![MSI]

915GM Speedster

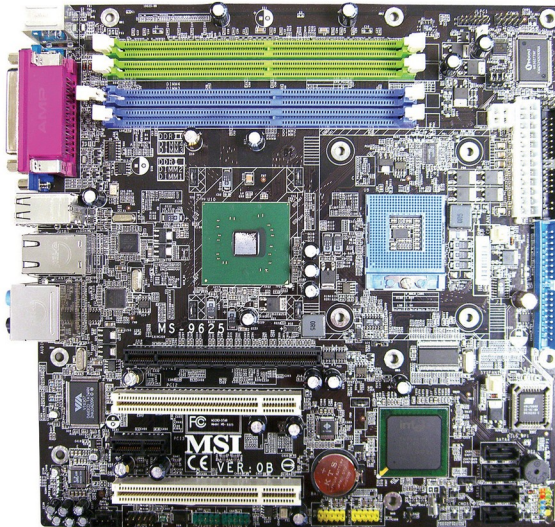## MS-9625 (v1.X) Workstation Board

English Version
G52-S9625X1

Copyright Notice

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Revision History

Revision	Revision History	Date
V1.0	First release	August 2005

Technical Support

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

- Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: *http://www.msi.com.tw/program/service/faq/faq/esc_faq_list.php*
- Contact our technical staff at: *support@msi.com.tw*

Safety Instructions

1. Always read the safety instructions carefully.

2. Keep this User's Manual for future reference.

3. Keep this equipment away from humidity.

4. Lay this equipment on a reliable flat surface before setting it up.

5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.

6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.

7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.

8. Always Unplug the Power Cord before inserting any add-on card or module.

9. All cautions and warnings on the equipment should be noted.

10. Never pour any liquid into the opening that could damage or cause electrical shock.

11. If any of the following situations arises, get the equipment checked by a service personnel:

    † The power cord or plug is damaged.
    † Liquid has penetrated into the equipment.
    † The equipment has been exposed to moisture.
    † The equipment has not work well or you can not get it work according to User's Manual.
    † The equipment has dropped and damaged.
    † The equipment has obvious sign of breakage.

12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60^{0}C (140^{0}F), IT MAY DAMAGE THE EQUIPMENT.

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

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.

iii

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-9625

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 municial 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/ЕС), 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 wypelni wymagania UE, przyjmując produkty (sprzedawane na terenie Unii Europejskiej) wycofywane z użycia. Produkty MSI będzie można zwracać w wyznaczonych punktach zbiorczych.

TÜRKÇE

Çevreci özelliğiyle bilinen MSI dünyada çevreyi korumak için hatırlatır:

Avrupa Birliği (AB) Kararnamesi Elektrik ve Elektronik Malzeme Atığı, 2002/96/EC Kararnamesi altında 13 Ağustos 2005 tarihinden itibaren geçerli olmak üzere, elektrikli ve elektronik malzemeler diğer atıklar gibi çöpe atılamayacak ve bu elektonik cihazların üreticileri, cihazların kullanım süreleri bittikten sonra ürünleri geri toplamakla yükümlü olacaktır. Avrupa Birliği'ne satılan MSI markalı ürünlerin kullanım 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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1

Getting Started

Thank you for choosing the 915GM Speedster (MS-9625 v1.X), an excellent Micro ATX workstation board from MSI.

Based on the innovative **Intel® 915GM** & **Intel® ICH6/ ICH6R** chipsets for optimal system efficiency, the 915GM Speedster mainboard accommodates the latest **Intel® Pentium® M Dothan/ Celeron® M Dothan** processors in 478-pin package and supports up to two 184-pin 333MHz non-ECC DDR DIMMs (or two 240-pin 400/533MHz non-ECC DDR-II DIMMs) to provide the maximum of 2GB memory capacity.

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

Mainboard Specifications

CPU
† Supports **Intel® Pentium® M Dothan/ Celeron® M Dothan** processors in 478-pin package
† Up to 2MB L2 cache for Pentium® M Dothan and up to 1MB L2 cache for Celeron® M Dothan
  (For more information on compatible components, please visit ***http://www.msi.com.tw/program/products/server/svr/pro_svr_qvl.php***)

Chipset
† Intel® 915GM Northbridge
  - Supports 400 and 533 MHz Intel® NetBurst micro-architecture bus
  - PCI Express external graphics support
  - Supports DDR333 or DDR-II 400/533 memory interface
  - Integrated Intel® Graphics Media Accelerator (GMA) 900 with ADD2 interface support
† Intel® ICH6 or ICH6R Southbridge
  - Direct connection to GMCH via Direct Media Interface
  - Supports one-channel Ultra ATA 100 bus Master IDE controller
  - Two-port Serial ATA controller
  - Support for up to eight USB 2.0 ports
  - Intel® High Definition Audio interface

Main Memory
† Supports up to *two 184-pin 333MHz non-ECC DDR DIMMs* or *two 240-pin 400/533MHz non-ECC DDR-II DIMMs*
† Supports up to 2GB
  (For more information on compatible components, please visit ***http://www.msi.com.tw/program/products/server/svr/pro_svr_qvl.php***)

Slots
† Two 32-bit/33MHz PCI slots (support 3.3V/5V PCI bus interface)
† One PCI Express x1 slot (PCI Express Bus specification v1.0a compliant)
† One PCI Express x16 slot (PCI Express Bus specification v1.0a compliant)

HDD Interface
† One IDE controller on the ICH6 / ICH6R chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA66/100 operation modes
† ICH6 / ICH6R chipset supports 4 Serial ATA 150 ports

Onboard Peripherals
† 1 floppy port supports one FDD with 360KB, 720KB, 1.2MB, 1.44MB, and 2.88MB
† 1 PS/2 keyboard port
† 1 PS/2 mouse port
† 1 serial port & 1 serial pinheader

† 1 VGA port
† 1 parallel port supports SPP/EPP/ECP mode
† 2 RJ-45 ports (with LEDs)
† 8 USB ports (4 on the front and 4 on the rear)
† 2 IEEE 1394 pinheaders
† 1 Line-In / Line-Out / MIC-In / Rear Speaker Out / Center-Subwoofer Speaker Out / optical SPDIF-Out audio port

Onboard LAN
† 2 Marvell 88E8053 Gigabit Ethernet controllers

Onboard Audio
† High Definition Audio interface integrated in ICH6 / ICH6R
† Realtek ALC880 8-channel codec
   - 8-CH DA connector with 48 KHz rate
   - Compliant with AC97 2.3 specifications
   - Meets perfomace requirement for audio on PC97/2001 system
   - Meets Microsoft WHQL / WLP 2.0 audio requirement

Onboard IEEE 1394
† VIA VT6307 IEEE 1394 controller

Power Management Features
† Wake up on LAN (WOL), wake up on PCI
† RTC alarm and wake up
† Wake up on keyboard/mouse/USB from S1
† Supports ACPI S1, S3, S4, S5 function

