MSI
MICRO-STAR INTERNATIONAL

K9ND Speedster2 Series

MS-9661 (V1.X) Server Board

G52-96611X3

Copyright Notice

Trademarks

Revision History

Revision	Revision History	Date
V1.2	Updating memory & CPU	November 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 at ***http://global.msi.com.tw/index.php?func=service*** for FAQ, technical guide, BIOS updates, driver updates, and other information.
- Contact our technical staff at ***http://ocss.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 service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well or you can not get it work according to User's Manual.
    - The equipment has dropped and damaged.
    - The equipment has obvious sign of breakage.
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60^0C (140^0F), 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 LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

Micro-Star International
MS-9661

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

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

WEEE (Waste Electrical and Electronic Equipment) Statement

ENGLISH

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

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

DEUTSCH

Hinweis von MSI zur Erhaltung und Schutz unserer Umwelt

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

FRANÇAIS

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

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

РУССКИЙ

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

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

ESPAÑOL

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

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

NEDERLANDS

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

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

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

SRPSKI

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

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

POLSKI

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

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

TÜRKÇE

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

ČESKY

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

MAGYAR

Annak érdekében, hogy környezetünket megvédjük, illetve környezetvédőként fellépve az MSI emlékezteti Önt, hogy ...
Az Európai Unió („EU") 2005. augusztus 13-án hatályba lépő, az elektromos és elektronikus berendezések hulladékairól szóló 2002/96/EK irányelve szerint az elektromos és elektronikus berendezések többé nem kezelhetőek lakossági hulladékként, és az ilyen elektronikus berendezések gyártói kötelessé válnak az ilyen termékek visszavételére azok hasznos élettartama végén. Az MSI betartja a termékvisszavétellel kapcsolatos követelményeket az MSI márkanév alatt az EU-n belül értékesített termékek esetében, azok élettartamának végén. Az ilyen termékeket a legközelebbi gyűjtőhelyre viheti.

ITALIANO

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

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Chapter 1
Getting Started

Thank you for choosing the K9ND Speedster2 (MS-9661 v1.X), an excellent ATX server board from MSI.

Based on the innovative **nVIDIA MCP55 Pro** chipset for optimal system efficiency, the K9ND Speedster2 supports up to two 45nm Quad-Core AMD Opteron processors under 115W (TDP) in Socket 1207 and supports up to 8 Registered ECC DDR2 533/667/800 DIMM slots to provide the maximum of 32GB memory capacity.

In the entry-level and mid-range market segment, the K9ND Speedster2 can provide a high-performance solution for today's front-end and general purpose server/workstation, as well as in the future.

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Mainboard Specifications

Processor

- Supports up to two 45nm Quad-Core AMD Opteron processors under 115W (TDP) in Socket 1207
- HyperTransport interface capable of operating up to 2000 MT/s
- Meets thermal requirements

Chipset

- nVIDIA nForce Professional 3600 MCP (MCP55 Pro)

Memory

- Supports ECC Registered DDR2 533/667/800 DIMMs
- 8 DDR2 DIMM slots up to 32GB memory

IDE

- 1-channel bus master IDE port
- Supports ATA133/100/66

SATA

- 6 SATA II ports support 6 SATA II devices
- Storage and data transfers at up to 300 MB/s

Floppy

- 1 floppy port

IEEE 1394 (Optional)

- VIA VT6308 IEEE 1394 controller

LAN

- 2 Gigabit Ethernet controllers bundled into Marvell 88E1116 (MCP55 Pro)

Audio

- Realtek ALC888 7.1-channel HDA codec

Graphics

- XGI Z7 graphics controller
- Onboard 16MB Video SDRAM

Connectors

- **Back Panel**
  - 1 x PS/2 mouse port
  - 1 x PS/2 keyboard port
  - 1 x serial port
  - 1 x VGA port
  - 2 x RJ-45 Gigabit LAN ports
  - 4 x USB ports
  - 1 x audio jack
- **Onboard Pinheaders**
  - 2 x USB connectors
  - 2 x 1394 connectors (optional)
  - 1 x serial port connector
  - 1 x proprietary front audio connector

Slots

- 1 PCI-Express x16 slot (PCI_E3 supports x8 SLI or x16 signal)
- 1 PCI-Express x16 slot (PCI_E1 supports x8 signal)
- 1 PCI-Express x8 slot (PCI_E2 supports x4 signal)
- 2 PCI slots

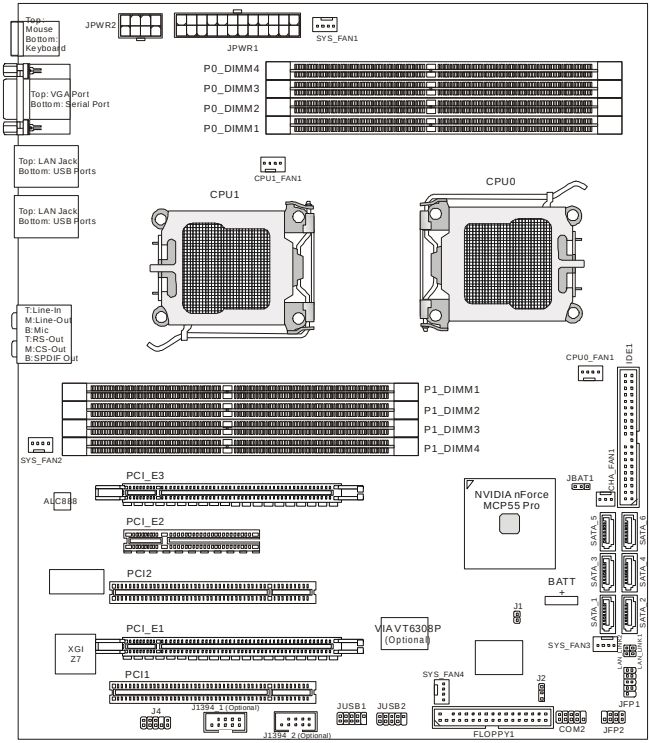
Form Factor

- ATX form factor 12” x 10.2”

Mounting

- 9 mounting holes

Mainboard Layout



K9ND Speedster2 (MS-9661 v1.X) ATX Server Board

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.

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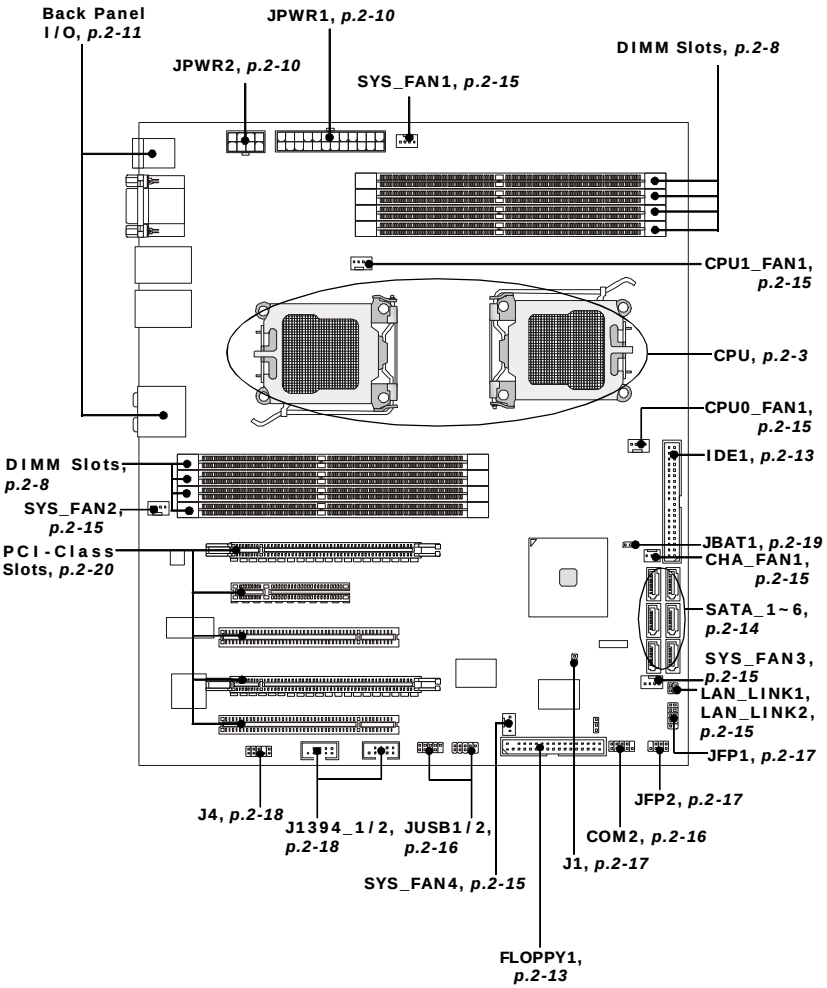
Quick Components Guide



CPU (Central Processing Unit)

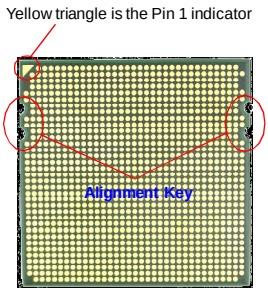
This mainboard supports the latest **Dual-Core/Quad-Core AMD® Opteron processor under 115W (TDP)**. When you are installing the CPU, **make sure that you install the cooler to prevent the CPU from overheating.** If you do not have the CPU cooler, contact your dealer to purchase and install it before turning on the computer.

Important

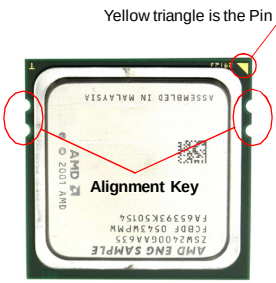
1. *Overheating will seriously damage the CPU and system. Always make sure the cooling fan can work properly to protect the CPU from overheating.*
2. *Make sure that you apply an even layer of heat sink paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.*
3. *While replacing the CPU, always turn off the power supply or unplug the power supply's power cord from the grounded outlet first to ensure the safety of CPU.*

AMD® Opteron CPU in 1207-Pin Package

The pin-pad side



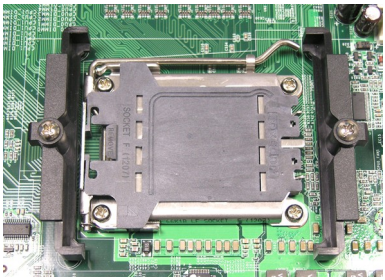
The surface

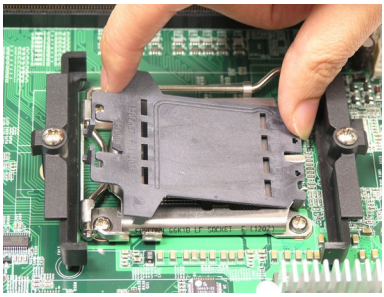


Remember to apply some silicone heat transfer compound on it for better heat dispersion.

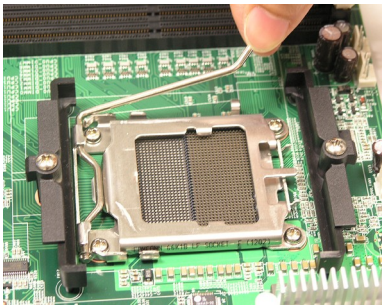
Socket 1207 CPU & Cooler Installation

1. Locate the first CPU socket. (The CPU has a plastic cap on it to protect the contact from damage. Before installing the CPU, always cover it to protect the socket pins.)
2. Remove the plastic cap from the load plate. The pins of the socket reveal.

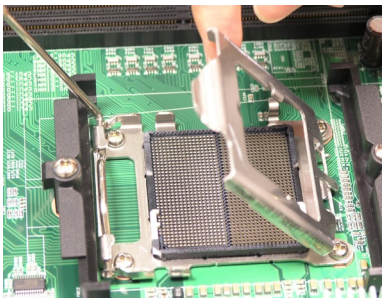




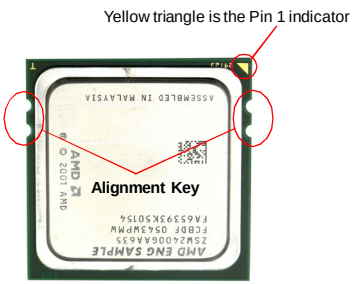
3. Raise the load lever up to its full extent.

