

P7N SLI Series

MS-7380 (v1.X) Mainboard



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Revision History

Revision	Revision History	Date
V1.1	First release for P7N SLI	March 2008

Technical Support

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

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

Safety Instructions

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



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



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



廢電池請回收

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

FCC-B Radio Frequency Interference Statement

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



15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the measures listed below.

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

Notice 1

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

Notice 2

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

VOIR LANOTICE D'INSTALLATIONAVANT DE RACCORDER AU RESEAU.



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

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

WEEE (Waste Electrical and Electronic Equipment) Statement



ENGLISH

To protect the global environment and as an environmentalist, MSI would 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 Erfüllung und Schutz unserer Umwelt

Laut der Richtlinie 2002/96/EG über Elektro- und Elektronik-Abfälle dürfen Elektro- und Elektronik-Abfälle nicht mehr als kommunale Abfälle entsorgt werden. MSI hat europaweit verschiedene Sammel- und Recyclingunternehmen beauftragt, die in die Europäische Union in Verkauf geförderter Produkte, am Ende ihres Lebenszyklus zurückzunehmen. Bitte entsorgen Sie dieses Produkt zum gegebenen Zeitpunkt ausschließlich an einer lokalen Abgabestelle in Ihrer Nähe.

FRANÇAIS

Pour protéger l'environnement et afin de protéger l'environnement, MSI tient à rappeler que...

Au sujet de la directive européenne (EU) relative aux déchets des équipements électriques et électroniques, directive 2002/96/CE, prenant effet le 13 août 2005, que les produits électriques et électroniques ne peuvent être éliminés 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 придерживается принципов экологически чистой и безопасной продукции, поэтому напоминаем вам, что...

В соответствии с директивой Европейского Сообщества (ЕС) по отходу электрических и электронных изделий (директива 2002/96/ЕС), вступающей в силу 13 августа 2005 года, изделия, относящиеся к категории электрических и электронных изделий, не могут быть просто выброшены в мусорный бак или отправлены на свалку. Производители таких изделий будут обязаны осуществлять прием изделий в конце их жизненного цикла. MSI будет соблюдать данное требование по отходу продукции, выходящей из категории MSI на территории ЕС, и предоставлять информацию о местах приема, для этого вы можете обратиться к местным пунктам приема.

ESPAÑOL

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

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 "electrónica y equipos electrónicos" no pueden ser depositados en los contenedores habituales de su municipio. Las fabricantes de equipos electrónicos, están obligadas a hacerse cargo de dichos productos al término de su período de vida. MSI estará comprometida con las tareas de recogida de sus productos vendidos en la Unión Europea al final de su período de vida. Usted debe depositar estos productos en el punto limpio establecido por el ayuntamiento de su localidad o entregarlos a una empresa autorizada para la recogida de estos residuos.

NEDERLANDS

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

De Richtlijn van de Europese Unie (EU) met betrekking tot de afwijzing van Elektrische en Elektronische producten (2002/96/EC), die op 13 Augustus 2005 in zal gaan, waarna alles meer beschouwd worden als vervuiling.

Fabrikanten van dit soort producten worden verplicht om producten terug te nemen van het eind van hun levenscyclus. MSI zal overeenkomstig de richtlijn handelen voor de producten die de merknaam MSI dragen en vertactis zijn in de EU. Deze goederen kunnen gerecycled worden op lokale verzamelpunten.

SRPSKI

Ile bi zaštititi prirodu sredstva i kao proizvode koje se odlažu na lokalni i regionalni reciklaži. MSI mora da vas podseti da...

Pre Direktivi Evropske unije ("EU") o odlaženju električnog i elektroničkog opreme, izdatima 2002/96/EU, koja stupa na snagu od 13. Avgusta 2005. proizvođači koji "prodaju pod "elektronička i elektronička oprema" na svom i/ili bilo gde na teritoriji EU, obaveštavaju i prate odnose u zajednici i/ili u inostranstvu da imaju odgovarajuće proizvode na kraju njihovog očekivanog veka trajanja. MSI će poštovati zakon o preuzimanju ovakvih proizvoda kojima je iskao vek trajanja, koji imaju MSI oznaku i koji su predati u EU. Ove proizvode možete vratiti na lokalnim mestima za prikupljanje.

POLSKI

Aby chronić naszą przyrodę i jakoś odłożyć odpady elektroniczne, MSI przypomina, że...

Zgodnie z Dyrektywą Unii Europejskiej ("UE") dotyczącą odpadów elektrycznych i elektronicznych (dyrektywa 2002/96/EC), która wejdzie 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 odzyskania ich w momencie gdy produkt jest wycofywany z użycia. MSI wypełni wymagania UE, przyjmując produkty (oprócz tych po terminie Unii Europejskiej) wycofywane i użyte. Produkty MSI będąc w stanie do recyklingu w miejscach zbierających.

TÜRKÇE

Çevresel Dalgaları İçeren MSİ Adıyalla Gevreyi Karı Makaleli Kurulum:

Avrupa Birliği (AB) Kararnameyi Elektrik ve Elektronik Malzeme Anlatı, 2002/96/EC Kararnameyi altında 13 Ağustos 2005 tarihinden itibaren geçerli olacak üzere, elektrikli ve elektronik malzemeler diğer anlatımla gürültüye uydurularak ve bu elektrikli cihazların üreticileri, cihazların kullanım süreleri bittikten sonra düzenli geri toplandırmaya yükümlü olacaktır. Avrupa Birliği'ne sadece MSİ markalı ürünlerin kullanım süreleri bittikten sonra MSİ kurulumları geri alınması için ilk yıldığı için, bu konuda Türk kurulumları için toplama kuruluşlarına bırakabilirsiniz.

ČESKY

Zdejší nápis sebeand životnímu prostředí, společností MSİ upozornit je...

Podle směrnice Evropské unie (EU) o likvidaci elektrických a elektronických výrobků 2002/96/EC (datá od 13. srpna 2005) je zakázáno likvidovat "elektronické a elektronické výrobky" v běžném komunálním odpadu a výrobci elektrických výrobků a lidí, kteří toto výrobky s dluhu, budou poskytnout MSİ kabele výrobky opět poskytnout jejich životnosti. Společnost MSİ splní požadavky na likvidaci výrobků značky MSİ, produčovaných v zemích EU, po skončení jejich životnosti. Tyto výrobky můžete získávat v místních obřadech.

MAGYAR

Annak érdekében, hogy elnyújtandó megvaljít, illetve elnyújtandó módon felépít az MSİ emelkedés Önt, hogy...

Az Európai Unió (EU) 2005. augusztus 13-án hatályba lépett, az elutasítás és elektronikus berendezések hulladékaitól 2002/96/EC irányelve szerinti az elektronikus és elektronikus termékekkel, többé nem használhatok feladatokat hallgatok. Ez az ilyen elektronikus berendezések, például használó által az ilyen termékek visszaételtre azok hasznos életkorának végéig. Az MSİ betartja a termékvisszavételre képesítés követelményeket az MSİ markájéval az EU-n belül értékesített termékek esetében, azok életkorának végén. Az ilyen termékekkel elnyújtandó megvaljít, illetve elnyújtandó módon felépít az MSİ emelkedés Önt.

ITALIANO

Per proteggere l'ambiente, MSİ, da sempre, dedica della natura, l'azienda che...

In base alla Direttiva dell'Unione Europea (EU) sulle Smaltimento dei Materiali Elettrici ed Elettronici, (Direttiva 2002/96/CE) 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 questi materiali saranno obbligati a mettere ogni prodotto alla fine del suo ciclo di vita. MSİ si impegna a fare l'ordine richiesto tutti i prodotti marchiati MSİ che sono stati venduti all'interno dell'Unione Europea alla fine del loro ciclo di vita. È possibile portare i prodotti nel più vicino punto di raccolta.

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Chapter 1

Getting Started

Thank you for choosing the P7N SLI Series (MS-7380 v1.X) ATX mainboard. The P7N SLI Series mainboards are based on **nVidia® nForce750i SLI & nForce430i** chipsets for optimal system efficiency. Designed to fit the advanced **Intel® Core 2 Extreme, Core 2 Quad, Core 2 Duo, Pentium dual-core and Celeron** processor, the P7N SLI Series deliver a high performance and professional desktop platform solution.

Mainboard Specifications

Processor Support

- Intel® Core 2 Extreme, Core 2 Quad, Core 2 Duo, Pentium dual-core and Celeron in the LGA775 package
- Supports Intel® EIST Technology
- Supports Intel® Hyper-Threading (HT) Technology
(For the latest information about CPU, please visit <http://global.msi.com.tw/index.php?func=cpuform>)

Supported FSB

- 1333/ 1066/ 800/ 533 MHz

Chipset

- North Bridge: nVidia® nForce 750i SLI (C72P)
- South Bridge: nVidia® nForce 430i (MCP51)

Memory Support

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

LAN

- Supports 10/100/1000 Fast Ethernet by Realtek® RTL8211BL

IEEE 1394 (optional)

- Chip integrated by VIA VT 6308P
- Transfer rate is up to 400Mbps

Audio

- Chip integrated by Realtek ALC888
- Up to 7.1 Channel audio-out
- Compliant with Azalia 1.0 Spec

IDE

- 2 IDE ports by nForce 430i
- Supports Ultra DMA 66/100/133 mode and PIO, Bus Master operation mode
- Supports up to 4 IDE devices

SATA

- 4 SATAII ports by nForce 430i
- Supports transfer rate up to 3 Gb/s

RAID

- 4 SATA ports support RAID 0/ 1/ 0+1/ 5 or JBOD mode

Floppy

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

Connectors

● **Back panel**

- 1 PS/2 mouse port
- 1 PS/2 keyboard port
- 1 IEEE 1394 port (optional)
- 1 Optical SPDIF-Out port
- 1 Clear CMOS button
- 4 USB 2.0 ports
- 1 LAN jack
- 6 flexible audio jacks

● **On-Board Pinheaders**

- 1 Chassis Intrusion pinheader
- 2 USB 2.0 pinheaders
- 1 IEEE 1394 pinheader (optional)
- 1 SPDIF-out pinheader
- 1 CD-in connector
- 1 front panel audio pinheader
- 1 TPM Module pinheader (optional)
- 1 COM Port pinheader (optional)

Slots

- 3 PCI Express x16 slots
 - a. the mazarine PCI Express x 16 slot (PCI_E1) supports up to PCI Express 2.0 x16
 - b. two blue PCI Express x16 slots, each one supports up to PCIE 2.0 x8
 - c. supports SLI technology
- 2 PCI slots, support 3.3V/ 5V PCI bus Interface

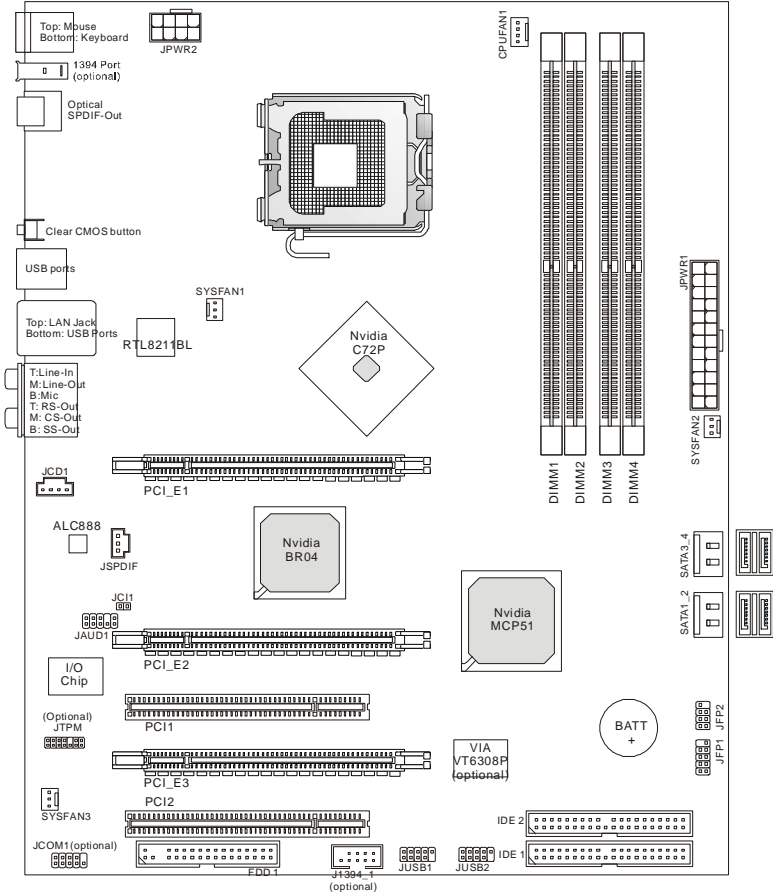
Form Factor

- ATX (30.4 cm X 24.5 cm)