System Management
† SMBus (I2C)
† Temperature, voltage, and fan monitors

BIOS
† The mainboard BIOS provides "Plug & Play" BIOS which detects the peripheral devices and expansion cards of the board automatically
† The mainboard provides a Desktop Management Interface (DMI) function which records your mainboard specifications
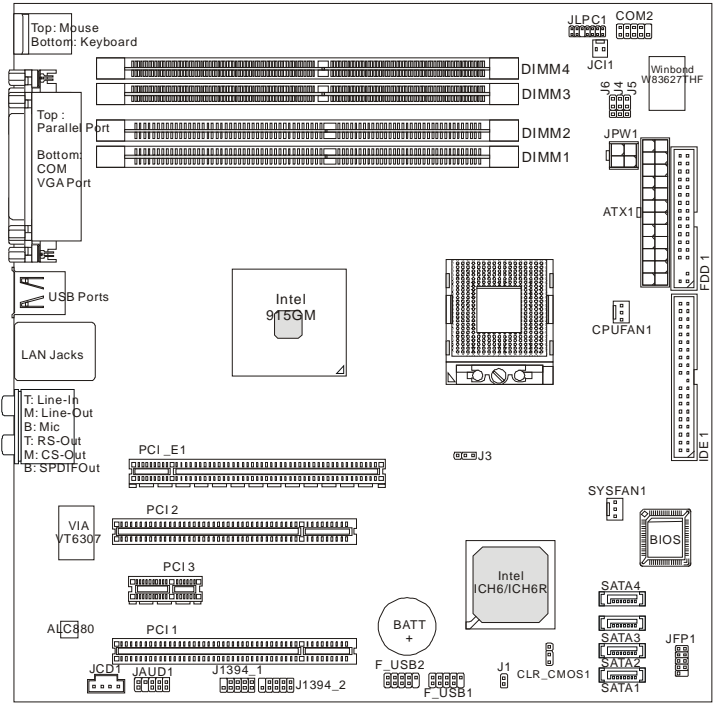† Supports boot from LAN, USB Device 1.1 & 2.0, and SATA HDD

Dimension
† Micro ATX Form Factor: 24.5 cm (W) x 24.5 cm (L)

Mounting
† 8 mounting holes

Mainboard Layout

915GM Speedster (MS-9625 v1.X) M-ATX Workstation Board

MSI Special Features

Core Center *(Optional)*

The Core Center is a new utility you can find in the CD-ROM disk. The utility is just like your PC doctor that can detect, view and adjust the PC hardware and system status during real time operation. In the left side it shows the current system status, including the Vcore, 3.3V, +5V and 12V. In the right side it shows the current PC hardware status such as the CPU & system temperatures and all fans speeds.

When you click the red triangles in the left and right sides, two sub-menus will open for users to overclock, overspec or to adjust the thresholds of system to send out the warning messages. If you click the *Core Center* button on the top, a screen pops up for you to choose the "*Auto mode*" or "*User mode*" of CPU fan. You may adjust the speeds of CPU fans and system fan here.

Left-side: Current system status
In the left sub-menu, you can configure the settings of FSB & DOT by clicking the radio button in front of each item and make it available (the radio button will be lit as yellow when selected), use the "**+**" and "**-**" buttons to adjust, then click "*ok*" to apply the changes. Then you can click *Save* to save the desired FSB you just configured.

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

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

Top-side: User mode/Auto mode
Here you may adjust the CPU fan speed. If you choose *User mode*, you may adjust the CPU fan speed in 8 different modes, from **Stop** to **Full speed**.

MSI

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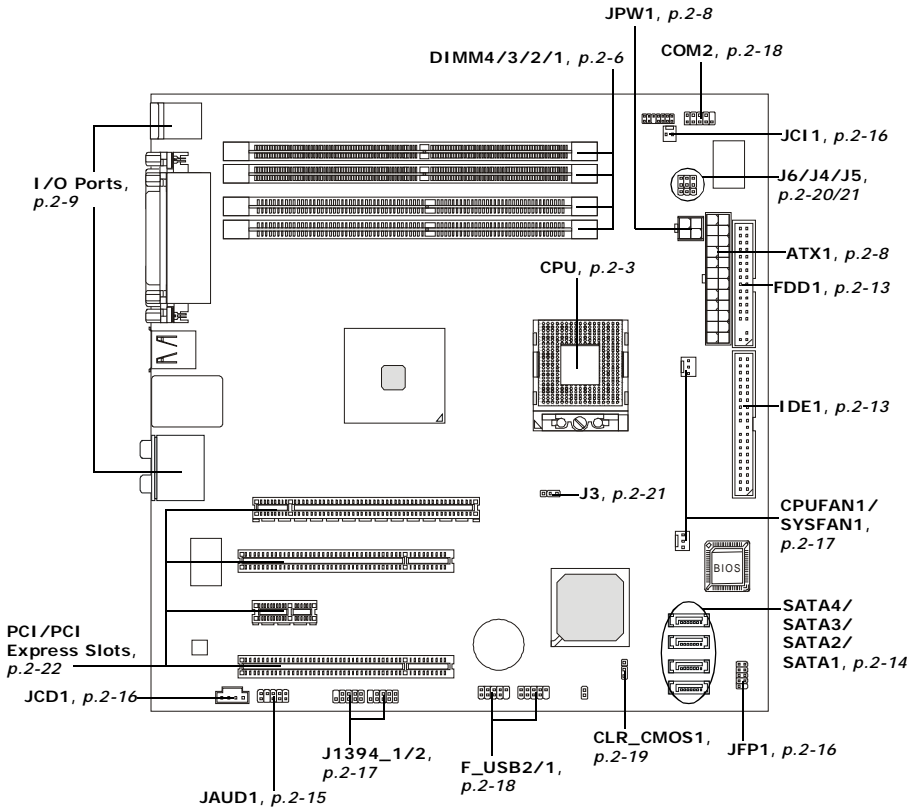*Items shown on Core Center may vary depending on your system status.*

2

Hardware Setup

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

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

Quick Components Guide

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COM2, *p.2-18*

JCI1, *p.2-16*

I/O Ports, *p.2-9*

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ATX1, *p.2-8*

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Central Processing Unit: CPU

The mainboard supports **Intel® Pentium® M Dothan/ Celeron® M Dothan** proces-sors in 478-pin package. The mainboard uses Socket 478 for easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not have the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

For more information on compatible components, please visit ***http://www.msi.com. tw/program/products/server/svr/pro_svr_qvl.php*** .

MSI

MSI Reminds You...