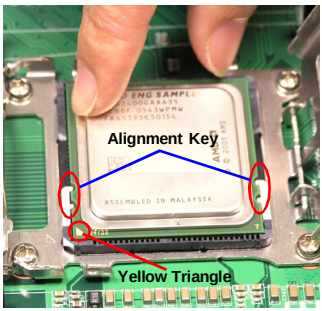


4. Open the load plate.

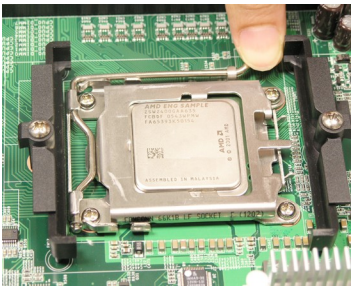


5. After confirming the CPU direction (indicated below with red circles) for correct mating, put down the CPU in the socket housing frame. Be sure to grasp on the edge of the CPU base. Note that the alignment keys are matched.
6. Visually inspect if the CPU is seated well into the socket. If not, take out the CPU with pure vertical motion and reinstall.

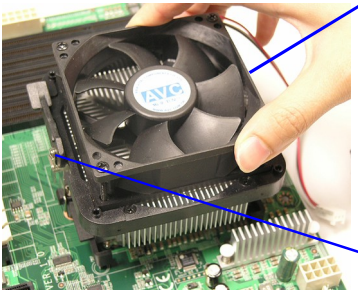


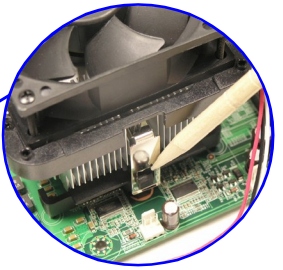


7. Cover the load plate onto the package.
8. Press down the load lever lightly onto the load plate and then secure the lever with the hook under the retention tab.

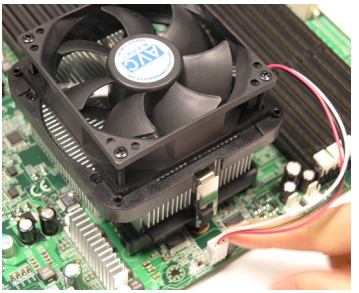


9. Place the cooler set on top of the retention mechanism. Secure the metal clips on the cooler set to the hooks on the retention mechanism.





10. Connect the cooler power cord to the onboard CPU fan power connector.



Mainboard photos shown in this section are for demonstration only and may differ from the actual look of your mainboard.

Precautions for Thermal Issues

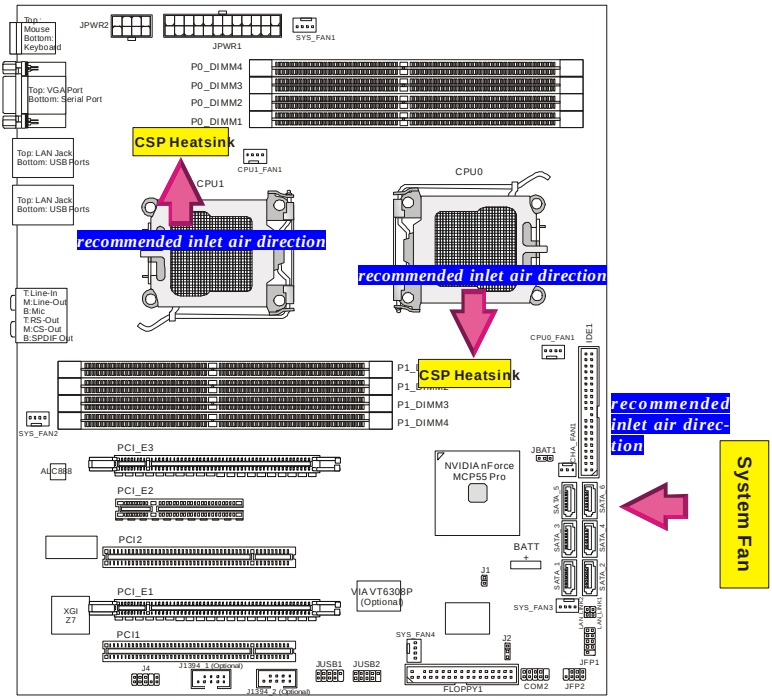
To virtually eliminate thermal issues, users are advised to take proper precautions.

1. Users are recommended to use **AVC Z7UB408*** ** series cooler when installing **120W** AMD Opteron CPU.

2. Users are recommended to use **AVC Z8UB009*** ** series cooler when installing **95W** AMD Opteron CPU.

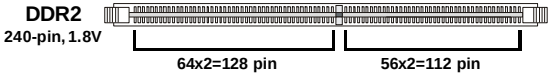
3. When choosing the system chassis, make sure that its system fan is located adjacent to the MCP55 Pro chipset. This way, the system fan will contribute a lot to the heat dissipation of the chipset and PCI interface cards.

4. The heat of the CPUs should be directed to the CSP heatsinks for better cooling effect. Follow the recommended inlet air direction (as indicated below by red arrows) for correct orientation of your CPU coolers.



Memory

The DIMM slots are intended for system memory modules.



Dual-Channel Mode Population Rule

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

CPU0	DIMM1	DIMM2	DIMM3	DIMM4
Rule 1 (Single-Channel)	V		V	
Rule 2 (Dual-Channel)	V	V		
Rule 3 (Dual-Channel)			V	V
Rule 4 (Dual-Channel)	V	V	V	V

CPU1	DIMM1	DIMM2	DIMM3	DIMM4
Rule 1 (Single-Channel)	V		V	
Rule 2 (Dual-Channel)	V	V		
Rule 3 (Dual-Channel)			V	V
Rule 4 (Dual-Channel)	V	V	V	V

Memory Frequency vs. Core Multiplier

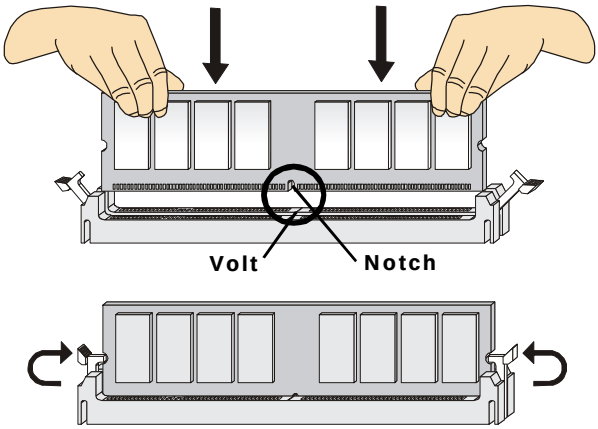
The DDR2 DIMM operates different frequency when using different CPU. For example, when using 2.4GHz CPU the DDR2 667MHz DIMM will operate at 600MHz.

CLKIN=200				
Core Multiplier	Core Frequency	Program DDR2 Frequency		
		200	267	333
4x	800	160	160	160
5x	1000	200	200	200
6x	1200	200	240	240
7x	1400	200	233	280
8x	1600	200	267	320
9x	1800	200	257	300
10x	2000	200	250	333
11x	2200	200	244	314
12x	2400	200	267	300
13x	2600	200	260	325
14x	2800	200	255	311
15x	3000	200	250	333

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.

   V *NOTE: You can barely see the golden finger if the memory module is properly inserted in the DIMM slot.*
3. The plastic clip at each side of the DIMM slot will automatically close.



Power Supply

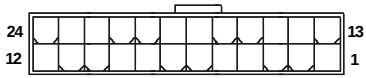
24-Pin System Power Connector: JPWR1

This connector allows you to connect to an SSI power supply. To connect to the 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.

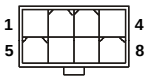
8-Pin CPU Power Connector: JPWR2

This connector provides 12V power output to the CPUs.

JPWR1



JPWR2



JPWR1 Pin Definition

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

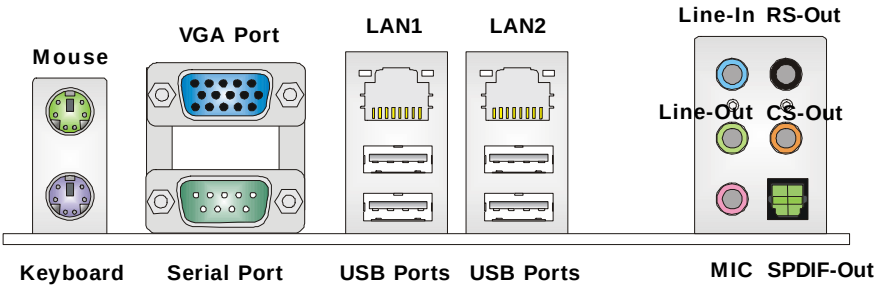
JPWR2 Pin Definition

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 both connectors are connected to proper power supply to ensure stable operation of the mainboard.*
2. *Powe;r supply of 600 watts (and above) is highly recommended for system stability.*

Back Panel



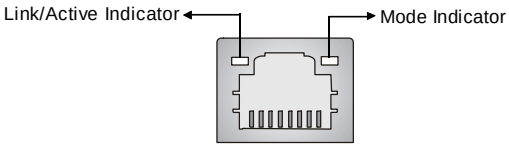
▶ Mouse/Keyboard Connector
The standard PS/2® mouse/keyboard DIN connector is for a PS/2® mouse/keyboard.

▶ VGA Port
The DB15-pin female connector is provided for VGA monitors.

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

▶ USB Port
The OHCI (Open Host Controller Interface) Universal Serial Bus root is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

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



RJ-45 LAN Jack

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. You can differentiate the color of the audio jacks for different audio sound effects.

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

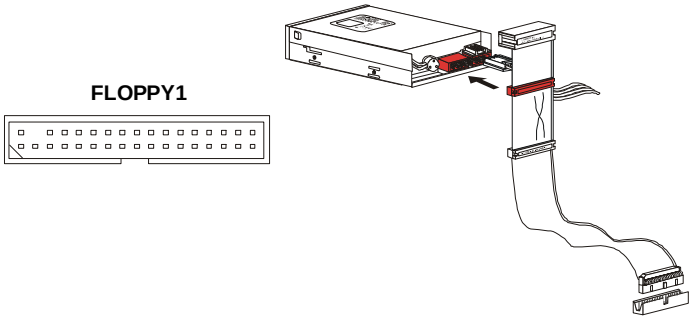
► **Optical S/PDIF-Out**

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

Connector

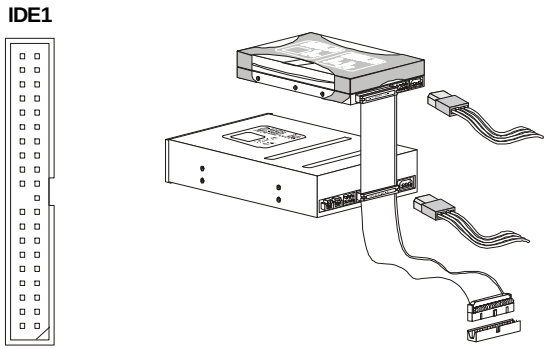
Floppy Disk Drive Connector: FLOPPY1

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



IDE Connector: IDE1

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

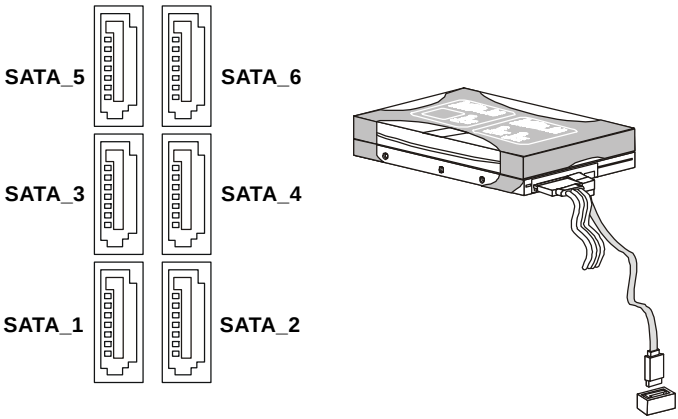


Important

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

Serial ATA Connector: SATA_1 ~ SATA_6

These connectors are high-speed Serial ATA II interface ports. Each connector can connect one Serial ATA II device.

