doesn't stop for any detected error.
[All, But Keyboard]	The system doesn't stop for a keyboard error.

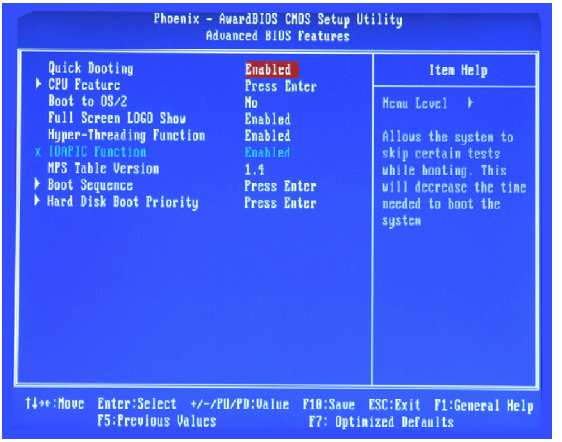
System Information
Press <Enter> to for the sub-menu of each item:



Total Memory/BIOS Version
This item shows the memory status and BIOS version of your system (read only).

****CPU Information****
Genuine Intel (R)/CPU ID/uCode ID/CPU Frequency
The three items show the CPU related information of your system (read only).

Advanced BIOS Features



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

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

Limit CPUID MaxVal:
The item allows you to enable/ 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.

Boot to OS/2
This allows you to run the OS/2® operating system with DRAM larger than 64MB. When you choose [No], you cannot run the OS/2® operating system with DRAM larger than 64MB. But it is possible if you choose [Yes].

Full Screen LOGO Show
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.

Hyper-Threading Function
The processor uses Hyper-Threading technology to increase transaction rates and reduces end-user response times. The technology treats the two cores inside the processor as two logical processors that can execute instructions simultaneously. In this way, the system performance is highly improved. If you disable the function, the processor will use only one core to execute the instructions. Setting options: [Enabled], [Disabled].

MSI Reminds You...

Enabling the functionality of Hyper-Threading Technology for your computer system requires ALL of the following platform Components:

* ***CPU:*** *An Intel® Pentium® 4 Processor with HT Technology;*
* ***Chipset:*** *An Intel® Chipset that supports HT Technology;*
* ***BIOS:*** *A BIOS that supports HT Technology and has it enabled;*
* ***OS:*** *An operating system that supports HT Technology.*

For more information on Hyper-threading Technology, go to:
www.intel.com/info/hyperthreading

IOAPIC Function

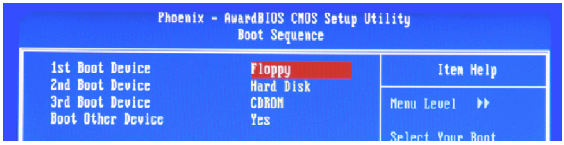
This field is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance with PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQ resources for the system. Settings: [Enabled], [Disabled].

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. Setting options: [1.4], [1.1].

Boot Sequence

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



1st/2nd/3rd Boot Device

These items allow you to set the sequence of boot devices where AMIBIOS attempts to load the operating system.

MSI Reminds You...

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

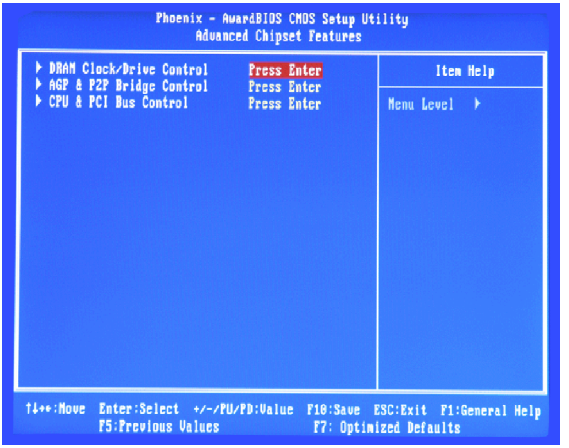
Boot From Other Devices

Setting the option to [Yes] allows the system to try to boot from other devices if the system fails to boot from the 1st/2nd/3rd boot device. Settings are: [Yes], [No].

Hard Disk Boot Priority

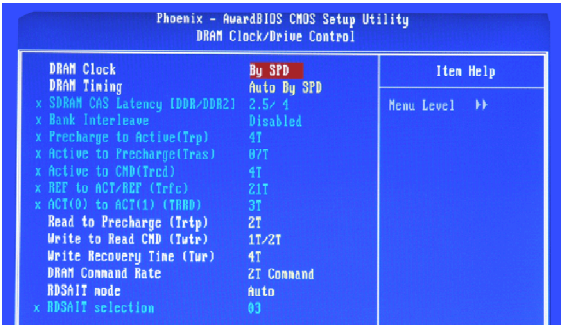
Press [Enter] to enter a sub menu which shows every current hard drive installed. Use [PageUp] or [PageDown] key to select the first boot hard disk.

Advanced Chipset Features



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

DRAM Clock/Drive Control
Press <Enter> and the following sub-menu appears.



DRAM Clock
Use this field to configure the clock frequency of the installed DRAM. Settings: *By SPD, DDR 266 [3:2], DDR 333 [6:5], DDR 400 [1:1], DDR 433, DDR 450, DDR 466, DDR 500, DDR 533.*

MSI Reminds You...
The value plus a ratio (CPU: DDR) with parentheses means the non-synchronous overclocking.

DRAM Timing
Selects whether DRAM timing is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to [Auto By SPD] enables the following fields automatically to be determined by BIOS based on the configurations on the SPD. Selecting [Manual] allows users to configure these fields manually.

SDRAM CAS Latency [DDR/DDR2]
This controls the timing delay (in clock cycles) before SDRAM starts a read command after receiving it. Settings: [1.5/ 2], [2/ 3], [2.5/ 4], [3/ 5] increases the system performance the most while [3/ 5] provides the most stable performance.

Bank Interleave
This field selects 2-bank, 4-bank or 8-bank interleave for the installed SDRAM. Disable the function if 16MB SDRAM is installed.

Precharge to Active (Trp)
This setting controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Setting options: [2T], [3T], [4T], [5T].

Active to Precharge (Tras)
This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Available settings: [05T]~ [20T].

Active to CMD (Trcd)
When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance. Settings: [2T], [3T], [4T], [5T].

REF to ACT / REF to REF (Trfc)
This setting determines the time RFC takes to read from and write to a memory cell. Setting options: [08T]~ [71T].

ACT(0) to ACT(1) (TRRD)
This field specifies The Row to Row delay of different banks.Setting options: [2T], [3T], [4T], [5T].

Read to Precharge (Trtp)
This item controls the internal Read to Precharge command delay. Setting options: [2T], [3T].

Write to Read CMD (Twtr)
This item controls the internal Write to Read Command Delay. Setting options: [1T/2T], [2T/3T].

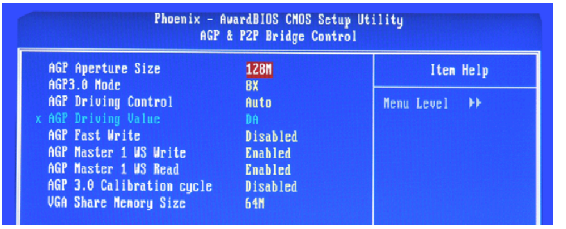
Write Recovery Time (Twr)
This function specifies the amount of delay (in clock cycles) that must elapse after the completion of a valid write operation, before an active bank can be precharged. This delay is required to guarantee that data in the write buffers can be written to the memory cells before precharge occurs. Setting options: [2T], [3T], [4T], [5T].