Overheating

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

Overclocking

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

CPU & Cooler Set Installation

1. Place the CPU on top of the socket. Make sure to align the gold arrow on the CPU with the arrow key on the socket.

2. Push the CPU down until its pins securely fit into the socket.
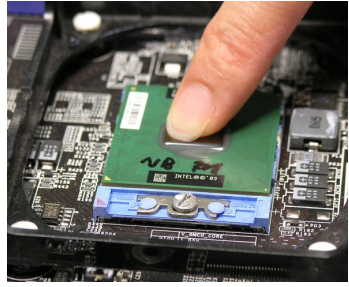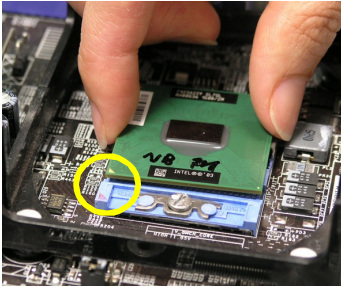
3. On the front end of the CPU socket is a locking mechanism designed into the form of a screw. Make sure that you actuate or deactuate this mechanism with a screwdriver before and after installing the CPU.
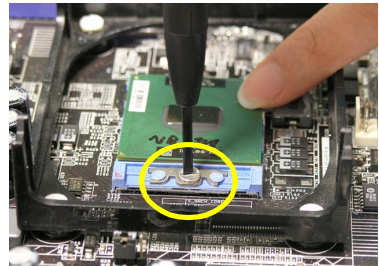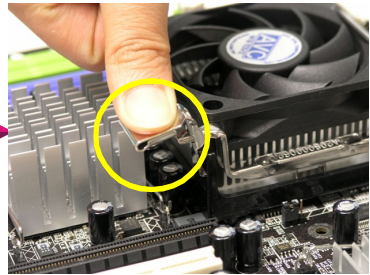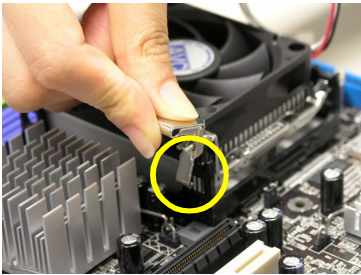

4. Mount the cooler set (fan & heatsink bundled) on top of the CPU and fit it into the retention mechanism.
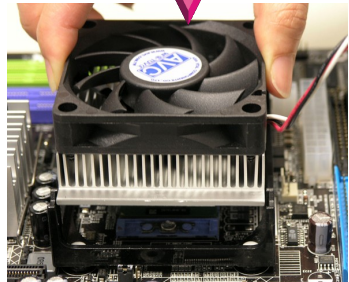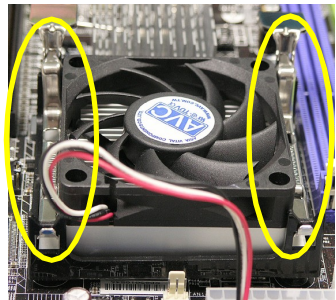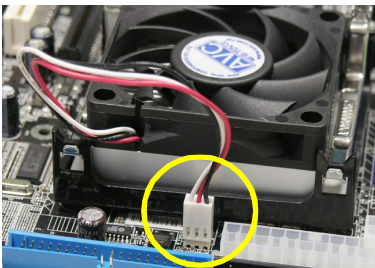
5. Secure one end of the metal clip to the retention mechanism.
6. Hook the other end of the clip to the retention mechanism and press the lever down to close.
7. Follow the same procedures to install the second clip.

8. Connect the fan power cable from the mounted fan to the 3-pin fan power connector on the board.

Memory

The mainboard supports up to 2GB of **DDR333** (two 184-pin 333MHz non-ECC DDR DIMMs) or **DDR-II 400/533** (two 240-pin 400/533MHz non-ECC DDR-II DIMMs) system memory. Please note that only one type of memory (all DDR or all DDR-II, no mixture allowed) can be used at one time.

For more information on compatible components, please visit ***http://www.msi.com. tw/program/products/server/svr/pro_svr_qvl.php*** .

DIMM4 (DDR-II 400/533)
DIMM3 (DDR-II 400/533)

DIMM2 (DDR333)
DIMM1 (DDR333)
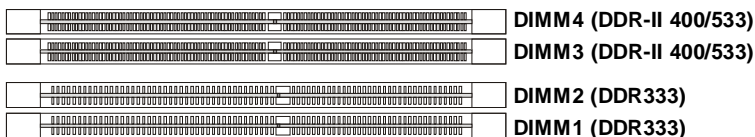
Installing DDR Modules

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

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

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

Volt   Notch
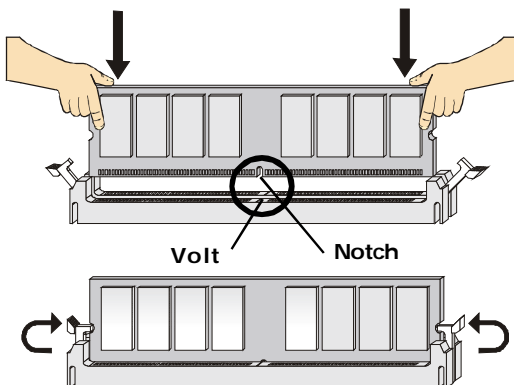
Memory Population Rules

This mainboard supports DDR333 (DIMM1 & DIMM2) or DDR-II 400/533 (DIMM3 & DIMM4) memory interface.

Each DIMM slot supports up to a maximum size of 1GB. Users can install either single- or double-sided modules depending on their needs. Please note that only one type of memory (all DDR or all DDR-II, no mixture allowed) can be used at one time.

Slot	Memory Module	Total Memory
DIMM1 or DIMM3	S/D	64MB~1GB
DIMM2 or DIMM4	S/D	64MB~1GB
Maximum System Memory Supported		64MB~2GB

S: Single Side   D: Double Side

MSI Reminds You...
Make sure that you install memory modules of the same type and density on DDR DIMMs.

Power Supply

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

SSI 24-Pin System Power Connector: ATX1

pin 13

pin 12

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

You may use the 20-pin ATX power supply or 24-pin SSI power supply as you like. If you'd like to use the ATX power supply, please plug your power supply along with pin 1 & pin 13 (refer to the image at the right hand). There is also a foolproof design on pin 11, 12, 23 & 24 to avoid wrong installation.
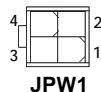
SSI 8-Pin CPU Power Connector: JPW1

This connector provides 12V power output to the CPU.
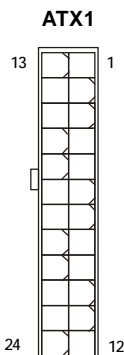
ATX1

ATX1 Pin Definition

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

JPW1

JPW1 Pin Definition

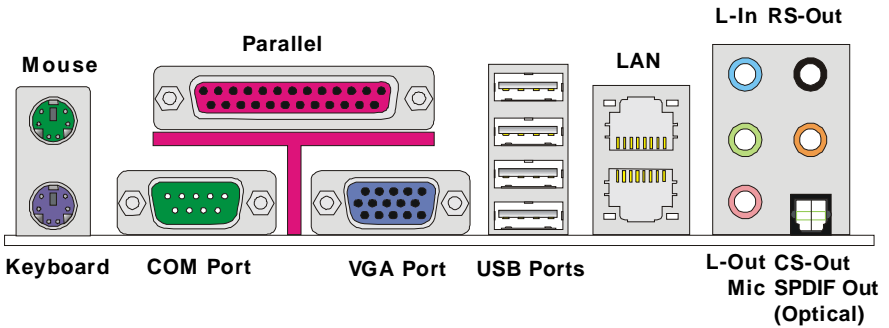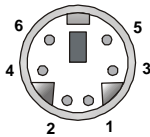| PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

MSI Reminds You...

1. Maker sure that these two connectors are connected to adequate SSI power supplies to ensure stable operation of the mainboard.