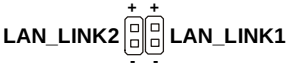


Important

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

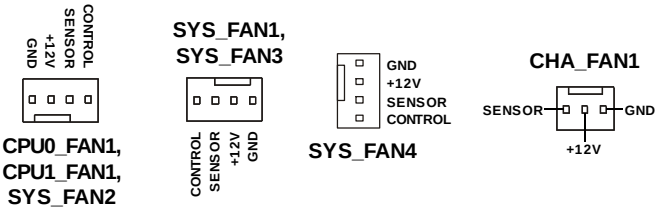
LAN LED Connector: LAN_LINK1, LAN_LINK2

The LAN LED connectors are used to connect to LAN LEDs, which show the activity of the LAN. The LAN_LINK1 is for the LAN 1 jack and the LAN_LINK2 is for the LAN2 jack. Both LAN1 & LAN2 jacks are located on the back panel.



Fan Power Connector: CPU0 / CPU1_FAN1, SYS_FAN 1 / 2 / 3 / 4, CHA_FAN1

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



Important

Please refer to the recommended CPU fans at AMD® official website or consult the vendors for proper CPU cooling fan.

Serial Port Connector: COM 2

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

COM2

Pin Definition

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

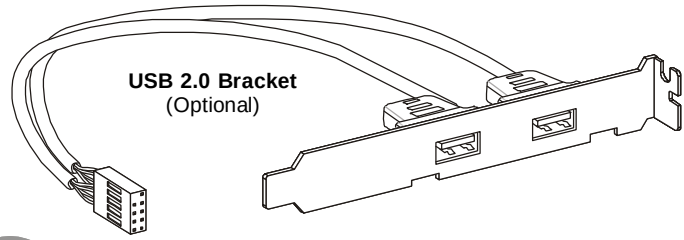
Front USB Connector: JUSB1, JUSB2

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**.

JUSB1/2

Pin Definition

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



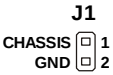
USB 2.0 Bracket
(Optional)

Important

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

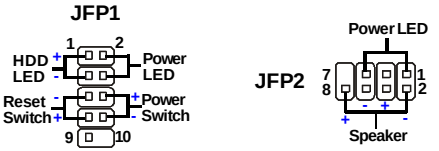
Chassis Intrusion Switch Connector: J1

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.



Front Panel Connector: 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	FP PWR/SLP	MSG LED pull-up
3	HD_LED -	Hard disk active LED
4	FP PWR/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+

Front Panel Audio Connector: J4

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

J4

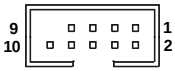
Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	MIC_L	6	LINE NEXTR
2	GND	7	HPON
3	MIC_R	8	KEY
4	PRESENCE#	9	FLINE OUTL
5	FLINE OUTR	10	LINE NEXTL

IEEE1394 Connector: J1394_1, J1394_2 (Optional)

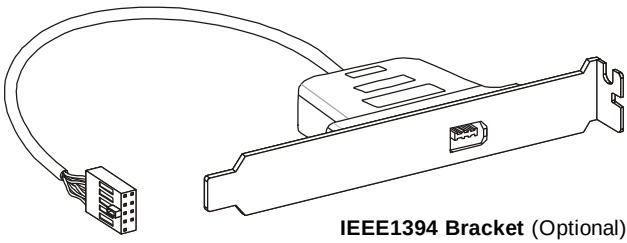
This connector allows you to connect the IEEE1394 device via an optional IEEE1394 bracket.

J1394_1/J1394_2



Pin Definition

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



IEEE1394 Bracket (Optional)

Jumper

Clear CMOS Jumper: JBAT1

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

Important

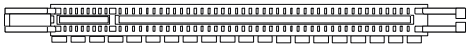
You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Slot

PCI (Peripheral Component Interconnect) Express Slot

The PCI Express slot supports the PCI Express interface expansion card.
The PCI Express x 16 slot supports up to 4.0 GB/s transfer rate.
The PCI Express x 8 slot supports up to 2.0 GB/s transfer rate.

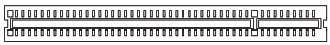
PCI Express x8 Slot



PCI Express x16 Slot

PCI (Peripheral Component Interconnect) Slot

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



32-bit/33MHz PCI Slot

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.

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 A#	INT B#	INT C#	INT D#
PCI Slot 2	INT B#	INT C#	INT D#	INT A#

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.

MSI
MICRO-STAR INTERNATIONAL

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 <F2> key to enter Setup.

Press F2 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:*

   P9661NMS V1.0 111507 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, V = VIA, and R = Serverworks.
   7th - 8th digit refers to the customer as MS = all standard customers.
   V1.0 refers to the BIOS version.
   111507 refers to the date this BIOS was released.

Control Keys

Key	Function
<F1> or <Alt-H>	General Help window
<Esc>	Exit this menu
↔ arrow keys	Select a different menu
↑ or ↓ arrow keys	Move cursor up and down
<Home> or <End>	Move cursor to top or bottom of window
<PgUp> or <PgDn>	Move cursor to next or previous page
<F5> or <->	Select the previous value for the field
<F6> or <+>or <Space>	Select the next value for the field
<F9>	Load the default configuration values for this menu
<F10>	Save and exit
<Enter>	Execute command or enter submenu

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

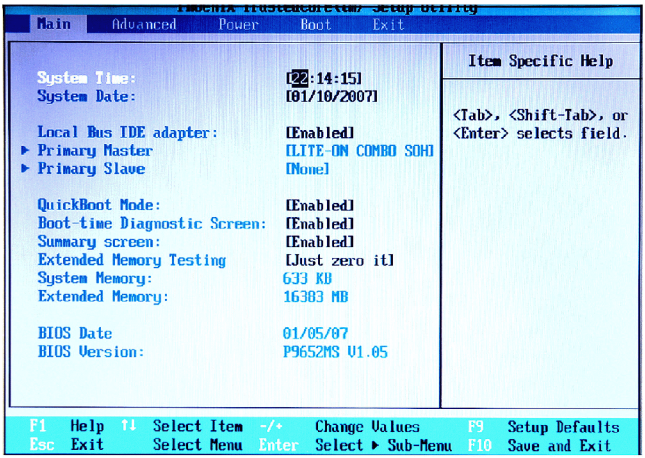
If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the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

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 Menu Bar

Once you enter **PhoenixBIOS Setup Utility**, the Main Menu will appear on the screen. On the Main Menu screen, you will see basic BIOS settings including system time & date, and the setup categories the BIOS supplies. Use Arrow keys to move among the items and menus, and make changes to the settings.



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

▶ Advanced
Use this menu to set up the items of special enhanced features available on your system's chipset.

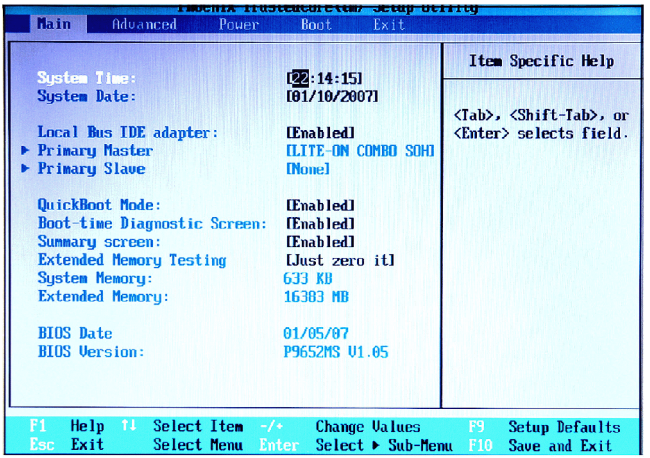
▶ Power
Use this menu to specify your settings for power management.

▶ Boot
Use this menu to specify the priority of boot devices.

▶ Exit
This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.

Main

The items inside the Main menu are for basic system information and configuration. Each item includes none, one or more setup items. Use the Up/Down arrow keys or <Tab> to highlight the item or field you want to modify and use the <+> or <-> key to switch to the value you prefer.



▶ System Time
The time format is <HH> <MM> <SS>.

▶ System Date
The date format is <MM> <DD> <YYYY>.

▶ Local Bus IDE Adapter
This setting controls the onboard IDE adapter.

▶ Primary Master, Primary Slave

[Type]	Press PgUp/<+> or PgDn/<-> to select [Manual], [None] or [Auto] type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use [Manual] to define your own drive type manually.
[Multi-Sector Transfers]	Any selection except Disabled determines the number of sectors transferred per block

[LBA Mode Control]	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors
[32-Bit I/O]	Enables 32-bit communication between CPU and IDE card
[Tranfer Mode]	Selects the method for transferring the data between the hard disk and system memory
[Ultra DMA Mode]	Indicates the type of Ultra DMA

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

► Boot-time Diagnostic Screen
Select [Enabled] if you want to view the system diagnostic screen during boot-time.

► Summary Screen
Select [Enabled] if you want to view the system summary screen.

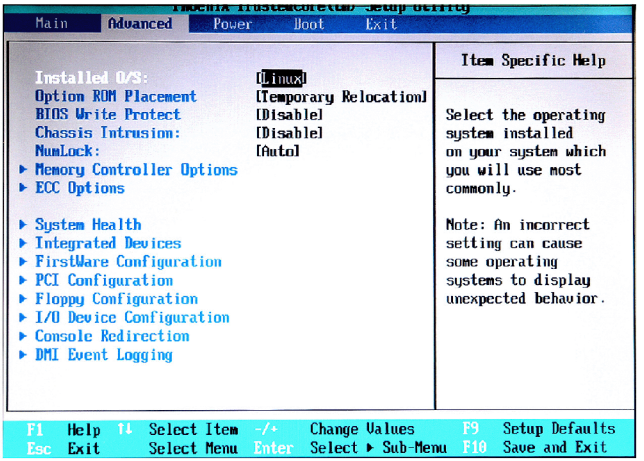
► Extended Memory Testing
This setting determines which type of tests will be performed on extended memory (above 1M).

► System Memory, Extended Memory
These items show the memory status of the system. (Read-only)

► BIOS Date, BIOS Version
These items show the information of the system BIOS. (Read-only)

Advanced

Items in the menu are divided into several sub-menus. Each sub-menu provides more settings. To enter the sub-menu, highligh the sub-menu you want to configure and press <Enter>.



▶ Installed O/S

When multiple operating systems are installed in your system, use this setting to select the major operating system that will be used most commonly. Note that an incorrect setting in this field may cause unexpected errors on the operating systems. **NOTE**: When installing Linux OS, you must switch this item to [Linux].

▶ Option ROM Placement

This setting determines the Option ROM placement. If the system hangs during boot, please restart the system and enter the BIOS Setup Utility to change this setting.

▶ BIOS Write Protect

This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When enabled, the BIOS' data cannot be changed when attempting to update the BIOS with a Flash utility. To successfully update the BIOS, you'll need to disable this BIOS Write Protect function.

You should enable this function at all times. The only time when you need to disable it is when you want to update the BIOS. After updating the BIOS, you should immediately re-enable it to protect it against viruses.

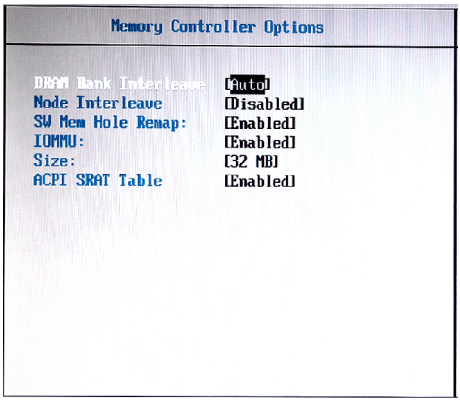
▶ Chassis Intrusion

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.

▶ NumLock

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.

▶ Memory Controller Options



▶ DRAM Bank Interleave

Interleaved memory is system memory divided into two or more sections. Setting to [Enabled] allows memory to be accessed faster since each section of memory is capable of being utilized at once.