Mounting

- 9 mounting holes

Mainboard Layout

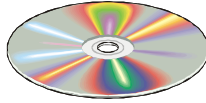


**P7N SLI Series
(MS-7380 v1.X) ATX Mainboard**

Packing Checklist



MSI motherboard



MSI Driver/Utility CD



SLI Video Link Card



Power Cable



SATA Cable



IDE Cable



User's Guide



Back IO Shield

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

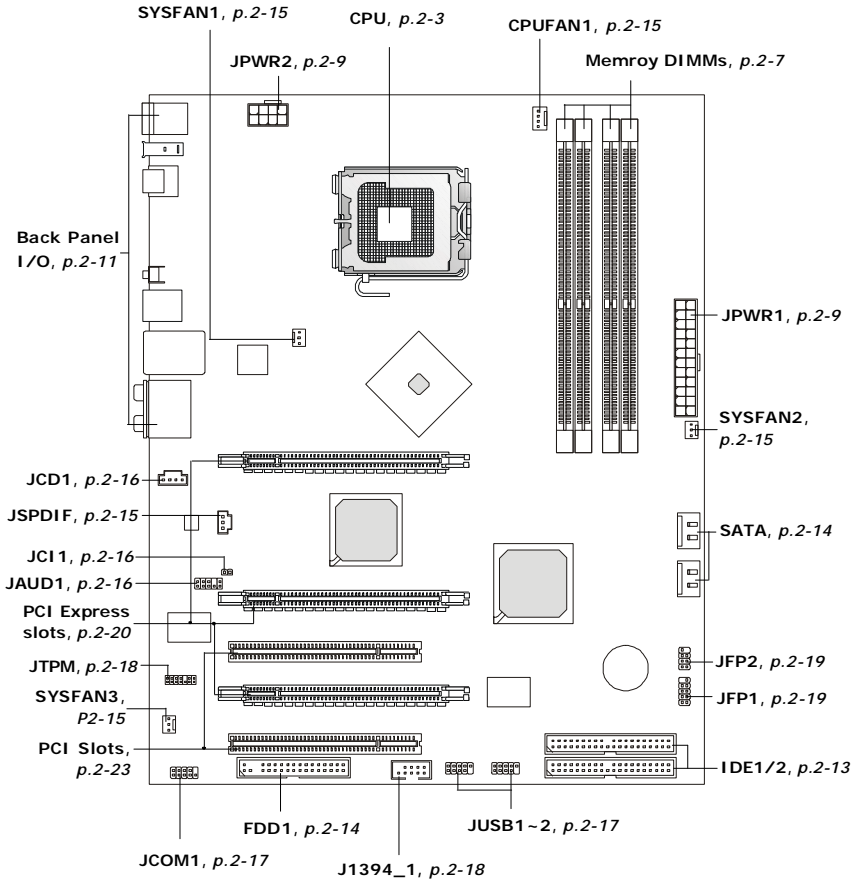
Chapter 2

Hardware Setup

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

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

Quick Components Guide



CPU (Central Processing Unit)

This mainboard supports Intel® processor in LGA 775 package. When you are installing the CPU, **make sure to install the cooler to prevent overheating**. If you do not have the CPU cooler, consult your dealer before turning on the computer. For the latest information about CPU, please visit <http://global.msi.com.tw/index.php?func=cpuform>



Important

Overheating

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

Replacing the CPU

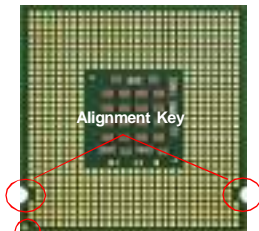
While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from the grounded outlet first to ensure the safety of CPU.

Overclocking

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

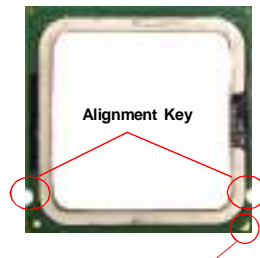
Introduction to LGA 775 CPU

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 thermal paste on it for better heat dispersion.

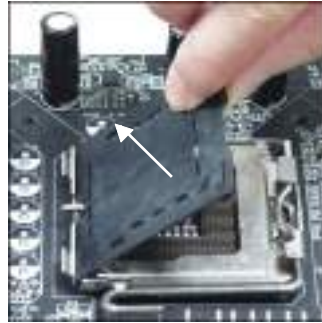


Yellow triangle is the Pin 1 indicator

CPU & Cooler Installation

When you are installing the CPU, **make sure the CPU has a cooler attached on the top to prevent overheating.** Meanwhile, do not forget to apply some thermal paste 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.



Important

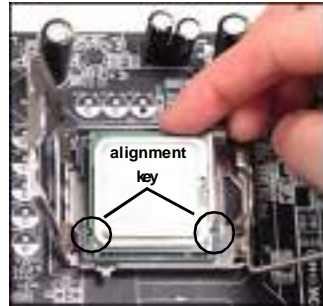
1. Confirm if your CPU cooler is firmly installed before turning on your system.
2. Do not touch the CPU socket pins to avoid damaging.
3. The availability of the CPU land side cover depends on your CPU packing.

Hardware Setup

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.

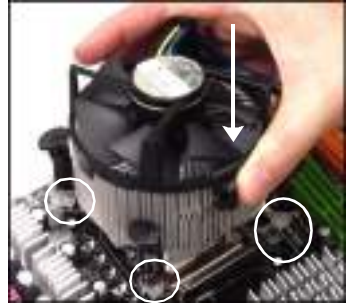


MS-7380 Mainboard

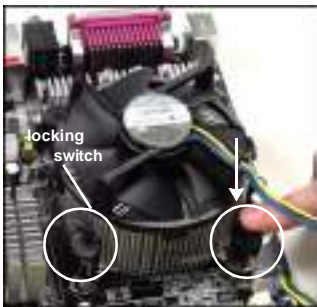
9. Press down the load lever lightly onto the load plate, and then secure the lever with the hook under retention tab.



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



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



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



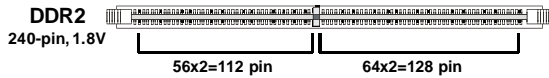
Important

1. Read the CPU status in BIOS (Chapter 3).
2. Whenever CPU is not installed, always protect your CPU socket pin with the plastic cap covered (shown in Figure 1) to avoid damaging.
3. Mainboard photos shown in this section are for demonstration of the CPU/cooler installation only. The appearance of your mainboard may vary depending on the model you purchase.

Memory

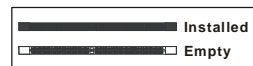
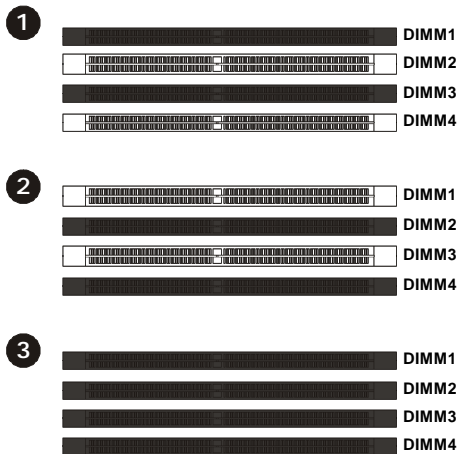
These DIMM slots are used for installing memory modules.

For more information on compatible components, please visit <http://global.msi.com.tw/index.php?func=testreport>



Dual-Channel Memory Population Rules

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



Installing Memory Modules

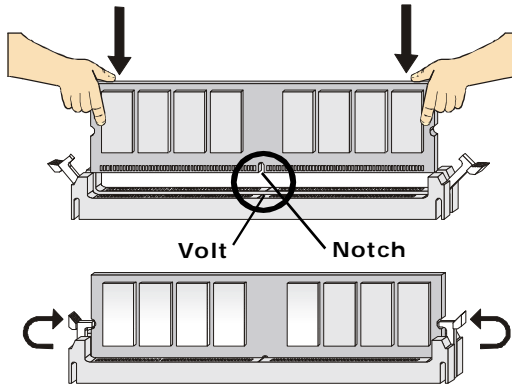
1. The memory module has only one notch on the center and will only fit in the right orientation.
2. Insert the memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the DIMM slot.



Important

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

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



Important

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

Power Supply

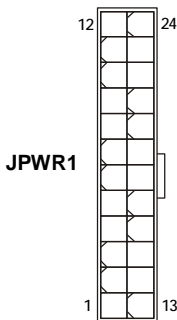
ATX 24-Pin Power Connector: JPWR1

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

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



Pin Definition

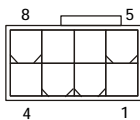


PIN	SIGNAL	PIN	SIGNAL
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS-ON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWR OK	20	Res
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

ATX 8-Pin Power Connector: JPWR2

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

JPWR2



Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V
4	GND	8	+12V



Important

1. Make sure that all the connectors are connected to proper ATX power supplies to ensure stable operation of the mainboard.
2. Power supply of 450 watts (and above) is highly recommended for system stability.

Important Notification about Power Issue

NForce chipset is very sensitive to ESD (Electrostatic Discharge), therefore this issue mostly happens while the users intensively swap memory modules under S5 (power-off) states, and the power code is plugged while installing modules. Due to several pins are very sensitive to ESD, so this kind of memory-replacement actions might cause system chipset unable to boot. Please follow the following solution to avoid this situation.

Unplug the AC power cable (shown in figure 1) or unplug the power connectors (shown in figure 2 & figure 3) before the 1st installation or during system upgrade procedure.



Figure 1:
Unplug the AC power cable



Figure 2:
Unplug the power connector

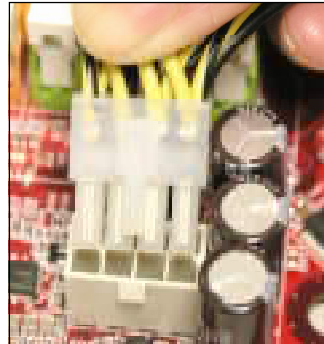
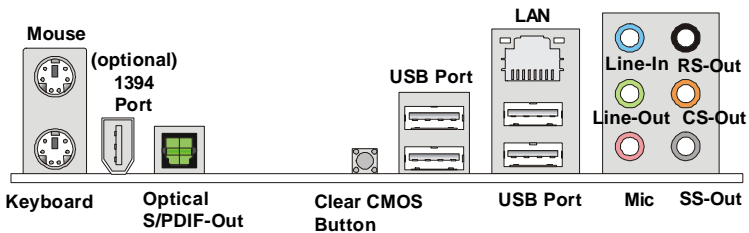


Figure 3:
Unplug the power connectors

Back Panel



► Mouse/Keyboard

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

► 1394 Port (optional)

The IEEE1394 port on the back panel provides connection to IEEE1394 devices.

► Optical S/PDIF-Out

This SPDIF (Sony & Philips Digital Interconnect Format) connector is provided for digital audio transmission to external speakers through an optical fiber cable.

► Clear CMOS Button

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 button to clear data. Press the button to clear the data.



Important

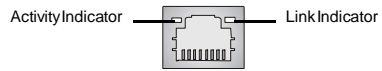
Make sure that you power off the system before clearing CMOS data.

► USB Port

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

► LAN

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



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

► Audio Ports

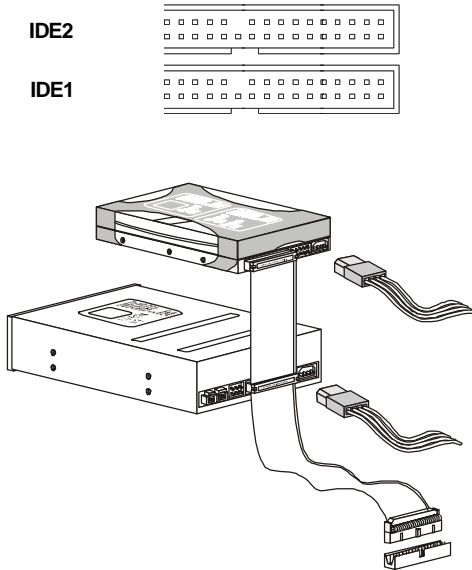
These audio connectors are used for audio devices. It is easy to differentiate between audio effects according to the color of audio jacks.

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

Connectors

IDE Connector: IDE1 / IDE2

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



IDE1 (Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive.