DRAM Command Rate
This setting controls the DRAM command rate. Select [1T Command] allows DRAM singlal controller to run at 1T (T=clock cycles) rate. Select [2T Command] makes DRAM siganl controller run at 2T rate. [1T] is faster than [2T]. Setting options: [1T Command], [2T Command].

RDSAIT mode
This setting controls the DQS Input Capture Range for channel A. Setting options: [Auto], [Manual].

RDSAIT Selection
This setting allows you to adjust the RDSAIT value.

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



AGP Aperture Size
This setting controls just how much system RAM can be allocated to AGP for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. Setting options: [32M], [64M], [128M], [256M], [512M] and [1G].

AGP 3.0 Mode
The item sets an appropriate mode for the installed AGP 3.0 card. Selects [8x] only if your AGP 3.0 card supports it. Setting options: [8x], [4x].

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

AGP Driving Value
This item specifies an AGP driving force.

AGP Fast Write
The item enables or disables the AGP Fast Write feature. The Fast Write technology allows CPU to write directly into the graphics controller without passing anything through system memory and improves 8x speed accordingly. Select [Auto] only when your AGP card supports the feature. Options: [Disabled], [Auto].

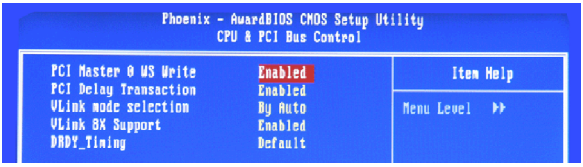
AGP Master 1 W/S Write
When [Enabled] is selected, writeing to the AGP bus are executed with one wait state inserted. Setting options: [Enabled], [Disabled].

AGP Master 1 W/S Read
When [Enabled] is selected, one wait state is inserted in the AGP read cycle. Setting options: [Enabled], [Disabled].

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

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

VGA Share Memory Size
Press <Enter> and the following sub-menu appears.



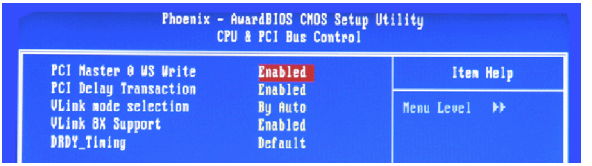
PCI Master 0 WS Write
When [Enabled], writes to the PCI bus are executed with zero wait states. Setting options: [Enabled], [Disabled].

PCI Delay Transaction
The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select [Enabled] to support compliance with PCI specification version 2.1.

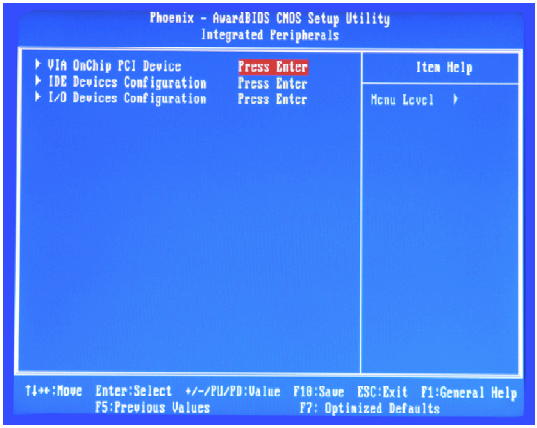
VLink mode selection
This item lets you choose the speed mode between the North Bridge & South Bridge. Setting options: [By Auto], [Mode 0], [Mode 1].

VLink 8X Supported
This item enables or disables the 8X VLink Data Rate. Setting options: [Enabled], [Disabled].

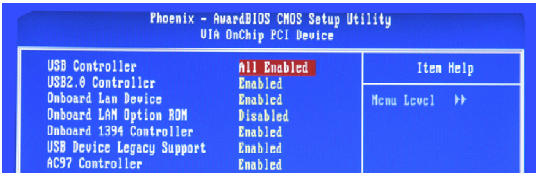
DRDY_Timing
This item allows you to set the DRDY timing. Setting options: [Slowest], [Default], [Optimize].



Integrated Peripherals



VIA OnChip PCI Device
Press <Enter> and the following sub-menu appears.



USB Controller
This setting is used to enable/disable the onboard USB host controller. Setting options: [Disabled], [Enabled].

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. Set to [Disabled] only if you want to use any USB device other than the USB mouse. Setting options: [Disabled], [Enabled], [Auto].

Onboard LAN Controller
The item enables or disables the onboard LAN controller. Setting options: [Enabled], [Disabled].

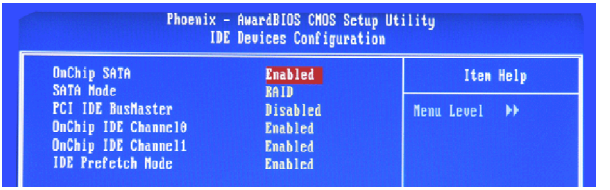
Onboard LAN Option ROM
The item enables or disables the initialization of the onboard LAN Boot ROMs during bootup. Selecting [Disabled] will speed up the boot process. Setting options: [Enabled], [Disabled].

Onboard 1394 Controller
The item enables or disables the onboard IEEE1394 controller. Setting options: [Enabled], [Disabled].

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

Onboard AC97 Controller
This item is used to enable or disable the onboard Audio controller. Selecting [Enabled] allows the mainboard to enable the onboard Audio controller. Disable the function if you want to use other controller cards to connect an audio device. Setting options: [Disabled], [Enabled].

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



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

SATA Mode
This feature allows users to enable or disable the RAID function for each SATA hard disk drive. The settings are: [RAID], [IDE].

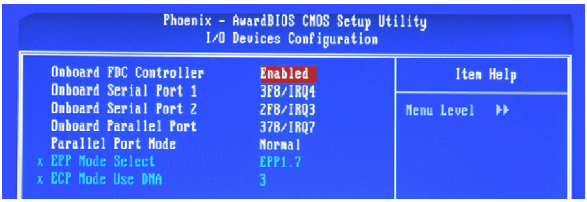
PCI IDE BusMaster
Set this option to [Enabled] to specify that the IDE controller on the PCI local bus has bus mastering capability. Settings options: [Disabled], [Enabled].

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

IDE Prefetch Mode
The onboard IDE drive interfaces support IDE prefetching, for faster drive accesses. When you install a primary and/or secondary add-in IDE interface, set this option to [Disabled] if the interface does not support prefetching. The settings are: [Enabled], [Disabled].

I/O Devices Configuration

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



Onboard FDC Controller

Select [Enabled] if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. Setting options: [Enabled], [Disabled].

Onboard Serial Port 1/2

This item specifies the base I/O port addresses of the onboard Serial Port 1/2. Selecting [Disabled] allows AMIBIOS to automatically determine the correct base I/O port address. Setting options: [3F8/IRQ4], [2F8/IRQ3], [3E8/IRQ4], [2E8/IRQ3] and [Disabled].

Onboard Parallel Port

This field specifies the base I/O port address of the onboard parallel port. Selecting [Auto] allows AMIBIOS to automatically determine the correct base I/O port address. Setting options: [378], [278], [3BC] and [Disabled].

Parallel Port Mode

This item selects the operation mode for the onboard parallel port. Setting options: [ECP], [Normal] or [Bi-Directional].