▶ Node Interleave

AMD Opteron CPU supports a mode called node interleave. When node interleave is **disabled**, the memory controller maps the local memory of each processor to a single contiguous range of physical addresses. This allows the operating system to map user data to local memory, whenever possible, to allow programs to access data the most rapidly. When node interleave is **enabled**, physical addresses are partitioned into 4KB blocks, and alternated among the processors. The operating system is then unable to use NUMA optimizations, and the memory space is treated as if the system were an SMP system.

▶ SW Mem Hole Remap

This setting enables the software to remap the physical memory to an address higher than 4GB.

▶ IOMMU

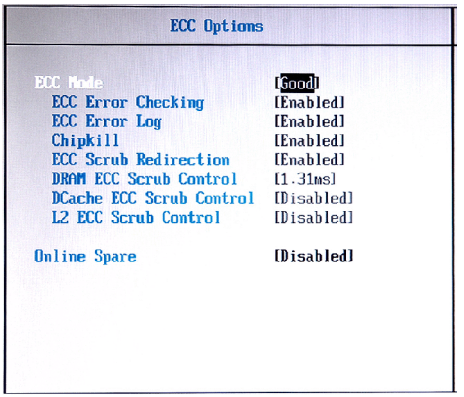
AMD64, one of the 64-bit architectures, contains a device called the IOMMU (Input/Output Memory Management Unit). The IOMMU allows 32-bit devices to

see all of the (64-bit addressed) main memory although with a 32-bit address bus you can only address a 32-bit address space. It is a MMU that translates DMA virtual addresses to real physical addresses.

▶ Size
This setting specifies the memory size for IOMMU.

▶ ACPI SRAT Table
The Static Resource Affinity Table (SRAT) can be used to describe the physical location of processors and memory in large-scale systems (such as CC-NUMA) to the Microsoft Windows Server 2003 operating system, allowing threads and memory to be grouped in an optimal manner.

▶ ECC Options



▶ ECC Mode
If all memory in the system supports ECC, enabling this will initial scrub DRAM and enable system requests to DRAM to be checked and/or corrected.

▶ ECC Error Checking
This setting enables/disables ECC (Error Correction Code) checking, a method of checking the integrity of data in DRAM. ECC provides more elaborate error detection than parity; ECC can detect multiple-bit errors and can locate and correct single-bit errors.

▶ ECC Error Log
This setting logs the ECC error.

▶ Chipkill
Chipkill is a new Advanced ECC (Error Correction Code) memory technology that protects servers from system downtime caused by memory failures.

▶ ECC Scrub Redirection
This setting enables/disables ECC Scrubber to correct errors detected in DRAM during normal CPU requests (foreground scrubbing).

▶ DRAM ECC Scrub Control
The DRAM ECC Scrub option controls the frequency at which memory read options are corrected while the system is in an idle state.

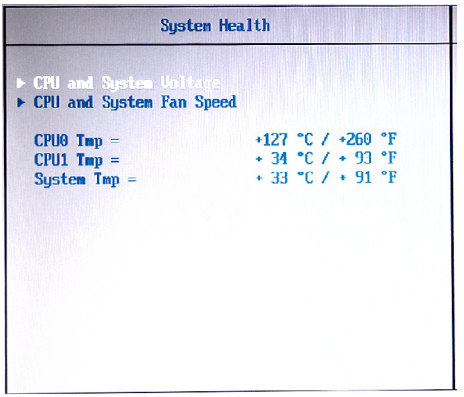
▶ DCache ECC Scrub Control
The Data Cache ECC Scrub option controls the time allotted for the L1 memory cache to be corrected when in an idle state.

▶ L2 ECC Scrub Control
The L2 ECC Scrub option controls the time allotted for the L2 memory cache to be corrected when in an idle state.

▶ Online Spare
Online Spare Memory mode provides a higher level of memory protection than Standard Memory mode. It protects against single-bit errors and is beneficial to businesses with sites that do not have sufficient IT staff available to service a failure, do not always have replacement memory on hand, or where the server cannot be brought down before a scheduled shutdown.

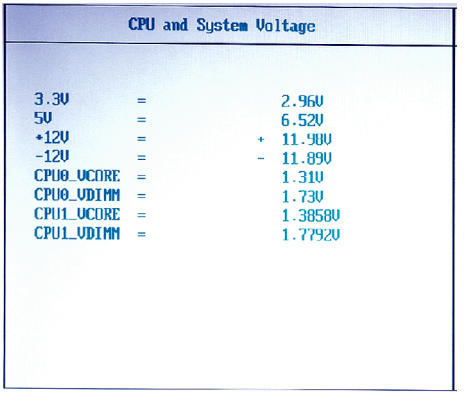
▶ System Health

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



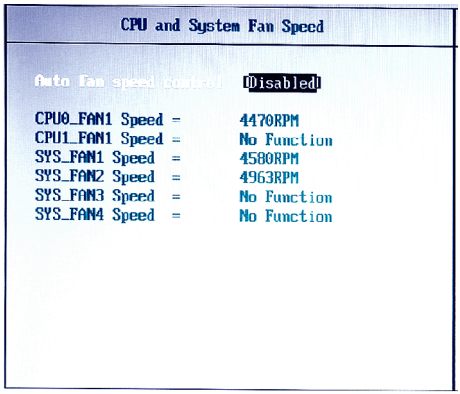
▶ CPU and System Voltage

This field shows the CPU and system voltages.



▶ CPU and System Fan Speed

These items display the current fans' speeds of the system.



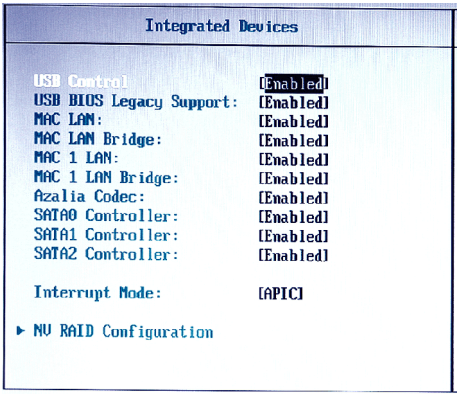
▶ Auto Fan Speed Control

This item enables/disables the Smart Fan feature. Smart Fan is an excellent feature which will adjust the CPU/system fan speed automatically depending on the current CPU/system temperature, avoiding system damage caused by overheating.

▶ CPU0_FAN1 / CPU1_FAN1 Speed, SYS_FAN1 / SYS_FAN2 / SYS_FAN3 / SYS_FAN4 Speed

You can select a fan value here. If the current temperature reaches to the minimum threshold you set here, the fan will slow down to keep the temperature stable.

▶ Integrated Devices



▶ USB Control
This setting enables/disables the onboard USB host controller.

▶ USB BIOS Legacy Support
Set to [Enabled] if your need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.

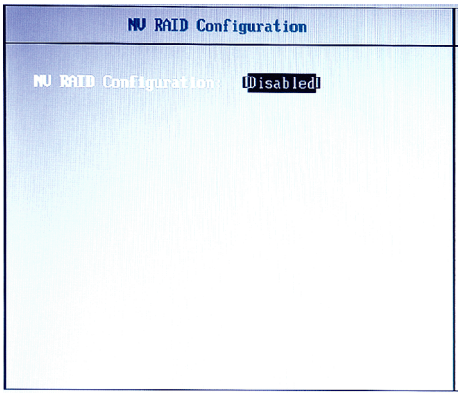
▶ MAC LAN, MAC LAN Bridge, MAC 1 LAN, MAC 1 LAN Bridge
These settings allow you to enable/disable the specified device controllers.

▶ Azalia Codec
Azalia is the codename of “High Definition Audio.” This setting allows users to disable/enable the High Definition Audio interface integrated in the Southbridge.

▶ SATA0 Controller, SATA1 Controller, SATA2 Controller
These settings allow you to enable/disable the onchip Serial-ATA controllers.

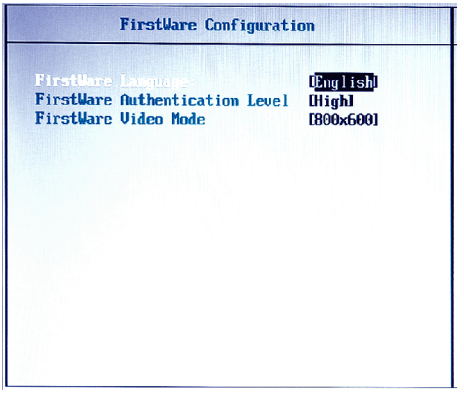
▶ Interrupt Mode
This BIOS feature is used to enable or disable the motherboard's APIC (Advanced Programmable Interrupt Controller). The APIC provides multiprocessor support, more IRQs and faster interrupt handling.
However, it is only supported by newer operating systems like Microsoft Windows NT, Windows 2000 and Windows XP. Older operating systems like DOS or Windows 95/98 do not support this feature.
It is recommended that you select APIC if you are using a newer operating system like Windows XP. Select PIC only if you are using an older operating system like DOS or Windows 95/98.

▶ **NV RAID Configuration**



▶ **NV RAID Configuration**
This setting enables/disables the nVIDIA software RAID configuration.

▶ FirstWare Configuration

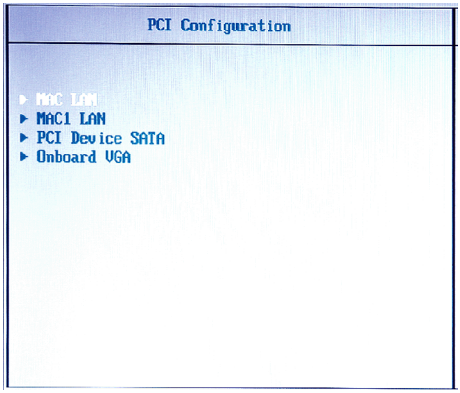


▶ FirstWare Language
This setting allows you to change the screen language for your FirstWare applications.

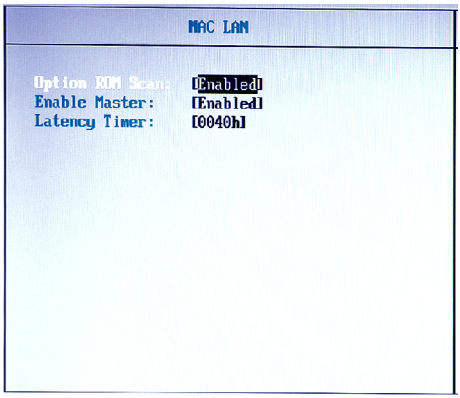
▶ FirstWare Authentication Level
This setting allows you to select the authentication level for your FirstWare applications.

▶ FirstWare Video Mode
This setting allows you to change the video resolution for your FirstWare applications.

▶ PCI Configuration



▶ MAC LAN, MAC1 LAN, PCI Device SATA, Onboard VGA

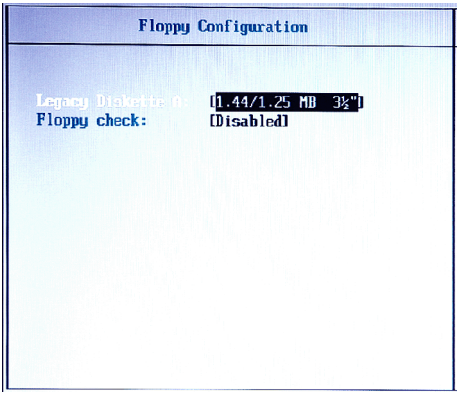


▶ Option ROM Scan
Use this feature to initialize device expansion ROM.

▶ Enable Master
When set to [Enabled], BIOS will activate the selected device as a PCI bus master.

▶ 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.

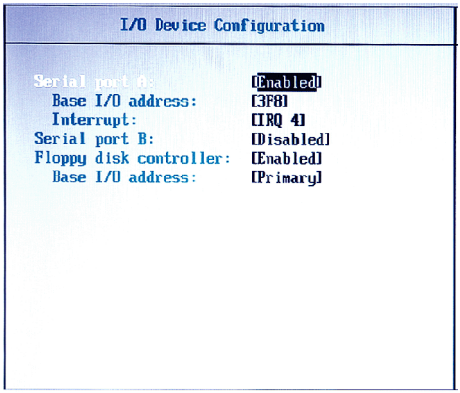
▶ Floppy Configuration



▶ Legacy Diskette A:
This setting allows you to set the type of floppy drives installed.