IDE2 (Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

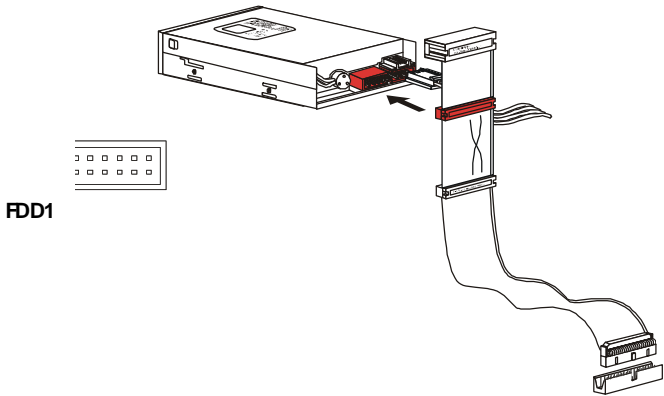


Important

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

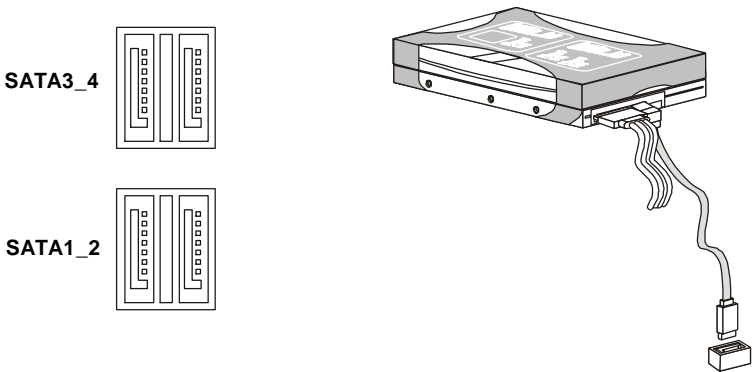
Floppy Disk Drive Connector: FDD1

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



Serial ATA Connector: SATA1_2/ SATA3_4

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

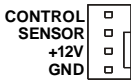


Important

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

Fan Power Connectors: CPUFAN1, SYSFAN1, SYSFAN2, SYSFAN3

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



CPUFAN1



SYSFAN1



SYSFAN2/3

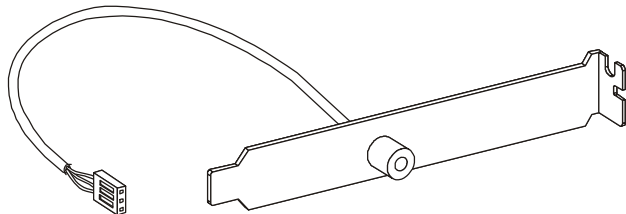
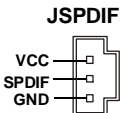


Important

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

SPDIF-Out Connector: JSPDIF

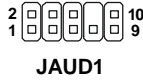
This connector is used to connect S/PDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.



S/PDIF Bracket (Optional)

Front Panel Audio Connector: JAUD1

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

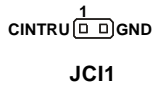


HD Audio Pin Definition

PIN	SIGNAL	DESCRIPTION
1	MIC_L	Microphone - Left channel
2	GND	Ground
3	MIC_R	Microphone - Right channel
4	NC	
5	LINE out_R	Analog Port - Right channel
6	MIC_JD	Jack detection return from front panel microphone JACK1
7	Front_JD	Jack detection sense line from the High Definition Audio CODEC jack detection resistor network
8	NC	No control
9	LINE out_L	Analog Port - Left channel
10	LINEout_JD	Jack detection return from front panel JACK2

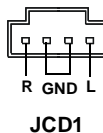
Chassis Intrusion Connector: JCI1

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



CD-In Connector: JCD1

This connector is provided for external audio input.



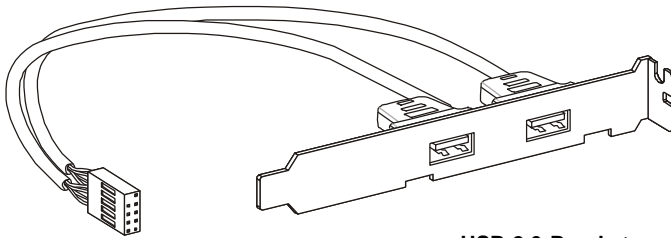
Front USB Connector: JUSB1 / JUSB2

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



Pin Definition

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



USB 2.0 Bracket
(optional)

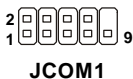


Important

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

Serial Port Connector: JCOM1 (optional)

This connector is a 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial device.



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

IEEE1394 Connector: J1394_1 (optional)

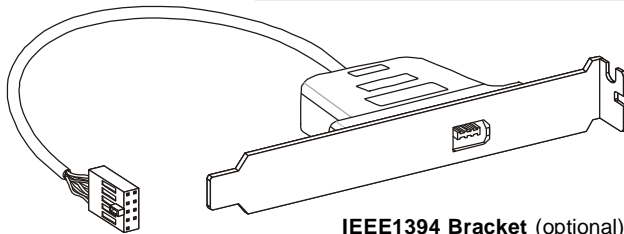
This connector allows you to connect the IEEE1394 device via an optional IEEE1394 bracket.

Pin Definition

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



J1394_1



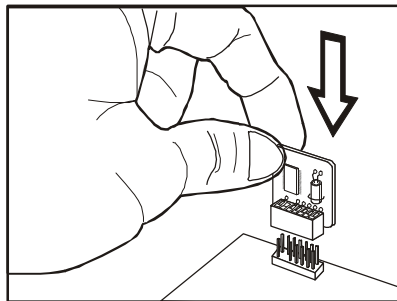
IEEE1394 Bracket (optional)

TPM Module Connector: JTPM (optional)

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



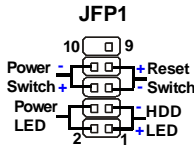
JTPM



Pin	Signal	Description	Pin	Signal	Description
1	LCLK	LPCclock	2	3V_STB	3Vstandbypower
3	LRST#	LPCreset	4	VCC3	3.3Vpower
5	LAD0	LPC address & data pin0	6	SIRQ	Serial IRQ
7	LAD1	LPC address & data pin1	8	VCC5	5Vpower
9	LAD2	LPC address & data pin2	10	KEY	No pin
11	LAD3	LPC address & data pin3	12	GND	Ground
13	LFRAME#	LPCFrame	14	GND	Ground

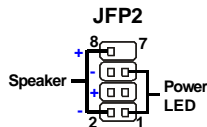
Front Panel Connectors: JFP1, JFP2

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



JFP1 Pin Definition

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



JFP2 Pin Definition

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

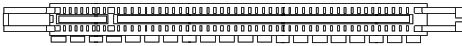
Slots

PCI (Peripheral Component Interconnect) Express Slots

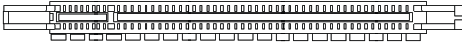
The PCI Express slot supports the PCI Express interface expansion card.

The PCI Express 2.0 x 16 supports up to 8.0 GB/s transfer rate.

The PCI Express 2.0 x 8 supports up to 4.0 GB/s transfer rate.



Mazarine PCI Express x16 Slot supports up to PCI Express 2.0x 16 speed (PCI_E1)



Blue PCI Express x 16 Slot supports up to PCI Express x 8 speed (PCI_E2/ PCI_E3)



Important

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

NV SLI Technology

NVIDIA SLI (Scalable Link Interface) technology allows two GPUs to run in tandem within a system to achieve up to twice the performance of a single graphics card. To utilize this technology, the two GPU cards must be connected by an *SLI Video Link card*.



SLI Video Link Card

If you intend to use the SLI mode for better graphics performance, please refer to the following instructions.

1. Install two graphics cards on PCI Express x16 slots. With two cards installed, an SLI Video Link Card is required to connect the golden fingers on the top of these two graphics cards (refer to the picture below). Please note that although you have installed two graphics cards, only the video outputs on the first card will work. Hence, you only need to connect a monitor to the first PCI Express card.



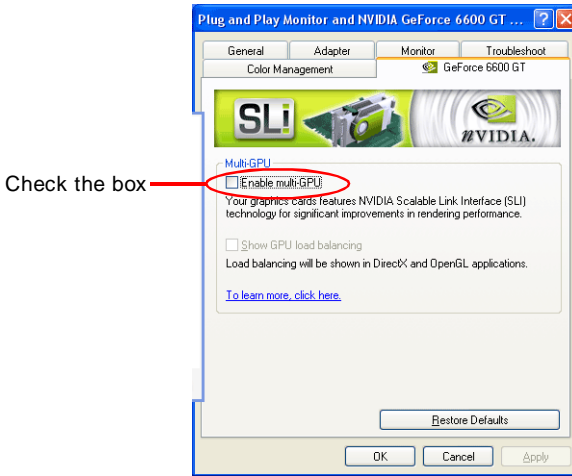
SLI Video Link Card



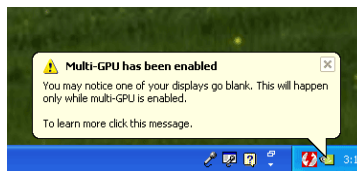
Important

1. The photos shown in this section are for demonstration only. The appearance of your mainboard may vary depending on the model you purchase.
2. If you intend to install **TWO** x16 graphics cards, make sure that these two graphics cards are of the same brand and specifications.
3. Make sure that you connect an adequate power supply to the power connector on the graphics card to ensure stable operation of the graphics card.
4. If you intend to install only **ONE** graphics card, make sure that the graphics card is installed on first **mazarine** PCIE x16 (PCI_E1) slot.

2. After the hardware installation is completed, restart the system and install the NV SLI driver/utility. A configuration panel will be provided for Multi-GPU control. Check the **Enable multi-GPU** box to enable the SLI function for the onboard graphics cards (concerning the details of multi-GPU settings, please refer to your graphics card manual) .



3. Restart your system and a pop-up message will show in the system tray confirming the **Multi-GPU has been enabled**.

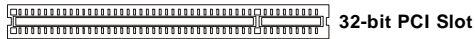


Important

If you want to remove one graphics card and quit the SLI function, make sure the "MultiGPU" function is disabled.

PCI (Peripheral Component Interconnect) Slots

The PCI slots support LAN cards, SCSI cards, USB cards, and other add-on cards that comply with PCI specifications. At 32 bits and 33 MHz, it yields a throughput rate of 133 MBps.



PCI Interrupt Request Routing

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

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT Y#	INT Z#	INT W#	INT X#
PCI Slot 2	INT Z#	INT W#	INT X#	INT Y#



Important

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

Chapter 3

BIOS Setup

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

You may need to run the Setup program when:

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

Entering Setup

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

Press DEL to enter SETUP

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



Important

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

A7380NMS V1.0 122007 where:

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

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

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

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

V1.0 refers to the BIOS version.

122007 refers to the date this BIOS was released.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F6>	Load Optimized Defaults
<F8>	Load Fail-Safe Defaults
<F10>	Save all the CMOS changes and exit

Getting Help

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

Main Menu

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

Sub-Menu

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



```

▶ IDE Primary Master
▶ IDE Primary Slave
▶ IDE Secondary Master
▶ IDE Secondary Slave
  
```

General Help <F1>

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

The Main Menu



► Standard CMOS Features

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

► Advanced BIOS Features

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

► Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

► Power Management Setup

Use this menu to specify your settings for power management.

► PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

► H/W Monitor

This entry shows your PC health status.

► BIOS Setting Password

Use this menu to set the password for BIOS.

► Cell Menu

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

► USER SETTINGS

Use this menu to save/ load your settings to/ from CMOS for BIOS.

► Load Fail-Safe Defaults

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

► Load Optimized Defaults

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

► 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 include some basic setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.



► Date (MM:DD:YY)

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

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

► Time (HH:MM:SS)

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

► IDE Primary/ Secondary Master/ Slave, SATA 1/2/3/4 , E-SATA 1/2

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



► **IDE Primary/ Secondary Master/ Slave, SATA 1/2/3/4 , E-SATA 1/2**

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

► **LBA/Large Mode**

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

► **DMA Mode**

Select DMA Mode.

► **Hard Disk S.M.A.R.T.**

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



Important

IDE Primary Master/ Slave, SATA 1/2/3/4, E-SATA 1/2 are appearing when you connect the IDE/ SATA devices to the IDE/ SATA connectors on the mainboard.

► Floppy Drive A

This item allows you to set the type of floppy drives installed. Available options: [None], [360K, 5.25 in.], [1.2M, 5.25 in.], [720K, 3.5 in.], [1.44M, 3.5 in.], [2.88M, 3.5 in.].

► System Information

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



This sub-menu shows the CPU information, BIOS version and memory status of your system (read only).

Advanced BIOS Features



► Full Screen LOGO Display

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

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

► Quick Booting

Setting the item to [Enabled] allows the system to boot within 10 seconds since it will skip some check items.

► Boot Up Num-Lock LED

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

► IOAPIC Function

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

► MPS Table Version

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

► **Primary Graphic's Adapter**

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

► **PCI Latency Timer**

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

► **CPU Feature**

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



► **Execute Bit Support**

Intel's Execute Disable Bit functionality can prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system. This functionality allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation.

► **Set Limit CPUID MaxVal to 3**

The Max CPUID Value Limit is designed to limit the listed speed of the processor to older operating systems.

► **Chipset Feature**

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



► **HPET**

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

► **Boot Sequence**

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



► **1st/ 2nd/ 3rd Boot Device**

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

► **Boot From Other Device**

Setting the option to [Yes] allows the system to try to boot from other device. if the system fails to boot from the 1st/ 2nd/ 3rd boot device.

► **Trusted Computing**

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



► **TCG/TPM SUPPORT**

Setting the option to [Yes] enables TPM (Trusted Platform Module) to the system.

► **Execute TPM Command**

Setting the option to [Enable] enable the system to execute TPM Command.

► **TPM Enable/Disable status, TPM Owner Status**

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

Integrated Peripherals



► USB Controller

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

► USB Device Legacy Support

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

► Onboard LAN Controller

This item is used to enable/disable the onboard LAN controller.