*2. Power supply of **350watts** (and above) is highly recommended for system stability.*

3. SSI 12V power connection should be greater than 18A.

Back Panel

```
                                                                    L-In  RS-Out
            Parallel                               LAN
  Mouse

  Keyboard    COM Port        VGA Port    USB Ports      L-Out  CS-Out
                                                         Mic    SPDIF Out
                                                                (Optical)
```

Mouse Connector (Green) / Keyboard Connector (Purple)

The mainboard provides a standard PS/2® mouse/keyboard mini DIN connector for attaching a PS/2® mouse/keyboard. You can plug a PS/2® mouse/keyboard directly into this connector. The connector location and pin assignments are as follows:
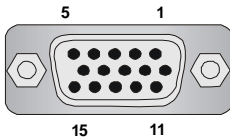
**PS/2 Mouse / Keyboard
(6-pin Female)**

Pin Definition

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

VGA Port

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

VGA Connector
(DB 15-pin)

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

Serial Port

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

Pin Definition

1 2 3 4 5

6 7 8 9
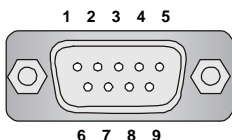
9-Pin Male DIN Connector

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

USB Ports

The rear panel provides four UHCI (Universal Host Controller Interface) Universal Serial Bus roots for attaching USB devices such as keyboard, mouse or other USB-compatible devices. You can plug the USB device directly into the connector.
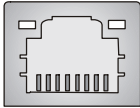
1 2 3 4
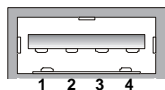
USB Port

USB Port Description

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

LAN (RJ-45) Jacks

The mainboard provides 2 standard RJ-45 jacks for connection to single Local Area Network (LAN). This Giga-bit LAN enables data to be transferred at 1000, 100 or 10Mbps. You can connect a network cable to either LAN jack.

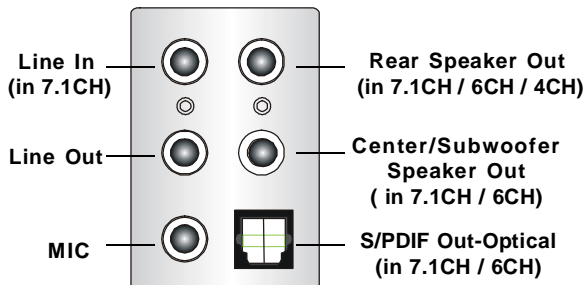**Giga-bit LAN Pin Definition**

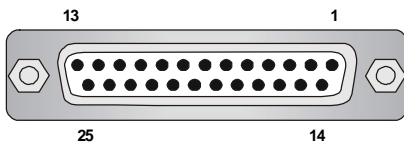| PIN	SIGNAL	DESCRIPTION
1	D0P	Differential Pair 0+
2	D0N	Differential Pair 0-
3	D1P	Differential Pair 1+
4	D2P	Differential Pair 2+
5	D2N	Differential Pair 2-
6	D1N	Differential Pair 1-
7	D3P	Differential Pair 3+
8	D3N	Differential Pair 3-

RJ-45 LAN Jack

Audio Port Connectors

The left 3 audio jacks are 2-channel mode for stereo speaker output. **Line Out** is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones.
However, there is an advanced audio application provided by Realtek ALC880 to offer support for **7.1-channel audio operation** and can turn rear audio connectors from 2-channel to 4-/5.1-/7.1 channel audio.

Line In (in 7.1CH)

Line Out

MIC

Rear Speaker Out (in 7.1CH / 6CH / 4CH)

Center/Subwoofer Speaker Out (in 7.1CH / 6CH)

S/PDIF Out-Optical (in 7.1CH / 6CH)

Connectors

The mainboard provides connectors to connect to FDD, IDE HDD, case, LAN, USB Ports, CPU/system power supply fans, ... and etc.

Floppy Disk Drive Connector: FDD1

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

FDD1

Hard Disk Connector: IDE1

The mainboard provides a one-channel Ultra ATA 100 bus Master IDE controller that supports PIO mode 0 ~ 4, Bus Master, and Ultra DMA 33/66/100 function. You can connect up to two hard disk drives, CD-ROM drives, 120MB floppy disk drive (reserved for future BIOS), and other devices.
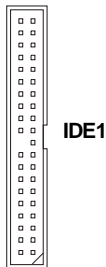
IDE1

IDE1 Definition

IDE	VDMA	Controller	RAID	ATAPI
1	66/100	Intel ICH6	N/A	Yes

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

MSI

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

Serial ATA Connectors: SATA1, SATA2, SATA3, SATA4

This mainboard provides four high-speed Serial ATA interface ports. Each supports 1st generation serial ATA data rates of 150 MB/s and is fully compliant with Serial ATA 1.0 specifications. Each Serial ATA connector can connect to 1 hard disk device.
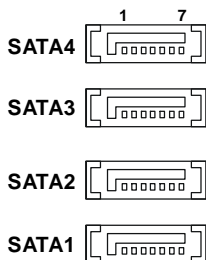
SATA1/2/3/4 Pin Definition

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

Optional Serial ATA cable

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

Connect to SATA1/2/3/4
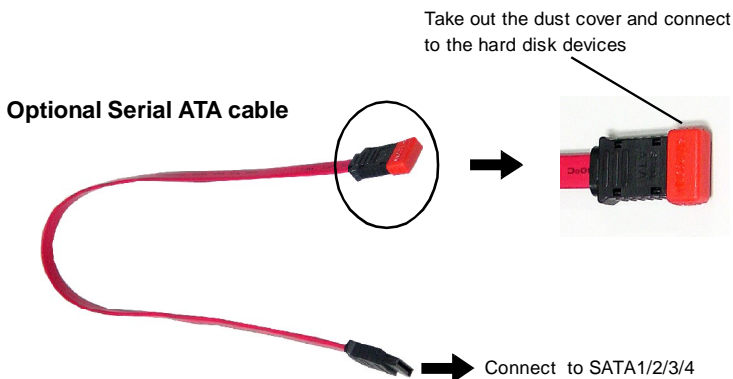
MSI Reminds You...
Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, the loss of data may occur during transmission.

Front Panel Audio Connector: JAUD1

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

JAUD1

```
 9 ┌─┬─┬─┬─┬─┐ 1
10 └─┴─┴─┴─┴─┘ 2
```

JAUD1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	PORT 1L	Analog Port 1 - Left channel
2	GND	Ground
3	PORT 1R	Analog Port 1 - Right channel
4	PRESENCE#	Active low signal - signals BIOS that a High Definition Audio dongle is connected to the analog header. PRESENCE# = 0 when a High Definition Audio dongle is connected.
5	PORT 2R	Analog Port 2 - Right channel
6	SENSE1_RETIRN	Jack detection return from front panel JACK1
7	SENSE_SEND	Jack detection sense line from the High Definition Audio CODEC jack detection resistor network
8	KEY	Connector Key
9	PORT 2L	Analog Port 2 - Left channel
10	SENSE2_RETIRN	Jack detection return from front panel JACK2

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

```
 9   5
┌─┬─┬─┬─┐
└─┴─┴─┴─┘
10   6
```
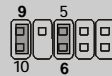
Chassis Intrusion Switch Connector: JCI1

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

JCI1

CD-In Connector: JCD1

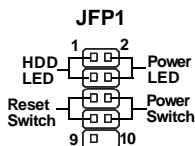The connector is for CD-ROM audio connector.