▶ Floppy Check
This setting causes the BIOS to search for floppy disk drives at boot time. When enabled, the BIOS will activate the floppy disk drives during the boot process.

▶ I/O Device Configuration



▶ Serial Port A/B

These settings enable/disable the onboard Serial Port A / B.

▶ Base I/O Address

These settings specify the base I/O port addresses of the onboard Serial Port A / B.

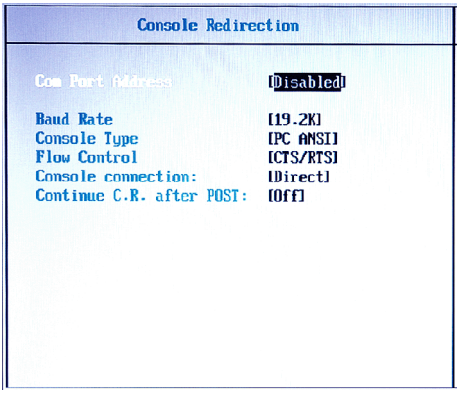
▶ Interrupt

These settings specify IRQs for the Serial Port A / B.

▶ Floppy Disk Controller

This setting enables/disables the onboard floppy disk controller.

▶ Console Redirection



▶ Com Port Address
This setting enables/disables the Com port address for console connection.

▶ Baud Rate
This setting specifies the transfer rate (bits per second) of Console Redirection.

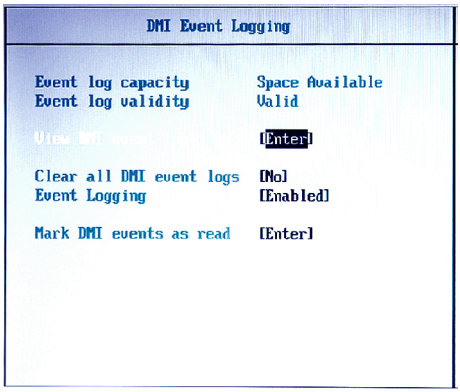
▶ Console Type
This setting specifies the console type.

▶ Flow Control
This feature allows you to enable flow control.

▶ Console Connection
This feature indicates whether the console is connected directly to the system or a modem is used for connection.

▶ Continue C. R. after POST
Selecting [On] will enable Console Redirection after OS has loaded.

▶ DMI Event Logging



▶ Event Log Capacity/Validity

These items indicate the status of Event log validity and capacity.

▶ View DMI Event Log

Press [Enter] to view the contents of the DMI event log.

▶ Clear All DMI Event Logs

When this setting is set to [Yes], the DMI event log will be cleared at next POST stage. Then, the BIOS will automatically set this option to [No].

▶ Event Logging

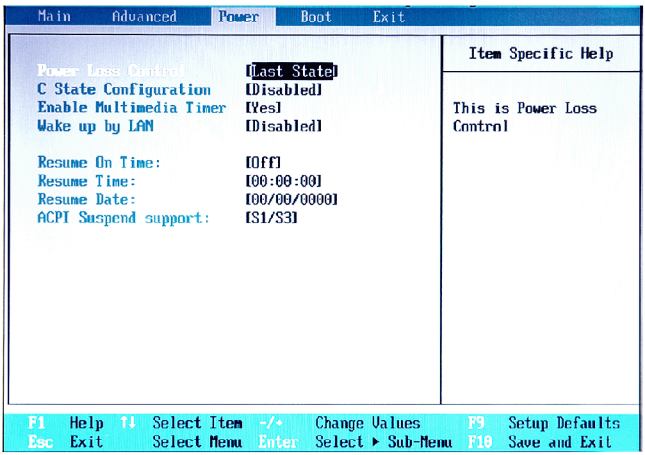
This setting disables/enables the BIOS to log DMI (Desktop Management Interface) events.

▶ Mark DMI Events as Read

Press [Enter] and a screen pops up, asking users to confirm whether or not to clear all DMI event logs immediately. Press [Y] and [Enter], the BIOS will clear all DMI event logs right away.

Power

Use this menu to specify your settings for Power Management. Remember that the options available depend upon the hardware installed in your system.



▶ Power Loss Control

This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

[Stay Off]	Returns the system to an off state.
[Power On]	Returns the system to an on state.
[Last State]	Restores the system to the previous status before power failure or interrupt occurred.

▶ C State Configuration

C-state performance indicates the ability to run the processor in lower power states when the PC is idle. This setting enables/disables the C-State Configuration for power saving purposes.

▶ Enable Multimedia Timer

This setting enables the Multimedia Timer to achieve better resolution for multimedia and other time-sensitive applications.

▶ Wake Up by LAN

Select [Enabled] to wake up the system when incoming signals are detected on the specified LAN devices.

► **Resume On Time**
Select [On] to wake up the system at predetermined time.

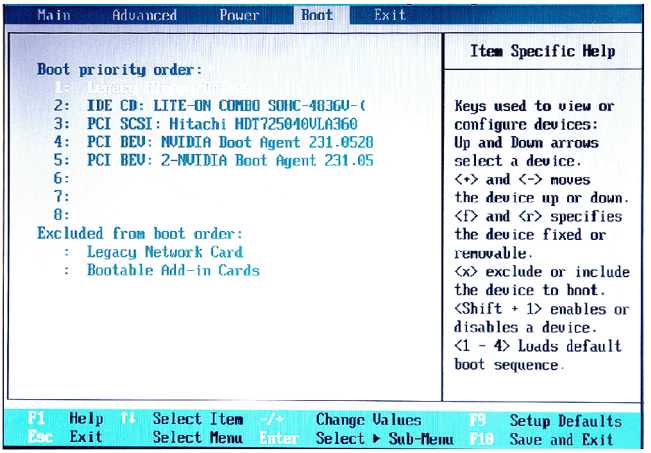
► **Resume Time**
The time format is <HH> <MM> <SS>.

► **Resume Date**
The date format is <MM> <DD> <YYYY>.

► **ACPI Suspend Support**
This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field.

Boot

Use this menu to arrange and specify the priority of the devices from which the BIOS will attempt to boot the Operating System.

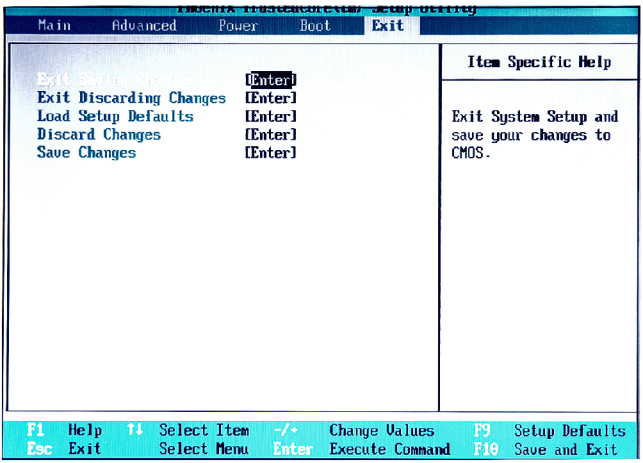


▶ Boot Priority Order
This setting allows users to set the boot priority of the specified devices. Refer to the ***Item Specific Help*** on the right pane for instructions.

▶ Excluded from Boot Order
This setting allows users to exclude the specified devices from the Boot Order list.

Exit

The following sections describe each of the options on this menu. Note that <Esc> does not exit this menu. You must select one of the items from the menu or menu bar to exit.



▶ Exit Saving Changes
When you want to quit the Setup menu, you can select this option to save the changes and quit.

▶ Exit Discarding Changes
When you want to quit the Setup menu, you can select this option to abandon the changes.

▶ Load Setup Defaults
The option allows users to restore all of the BIOS settings to the Optimal Defaults. The Setup Defaults are the default values set by the mainboard manufacturer specifically for the optimized performance of the mainboard.

▶ Discard Changes
The option allows users to restore all of the BIOS settings to previous values.

▶ Save Changes
The option allows users to save the changes without exiting Setup.

Appendix A
nVIDIA SATA 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.

MSI
MICRO-STAR INTERNATIONAL

Introduction

System Requirement

Operating System Support

NVRAID supports the following operating systems:

Windows XP
Windows 2003 x64
Windows 2003
Windows Vista x64
Windows 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.

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 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. (To enable the ***nVidia RAID Function*** in **nVidia RAID Setup** of **Integrated Peripherals** in BIOS.)
2. Specify the RAID level, either Mirroring (RAID 1) or Striping (RAID 0) and create the desired RAID array.
3. Enter the Windows OS, run the Windows nForce Setup application and install the RAID software.
4. Initialize the NVRAID Array Disks.

Bootable RAID Array

1. Choose the hard disks that are to be RAID enabled in the system BIOS. (To enable the ***nVidia RAID Function*** in **nVidia RAID Setup** of **Integrated Peripherals** in BIOS.)
2. Specify the RAID level, either Mirroring (RAID 1) or Striping (RAID 0),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.
4. Initialize the NVRAID Array Disks.

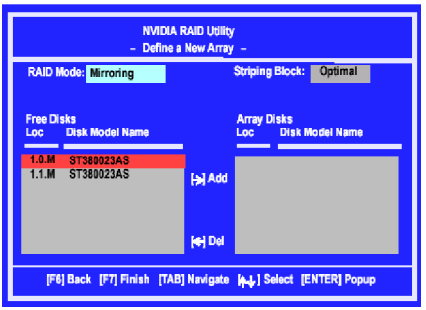
Setting Up the NVRAID BIOS

Be sure to enable the ***nVidia RAID Function*** in **nVidia RAID Setup** of **Integrated Peripherals** 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***.



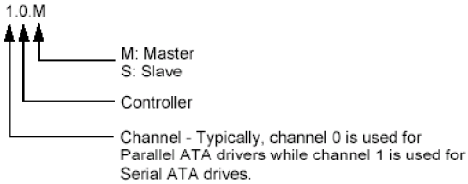
Understanding the "Define a New Array" Window

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 Channel 1, Controller 0, and the drive is set to Master. The following is a list of all possible combinations:

Parallel ATA

0.0.M	Channel 0, controller 0, Master
0.0.S	Channel 0, controller 0, Slave
0.1.M	Channel 0, controller 1, Master
0.1.S	Channel 0, controller 1, Slave

Serial ATA

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

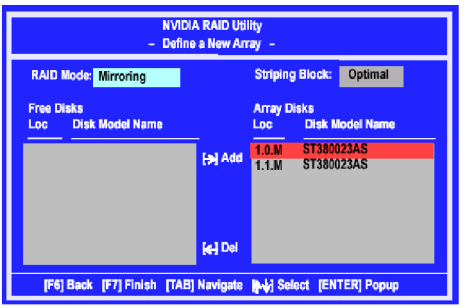
Using the Define a New Array Window
If necessary, press the tab key to move from field to field until the appropriate field is highlighted.

• 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].

• 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,

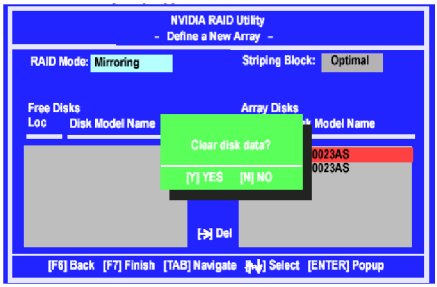
1. Tab to the **Free Disks** section. The first disk in the list is selected.
2. Move it from the Free Disks block to the Array Disks block by pressing the right arrow key (-->). The first disk in the list is moved, and the next disk in the list is selected and ready to be moved.
3. Continue pressing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



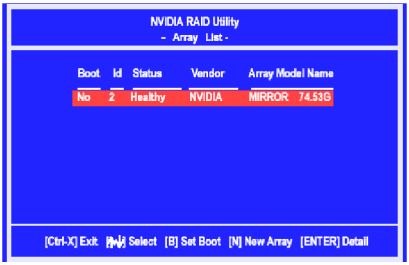
It shows that two disks have been assigned as RAID1 array disks in the figure above.