► LAN Option ROM

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

► Onboard IEEE1394 Controller

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

► Onboard E-SATA Controller

This item allows you to enable/disable the RAID mode for onboard E-SATA device.

► HD Audio Controller

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

► **On-Chip ATA Devices**

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



► **On-Chip IDE Controller**

This item allows you to enable/ disable IDE Controller.

► **PCI IDE BusMaster**

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

► **On-Chip SATA Controller**

This item allows users to enable or disable the SATA controller.

► **RAID mode**

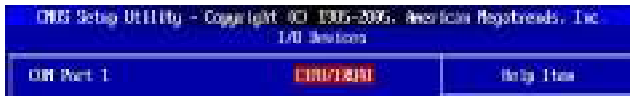
Setting this option to [RAID] activates the following fields, and use the following fields to enable RAID for SATA hard disks.

► **SATA 1/2/3/4**

These items allow you to enable RAID for SATA 1/2/3/4.

► **I/O Devices**

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



► **COM Port 1**

Select an address and corresponding interrupt for the first serial port.

Power Management Setup



Important

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

► ACPI Function

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

► ACPI Standby State

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

- [S1] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system context.
- [S3] The S3 sleep mode is a lower power state where the information of system configuration and open applications/files are 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**

When **ACPI Standby State** is set to [S3], users can select the options in this field. Selecting [Yes] allows BIOS to call VGABIOS 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 VGA driver to initialize the VGA card. Therefore, if the VGA driver of the card does not support the initialization feature, the display may work abnormally or not function after resuming from S3.

► **Power Button Function**

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

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

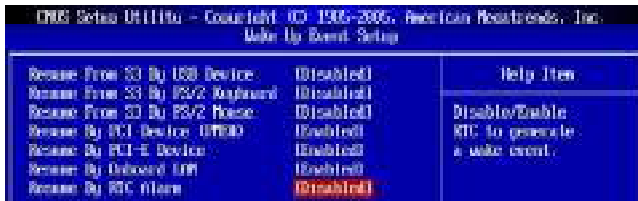
► **Restore On AC Power Loss**

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

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

► **Wake Up Event Setup**

Press <Enter> 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.

► **Resume From S3 By PS/2 Keyboard**

This setting determines whether the system will be awakened from S3 power saving modes when input signal of the PS/2 keyboard is detected.

► **Resume From S3 By PS/2 Mouse**

This setting determines whether the system will be awakened from S3 power saving modes when input signal of the PS/2 mouse is detected.

▶ **Resume By PCI Device (PME#)**

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

▶ **Resume By PCI-E Device**

When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event by PCI-E device.

▶ **Resume By Onboard LAN**

This controls how and whether the system can be powered on by the devices installed in LAN port.

▶ **Resume By RTC Alarm**

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

H/W Monitor



► Chassis Intrusion

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

► CPU Smart FAN Target

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

► CPU Min. FAN Speed (%)

When you set a FAN target in “CPU Smart FAN Target”, this item will appear. This item allows you to select percentage of minimum speed limit for the CPU Smart FAN.

► PC Health Status

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

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

Cell Menu



Important

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

► Current CPU/ FSB/ DRAM Frequency

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

► D.O.T. Control

D.O.T. (Dynamic Overclocking Technology) is the automatic overclocking function, included in the MSI™'s newly developed CoreCell™ Technology. It is designed to detect the load balance of CPU while running programs, and to adjust the best CPU frequency automatically. When the motherboard detects CPU is running programs, it will speed up CPU automatically to make the program run smoothly and faster. When the CPU is temporarily suspending or staying in the low load balance, it will restore the default settings instead. Usually the Dynamic Overclocking Technology will be powered only when users' PC need to run huge amount of data like 3D games or the video process, and the CPU frequency need to be boosted up to enhance the overall performance. Settings are:

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

- [General] 5th level of overlocking, increasing the frequency by 10%.
- [Commander] 6th level of overlocking, increasing the frequency by 15%.



Important

Even though the Dynamic Overclocking Technology is more stable than manual overlocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overlocking regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to disable the Dynamic Overclocking or to lower the level of overlocking options. By the way, if you need to conduct overlocking manually, you also need to disable the Dynamic OverClocking first.

► **Intel EIST**

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

► **System Clock Mode**

This item is used to switch the following two items.

► **FSB Clock (MHz)**

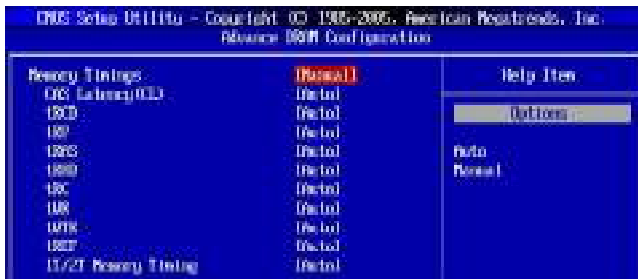
When the **System Clock Mode** sets to [Manual], the field is adjustable. This item allows you to select the CPU Front Side Bus clock frequency (in MHz).

► **Memory Clock (MHz)**

When the **System Clock Mode** sets to [Manual], the field is adjustable. This item allows you to select the memory clock frequency (in MHz).

► **Advance DRAM Configuration**

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



► **Memory Timings**

This field has the capacity to automatically detect all of the DRAM timing. If you set this field to [Manual], some fields will appear and selectable.

► **CAS Latency(CL)**

When the **Memory Timings** sets to [Manual], the field is adjustable. This controls the CAS latency, which determines the timing delay (in clock cycles) before SDRAM starts a read command after receiving it.

► **tRCD**

When the **Memory Timings** sets to [Manual], the field is adjustable. 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.

► **tRP**

When the **Memory Timings** sets to [Manual], this field is adjustable. 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.

► **tRAS**

When the **Memory Timings** sets to [Manual], this field is adjustable. This setting determines the time RAS takes to read from and write to memory cell.

► **tRRD**

When the **Memory Timings** sets to [Manual], the field is adjustable. Specifies the active-to-active delay of different banks. Time interval between a read and a precharge command.

► **tRC**

When the **Memory Timings** sets to [Manual], the field is adjustable. The rowcycle time determines the minimum number of clock cycles a memory row takes to complete a full cycle, from row activation up to the precharging of the activerow.

► **tWR**

When the **Memory Timings** sets to [Manual], the field is adjustable. Minimum time interval between end of write data burst and the start of a precharge command. Allows sense amplifiers to restore data to cells.

► **tWTR**

When the **Memory Timings** sets to [Manual], the field is adjustable. Minimum time interval between the end of write data burst and the start of a column-read command. It allows I/O gating to overdrive sense amplifiers before read command starts.

► **tREF**

When the **Memory Timings** sets to [Manual], the field is adjustable. Specifies the refresh rate of the DIMM requiring the most frequent refresh.

► 1T/2T Memory Timing

This item controls the SDRAM command rate. Select [1T] makes SDRAM signal controller to run at 1T (T=clock cycles) rate. Selecting [2T] makes SDRAM signal controller run at 2T rate.

► Adjust PCI-E Frequency (MHz)

This field allows you to select the PCI-E frequency (in MHz).

► CPU Voltage (V)

This item allows you to increase the CPU voltage.

► Memory Voltage (V)

Adjusting the memory voltage can increase the memory speed.

► VTT FSB Voltage (V)

This item allows you to set the FSB VTT voltage.

► NB Voltage (V)

Adjust the North Bridge chipset voltage.

► SB Voltage (V)

Adjust the South Bridge voltage.

► Spread Spectrum

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

**Important**

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

CPU and Memory Clock Overclocking

The **D.O.T. Control/ FSB Clock/ Memory Clock** are the items for you to overclock the CPU and the Memory. Please refer to the descriptions of these fields for more information.



Important

This motherboard supports overclocking greatly. However, please make sure your peripherals and components are bearable for some special settings. Any operation that exceeds product specification is not recommended. Any risk or damage resulting from improper operation will not be under our product warranty.

Two ways to save your system from failed overclocking...

Reboot

1. Press the Power button to reboot the system three times. Please note that, to avoid electric current to affect other devices or components, we suggest an interval of more than 10 seconds among the reboot actions.



2. At the fourth reboot, BIOS will determine that the previous overclocking is failed and restore the default settings automatically. Please press any key to boot the system normally when the following message appears on screen.

**Warning !!! The previous performance of overclocking is failed,
and the system is restored to the defaults setting.
Please press any key to continue...**

Clear CMOS

- Please refer to “chapter 2” for more information about how to clear CMOS data.

USER SETTINGS



► Save Settings 1 / 2

These items are used to save the settings set by yourself to CMOS.

► Load Settings 1 / 2

These items are available after you save your settings in **Save Settings 1 / 2** items, and are used to load the settings from CMOS.

Load Fail-Safe/ Optimized Defaults

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

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



Selecting [OK] and pressing *Enter* loads the BIOS default values for the most stable, minimal system performance.

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



Selecting [OK] and pressing *Enter* 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.

Appendix A

Realtek ALC888 Audio

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

Installing the Realtek HD Audio Driver

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

Installation for Windows 2000/ XP/ Vista

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

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

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



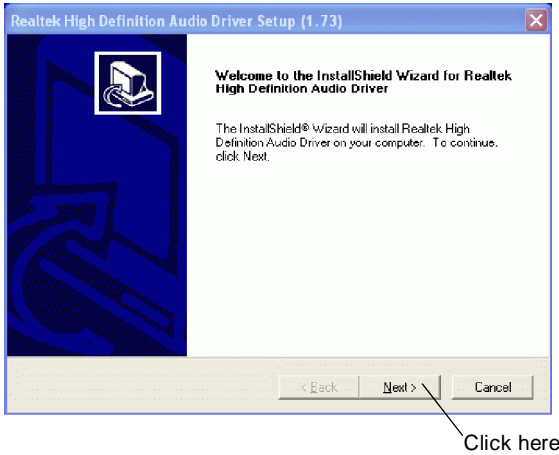
Click here



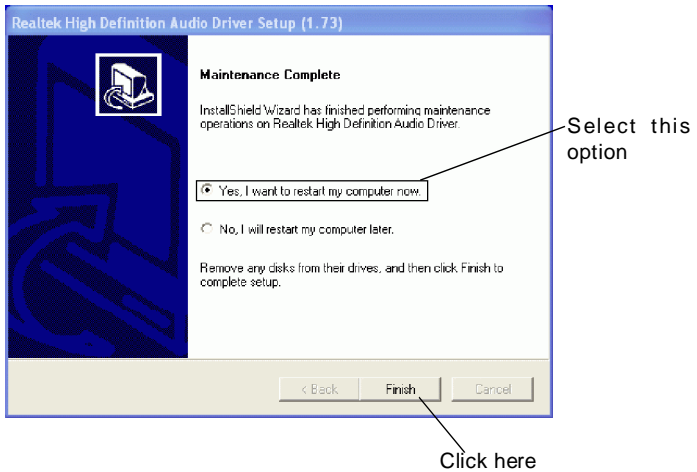
Important

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


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

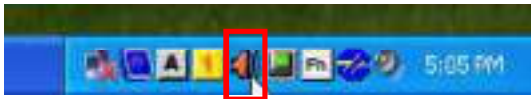


4. Click **Finish** to restart the system.

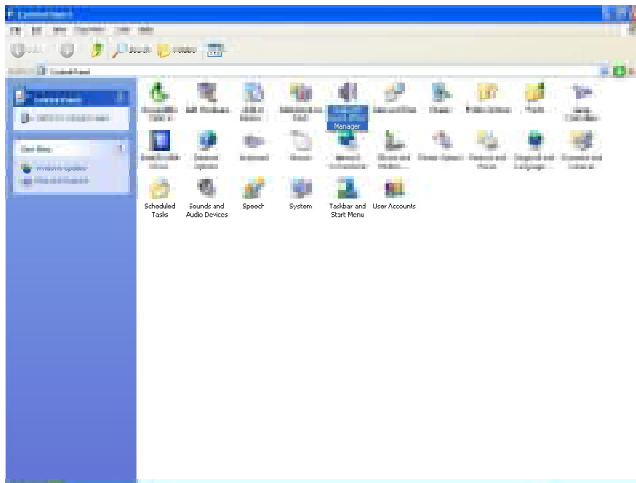


Software Configuration

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



Double click



Sound Effect

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



Environment Simulation

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

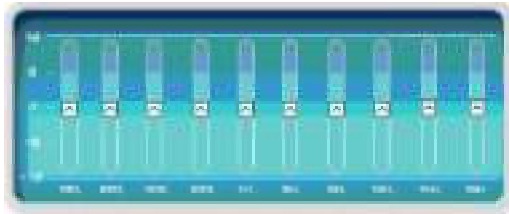
You may choose the provided sound effects, and the equalizer will adjust automatically. If you like, you may also load an equalizer setting or make an new equalizer setting to save as an new one by using the “**Load EQ Setting**” and “**Save Preset**” button, click “**Reset EQ Setting**” button to use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

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

Equalizer Selection

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

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



Save

The settings are saved permanently for future use

Reset

10 bands of equalizer would go back to the default setting

Enable / Disable

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

Load

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

Delete

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



Frequently Used Equalizer Setting

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

[How to Use It]

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

Karaoke Mode

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

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



Mixer

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

1. Adjust Volume

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




Important

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

2. Multi-Stream Function

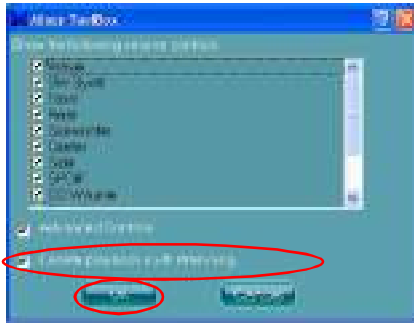
ALC888 supports an outstanding feature called Multi-Stream, which means you may play different audio sources simultaneously and let them output respectively from the indicated rear panel or front panel. This feature is very helpful when 2 people are using the same computer together for different purposes.