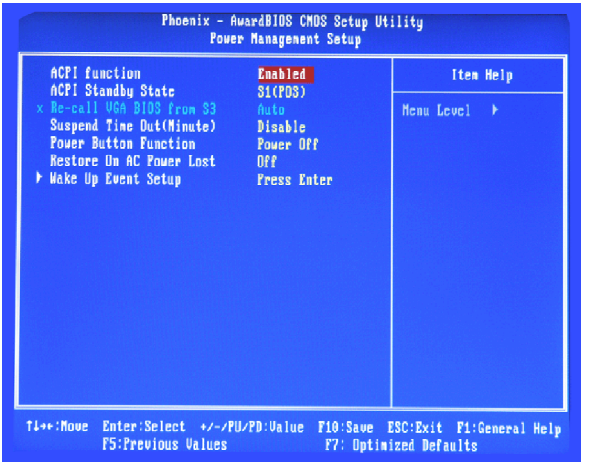
EPP Mode Select

The onboard parallel port is EPP Spec. compliant, so after the user chooses the onboard parallel port with the EPP function, the following message will be displayed on the screen: “EPP Mode Select.” At this time either [EPP 1.7] spec or [EPP 1.9] spec can be chosen.

ECP Mode Use DMA

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

Power Management Features



MSI Reminds You...

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]. Setting options: [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, Windows 2000 and Windows XP, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field. Options are:

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

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

Re-Call VGA BIOS from S3

Selecting [Enabled] allows BIOS to call VGA BIOS to initialize the VGA card when system wakes up (resumes) from S3 sleep state. The system resume time is shortened when you disable the function, but system will need an AGP driver to initialize the VGA card. Therefore, if the AGP driver of the card does not support the initialization feature, the display may work abnormally or not function after resuming from S3.

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], [4], [8], [10], [20], [30], [40], [50], [60].

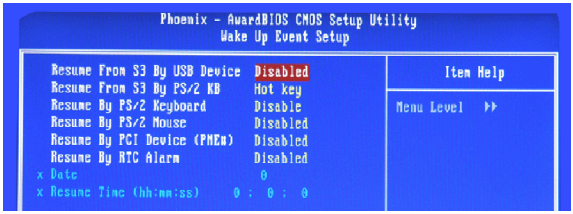
Power Button Function
This feature allows users to configure the Power Button function. Setting options are:

[On/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:

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

Wake Up Event Setup
Press <Enter> and the following sub-menu 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. Setting options: [Disabled], [Enabled].

Resume From S3 By PS/2 KB
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. Setting options: [Password], [Hot Key].

Resume By PS/2 Keyboard
This setting only works *Resume From S3 By PS/2 KB* is set to [Hot Key]. This setting specifies how the system will be awakened from power saving mode when input signal of the keyboard is detected. Setting options: [Disable], [Ctrl+F1], [Ctrl+F2], [Ctrl+F3], [Ctrl+F4], [Ctrl+F5], [Ctrl+F6], [Ctrl+F7], [Ctrl+F8], [Ctrl+F9], [Ctrl+F10], [Ctrl+F11], [Ctrl+F12], [Power], [Wake], [Any Key].

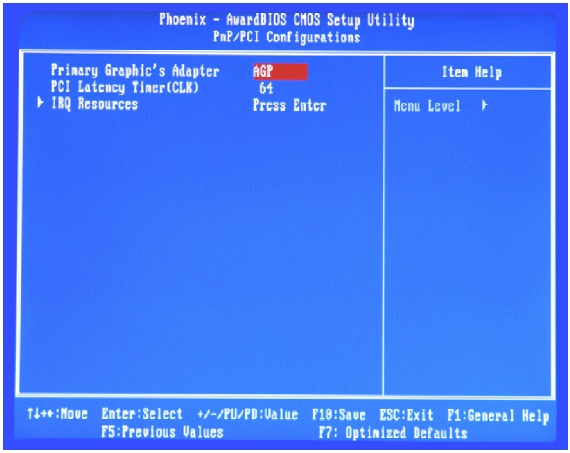
Resume From S3 By PS/2 Mouse
This setting only works *Resume From S3 By PS/2 KB* is set to [Hot Key]. This setting determines whether the system will be awakened from what power saving modes when input signal of the PS/2 mouse is detected. Setting options: [Disabled], [Enabled].

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). Setting options: [Disabled], [Enabled].

Resume On 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].

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 VGA card is your primary graphics adapter. Setting options are:

[AGP] The system initializes the installed AGP card first. If an AGP card is not available, it will initialize the PCI VGA or Internal VGA card.

[PCI] The system initializes the installed PCI VGA card first. If a PCI VGA card is not available, it will initialize the AGP or Internal VGA card.

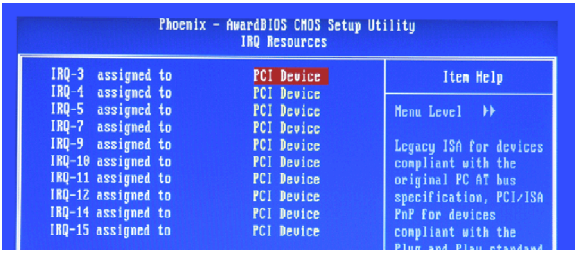
[Internal] The system initializes the installed Internal VGA card first. If a Internal VGA card is not available, it will initialize the AGP or PCI VGA card.

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. Setting options: [0]~ [255].

IRQ Resource Setup

Press <Enter> and the following sub-menu 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. Setting options: [Reserved] and [Available].

H/W Monitor

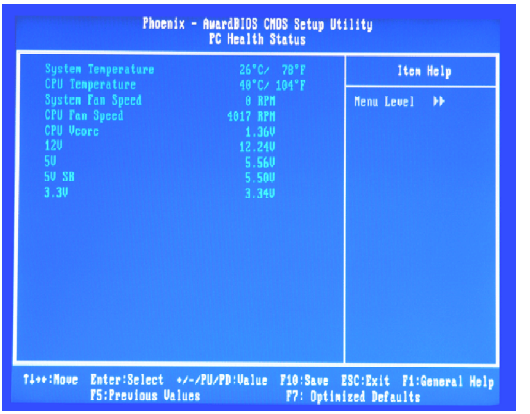
This section shows the status of your CPU, fan, overall system status, etc. Monitor function is available only if there is hardware monitoring mechanism onboard.

CPU Shutdown Temperature
If the CPU temperature reaches the upper limit preset in this setting, the system will be shut down automatically. This helps you to prevent the CPU overheating problem. This item is available only when your OS supports this function, such as Windows ME/XP. Setting options: [80°C/176°C], [85°C/185°C], [90°C/194°C], [Disabled].

CPU Smart Fan Temperature
When the current temperature of the CPU fan reaches the value you specify here, the CPU fan will speed up for cooling down to avoid the CPU damage; on the contrary, if the CPU fan current temperature is lower than the specified value, the CPU fan will slow down its speed to keep the temperature stable.

CPU Temperature Tolerance (°C)
Setting the tolerance from 1 to 5.

PC Health Status
Press <Enter> and the following sub-menu appears.

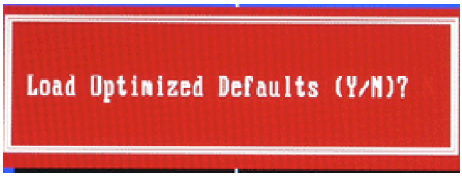


CPU/System Temperature, CPU/System FAN Speed, CPU Vcore, 12V, 5V, 5V SB, 3.3V
These items display the current status of all of the monitored hardware devices/ components such as CPU voltages, temperatures and all fans' speeds.

Load Optimized Defaults

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

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



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:

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.

Introduction to Realtek ALC655

The motherboard is equipped with Realtek ALC655 chip, which provides support for 6-channel audio output, including 2 Front, 2 Rear, 1 Center and 1 Subwoofer channel. ALC655 allows the board to attach 4 or 6 speakers for better surround sound effect. The section will tell you how to install and use 4-/6-channel audio function on the board.