Completing the RAID BIOS Setup

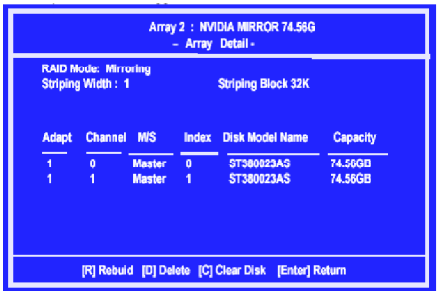
1. After assigning your RAID array disks, press **F7.** The Clear disk data prompt appears.



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.



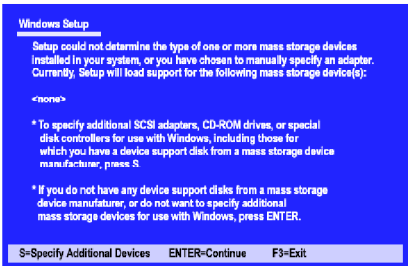
3. Use the arrow keys to select the array that you want to set up, then press **Enter.** The **Array Detail** window appears.



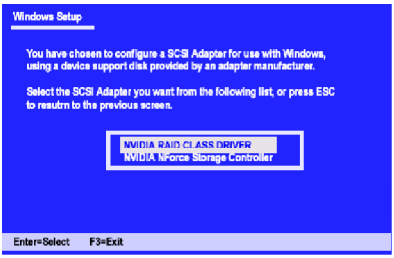
4. If you want to mark this disk as empty and wipe out all its contents then press **C**.
5. At the prompt, press **Y** to wipe out all the data, otherwise press **N**.
6. Press **Enter** again to go back to the previous window and then press **Ctrl+X** to exit the RAID setup. Now that the RAID setup 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”.

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.
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:

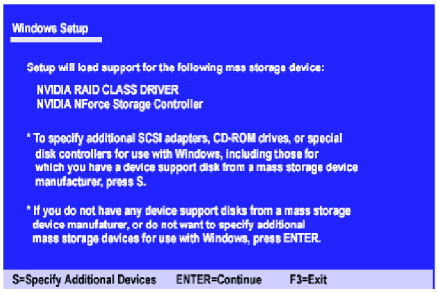


Important

Please follow the instructions below to make an nVIDIA Serial ATA RAID driver diskette 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\MCP55\IDE\WinXP\sataraid *or*
   \\nVidia\System\MCP55\IDE\Win2K\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

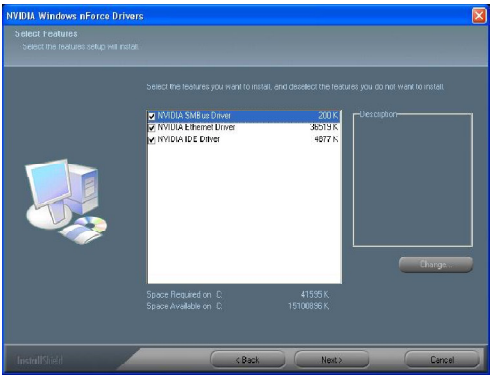
Each time you add a new hard drive to a RAID array, the RAID driver will have to be installed under Windows once for that hard drive. After that, the driver will not have to be installed.

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 C19 System 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 enabled.*

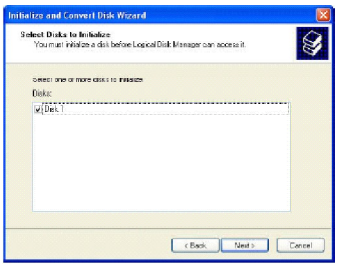
3. Click **Next** and then follow the instructions.
4. After the installation is completed, be sure to reboot the PC.
5. After the reboot, initialize the newly created array.

Initializing and Using the Disk Array

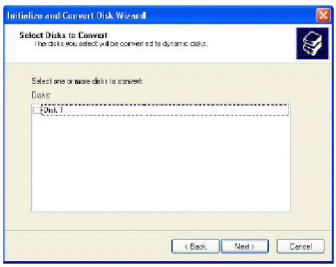
The RAID array is now ready to be initialized under Windows.

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.

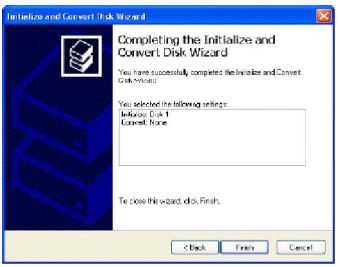
3. Click **Next**. The Select Disks to Initialize window appears. The disks listed depend on how many arrays you have configured.



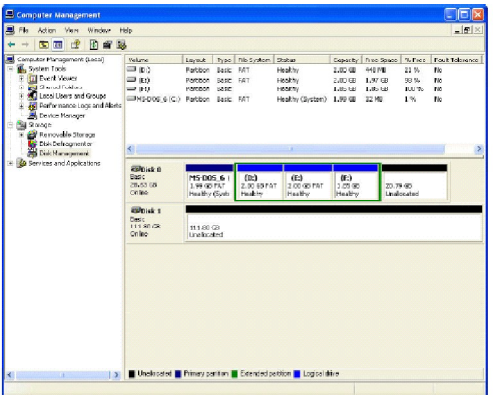
4. Click **Next**. The Select Disks to Convert window appears.



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

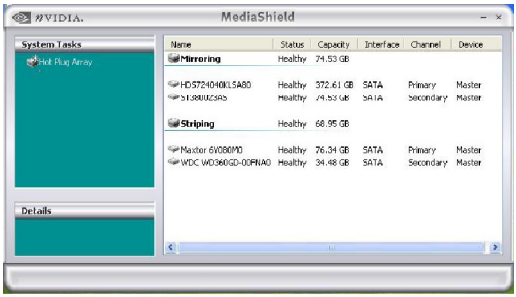
There is an application called NVRAIDMAN which helps you perform the following tasks of nVDIA RAID.

- **Viewing RAID Array Configurations**
  View an array configuration (mirrored or striped)
- **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 arrays
- **Synchronizing a RAID Array**
  - Rebuild the redundancy in RAID 1 arrays (copy the data to the redundant disk—the same operation as rebuilding)

Viewing RAID Array Configurations

To view your RAID configuration from Windows, launch the NVRAID Management utility by double-clicking NvRaidMan.exe (the default location of NvRaidMan.exe is in \\nVidia\System\MCP55\IDE\Win2k or XP\raidtool\ of the setup CD accompanied with your mainboard).

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



Important

The setup screens are for demonstration only and may vary from what 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 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 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

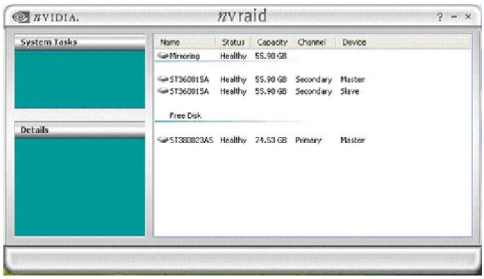
A dedicated free disk is a disk that is assigned to a RAID 1 array and that disk is used by that array only when needed, for example during a system crash where a RAID mirrored drive is broken. The dedicated disk can be used only by the array that it is assigned to and not by any other array, unlike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



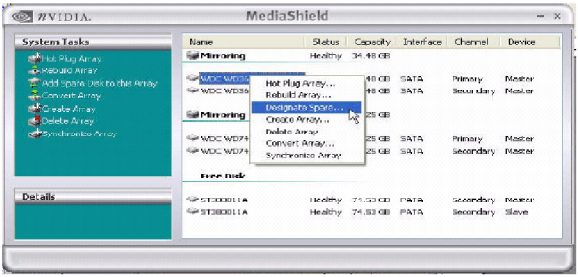
Assigning a Dedicated Disk
To mark a disk as dedicated, or reserve it for use by a specific array,

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.

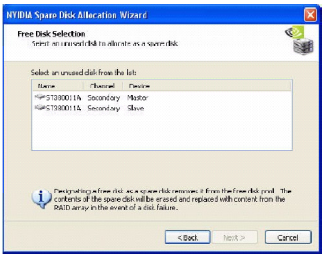
Step 2: Dedicate the Free Disk to an Array
While running NVRAIDMAN, dedicate the free disk to an array by doing the following:

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



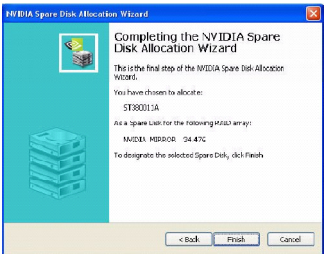
2. Select **Designate Spare** from the menu to launch the Spare Disk Allocation Wizard.

3. Click **Next**.
The RAID Array Selection page appears.

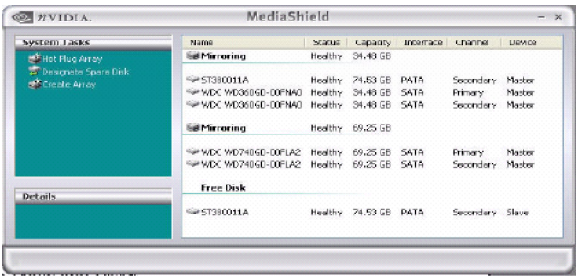


4. From the Free Disk Selection page, select one of the two free disks available. This would be the disk that will be designated to the mirror array.

5. Click **Next**.
The Completing the NVIDIA Spare Disk Allocation page appears.

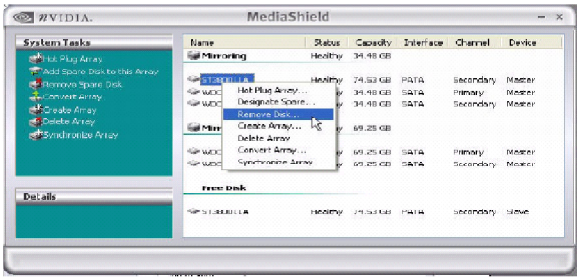


6. Click **Finish**.
As shown in figure below, the ST380011A drive is now a dedicated free disk in the mirrored array. If a system crash occurs that causes any of the two WD360GD drives to fail, the ST380011A hard drive will take over and be used in the newly formed mirrored array.



Removing a Dedicated Disk

Once a dedicated disk has been assigned to a particular array, it can be removed at any time. To remove the disk, right click on the dedicated disk and select “Remove Disk...” to remove it. In the previous example, simply right click on the ST380011A drive and select “Remove Disk...”. as shown in the screen shot below:



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 from RAID 1 to RAID 1

Specific Morphing Requirements

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

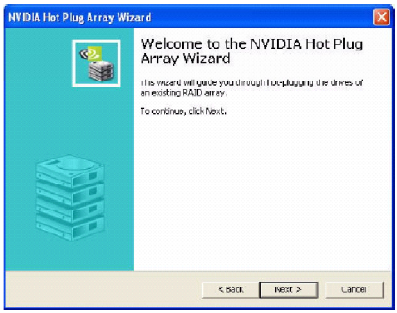
From	To	New Array Disk Requirements
RAID 0	**RAID 0**	m > n Number of disks in the new array must be greater than the original array.
	RAID 1	m =2, n =1 RAID 1 array must include two disks, converted from a one disk RAID 0 array.
RAID 1	**RAID 0**	No additional restrictions.
	RAID 1	**** Not a valid combination ****

Hot Plug Array

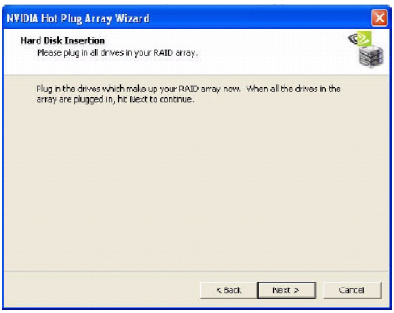
With respect to RAID, hot plugging is the ability to add a disk to a system safely and without causing problems for the RAID software. For example, when a drive in a mirrored array fails, the user can launch the Hot Plug Array Wizard which instructs the user as to when a drive can be safely added to 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:

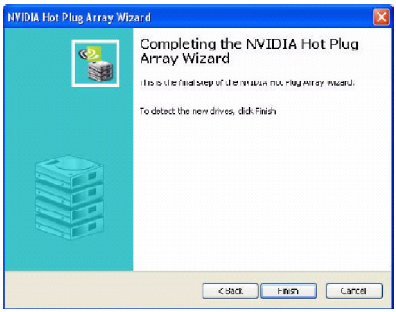
1 Launch NVRAIDMAN and click on “Hot Plug Array” and the following screen shot will appear:



2 Click **Nex**t 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:

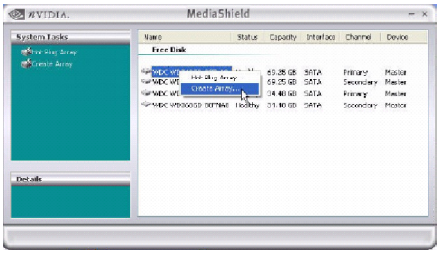


5 Click **Finish**.

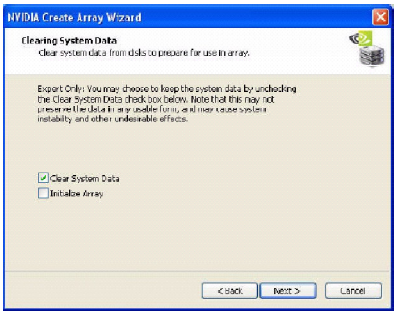
Initializing a RAID Array

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 0. 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.