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



Important

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



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

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



3. Playback control



Tool **Mute**

Playback device

This function is to let you freely decide which ports to output the sound. And this is essential when multi-streaming playback enabled.

- Realtek HD Audio Rear Output
- Realtek HD Audio Front Output

Mute

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

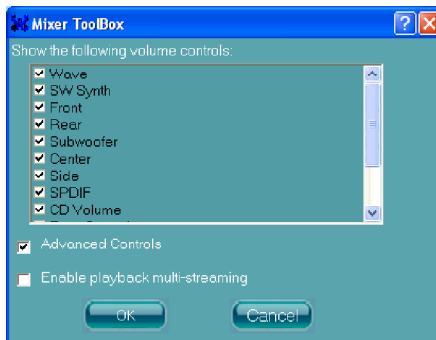
Tool

- Show the following volume controls

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

- Advanced controls
- Enable playback multi-streaming

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



4. Recording control



Mute

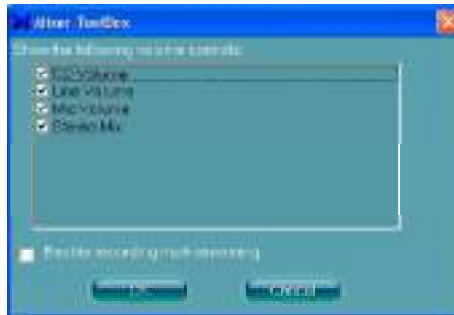
You may choose to mute single or multiple volume controls or to completely mute sound input.

Tool

- Show the following volume controls

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

- Enable recording multi-streaming



Important

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

Audio I/O

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


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



Speaker Configuration:

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

Connector Settings

Click  to access connector settings.



Disable front panel jack detection (option)

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

Mute rear panel output when front headphone plugged in.

Enable auto popup dialogue, when device has been plugged in

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

S/PDIF

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



Output Sampling Rate

44.1KHz: This is recommend while playing CD.

48KHz: This is recommended while playing DVD or Dolby.


96KHz: This is recommended while playing DVD-Audio.

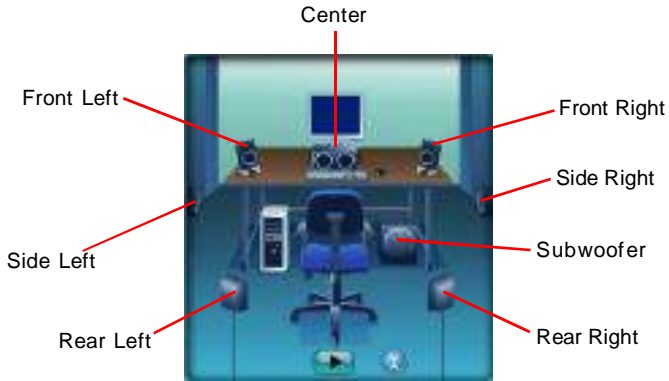
192KHz: This is recommended while playing High quality Audio.

Output Source

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

Test Speakers

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



Microphone

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

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



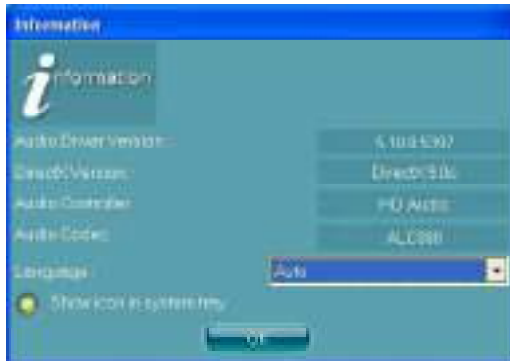
3D Audio Demo


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



Information

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



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

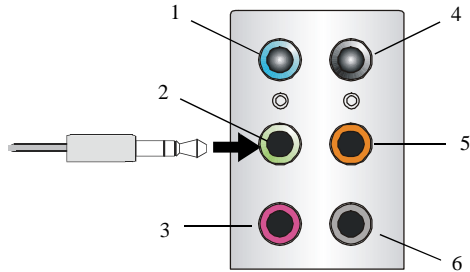


Hardware Setup

Connecting the Speakers

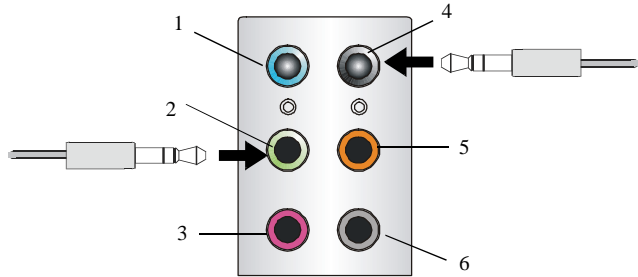
When you have set the Multi-Channel Audio Function mode properly in the software utility, connect your speakers to the correct phone jacks in accordance with the setting in software utility.

n 2-Channel Mode for Stereo-Speaker Output



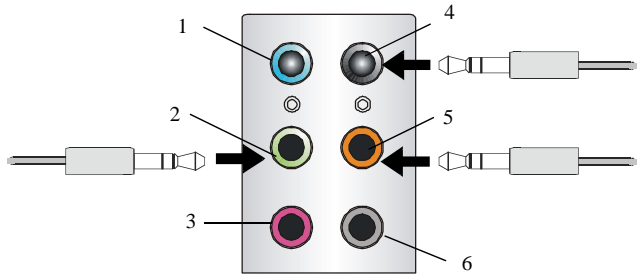
- 1 Line In
- 2 Line Out (*Front channels*)
- 3 MC
- 4 No function
- 5 No function
- 6 No function

n 4-Channel Mode for 4-Speaker Output



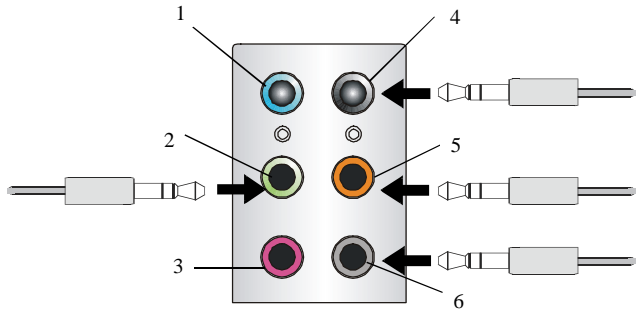
- 1 Line In
- 2 Line Out (*Front channels*)
- 3 MIC
- 4 Line Out (*Rear channels*)
- 5 No function
- 6 No function

n 6-Channel Mode for 6-Speaker Output



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

n 8-Channel Mode for 8-Speaker Output



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



Important

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

Appendix B

nVidia RAID

NVIDIA brings Redundant Array of Independent Disks (RAID) technology—which is used by the world's leading businesses—to the common PC desktop. This technology uses multiple drives to either increase total disk space or to offer data protection. For all levels, RAID techniques optimize storage solutions by using multiple disks grouped together and treating them as a single storage resource.

Introduction

System Requirement

Operating System Support

NVRAID supports the following operating systems:

Windows XP/ 2000 & Vista

RAID Arrays

NVRAID supports the following types of RAID arrays described in this section:

RAID 0: RAID 0 defines a disk striping scheme that improves the disk read and write times for many applications.

RAID 1: RAID 1 defines techniques for mirroring data.

RAID 0+1: RAID 0+1 combines the techniques used in RAID 0 and RAID 1 arrays.

RAID 5: RAID 5 defines techniques for parity data.

Spanning (JBOD): JBOD provides a method for combining drives of different sizes into one large disk

Summary of RAID Configurations

Array	Uses	Advantages	Drawbacks	# Hard Disks	Fault Tolerance
RAID 0	Non-critical data requiring high performance.	High data throughput.	No fault tolerance.	multiple	None
RAID 1	Small databases or any other small capacity environment requiring fault tolerance.	100% data redundancy.	Requires 2 drives for the storage space of 1 drive.	2	Yes
RAID 0+1	Critical data requiring high performance.	Optimized for both 100% data redundancy and performance. Allows spare disks.	Requires 2 drives for the storage space of 1 drive—the same as RAID level 1.	4+	Yes
RAID 5	Critical data and reasonable level of performance.	Fault tolerance and better utilization of disk space.	Decreased write performance due to parity calculations. Requires at least three drives.	3+	Yes
JBOD	Combining odd size drives into one big drive	Combines and uses the capacity of odd size drives.	Decreases performance because of the difficulty in using drives concurrently or to optimize drives for different uses.	Multiple	No

RAID Configuration

Basic Configuration Instructions

The following are the basic steps for configuring NVRAID:

Non-Bootable RAID Array

1. Choose the hard disks that are to be RAID enabled in the system BIOS. (Refer the bios section for details.)
2. Specify the RAID level, either Mirroring (RAID 1), Striping (RAID 0), Striping and Mirroring (RAID 0+1), RAID 5 or JBOD and create the desired RAID array.
3. Enter the Windows OS, run the Windows nForce Setup application and install the RAID software. (Check B-9 for details.)
4. Initialize the NVRAID Array Disks.

Bootable RAID Array

1. Choose the hard disks that are to be RAID enabled in the system BIOS.(Refer the bios section for details.)
2. Specify the RAID level, either Mirroring (RAID 1), Striping (RAID 0), Striping and Mirroring (RAID 0+1), RAID 5 or JBOD and create the desired RAID array.
3. Boot from the Windows CD, use the floppy disk that has the RAID driver to copy and install the nForce RAID software. (Check p.B-7 for details.)
4. Initialize the NVRAID Array Disks.

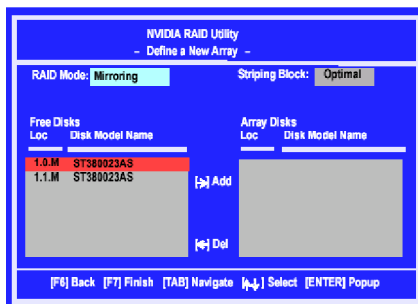
Setting Up the NVRAID BIOS

Be sure to enable the RAID mode for SATA devices in BIOS before configuring the NVRAID BIOS. After that press F10 to save the configuration and exit. The PC will reboot right away. Then enter the RAID BIOS Setup by pressing **F10** when prompted, and follow the procedures described below to set up the NVRAID BIOS. NVRAID BIOS setup lets you choose the RAID array type and which hard drives you want to make part of the array.

Entering the RAID BIOS Setup

1. After rebooting your PC, wait until you see the RAID software prompting you to press **F10**. The RAID prompt appears as part of the system POST and boot process prior to loading the OS.
2. Press **F10**, and the NVIDIA RAID Utility --- **Define a New Array** window will appear.

The default **RAID Mode** is set to **Mirroring** and **Striping Block** is set to **Optimal**.



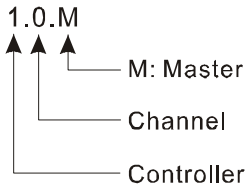
Understanding the “Define a New Array” Window

Use the Define a New Array window to

- Select the RAID Mode
- Set up the Striping Block
- Specify which disks to use for the RAID Array

Depending on the platform used, the system can have one or more channels. In a typical system there is usually one controller and multiple channels, and each channel has a slave and a master.

The channel/controller/master/slave status of each hard disk is given in the Loc (location) columns of the Free Disks and Array Disks lists.



In the example above, 1.0.M means the hard drive is attached to Controller 1, Channel 0, and the drive is set to Master. The following is a list of all possible combinations:

Serial ATA

- 1.0.M Controller 1, Channel 0, Master
- 1.1.M Controller 1, Channel 1, Master
- 2.0.M Controller 2, Channel 0, Master
- 2.1.M Controller 2, Channel 1, Master



Important

There is no such thing as Slave drive in Serial ATA. All drives are considered to be Master since there is a one to one connection between the drive and the controller.

Using the Define a New Array Window

If necessary, press the tab key to move from field to field until the appropriate field is highlighted.

• Selecting the RAID Mode

By default, this is set to [Mirroring]. To change to a different RAID mode, press the down arrow key until the mode that you want appears in the RAID Mode box—either [Mirroring], [Striping], [RAID5], [Spanning], or [Stripe Mirroring].