Installing the Audio Driver

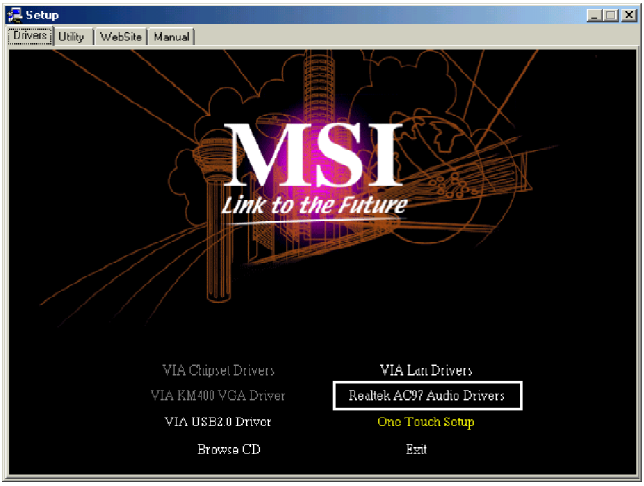
You need to install the driver for Realtek ALC655 chip to function properly before you can get access to 4-/6-channel audio operations. Follow the procedures described below to install the drivers for different operating systems.

Installation for Windows 98SE/ME/2000/XP

For Windows® 2000, you must install Windows® 2000 Service Pack2 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.

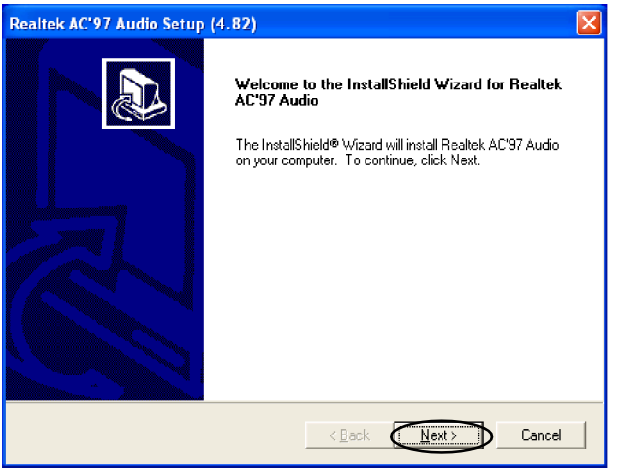
1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear. (***Please note the screen below might be different depending on the different mainboard you purchased.)***
2. Click **Realtek AC97 Audio Drivers**.



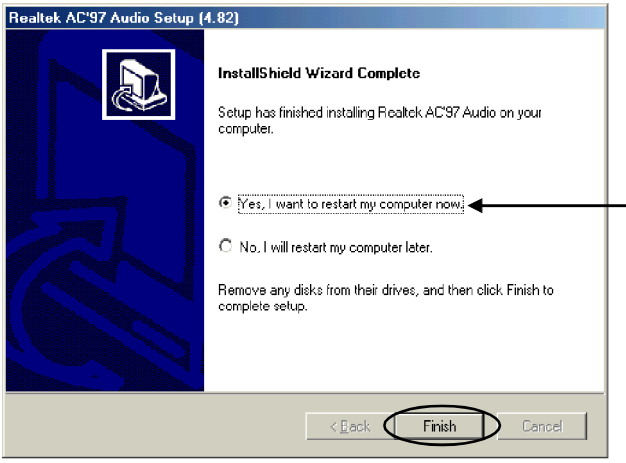
MSI Reminds You...

*The **AC97 Audio Configuration** software utility is under continuous update to enhance audio applications. Hence, the program screens shown here in this appendix may be slightly different from the latest software utility and shall be held for reference only.*

3. Click **Next** to start installing files into the system.



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



Using 4- or 6-Channel Audio Function

After installing the audio driver, you are able to use the 4-/6-channel audio feature now. To enable 4- or 6-channel audio operation, first connect 4 or 6 speakers to the appropriate audio connectors, and then select 4- or 6-channel audio setting in the software utility.

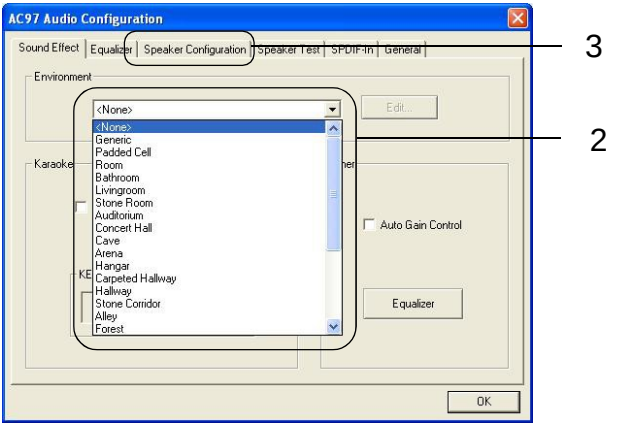
Using the Back Panel

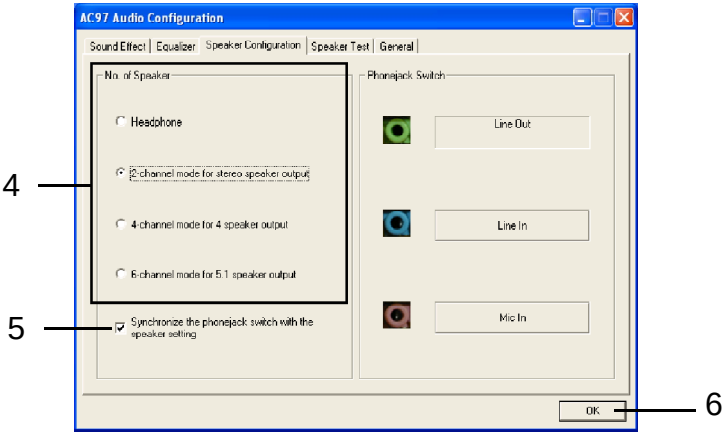
In addition to a default 2-channel analog audio output function, the audio connectors on the Back Panel also provide 4- or 6-channel analog audio output function if a proper setting is made in the software utility.

Read the following steps to have the Multi-Channel Audio Function properly set in the software utility, and have your speakers correctly connected to the Back Panel.

Configuration in the Software Utility

1. Click the audio icon  from the window tray at the lower-right corner of the screen.
2. Select a desired surround sound effect from the “Environment” drop-down menu.
3. Click the **Speaker Configuration** tab.
4. Select **Synchronize the phonejack switch with the settings**.
5. Select a desired multi-channel operation from **No. of Speakers**.
   a. Headphone
   b. 2-Channel Mode for Stereo-Speaker Output
   c. 4-Channel Mode for 4-Speaker Output
   d. 6-Channel Mode for 5.1-Speaker Output
6. Click **OK** to close this window.


AC97 Audio Configuration
Sound Effect
Equalizer
Speaker Configuration
Speaker Test
SPDIF-In
General
Environment
<None>
Edit...
Karaoke
Generic
Padded Cell
Room
Bathroom
Livingroom
Stone Room
Auditorium
Concert Hall
Cave
Arena
Hangar
Carpeted Hallway
Hallway
Stone Corridor
Alley
Forest
Auto Gain Control
Equalizer
OK
3
2


AC97 Audio Configuration
Sound Effect
Equalizer
Speaker Configuration
Speaker Test
General
No. of Speaker
Headphone
2-channel mode for stereo speaker output
4-channel mode for 4 speaker output
6-channel mode for 5.1 speaker output
Synchronize the phonejack switch with the speaker setting
Phonejack Switch
Line Out
Line In
Mic In
OK
4
5
6

Connecting the Speakers

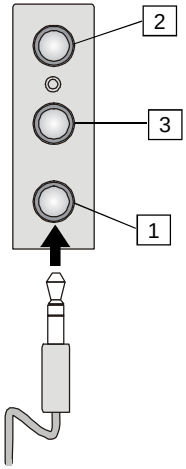
When you have set the Multi-Channel Audio Function mode properly in the software utility, connect your speakers to the correct phone jacks in accordance with the setting in software utility.