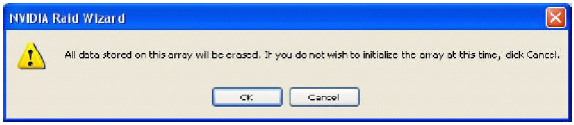
1 From the NVRAIDMAN window, right click on any available free disk and select **Create Array** as show in Figure below.



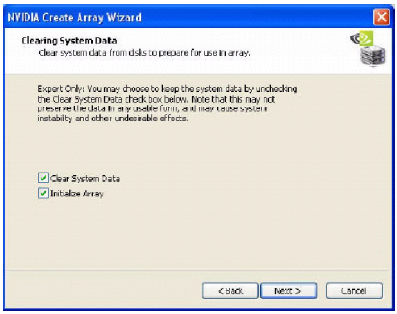
2 The Create Array Wizard opens. Follow the Wizard to create a Mirror array.
3 At the Create Array Wizard Welcome screen, click **Next**.
4 At the RAID Array Selection page, make sure that RAID Mode is set to "**Mirroring**" and Stripe Size is set to its default value of 64K, then click **Next**.
5 At 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:



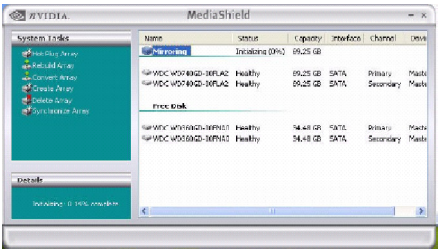
7 Check "Intialize Array" and then click **Next**. The Initialization Warning dialog appears.



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



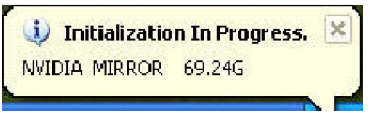
9 Click **Next**, then click **Finish** at the Completing the NVIDIA Create Array Wizard screen. The NVRAIDMAN windows shows the created RAID array as shown below.



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:



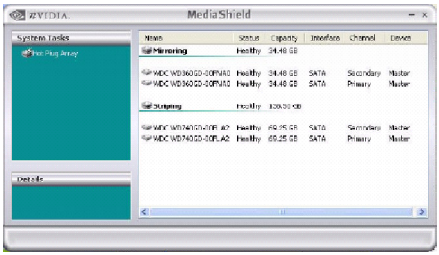
Rebuilding a RAID Array

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. For example, assuming you have a two disk RAID 1 array, and one of the drives fail, then you need the lost data on the newly added drive.

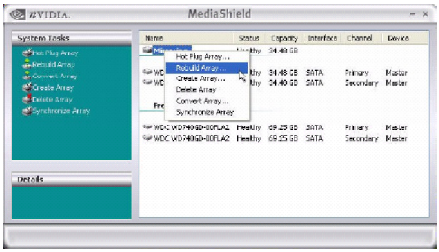
Rebuilding Instructions

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

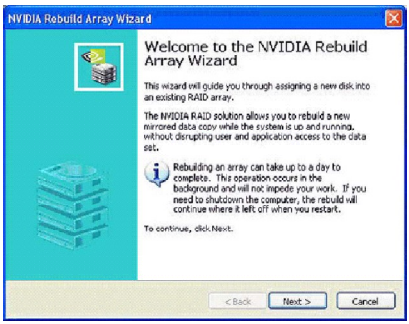
1 Go to Windows and run the NVIDIA RAID Management utility.
The picture below shows an example of a system with one mirrored array and two free disks.



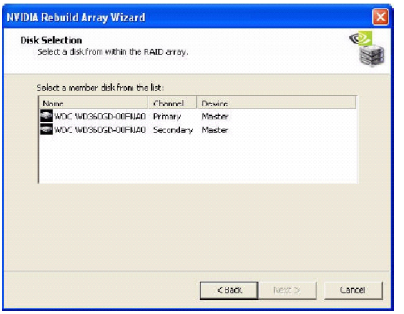
2. Right-click on Mirroring. The popup menu appears.



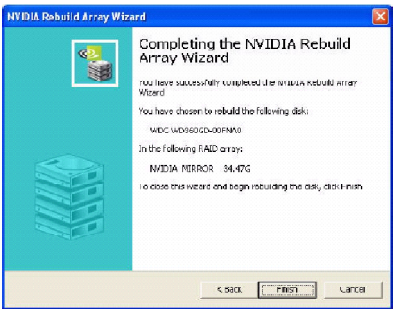
3. From the popup menu, click **Rebuild Array**. The NVIDIA Rebuild Array Wizard appears.



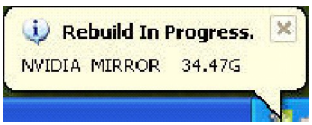
4. Click **Next.** The Disk Selection page appears.



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.

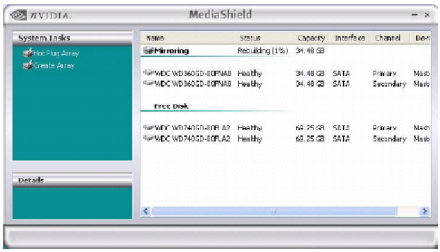


6. Click **Finish**. The array rebuilding starts after a few seconds, and a small pop-up message appears towards the bottom right corner of the screen as shown in the figure below.



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***

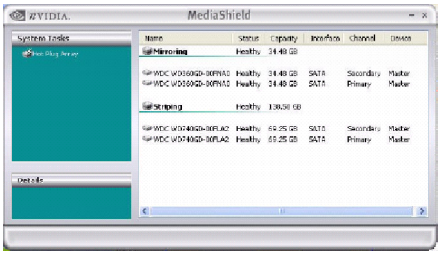
The rebuilding process is very slow (it can take up to a day) and occurs in the background so as not to affect the performance of the system.

• ***Rebuilding Applies Only to RAID 1 Array***

Rebuilding an array works only when using RAID 1. Rebuilding does not apply to RAID 0.

• ***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”, except when prompted to select a disk, choose one of the two available free disks.

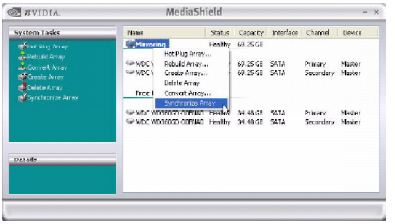
Synchronizing a RAID Array

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

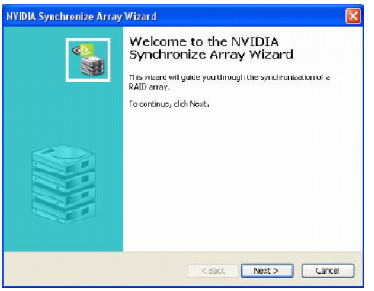
• For RAID1, “sync” results in copying the data to the redundancy disk,

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

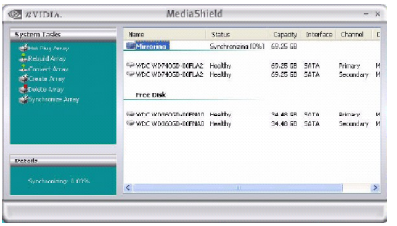
1 Right click on “Mirroring” and select **Synchronize Array** as shown in Figure below.



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.

Usind Disk Alert

The RAID manager application includes a disk alert feature that provides a graphical indication of the status of the hard disks in the system.
When the RAID manager application detects a failure condition of an attached drive, a pop-up box appears in the clock area of the Windows system tray. Click the pop-up box to view the manufacturer-provide bitmap image of the system motherboard. The image shows the hard drive connector ports and provides a visual indication of the location and status of the drives as follows:

- ***Red rectangle:*** A red rectangle will flash around the port connector that is attached to the failed drive.

- ***Green rectangle:*** Ports that have a drive attached, and are in a healthy state, are indicated with a green rectangle around the port connector.

- ***Yellow rectangle:*** Ports that have a drive attached, are members of a failed RAID array, but are not the cause of the failure have a yellow rectangle around the port connector.

Unconnected ports have no visual indication.

Appendix B
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.

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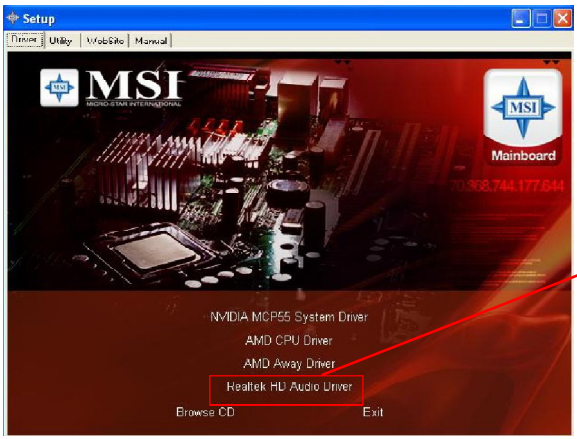
Installing the Realtek HD Audio Driver

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

Installation for Windows 2000/XP

For Windows® 2000, you must install Windows® 2000 Service Pack4 or later before installing the driver. For Windows® XP, you must install Windows® XP Service Pack1 or later before installing the driver.
The following illustrations are based on Windows® XP environment and could look slightly different if you install the drivers in different operating systems.

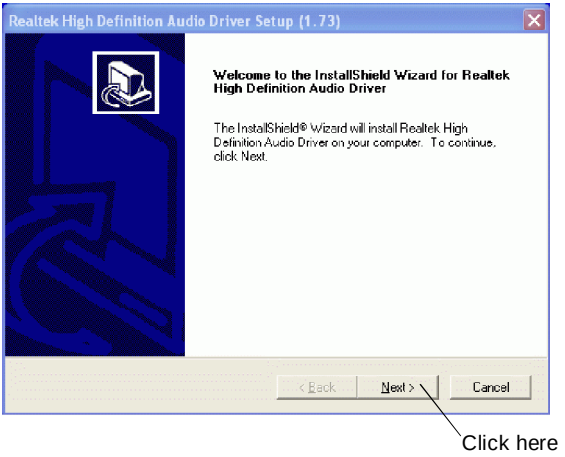
1. Insert the application CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click **Realtek HD Audio Driver**.