• Selecting the Striping Block Size

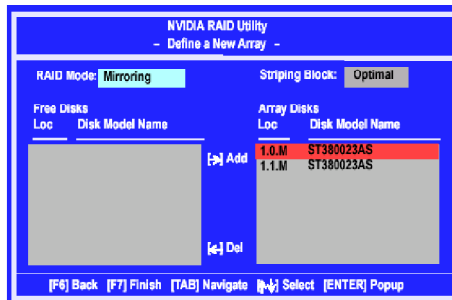
Striping Block size is given in kilobytes, and affects how data is arranged on the disk. It is recommended to leave this value at the default [Optimal], which is 32KB, but the values can be between [4 KB] and [128 KB].

• Assigning the Disks

The disks that you enabled from the RAID Config BIOS setup page appear in the **Free Disks** block. These are the drives that are available for use as RAID array disks.

To designate a free disk to be used as a RAID array disk,

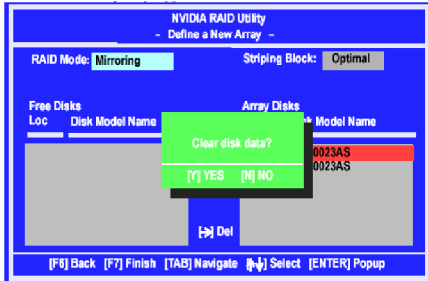
1. Tab to the **Free Disks** section. The first disk in the list is selected.
2. Move it from the Free Disks block to the Array Disks block by pressing the right arrow key (-->). The first disk in the list is moved, and the next disk in the list is selected and ready to be moved.
3. Continue pressing the right-arrow key (-->) until all the disks that you want to use as RAID array disks appear in the **Array Disks** block.



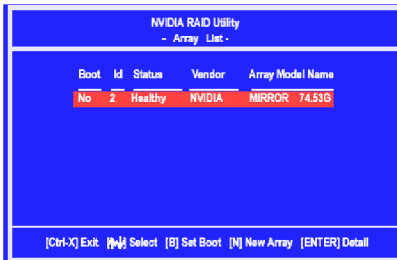
It shows that two disks have been assigned as RAID1 array disks in the figure above.

Completing the RAID BIOS Setup

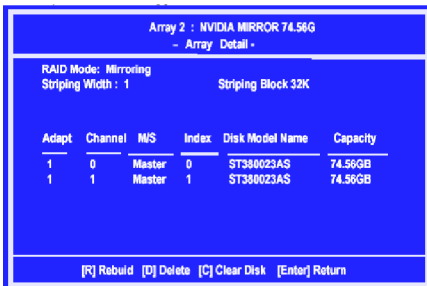
1. After assigning your RAID array disks, press **F7**. The Clear disk data prompt appears.



2. Press **Y** if you want to wipe out all the data from the RAID array, otherwise press **N**. You must choose **Yes** if the drives were previously used as RAID drives. The **Array List** window appears, where you can review the RAID arrays that you have set up.



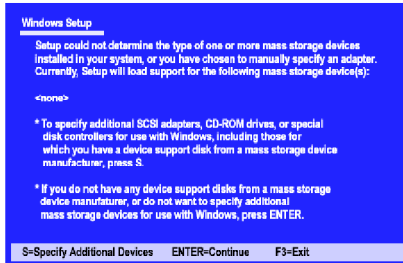
3. Use the arrow keys to select the array that you want to set up, then press **Enter**. The **Array Detail** window appears.



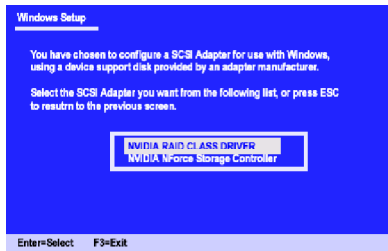
4. If you want to mark this disk as empty and wipe out all its contents then press **C**.
5. At the prompt, press **Y** to wipe out all the data, otherwise press **N**.
6. Press **Enter** again to go back to the previous window and then press **Ctrl+X** to exit the RAID setup. Now that the RAID setup has been configured from the RAID BIOS, the next step is to configure and load NVRAID drivers under Windows, as explained in "Installing the NVIDIA RAID Software Under Windows" on p.B-9.

Installing the RAID Driver (for bootable RAID Array)

1. After you complete the RAID BIOS setup, boot from the Windows CD, and the Windows Setup program starts. The following illustrations are based on Windows® XP environment.
2. Press **F6** and wait for the Windows Setup screen to appear.



3. Specify the NVIDIA drivers:
 - (1) Insert the floppy that has the RAID driver, press S, then press Enter. The Windows Setup screen appears as below:

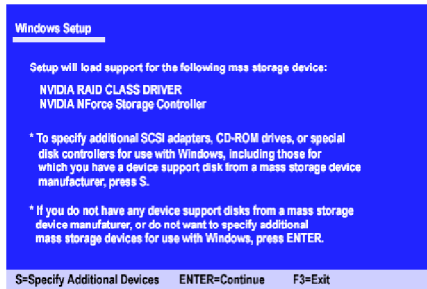


Important

Please follow the instruction below to make an nVIDIA Serial ATA RAID driver for yourself.

1. Insert the MSI CD into the CD-ROM drive.
2. Click the "Browse CD" on the Setup screen.
3. Copy all the contents in the `:\nVidia\System \ C72+MCP55\ IDE\ WinXP\ sataraid` to a formatted floppy disk.
4. The driver disk for nVIDIA RAID controller is done.

- (2) Select "NVIDIA RAID CLASS DRIVER" and then press **Enter**.
- (3) Press **S** again at the Specify Devices screen, then press **Enter**.
- (4) Select "NVIDIA NForce Storage Controller" and then press **Enter**. The following Windows Setup screen appears listing both drivers:



4. Press **Enter** to continue with Windows XP Installation. Be sure to leave the floppy disk inserted in the floppy drive until the blue screen portion of Windows XP installation is completed, then take out the floppy.
5. Follow the instructions on how to install Windows XP. After Windows XP is completely installed, it is recommended that you install the the RAID management tool.



Important

Each time you add a new hard drive to a RAID array, the RAID driver will have to be installed under Windows once for that hard drive. After that, the driver will not have to be installed.

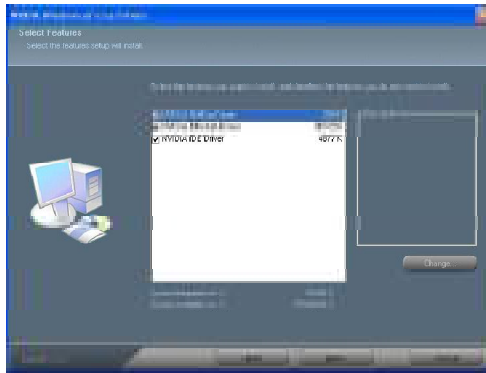
NVIDIA RAID Utility Installation

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

The existing Windows IDE Parallel ATA driver (as well as the Serial ATA driver if SATA is enabled) must be upgraded to use the NVIDIA IDE Parallel ATA driver (as well as the NV Serial ATA driver if SATA is enabled).

This section describes how to run the setup application and install the RAID software which will upgrade the Windows IDE driver and install the RAID software.

1. Start the NVIDIA nForce Drivers installation program to open the NVIDIA Windows nForce Drivers page.



2. Select the modules that you want to install. Make sure that the “NVIDIA IDE Driver” is selected.



Important

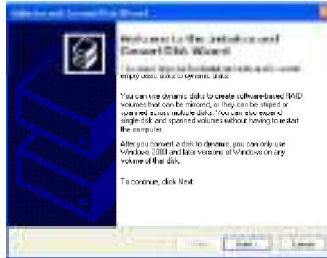
You must install the NVIDIA IDE driver in order to enable NVIDIA RAID. If you do not install the NVIDIA IDE driver, NVIDIA RAID will not be worked.

3. Click **Next** and then follow the instructions.
4. After the installation is completed, be sure to reboot the PC.
5. After the reboot, initialize the newly created array.

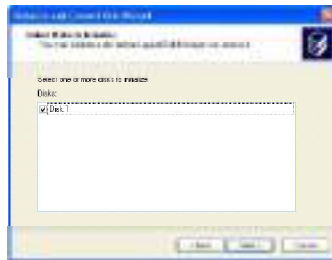
Initializing and Using the Disk Array

The RAID array is now ready to be initialized under Windows.

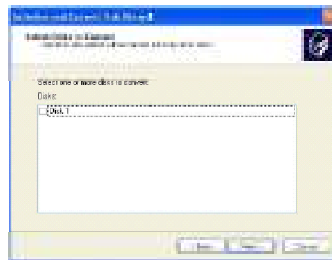
1. Launch Computer Management by clicking “Start” --> “Settings” --> “Control Panel” then open the “Administrative Tools” folder and double click on “Computer Management”.
2. Click “Disk Management” (under the “Storage” section). The Initialize and Convert Disk Wizards appears.



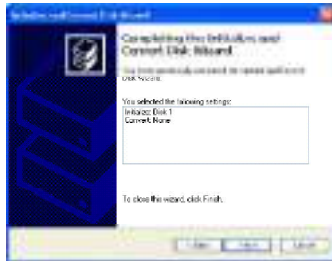
3. Click **Next**. The Select Disks to Initialize window appears. The disks listed depend on how many arrays you have configured.



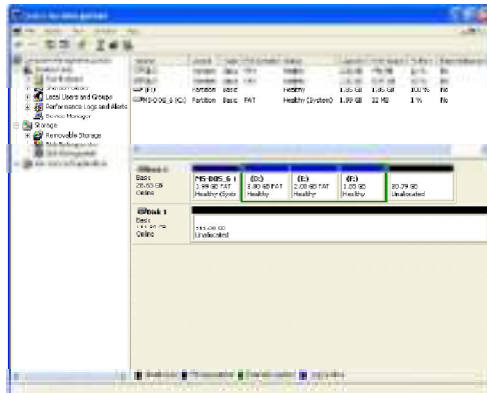
4. Click **Next**. The Select Disks to Convert window appears.



5. Check the disk in the list if you want to make the array a dynamic disk, then click **Next**. The Completing the Initialize and Convert Disk Wizard window appears.



6. Click **Finish**. The “Computer Management” window appears.



The actual disks listed will depend on your system, and the unallocated partition is the total combined storage of two hard disks. You must format the unallocated disk space in order to use it.

7. Format the unallocated disk space. Right click “Unallocated space”, select “New Partition...” and follow the wizard. After the drive has been formatted, it is ready for use.

RAID Drives Management

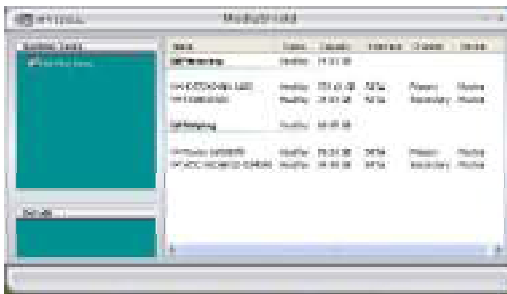
There is an application called NVRAIDMAN which helps you perform the following tasks of nVIDIA RAID.

- **Viewing RAID Array Configurations**
View an array configuration (mirrored, striped, mirror-striped, JBOD, or any supported combination)
- **Setting Up a Spare RAID Disk**
 - View free and/or dedicated free disks
 - Designate a free disk to a particular array
- **Creating RAID Arrays**
- **Deleting a RAID Array**
- **Morphing From One RAID Array to Another**
- **Hot Plug Array**
- **Initializing a RAID Array**
 - Erase the data on the array by writing all zeros to the sectors of each hard disk.
- **Rebuilding a RAID Mirrored Array**
 - Rebuild a broken mirrored array
 - Watch the progress of rebuilding an array
 - Only applies to RAID 1, RAID 0+1, and RAID 5 arrays
- **Synchronizing a RAID Array**
 - Rebuild the redundancy in RAID 1 or RAID 0+1 arrays (copy the data to the redundant disk—the same operation as rebuilding)
 - Rebuild the parity in RAID 5 arrays

Viewing RAID Array Configurations

To view your RAID configuration from Windows, launch the NVRAID Management utility by double-clicking `NvRaidMan.exe`.

The RAID configuration information appears in the right-side pane, as shown below.



Important

The information in the figures in this part may vary from what it is shown in your system.

Setting Up a Spare RAID Disk

You can designate a hard drive to be used as a spare drive for a RAID 1, RAID 0+1 or RAID 5 array. The spare drive can take over for a failed disk. NVRAID supports two types of spare drives:

- **Free Disk**

A free disk is a disk that is not part of any RAID array, but can be used by any available RAID 1 or RAID 0+1 array that requires a particular disk when one of its disks crashes or becomes unusable. The process is automatic and doesn't require any user interaction.

For example, if you have a system with four hard disks where one disk is used to boot the OS, two hard drives are set up in a mirrored array, and a fourth hard disk is set up as a free disk, then if one of the mirrored array drives fails, the free disk will be automatically assigned to the mirrored array to be used instead of the failed disk.