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 MIC
2 Line In
3 Line Out *(Front channels)*

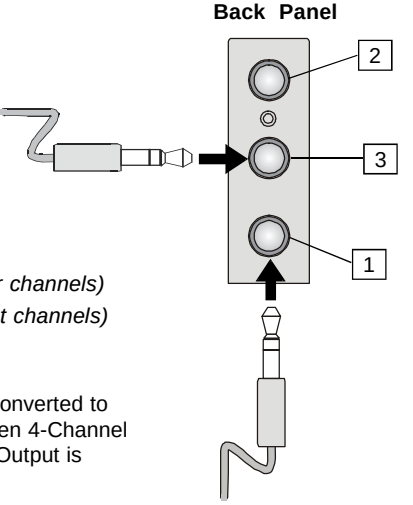
Back Panel



n 4-Channel Mode for 4-Speaker Output

The audio jacks on the back panel always provide 2-channel analog audio output function, however these audio jacks can be transformed to 4- or 6-channel analog audio jacks by selecting the corresponding multi-channel operation from **No. of Speakers**.

Refer to the following diagram and caption for the function of each jack on the back panel when 4-Channel Mode is selected.

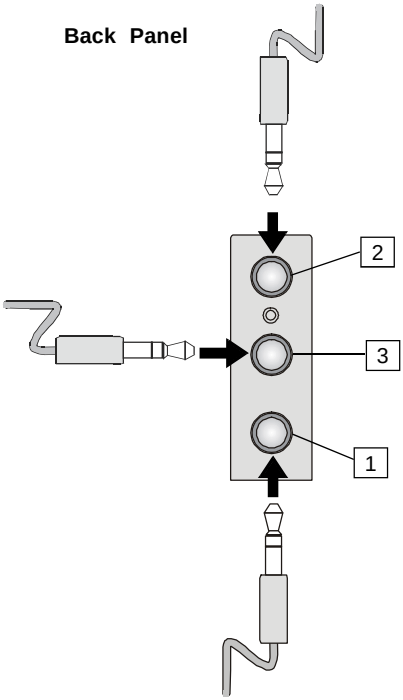


1 MIC
2 * Line Out *(Rear channels)*
3 Line Out *(Front channels)*

* Line In function is converted to Line Out function when 4-Channel Mode for 4-Speaker Output is selected.

n 6-Channel Mode for 6-Speaker Output

Refer to the following diagram and caption for the function of each jack on the back panel when 6-Channel Mode is selected.



1 Line Out *(Center and Subwoofer channel)*

2* Line Out *(Rear channels)*

3* Line Out *(Front channels)*

* Both Line In and MIC function are converted to Line Out function when 4-Channel Mode for 6-Speaker Output is selected.

MSI Reminds You...

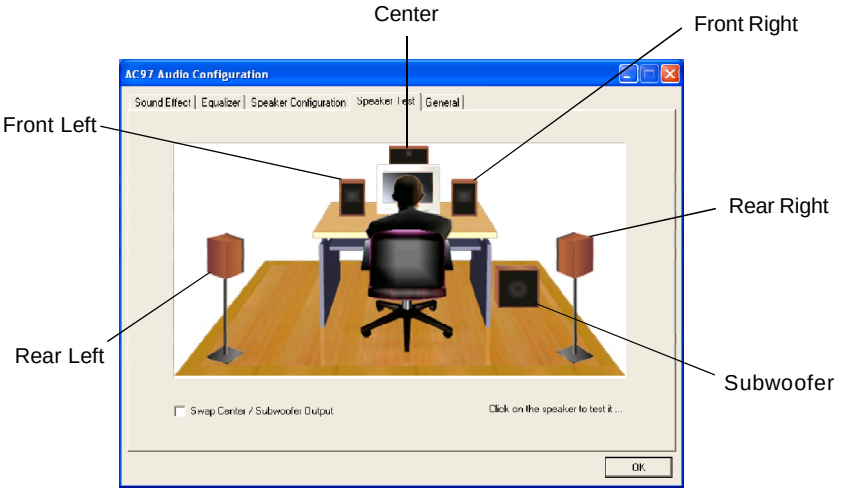
If the Center and Subwoofer speaker exchange their audio channels when you play video or music on the computer, a converter may be required to exchange center and subwoofer audio signals. You can purchase the converter from a speaker store.

Testing the Connected Speakers

To ensure that 4- or 6-channel audio operation works properly, you may need to test each connected speaker to make sure every speaker work properly. 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.

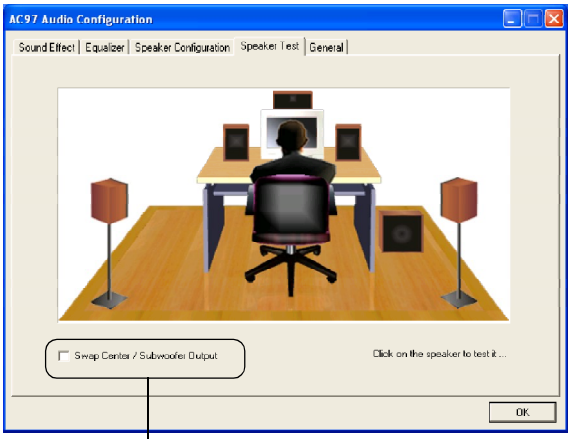
Testing Each Speaker

1. Click the audio icon from the window tray at the lower-right corner of the screen.
2. Click the **Speaker Test** tab.
3. The following window appears. Select the speaker which you want to test by clicking it.



MSI Reminds You...
6 speakers appear on the “Speaker Test” window only when you select “6-Channel Mode” in the “No. of Speakers” column. If you select “4-Channel Mode”, only 4 speakers appear on the window.

4. While you are testing the speakers in 6-Channel Mode, if the sound coming from the center speaker and subwoofer is swapped, you should select **Swap Center/ Subwoofer Output** to readjust these two channels**.**



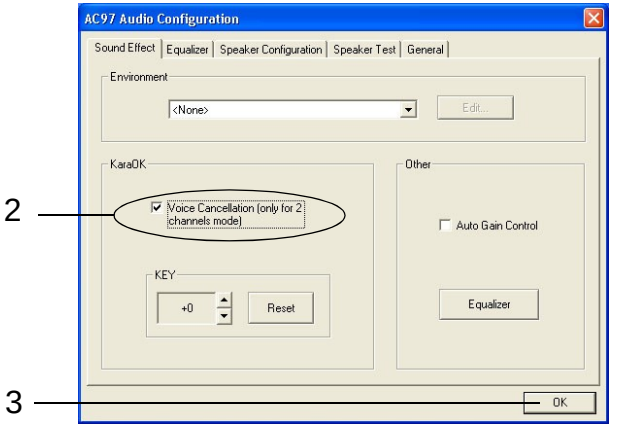
Select this function

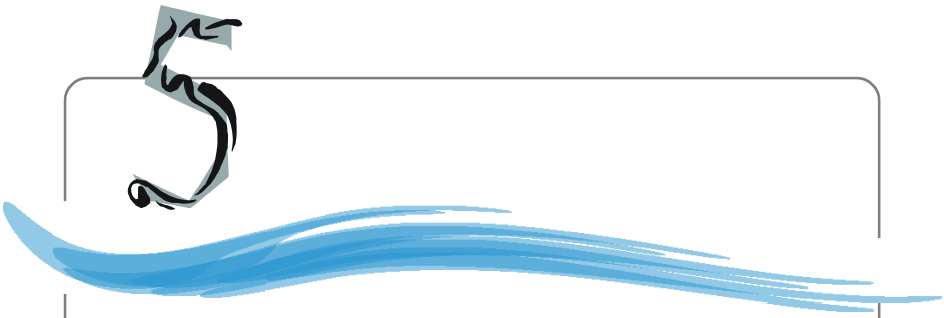
Playing KaraOK

The KaraOK function will automatically remove human voice (lyrics) and leave melody for you to sing the song. Note that this function applies only for 2-channel audio operation.