JCD1

R GND L
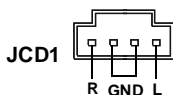
Front Panel Connector: JFP1

The mainboard provides one front panel connector 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

JFP1

HDD LED   **1   2**   **Power LED**

Reset Switch   **Power Switch**

9   10

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

Fan Power Connectors: CPUFAN1, SYSFAN1

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

```
□  GND              □  GND
□  +12V             □  +12V
□  SENSOR           □  SENSOR
```

CPUFAN1   **SYSFAN1**
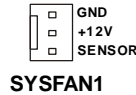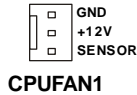
MSI Reminds You...
Please refer to the recommended CPU fans at Intel® official website or consult the vendors for proper CPU cooling fan.
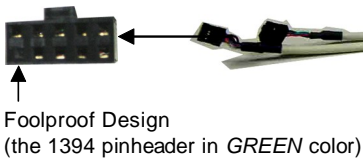
IEEE 1394 Connectors: J1394_1, J1394_2

The mainboard provides two 1394 pin headers that allow you to connect IEEE 1394 ports via an external IEEE1394 bracket.

Pin Definition

```
9             1
10            2
```

J1394_1/J1394_2
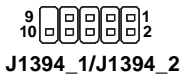
PIN	SIGNAL	PIN	SIGNAL
1	TPA+	2	TPA-
3	Ground	4	Ground
5	TPB+	6	TPB-
7	Cable power	8	Cable power
9	Key (no pin)	10	Ground

IEEE1394 Bracket
(Optional)

Foolproof Design
(the 1394 pinheader in *GREEN* color)
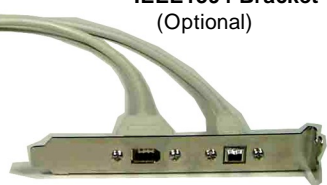
Serial Port Header: COM2

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

Pin Definition

COM2

2 [□□□□□] 9
1

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 Connectors: F_USB1, F_USB2

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

Pin Definition

F_USB1/F_USB2

2 [□□□□□] 10
1   9

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

Connect to F_USB1 or F_USB2
(the USB pinheader in *YELLOW* color)

USB 2.0 Bracket
(Optional)

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

Jumper

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

Clear CMOS Jumper: CLR_CMOS1

There is a CMOS RAM on board 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, use this jumper to clear data.
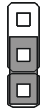
CLR_CMOS1

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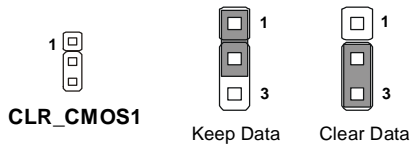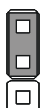
> **MSI Reminds You...**
> *You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.*

FSB Frequency Jumpers: J4, J5

These two jumpers specify the FSB frequency of the onboard CPU. To ensure system stability, make sure that these jumpers are properly set to correspond with your CPU's FSB frequency.

J4   J5

Dothan B	J4	J5
Dothan A FSB400	J4	J5
Dothan A FSB533	J4	J5

CPU VCCA Jumper: J6

This jumper controls the CPU VCCA supply voltage.

VCCA = 1.8V   VCCA = 1.5V
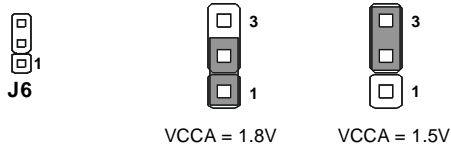
GMCH Voltage Jumper: J3

This jumper is used to adjust the voltage of the Intel 915GM GMCH (Graphics and Memory Controller Hub) as a way to enhance graphics performance.

J3

1 ◻◻◻ Short Pin #1-2 **(1.05V)**	} 1.05V for add-on VGA card } **1.05V** for onboard Intel 915GM GMCH *(lower performance)*
1 ◻◻◻ Short Pin #2-3 **(Auto Detect)**	} 1.05V for add-on VGA card } **1.5V** for onboard Intel 915GM GMCH *(higher performance)*

Slots

The motherboard provides one PCI Express x1 slot, one PCI Express x16 slot, and two 32-bit/33MHz PCI slots.

PCI (Peripheral Component Interconnect) Express Slots

The PCI Express slots support high-bandwidth, low pin count, and serial interconnect technology. You can insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first.

PCI Express architecture provides a high performance I/O infrastructure for Desktop Platforms with transfer rates starting at 2.5 Giga transfers per second over a PCI Express x1 lane for Gigabit Ethernet, TV Tuners, 1394 controllers, and general purpose I/O. Also, desktop platforms with PCI Express Architecture will be designed to deliver highest performance in video, graphics, multimedia and other sophisticated applications. Moreover, PCI Express architecture provides a high performance graphics infrastructure for Desktop Platforms doubling the capability of existing AGP 8x designs with transfer rates of 4.0 GB/s over a PCI Express x16 lane for graphics controllers, while PCI Express x1 supports transfer rate of 250 MB/s.

PCI Express x16 slot
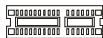
PCI Express x1 slot

PCI (Peripheral Component Interconnect) Slots

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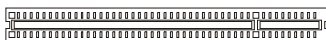
PCI Slot

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:

DEVICE	ICH INT Pin	IDSEL	CLOCK	REQ & GNT
PCI Slot 1	INT# B/C/D/A	AD17	PCICLK0	1/2
PCI Slot 2	INT# A/B/C/D	AD16	PCICLK1	0
VT6307 IEEE 1394	INT# F	AD25	PCICLK2	3

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:

- ² An error message appears on the screen during the system booting up, and requests you to run SETUP.

- ² You want to change the default settings for customized features.

MSI

MSI Reminds You...

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

2. Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format:

W9625IMS V1.0 031505 where:

1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX.
2nd - 5th digit refers to the model number.
6th digit refers to the chipset as I = Intel, N = nVidia, and V = VIA.
7th - 8th digit refers to the customer as MS = all standard customers.
V1.0 refers to the BIOS version.
031505 refers to the date this BIOS was released.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <F1> key to enter Setup.

Press F1 to enter SETUP

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

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General help, only for Status Page Setup Menu and Option Page Setup Menu
<F5>	Load Previous Values
<F6>	Load Fail-safe Defaults
<F7>	Load Optimized Defaults
<F10>	Save and Exit Setup

Getting Help

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

Main Menu

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

Sub-Menu

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

▶ IDE Channel 0 Master   [ST380011A]
▶ IDE Channel 0 Slave   [CD-540E]
▶ IDE Channel 1 Master   [None]
▶ IDE Channel 1 Slave   [None]

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 **Phoenix-AwardBIOS CMOS 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.
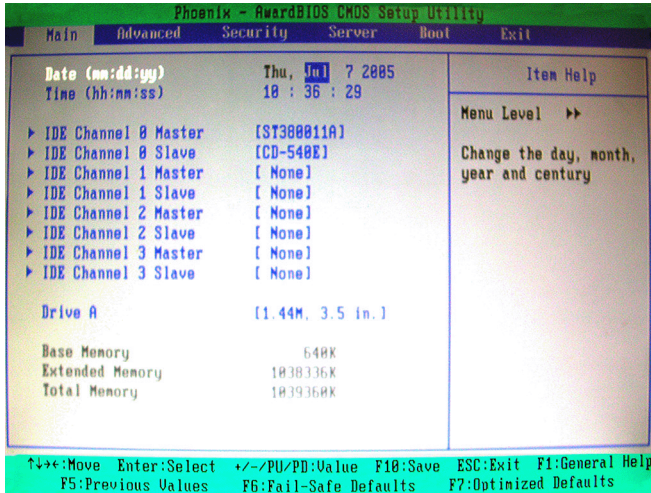
Main
Use this menu for basic system configurations, such as time, date etc.