- **Dedicated Disk**

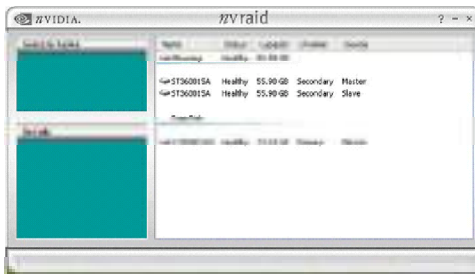
A dedicated free disk is a disk that is assigned to a RAID 1, RAID 0+1 or RAID 5 array and that disk is used by that array only when needed, for example during a system crash where a RAID mirrored drive is broken. The dedicated disk can be used only by the array that it is assigned to and not by any other array, unlike a free disk which can be used by any available RAID 1, RAID 0+1 or RAID 5 array.

Note: You must have at least two RAID arrays to use this feature.

Assigning a Free Disk

To mark a disk as free, or not a part of any array,

1. Enter the system BIOS setup and make sure that the drive that you want to mark as free is RAID enabled.
2. Enter the RAID BIOS and make sure that the drive is not part of any array (if one exists).
3. Boot into Windows and run the NVRAIDMAN program. The drive appears under the Free Disk section. The figure below shows an example of the NVRAIDMAN display if you have a mirror array and one free disk.



Assigning a Dedicated Disk

To mark a disk as dedicated, or reserve it for use by a specific array,

Step 1: Mark the Disk as a Free Disk

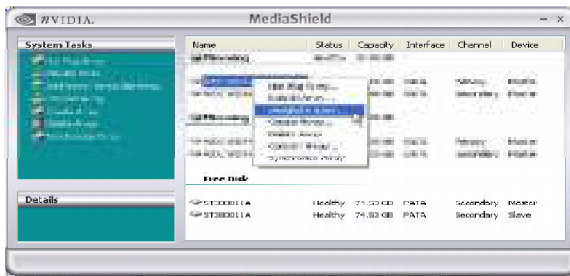
1. Enter the system BIOS setup and make sure that the drive that you want to mark as free is RAID enabled.
2. Boot into Windows and run the NVRAIDMAN program.

If the disk is not part of any RAID array, then it will appear under the Free Disk section of the RAID GUI.

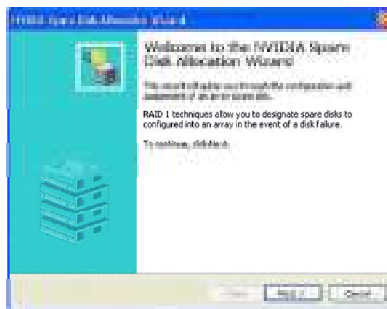
Step 2: Dedicate the Free Disk to an Array

While running NVRAIDMAN, dedicate the free disk to an array by doing the following:

1. Right click one of the two Mirrored arrays as shown below.

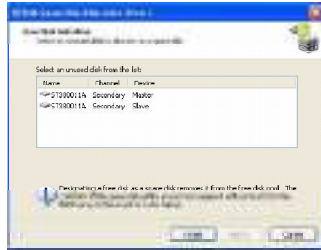


2. Select **Designate Spare** from the menu to launch the Spare Disk Allocation Wizard.



3. Click **Next**.

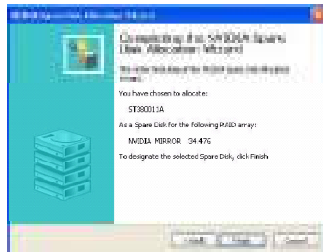
The RAID Array Selection page appears.



4. From the Free Disk Selection page, select one of the two free disks available. This would be the disk that will be designated to the mirror array.

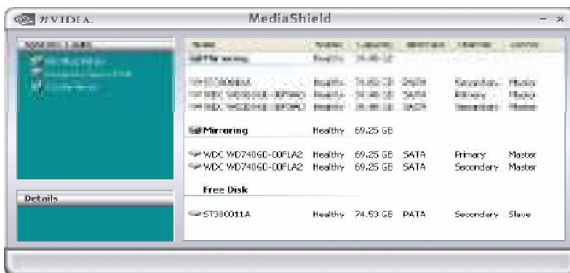
5. Click **Next**.

The Completing the NVIDIA Spare Disk Allocation page appears.



6. Click **Finish**.

As shown in figure below, the ST380011A drive is now a dedicated free disk in the mirrored array. If a system crash occurs that causes any of the two WD360GD drives to fail, the ST380011A hard drive will take over and be used in the newly formed mirrored array.



Morphing From One RAID Array to Another

In a traditional RAID environment, when a user wants to change the current state of a disk or a current array to a new RAID configuration, the process of reconfiguring the new array involves multiple steps. The user must back up the data, delete the array, re-boot the PC, and then reconfigure the new array.

NVIDIA RAID allows the end user to change the current state of the disk or array to another with a one-step process called [Morphing]. This section describes the NVIDIA Morphing process and explains how to use Morphing to convert from one RAID array type to another.

General Morphing Principles

NVIDIA RAID includes extensive support for morphing, a process of converting from one RAID mode to another RAID mode.

General Requirements and Limitations

- The new array capacity must be equal to or greater than the previous array. For example, it is possible to morph from a RAID 1 array to a RAID 0 array as long as the RAID 0 array is the same size as (or larger than) the RAID 1 array.
- You can't morph
 - To or from a JBOD (Spanning) array
 - From RAID 1 to RAID 1
 - From RAID 0+1 to RAID 1
 - From RAID 5 to 1

Specific Morphing Requirements

The following table lists the disk requirements for a new RAID array for various morphing combinations.

From	To	New Array Disk Requirements
RAID 0	RAID 0	$m > n$ Number of disks in the new array must be greater than the original array.
	RAID 1	$m = 2, n = 1$ RAID 1 array must include two disks, converted from a one disk RAID 0 array.
	RAID 0+1	$m \geq 2 \times n$ Number of RAID 0+1 disks must be equal to or greater than twice the number of RAID 0 disks.
	RAID5	$m \geq n+1$
RAID 1	RAID 0	No additional restrictions.
	RAID 1	** Not a valid combination **
	RAID 0+1	No additional restrictions.
	RAID 5	$m \geq 3$

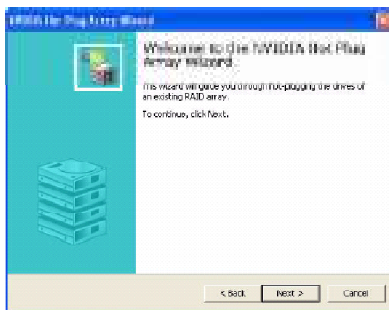
From	To	New Array Disk Requirements
RAID 0+1	RAID 0	$m \geq n/2$ Number of RAID 0 disks must be equal to or greater than half the number of RAID 0+1 disks.
	RAID 1	** Not a valid combination **
	RAID 0+1	** Not a valid combination **
	RAID 5	$m \geq (n/2 + 1)$
RAID 5	RAID 0	$m \geq n - 1$
	RAID 1	** Not a valid combination **
	RAID 0+1	$m \geq 2 \times (n - 1)$; where m is an even number of disks.
	RAID 5	$m \geq n$

Hot Plug Array

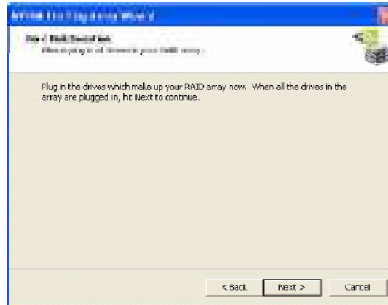
With respect to RAID, hot plugging is the ability to add a disk to a system safely and without causing problems for the RAID software. For example, when a drive in a mirrored array fails, the user can launch the Hot Plug Array Wizard which instructs the user as to when a drive can be safely added to the system. As soon as the drive is added, the user can then finish running the RAID wizard and the drive becomes usable by the system. Hot Plug Array allows the user to add or remove an entire array without degrading the array in the process.

NVRAIDMAN can be used to hot plug a RAID disk. To hot plug a disk, simply do the following:

- 1 Launch NVRAIDMAN and click on "Hot Plug Array" and the following screen shot will appear:

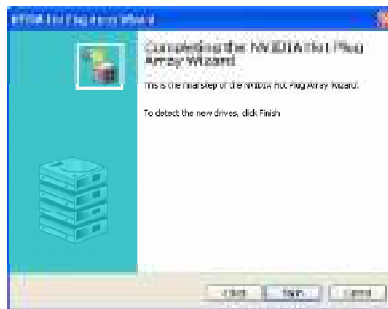


2 Click **Next** and the following screen shot will appear:



3 Connect the RAID disk that you want to use with any given RAID array.

4 Click **Next** and the following screen shot will appear:



5 Click **Finish**.

Initializing a RAID Array

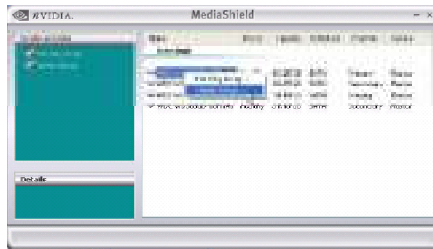
Initializing a RAID array erases all the data that is stored on that array, and writes all zeros to the disks. Initialization of newly configured RAID arrays is recommended to ensure consistency and reliable performance on any supported fault tolerant array such as RAID 5, RAID 0, and RAID 0+1. Use this feature only if you are absolutely sure that you want to wipe out all the data on *that array*.

Initialization of a fault tolerant array can only be done when the array is being created. To initialize an array, perform the following steps:

Note: In this example, a mirror array is initialized.

MS-7380 Mainboard

1 From the NVRAIDMAN window, right click on any available free disk and select **Create Array** as show in Figure below.



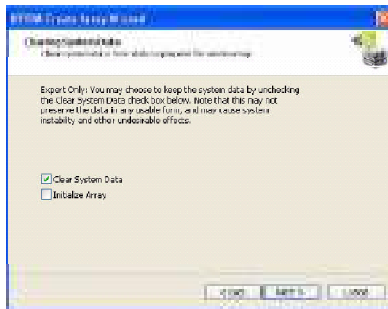
2 The Create Array Wizard opens. Follow the Wizard to create a Mirror array.

3 At the Create Array Wizard Welcome screen, click **Next**.

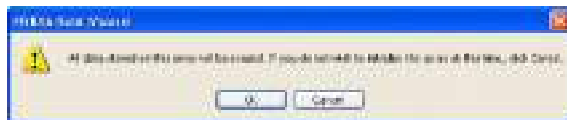
4 At the RAID Array Selection page, make sure that RAID Mode is set to “**Mirroring**” and Stripe Size is set to its default value of 64K, then click **Next**.

5 At the Free Disk Selection page, select the two drives that you want to Mirror and click **Next**.

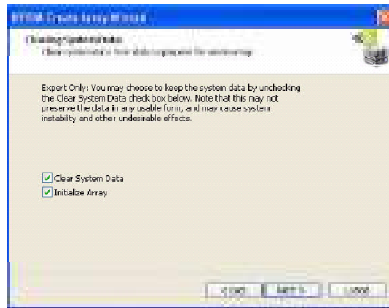
6 Click **Next** again and the following screen shot will appear:



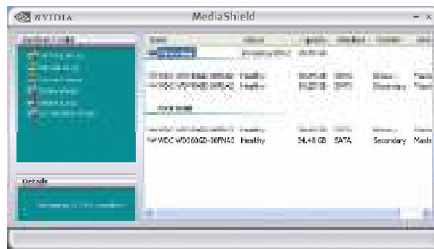
7 Check “Initialize Array” and then click **Next**. The Initialization Warning dialog appears.



8 Click **OK**. The Clearing System Data screen appears again with the Initialize Array check box checked as shown below.



9 Click **Next**, then click **Finish** at the Completing the NVIDIA Create Array Wizard screen. The NVRAIDMAN windows shows the created RAID array as shown below.

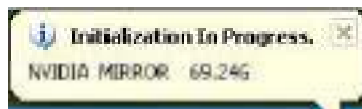


The Initialization Process

As you can see from the screen shot above, the initialization process has started and it will be completed in a short period of time. As soon as the Initialization process starts, a popup window similar to the following will appear:



followed by the following pop-up window:



Rebuilding a RAID Array

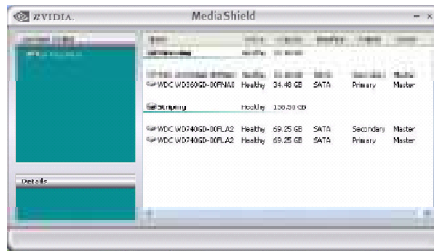
Rebuilding is the process of restoring data to a hard drive from other drives in the array. This applies only to fault tolerant arrays such as RAID 1, RAID 0+1, as well as a RAID 5. For example, assuming you have a three disk RAID 5 array, and one of the drives fail, then you need the lost data on the newly added drive.