Playing KaraOK

1. Click the audio icon from the window tray at the lower-right corner of the screen.
2. In the Sound Effect tab, select **Voice Cancellation** under "KaraOK."
3. Click **OK** to close this window.





VIA VT8237R/ VT8237R Plus SATA RAID Introduction

The Southbridge VT8237R/ VT8237R Plus provides a hybrid solution that combines two independent SATA ports for support of up to two Serial ATA (Serial ATA RAID) drives.
Serial ATA (SATA) is the latest generation of the ATA interface. SATA hard drives deliver blistering transfer speeds of up to 150MB/sec. Serial ATA uses long, thin cables, making it easier to connect your drive and improving the airflow inside your PC.

The key features of VT8237R/ VT8237R Plus SATA RAID are:

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

Introduction

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

RAID Basics

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

Hard disk drives can be combined together through a few different methods. The different methods are referred to as different RAID levels. Different RAID levels represent different performance levels, security levels and implementation costs. The RAID levels which the VIA VT8237R/Plus SATA RAID Host Controller supports are RAID 0 and RAID 1. The table below briefly introduced these RAID levels.

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

RAID 0 (Striping)

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

RAID 1 (Mirroring)

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

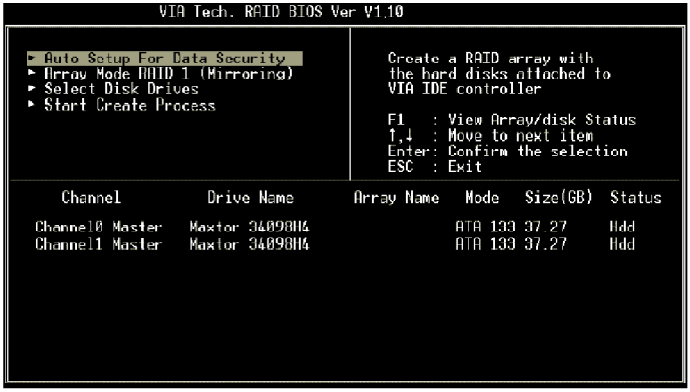
BIOS Configuration

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

The Serial ATA RAID volume may be configured using the VIA Tech. RAID BIOS. Always use the arrow keys to navigate the main menu, use up and down arrow key to select the each item and press <Enter> to call out the list of creation steps. The main screen of BIOS configuration utility is as below:

Create Disk Array

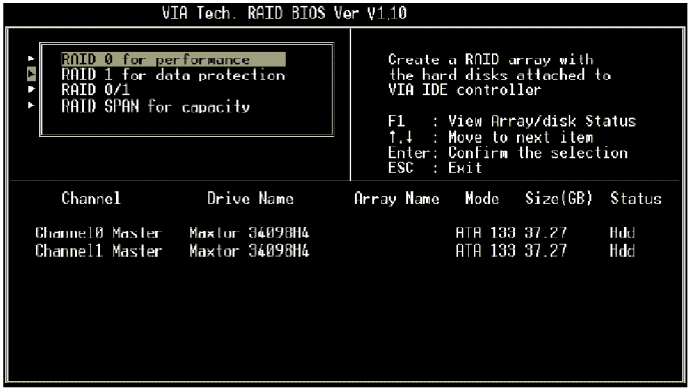
Use the up and down arrow keys to select the **Create Array** command and press <Enter>.



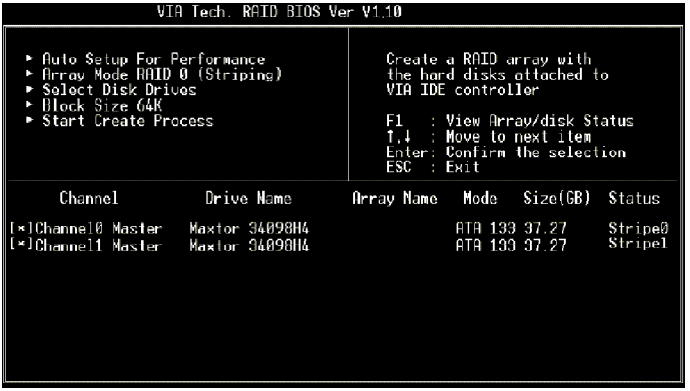
MSI Reminds You...

The "Channel", "Drive Name", "Mode" and "Size (GB)" in the following example might be different from your system.

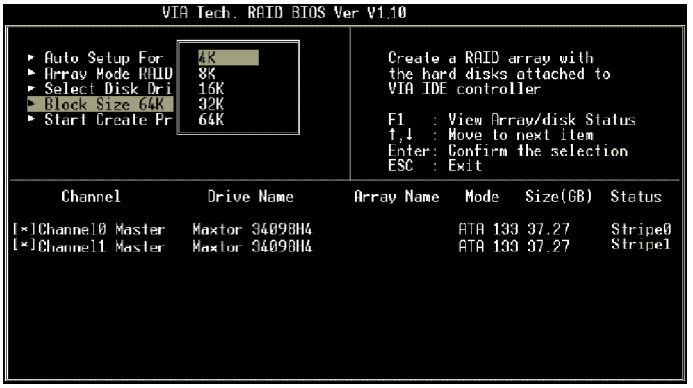
Select **Array Mode** and press <Enter>, a list of array modes will appear. Highlight the target array mode that you want to create, and press <Enter> to confirm the selection. If RAID 1 is selected, an option list will popup and enable the users to select **Create only** or **Create and duplicate**.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



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



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



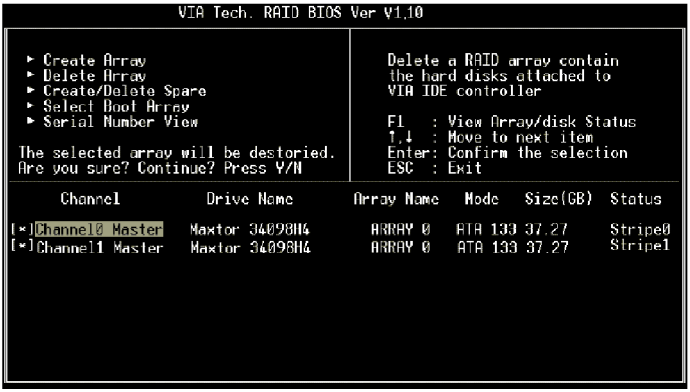
MSI Reminds You...
Even though 64KB is the recommended setting for most users, you should choose the block size value which is best suited to your specific RAID usage model.
***4KB**: For specialized usage models requiring 4KB blocks*
***8KB**: For specialized usage models requiring 8KB blocks*
***16KB**: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