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

Security
Use this menu to set Supervisor and User Passwords.

Server
This entry shows your system summary.

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.
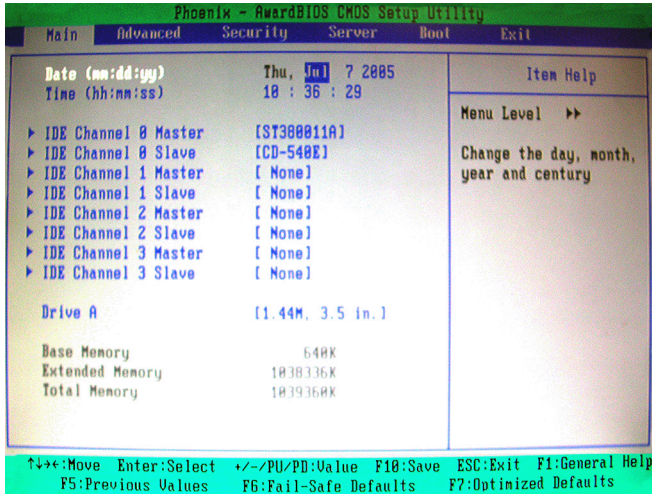
Date (mm:dd:yy)
The date format is <Day>, <Month> <Date> <Year>.

Time (hh:mm:ss)
The time format is <Hour> <Minute> <Second>.

IDE Channel 0/1/2/3 Master/Slave
These fields show the information of the installed IDE devices. (Read-only)

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

Base/Extended/Total Memory
The three items show the memory status of the system. (Read-only)

Advanced

Items in the menu are divided into several sub-menus. Each sub-menu provides more settings. To enter the sub-menu, highlight the sub-menu you want to configure and press <Enter>.
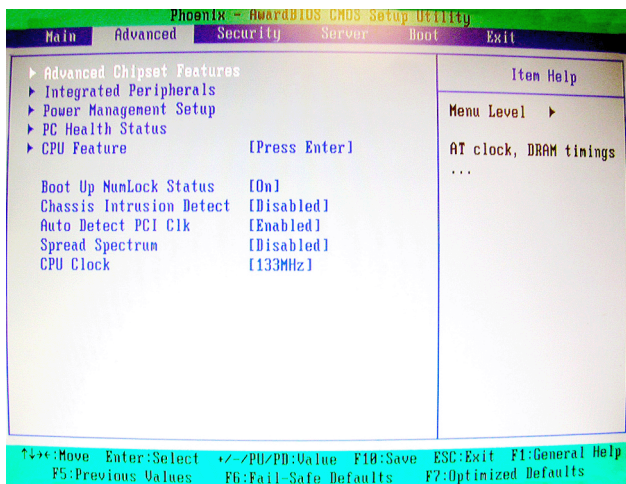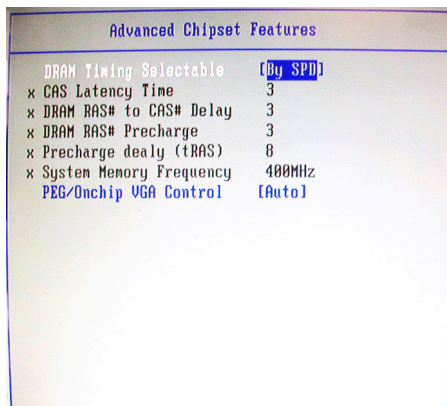
```
           Phoenix - AwardBIOS CMOS Setup Utility
    Main    Advanced    Security    Server    Boot    Exit

 ▶ Advanced Chipset Features                    Item Help
 ▶ Integrated Peripherals
 ▶ Power Management Setup              Menu Level  ▶
 ▶ PC Health Status
 ▶ CPU Feature             [Press Enter]         AT clock, DRAM timings
                                                 ...
   Boot Up NumLock Status  [On]
   Chassis Intrusion Detect [Disabled]
   Auto Detect PCI Clk     [Enabled]
   Spread Spectrum         [Disabled]
   CPU Clock               [133MHz]

↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
       F5:Previous Values    F6:Fail-Safe Defaults   F7:Optimized Defaults
```

Advanced Chipset Features
The sub-menu is used to configure chipset features for optimal system performance.

```
              Advanced Chipset Features

   DRAM Timing Selectable    [By SPD]
 x CAS Latency Time           3
 x DRAM RAS# to CAS# Delay    3
 x DRAM RAS# Precharge        3
 x Precharge dealy (tRAS)     8
 x System Memory Frequency    400MHz
   PEG/Onchip VGA Control    [Auto]
```

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

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

DRAM RAS# to CAS# Delay
This field allows you to set the number of cycles for a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from or refreshed. Fast speed offers faster performance while slow speed offers more stable performance.

DRAM RAS# Precharge
This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system.

Precharge Delay (tRAS)
The field specifies the idle cycles before precharging an idle bank.
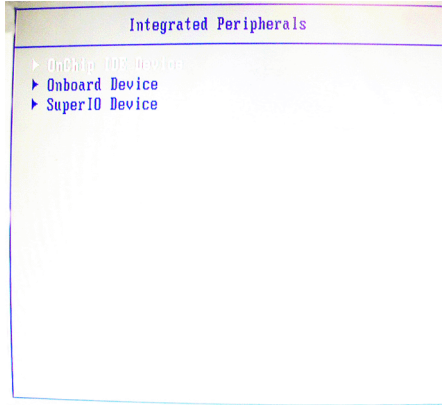
System Memory Frequency
Use this item to configure the clock frequency of the installed DRAMs.

PEG/OnChip VGA Control
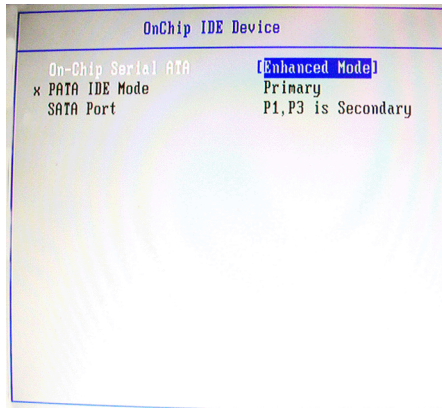Use this feature to enable or disable the onboard VGA controller.