Rebuilding Instructions

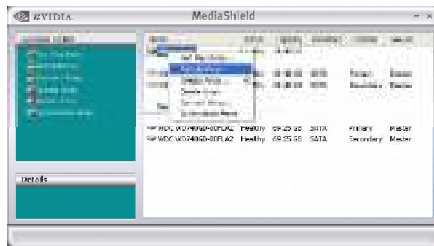
After creating a mirrored array, you can rebuild the array using the following steps:

1. Go to Windows and run the NVIDIA RAID Management utility.

The picture below shows an example of a system with one mirrored array and two free disks.



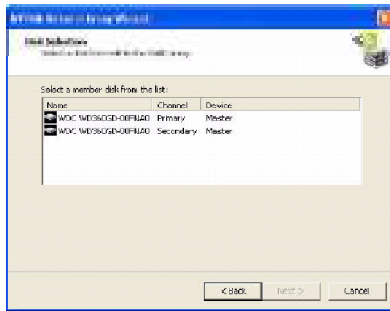
2. Right-click on Mirroring. The popup menu appears.



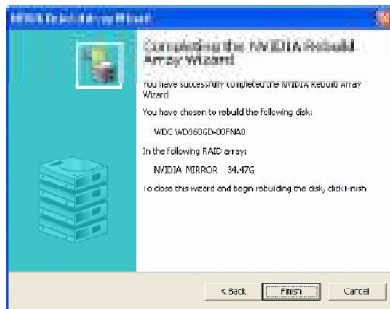
3. From the popup menu, click **Rebuild Array**. The NVIDIA Rebuild Array Wizard appears.



4. Click **Next**. The Disk Selection page appears.



5. Select the drive that you want to rebuild by clicking it from the list, then click **Next**. The Completing the NVIDIA Rebuild Array page appears.



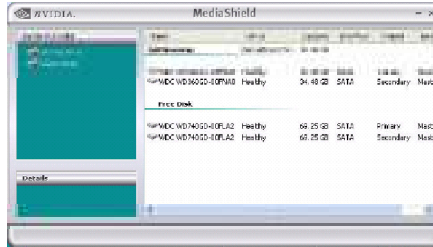
6. Click **Finish**. The array rebuilding starts after a few seconds, and a small pop-up message appears towards the bottom right corner of the screen as shown in the figure below.



When the rebuilding process is finished you will see the pop up box shown in Figure below.



During the rebuilding process, the NVRAID Management utility screen shows the status under the System Tasks and Details sections.



More About Rebuilding Arrays

- **Rebuilding Occurs in the Background**

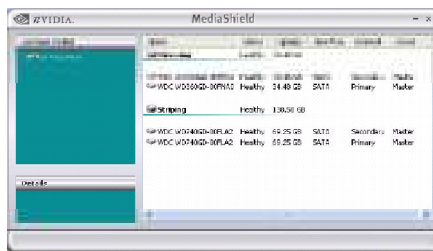
The rebuilding process is very slow (it can take up to a day) and occurs in the background so as not to affect the performance of the system.

- **Rebuilding Applies Only to RAID 1/ RAID 0+1 or RAID 5 Arrays**

Rebuilding an array works only when using RAID 1, RAID 0+1, or RAID 5. Rebuilding does not apply to RAID 0 and JBOD arrays.

- **Rebuilding applies to a degraded fault tolerant array**

You can rebuild a degraded mirrored array using any available Free Disk or Dedicated Disk. For example, Figure below shows a mirrored array using two 34.48 GB drives while having two Free Disks each 55.90 GB large.



To use one of these available free disks to rebuild your array, follow the same steps as explained in "Rebuilding a RAID Array" on p.B-22, except when prompted to select a disk, choose one of the two available free disks.

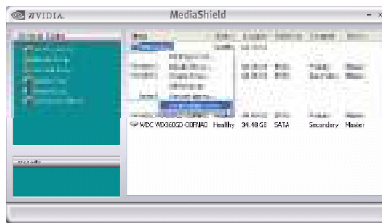
Synchronizing a RAID Array

Synchronizing an array will force a rebuild of redundancy or parity. The operation is applicable to any fault tolerant array such as RAID 1, 0+1 and RAID 5.

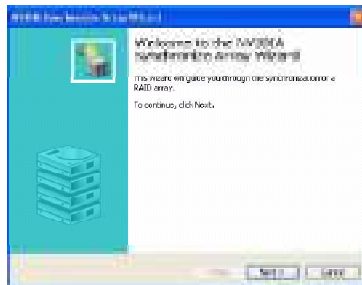
- For RAID1 and RAID 0+1, “sync” results in copying the data to the redundancy disk,
- For RAID 5, “sync” results in rebuilding the parity

To sync an array, do the following (This example assumes you have already created a fault tolerant array such as RAID 1):

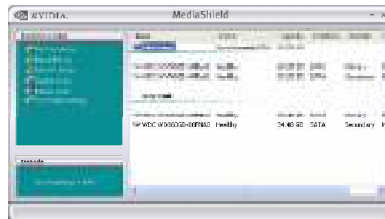
1. Right click on “Mirroring” and select **Synchronize Array** as shown in Figure below.



2. The Synchronize Array Wizard Welcome screen appears.



3. Click on **Next** and then click **Finish** at the Wizard Completion screen. The NVRAIDMAN window indicates that the array is synchronizing, as shown in Figure below.



As you can see from the screen shot above, the synchronization process has started and it will be completed in a short period of time.

Appendix C

Dual Core Center

Dual CoreCenter, the most useful and powerful utility that MSI has spent much research and efforts to develop, helps users to monitor or configure the hardware status of MSI Mainboard & MSI Graphics card in windows, such as CPU/GPU clock, voltage, fan speed and temperature.

Before you install the Dual CoreCenter, please make sure the system has meet the following requirements:

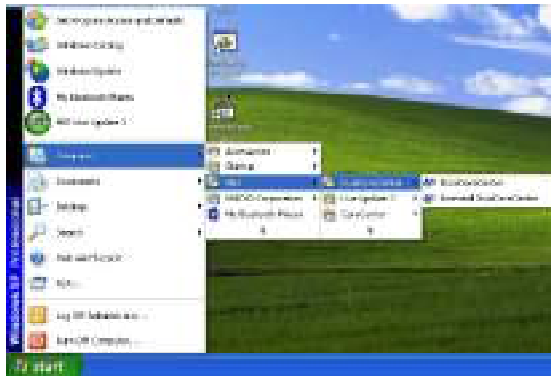
1. Intel Pentium4 / Celeron, AMD Athlon XP/ Sempron or compatible CPU with PCI Express slot.
2. 256MB system memory.
3. CD-ROM drive for software installation.
4. Operation system: Windows XP.
5. DotNet Frame Work 2.0

Activating Dual Core Center

Once you have your Dual Core Center installed (locate the setup source file in the setup CD accompanying with your mainboard, path: **Utility --> MSI Utility --> Dual Core Center**), it will have an icon  in the system tray, a short cut icon on the desktop, and a short cut path in your "Start-up" menu. You may double-click on each icon to enable Dual Core Center.



short-cut icon in the system tray



short-cut path in the start-up menu
(path: Start-->Programs-->MSI-->
DualCoreCenter-->DualCoreCenter)

Main

Before using this utility, we have to remind you: only when installing the MSI V044 (V044 has to install with the version 8.26 or newer driver)/ V046 or V060 graphics card can activate the full function of this utility. If you install a graphics card of other brand, only hardware status of the MSI mainboard would be available.



Introduction:

Click each button appearing above to enter sub-menu to make further configuration or to execute the function.

MB

Click MB button to read current CPU temperature, FSB and CPU clock of mainboard will show below.

VGA

Click VGA button to read current GPU temperature, GPU clock and memory clock of graphics card will show below.

DOT

Click DOT button to enable or disable the Dynamic Overclocking Technology.

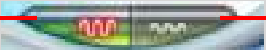
AV/ Game/ Office/ Silence/ Cool

MSI provides five common settings for different environments. The settings had been set to optimal values to reach better performance in each environment. Click the button you need.



Important

Before clicking the AV/ Game/ Office/ Silence or Cool button, select Smooth mode or Sharp mode to decide whether you want the system to reach the optimal values smoothly or quickly.

Sharp mode  **Smooth mode**

Clock



In this sub-menu, you can adjust and monitor the clocks of MB and graphics card.

Voltage



In this sub-menu, you can adjust and monitor the voltages of MB and graphics card.

FAN Speed



In this sub-menu, you can adjust and monitor the fan speeds of MB and graphics card.

Temperature




In this sub-menu, you can monitor the temperatures of MB and graphics card.

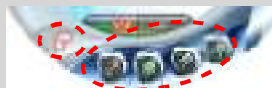
User Profile

In this sub-menu, you can set the values of clock, voltage and fan speed by your need and save them in a profile. You can save 3 profiles for further use.






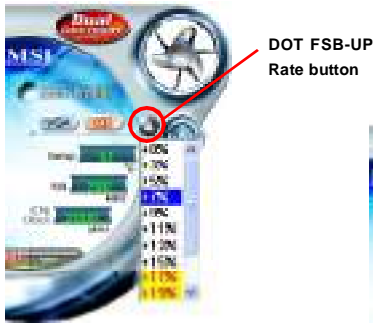
Important

Click on the icon  , the clock, voltage, fan, and temperature buttons will appear beside the icon.



DOT (Dynamic OverClocking)




Dynamic Overclocking Technology is an automatic overclocking function, included in the MSI™'s newly developed Dual CoreCenter Technology. It is designed to detect the loading of CPU/ GPU while running programs, and to over-clock automatically. When the motherboard detects that the loading of CPU is exceed the default threshold for a time, it will speed up the CPU and fan automatically to make the system run smoother and faster. When the graphics card detects that the loading of GPU is exceed the default threshold for a time, it will speed up the GPU, memory, fan and voltage automatically to make the system run smoother and faster. When the CPU/ GPU is temporarily suspending or staying in low loading balance, it will restore the default settings instead. Usually the Dynamic Overclocking Technology will be powered only when users' PC runs huge amount of data, like 3D games or video process, and the motherboard/ graphicd card need to be boosted up to enhance the overall performance. There will be several selections when you click the DOT rate button (include increase rate  and decrease  rate buttons), to select the DOT level, then you have to click the DOT button  to apply the DOT function.



Important

Even though the Dynamic Overclocking Technology is more stable than manual overclocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overclock regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to lower the level of overclocking options. By the way, if you need to conduct overclocking manually, please do not to apply the DOT function.

Clock

In the **Clock** sub-menu, you can see clock status (including FSB/ CPU clock of mainboard and GPU/ memory clock of graphics card) of your system. And you can select desired value for overclocking. There will be several items for you to select for overclocking after you click  button. You can click the plus sign button  to increase the clock, or click the minus sign button  to decrease the clock. And finally, click the Apply button to apply the values adjusted. If you do not want to apply the adjustments, click the Cancel button to cancel. Or click the Default button to restore the default values.






On the underside, it shows the graphs of the clocks. Only the curves of the item which the button is lit up with red color will be shown.



Important

*In the user profile, clicking the **Save** button can save the changes to it. In the default profile, the Save button is not available.*

Voltage

In the **Voltage** sub-menu, you can see voltage status (including Vcore, memory, GPU voltage... etc.) of your system, and you can select desired value for overclocking. It will show several items to select for overclocking after you click the  button. You can click the plus sign button  to increase the voltage, or click the minus sign button  to decrease. And finally, click the Apply button to apply the adjustments. If you do not want to apply the adjustments, click the Cancel button to cancel. Or click the Default button to restore the default values.






On the underside, it shows the graphs of the voltages. Only the curves of the item which the button is lit up with red color will be shown.



Important

*In the user profile, clicking the **Save** button can save the changes to it. In the default profile, the Save button is not available.*

FAN Speed

In the **FAN Speed** sub-menu, you can read fan status of your system. Select higher speed for better cooling effect. There are several sections for you to change the fan speed to a section after clicking  button. Click the plus sign button  to increase the fan speed to a section, or click the minus sign button  to decrease. Or click the Default button to restore the default values.



On the underside, it shows the graphs of the fan speed. Only the curves of the item which the button is lit up with red color will be shown.



Important

1. When you set the fan speed manually, please make sure to disabled the "CPU Smart FAN Target" item in the BIOS.
2. In the user profile, clicking the **Save** button can save the changes to it. In the default profile, the Save button is not available.

Temperature

In the **Temperature** sub-menu, you can see temperature status of your system.






On the underside, it shows the graphs of the temperatures. Only the curves of the item which the button is lit up with red color will be shown.

User Profile

In the **User Profile** sub-menu, click the setting button that besides the user profile bar, and the next screen will appear.




Here you can define the clock/ fan speed/ voltage by your need, click the  button to choose a value quickly, or click the plus  / minus sign  button to increase/ decrease the value.



Use the draw bar to set the max system temperature. When the system temperature exceeds the threshold you defined, the system will pop up a warning message and shut down the system.

Use the draw bar to set the minimal fan speed. When the fan speed is lower than the threshold you defined, the system will pop up a warning message.



After setting all values you need, you can change the user profile name in the box then click the save button  to save all changes in a profile.



Finally, you can choose the user profile by click the button in the left side and click the Apply button to load the user profile.