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

Delete Disk Array

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

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



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

Create and Delete Spare Hard Drive

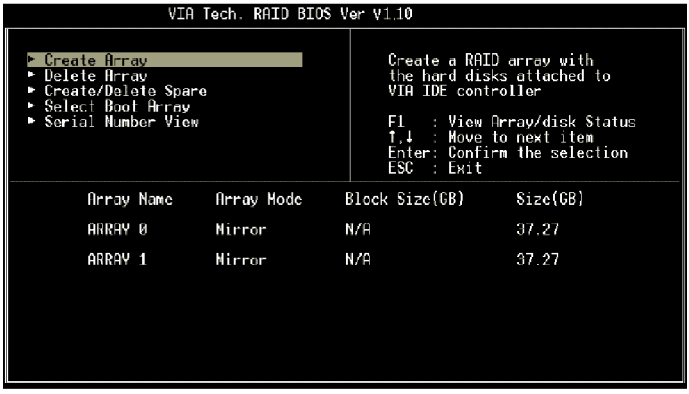
If a RAID 1 array is created and there are drives that do not belong to other arrays, the one that has a capacity which is equal to or greater than the array capacity can be selected as a spare drive for the RAID 1 array. Select **Create/Delete Spare** and press <Enter>, the channel column will then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

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

View Serial Number of Hard Drive

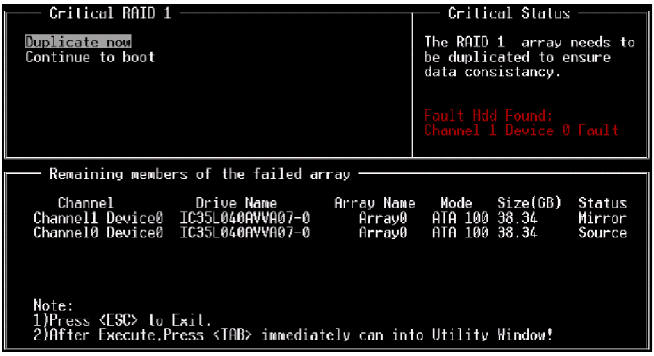
Highlight **Serial Number View** and press <Enter>. Use arrow key to select a drive, the selected drive's serial number can be viewed in the last column. The serial number is assigned by the disk drive manufacturer.

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



Duplicate Critical RAID 1 Array

When booting up the system, BIOS will detect if the RAID 1 array has any inconsistencies between user data and backup data. If BIOS detects any inconsistencies, the status of the disk array will be marked as critical, and BIOS will prompt the user to duplicate the RAID 1 in order to ensure the backup data consistency with the user data.



If user selects **Continue to boot,** it will enable duplicating the array after booting into OS.

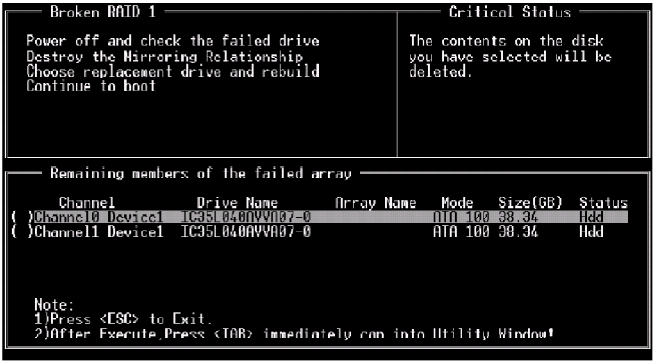
Rebuild Broken RAID 1 Array

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

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

If BIOS detects a broken RAID 1 array but there is no spare hard drive available for rebuilding the array, BIOS will provide several operations to solve such problem.

1. Power off and Check the Failed Drive:
This item turns off the computer and replaces the failed hard drive with a good one. If your computer does not support APM, you must turn off your computer manually. After replacing the hard drive, boot into BIOS and select **Choose replacement drive and rebuild** to rebuild the broken array.
2. Destroy the Mirroring Relationship:
This item cancels the data mirroring relationship of the broken array. For broken RAID 1 arrays, the data on the surviving disk will remain after the destroy operation. However, **Destroy the Mirroring Relationship** is not recommend because the data on the remaining disk will be lost when the hard drive is used to create another RAID 1 array.
3. Choose Replacement Drive and Rebuild:
This item enables users to select an already-connected hard drive to rebuild the broken array. After choosing a hard drive, the channel column will be activated.



Highlight the target hard drive and press <Enter>, a warning message will appear. Press **Y** to use that hard drive to rebuild, or press **N** to cancel. Please note selecting option **Y** will destroy all the data on the selected hard drive.
4. Continue to boot:
This item enables BIOS to skip the problem and continue booting into OS.

Installing RAID Software & Drivers

Install Driver in Windows OS

† **New Windows OS (2000/XP/NT4) Installation**

The following details the installation of the drivers while installing Windows XP.

1. Start the installation:

Boot from the CD-ROM. Press **F6** when the message "Press F6 if you need to install third party SCSI or RAID driver" appears.

2. When the Windows Setup window is generated, press **S** to specify an Additional Device(s).

3. Insert the driver diskette ***VIA VT8237R Disk Driver*** into drive A: and press <Enter>.

MSI Reminds You...

Please follow the instruction below to make a VIA Serial ATA RAID driver for yourself.

1. *Insert the MSI CD into the CD-ROM drive.*
2. *Ignore the Setup screen and use "Explorer" to browse the CD.*
3. *Copy all the contents (including the sub-folders) in the **\\IDE\VIA\Floppy** to a fomatted floppy disk.*
4. *The driver disk for VIA Serial ATA driver is done.*

4. Depending on your operation system, choose ***VIA RAID Controller (Windows XP)***, ***VIA RAID Controller(Windows 2000)*** or ***VIA RAID Controller (Windows NT4)*** from the list that appears on Windows XP Setup screen, press the <Enter> key.

5. Press <Enter> to continue with installation or if you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, press <Enter> to continue with installation.

6. From the Windows XP Setup screen, press the <Enter> key. Setup will now load all device files and then continue the Windows XP installation

† **Existing Windows XP Driver Installation**

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

† **Confirming Windows XP Driver Installation**

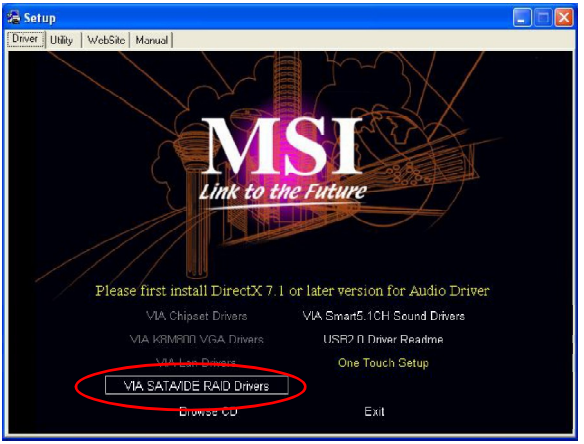
1. From Windows XP, open the **Control Panel** from **My Computer** followed by the System icon.
2. Choose the **Hardware** tab, then click the **Device Manager** tab.
3. Click the "**+**" in front of the **SCSI and RAID Controllers** hardware type. The driver ***VIA SATA RAID Controller*** should appear.