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

```
                    Integrated Peripherals

    ▶ OnChip IDE Device
    ▶ Onboard Device
    ▶ SuperIO Device
```

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

```
                    OnChip IDE Device

    On-Chip Serial ATA      [Enhanced Mode]
    x PATA IDE Mode         Primary
    SATA Port               P1,P3 is Secondary
```

On-Chip Serial ATA
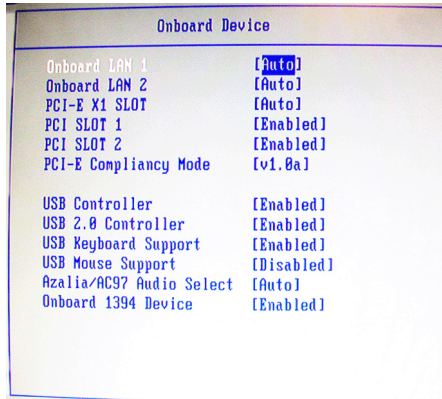This setting specifies the function of the on-chip SATA controller.

[Disabled]	Disable SATA controller
[Enhanced Mode]	Enable both SATA and PATA, max. 6 IDE drives supported
[SATA Only]	SATA operates in legacy mode

PATA IDE Mode / SATA Port
These settings show the modes of the PATA & SATA ports.

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

```
                    Onboard Device

  Onboard LAN 1              [Auto]
  Onboard LAN 2              [Auto]
  PCI-E X1 SLOT              [Auto]
  PCI SLOT 1                 [Enabled]
  PCI SLOT 2                 [Enabled]
  PCI-E Compliancy Mode      [v1.0a]

  USB Controller             [Enabled]
  USB 2.0 Controller         [Enabled]
  USB Keyboard Support       [Enabled]
  USB Mouse Support          [Disabled]
  Azalia/AC97 Audio Select   [Auto]
  Onboard 1394 Device        [Enabled]
```

Onboard LAN 1, Onboard LAN 2, PCI-E X1 Slot
These settings control the onboard LAN 1, LAN 2, and PCI-Express X1 slot controllers. Please note that when onboard LAN 1 is set to [Disabled], onboard LAN 2 and PCI-Express X1 slot will be disabled as well.

PCI Slot 1, PCI Slot 2
These settings disable/enable the specified PCI devices.

PCI-E Compliancy Mode
This setting specifies the PCI-Express compliancy mode.

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

USB 2.0 Controller
This setting is used to enable/disable the onboard USB 2.0 controller. Setting options: [Enabled], [Disabled].

USB Keyboard/Mouse Support
Set to [Enabled] if your need to use a USB-interfaced keyboard/mouse in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix.
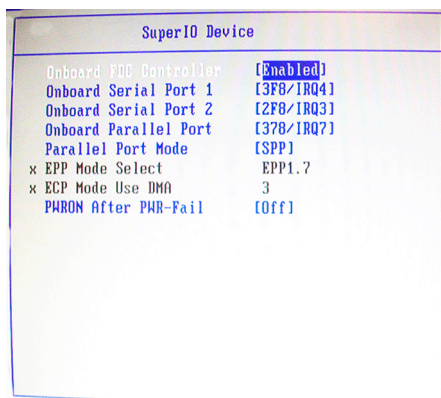
Azalia/AC97 Audio Select

Azalia is the codename of "High Definition Audio." This setting allows users to disable/enable the High Definition Audio interface integrated in ICH6 / ICH6R southbridge.

Onboard 1394 Device

This setting is used to enable/disable the onboard IEEE 1394 controller. Setting options: [Disabled], [Enabled].

Super IO Device

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

```
                    SuperIO Device

     Onboard FDC Controller    [Enabled]
     Onboard Serial Port 1     [3F8/IRQ4]
     Onboard Serial Port 2     [2F8/IRQ3]
     Onboard Parallel Port     [378/IRQ7]
     Parallel Port Mode        [SPP]
   x EPP Mode Select            EPP1.7
   x ECP Mode Use DMA           3
     PWRON After PWR-Fail      [Off]
```

Onboard FDC Controller

Select [Enabled] if your system has a floppy disk controller (FDD) installed on the system board and you wish to use it. If you install add-on FDC or the system has no floppy drive, select [Disabled] in this field. The settings are: [Enabled] and [Disabled].

Onboard Serial Port 1 / 2

Select an address and corresponding interrupt for Serial Port 1/2. The settings are: [3F8/IRQ4], [2E8/IRQ3], [3E8/IRQ4], [2F8/IRQ3], [Disabled], [Auto].

Onboard Parallel Port

This specifies the I/O port address and IRQ of the onboard parallel port. Settings: [378/IRQ7], [278/IRQ5], [3BC/IRQ7], [Disabled].

Parallel Port Mode

This setting specifies the parallel port mode.

SPP: Standard Parallel Port
EPP: Enhanced Parallel Port
ECP: Extended Capability Port

Setting options: [SPP], [EPP], [ECP], [ECP+EPP], [Normal].

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

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

PWRON After PWR-Fail
This setting specifies whether your system will reboot after a power failure or interrupts occurs. Available settings are:

[Off]	Leaves the computer in the power off state.
[On]	Reboots the computer.
[Former-Sts]	Restores the system to the status before power failure or interrupt occurs.

Power Management Setup
Press <Enter> to enter the sub-menu and the following screen appears:
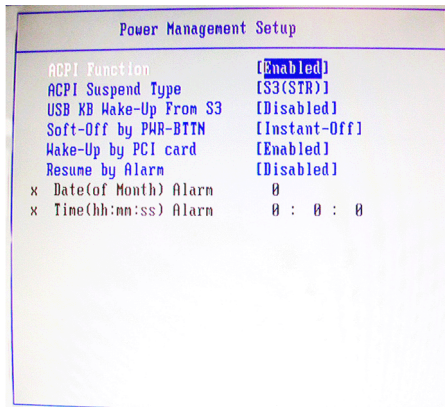
ACPI Function
This item is to activate the ACPI (Advanced Configuration and Power Management Interface) Function. If your operating system is ACPI-aware, such as Windows 98SE/2000/ME, select [Enabled]. Settings: [Enabled] and [Disabled].

ACPI Suspend Type
This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows ME and Windows 2000, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field. Options are:

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

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

USB KB Wake-Up from S3
This setting allows you to enter "Any Key" (max. 8 numbers) to wake up the system from S3 state. Settings are: [Hot Key] and [Disabled].

Soft-Off by PWR-BTTN
This feature allows users to configure the power button function. Settings are:

    [Instant-Off] The power button functions as a normal power-on/-off button.
    [Delay 4 Sec.] When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

Wake-Up by PCI Card
When it is set to [Enabled], the feature allows your system to be powered on by the PCI card. Setting options: [Enabled], [Disabled].

Resume By Alarm
When [Enabled], your can set the date and time at which the RTC (real-time clock) alarm awakens the system from suspend mode. Setting options: [Disabled], [Enabled].
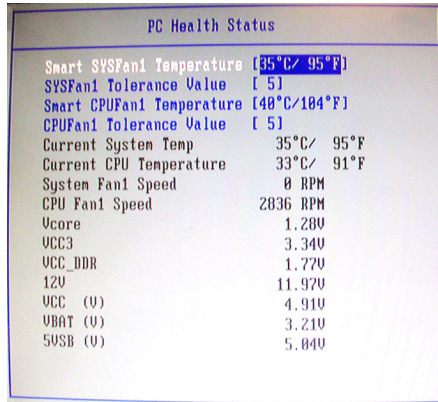
Date (of Month) Alarm
When *Resume By Alarm* is set to [Enabled], the field specifies the month for *Resume By Alarm*. Settings: [NA], [1]-[12].