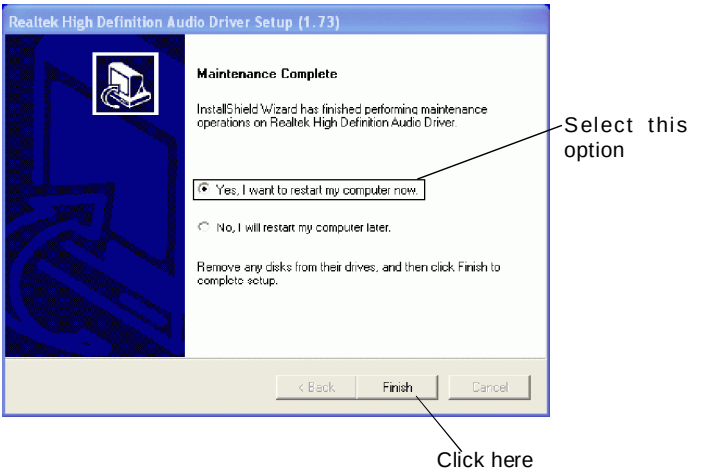
Important

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

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

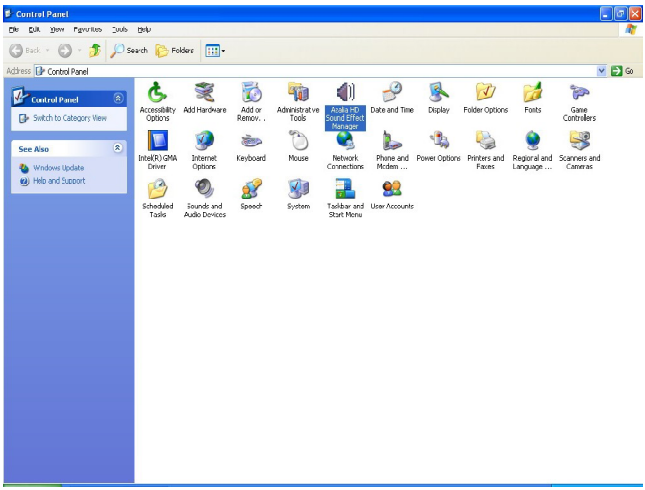


4. Click **Finish** to restart the system.



Software Configuration

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



Sound Effect

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

Environment Simulation

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

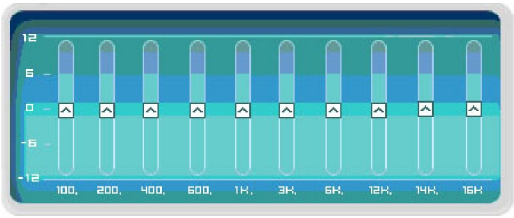
You may choose the provided sound effects, and the equalizer will adjust automatically. If you like, you may also load an equalizer setting or make an new equalizer setting to save as an new one by using the “**Load EQ Setting**” and “**Save Preset**” button, click “**Reset EQ Setting**” button to use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

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

Equalizer Selection

Equalizer frees users from default settings; users may create their owned 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]

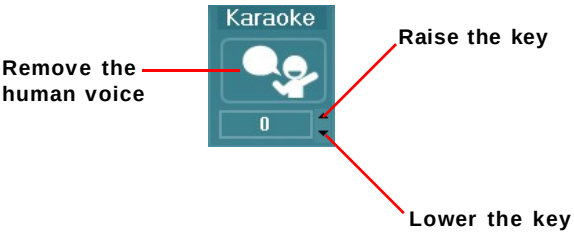
Other than the buttons “Pop” “Live” “Club” & “Rock” shown on the page, to pull down the arrow in “Others”, you will find more optimized settings available to you.

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 pluged 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 pluging the speakers into the jacks on the front panel.*

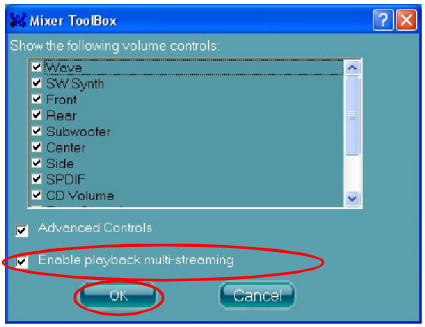
2. Multi-Stream Function

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

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

Important

You have to plug audio device into the jacks on the rear and front panel first before enable the multi-stream function.



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

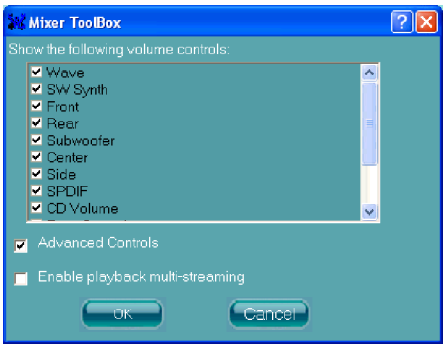
Then you **must** to select the **Realtek HD Audio front output** from the scroll list **first**, and use a different program to play the second audio source (for example: use Winamp to play MP3 files). You will find that the second audio source (MP3 music) will come out from the Line-Out audio jack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

3. Playback control

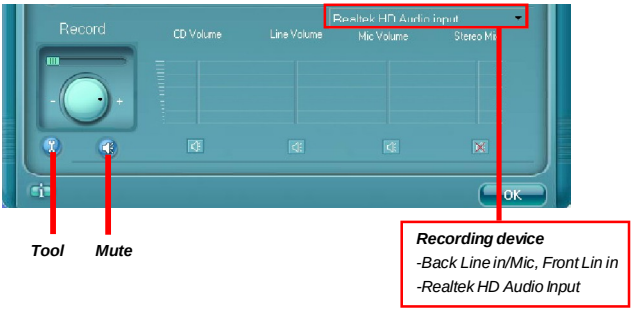
Playback device
This function is to let you freely decide which ports to output the sound. And this is essential when multi-streaming playback enabled.
- Realtek HD Audio Rear Output
- Realtek HD Audio Front Output

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

Tool
- Show the following volume controls
This is to let you freely decide which volume control items to be displayed.
- Advanced controls
- Enable playback multi-streaming
With this function, you will be able to have an audio chat with your friends via headphone (stream 1 from front panel) while still have music (stream 2 from back panel) in play. At any given period, you can have maximum 2 streams operating simultaneously.



4. Recording control



Mute
You may choose to mute single or multiple volume controls or to completely mute sound input.
Tool
- Show the following volume controls
This is to let you freely decide which volume control items to be displayed.
- Enable recording multi-streaming

Important

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

Audio I/O

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

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

Speaker Configuration:

1. Plug the speakers in the corresponding jack.

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

Connector Settings

Click  to access connector settings.

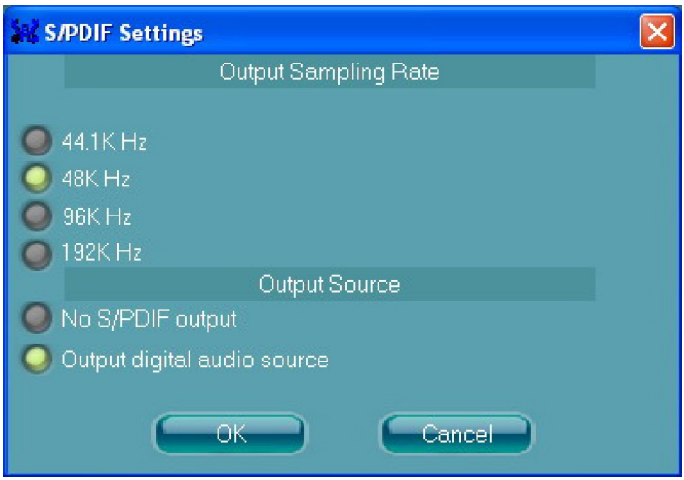
Disable front panel jack detection (option)
Find no function on front panel jacks? Please check if front jacks on your system are so-called AC'97 jacks. If so, please check this item to disable front panel jack detection.

Mute rear panel output when front headphone plugged in.

Enable auto popup dialogue, when device has been plugged in
Once this item checked, the dialog "Connected device" would automatically pop up when device plugged in.

S/PDIF

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



Output Sampling Rate

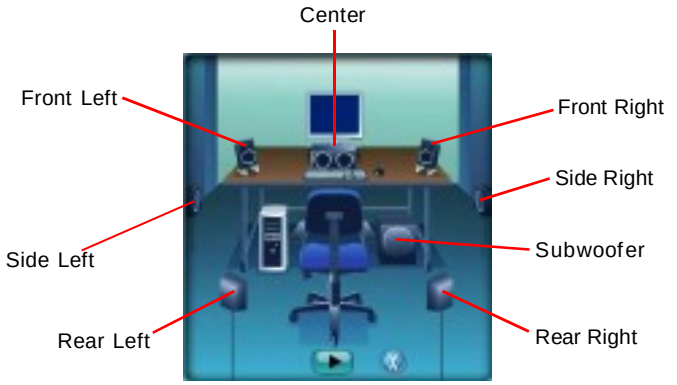
44.1KHz: This is recommend while playing CD.
48KHz: This is recommended while playing DVD or Dolby.
96KHz: This is recommended while playing DVD-Audio.
192KHz: This is recommended while playing High quality Audio.

Output Source

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

Test Speakers

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



Microphone

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

Acoustic Echo Cancelltion 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.

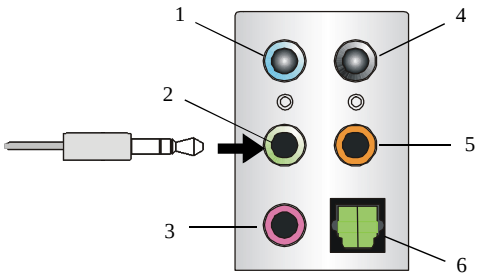
Hardware Setup

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

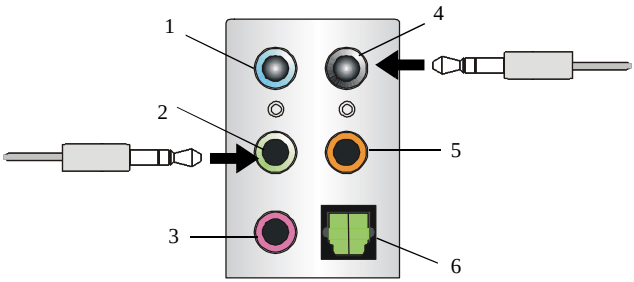
Back Panel



1 Line In
2 Line Out *(Front channels)*
3 MIC
4 Line Out *(Rear channels, but not functioning in this mode)*
5 Line Out *(Center and Subwoofer channel, but not functioning in this mode)*
6 *S/PDIF Out-Optical*

n 4-Channel Mode for 4-Speaker Output

Back Panel



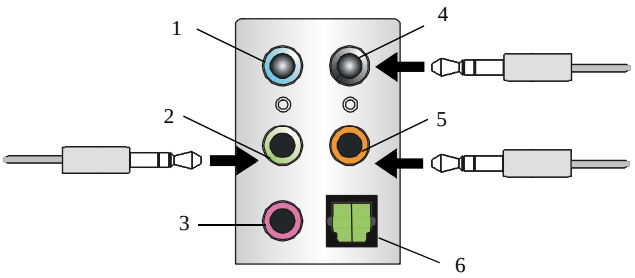
Description:
Connect two speakers to back panel's Line Out connector and two speakers to the real-channel Line Out connector.

4-Channel Analog Audio Output

1. Line In
2. Line Out *(Front channels)*
3. MIC
4. Line Out *(Rear channels)*
5. Line Out *(Center and Subwoofer channel, but not functioning in this mode)*
6. *S/PDIF Out-Optical*

n 6-Channel Mode for 6-Speaker Output

Back Panel

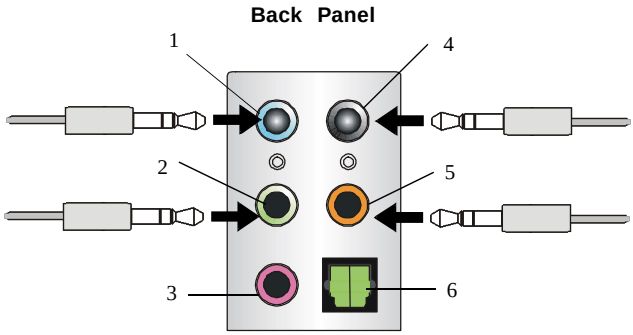


Description:
Connect two speakers to back panel's Line Out connector, two speakers to the rear-channel Line out connector and two speakers to the center/ subwoofer-channel Line Out connector.

6-Channel Analog Audio Output

1. Line In
2. Line Out *(Front channels)*
3. MIC
4. Line Out *(Rear channels)*
5. Line Out *(Center and Subwoofer channel)*
6. *S/PDIF Out-Optical*

n 8-Channel Mode for 8-Speaker Output



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

8-Channel Analog Audio Output

1. Side Surround Out *(Side channels)*
2. Line Out *(Front channels)*
3. MIC
4. Line Out *(Rear channels)*
5. Line Out *(Center and Subwoofer channel)*
6. *S/PDIF Out-Optical*

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.