Installation of VIA SATA RAID Drvier and Utility

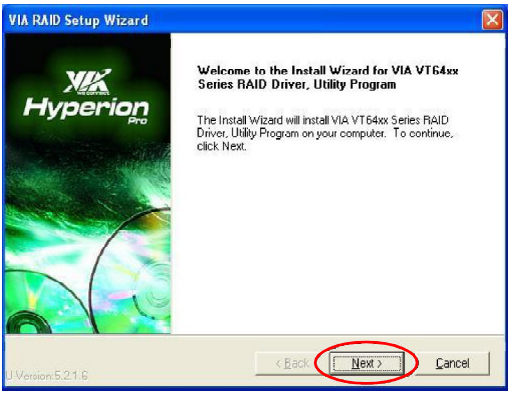
The VIA SATA RAID Driver is the software package that enables high-performance RAID 0 arrays in the Windows* XP operating system. This version of VIA SATA RAID Driver contains the following key features:

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

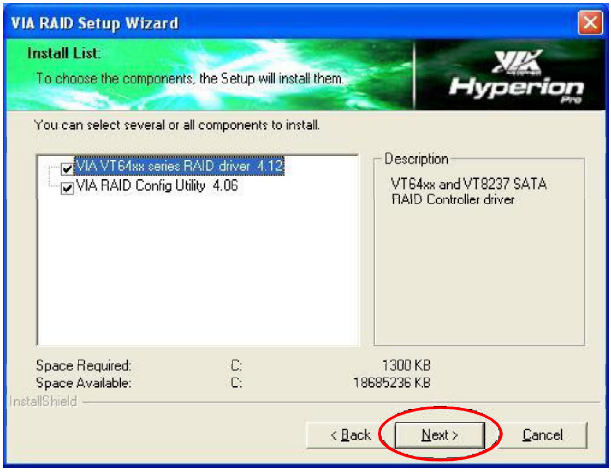
Insert the MSI CD and click on the **VIA SATA/IDE RAID Drivers** to install the software.



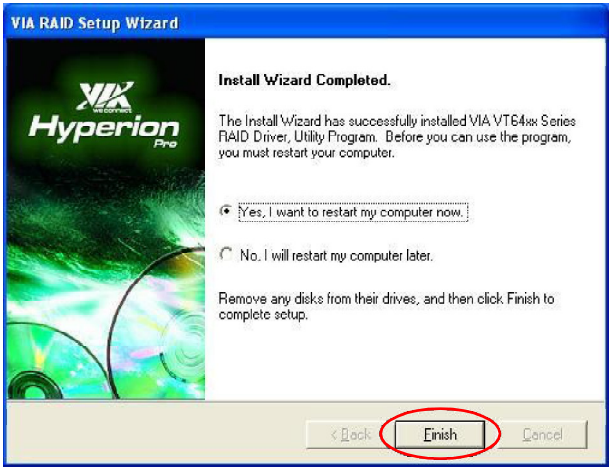
The **InstallShield Wizard** will begin automatically for installation. Click on the **Next** button to proceed the installation in the welcoming window.



Put a check mark in the check box to install the feature you want. Then click **Next** button to proceed the installation.

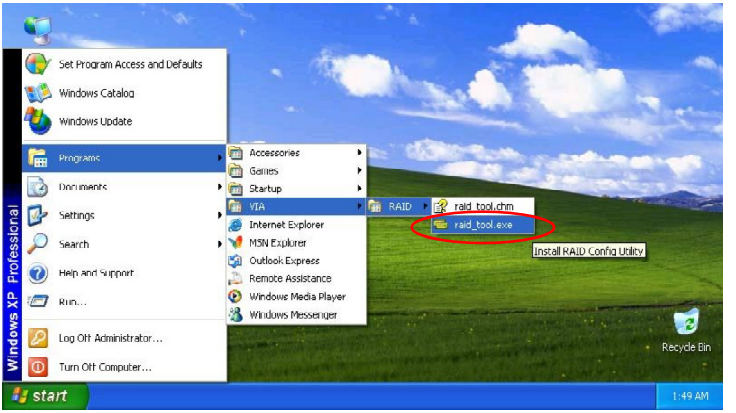


Finally, click “Finish” to complete the installation.



Using VIA RAID Tool

Once the installation is complete, go to **Start** ---> **Programs** --->**VIA** ---> **RAID** ---> **raid_tool.exe** to enable **VIA RAID Tool**.



After the software is finished installation, it will automatically started every time Windows is initiated. You may double-click on the icon shown in the system tray of the tool bar to launch the **VIA RAID Tool** utility.

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

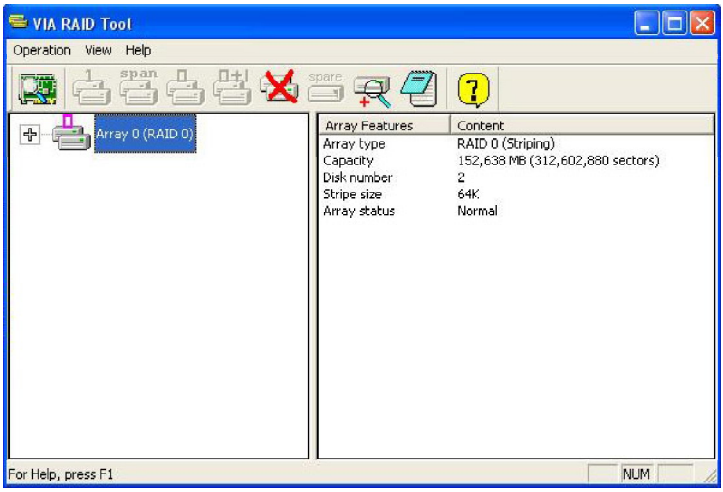
View by Controller

View by Devices

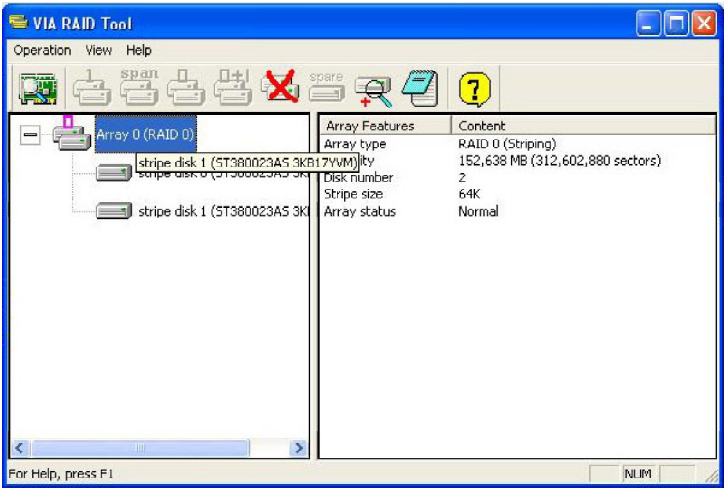
View Event log

Help Topics

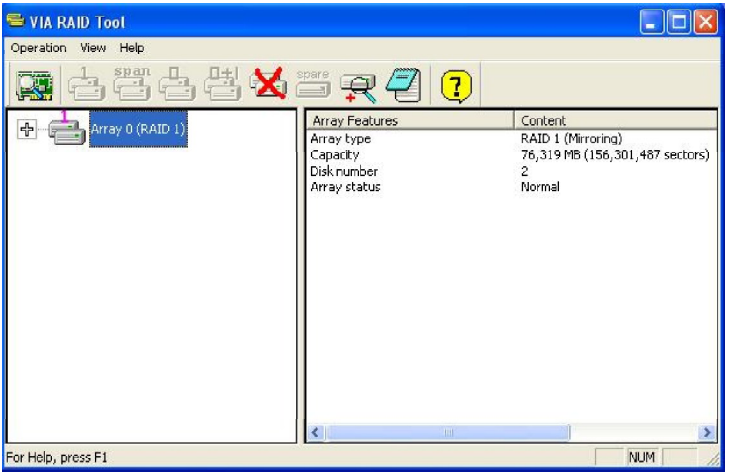
Click on  o r  button to determine the viewing type of left window pane. There are two viewing types: By controllers and by device. Click on the object in the left window pane to display the status of the object in the right windowpane. The following screen shows the status of Array 0---RAID 0.



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



You may also use the same  o r  button to view the statuses of Array 0---RAID 1.



Click on the plus (+) symbol next to Array 0---RAID 1 to see the details of each disk.