Time (hh:mm:ss) Alarm
You can choose what hour, minute and second the system will boot up.

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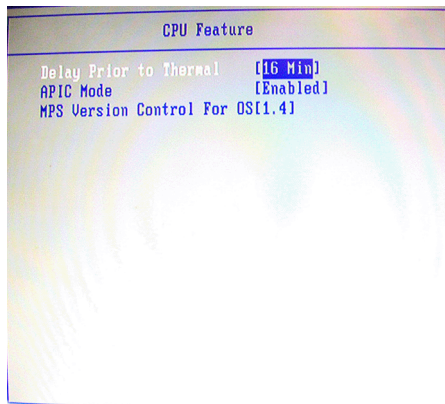Press <Enter> to enter the sub-menu and the following screen appears:

```
                    PC Health Status

  Smart SYSFan1 Temperature  [35°C/ 95°F]
  SYSFan1 Tolerance Value    [ 5]
  Smart CPUFan1 Temperature  [40°C/104°F]
  CPUFan1 Tolerance Value    [ 5]
  Current System Temp         35°C/  95°F
  Current CPU Temperature     33°C/  91°F
  System Fan1 Speed              0 RPM
  CPU Fan1 Speed              2836 RPM
  Vcore                       1.28V
  VCC3                        3.34V
  VCC_DDR                     1.77V
  12V                        11.97V
  VCC   (V)                   4.91V
  VBAT  (V)                   3.21V
  5VSB  (V)                   5.04V
```

Smart SYSFan1/CPUFan1 Temperature, SYSFan1/CPUFan1 Tolerance Value, Current System/CPU Temperature, System Fan1/CPU Fan1 Speed, Vcore, VCC3, VCC_DDR, 12V, VCC (V), VBAT (V), 5VSB (V)
These items display the current status of all of the monitored hardware devices/components such as CPU voltage, temperatures and all fans' speeds.

CPU Feature
Press <Enter> to view the settings of the onboard CPU(s).

```
                    CPU Feature

  Delay Prior to Thermal    [16 Min]
  APIC Mode                 [Enabled]
  MPS Version Control For OS[1.4]
```

Delay Prior to Thermal
When the CPU temperature reaches a factory preset level, a thermal monitoring mechanism will be enabled following the appropriate timing delay specified in this field. With the thermal monitoring enabled, clock modulation controlled by the processor's internal thermal sensor is also activated to keep the processor within allowable temperature limit.

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

MPS Version Control For OS
This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Settings: [1.4], [1.1].

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

Chassis Intrusion Detect
The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. The setting of the field will automatically return to [Enabled] later. Setting options: [Enabled], [Disabled].

Auto Detect PCI Clk
This item is used to auto detect the PCI slots. When set to [Enabled], the system will remove (turn off) clocks from empty PCI slots to minimize the electromagnetic interference (EMI). Settings: [Enabled], [Disabled].

Spread Spectrum
When the motherboard's clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves.

MSI Reminds You...
1. If you do not have any EMI problem, leave the setting at [Disabled] for optimal system stability and performance. But if you are plagued by EMI, select the value of Spread Spectrum for EMI reduction.

2. The greater the Spread Spectrum value is, the greater the EMI is reduced, and the system will become less stable. For the most suitable Spread Spectrum value, please consult your local EMI regulation.

3. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clock speed which may just cause your overclocked processor to lock up.

CPU Clock
This item specifies the clock frequency of the CPU host bus (FSB) for overclocking purposes.

Security

This section lets you set security passwords to control access to the system at boot time and/or when entering the BIOS setup program.
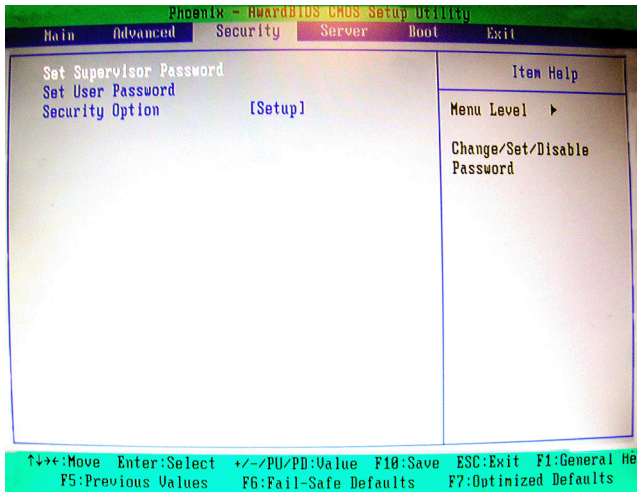
Set Supervisor Password
Use this menu to set Supervisor Password.

Set User Password
Use this menu to set User Password.

Security Option
This specifies the type of BIOS password protection that is implemented. Settings are described below:

Option	Description
[Setup]	The password prompt appears only when end users try to run Setup.
[System]	A password prompt appears every time when the computer is powered on or when end users try to run Setup.

Server

This section shows the overall hardware specifications of your system.
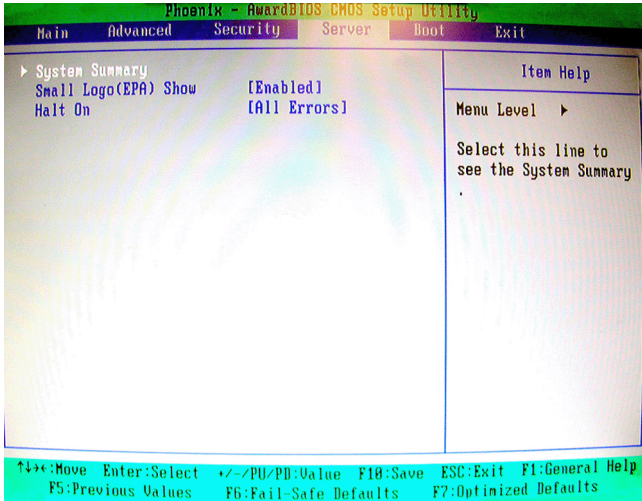
System Summary
Press <Enter> to view the hardware specifications of your system.
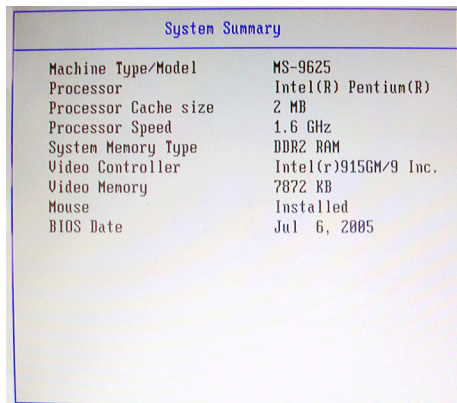
Small Logo(EPA) Show
This item enables you to show the EPA logo (brand specific graphics) on the bootup screen. Settings are:

[Disabled]   Shows the normal POST screen at boot.
[Enabled]   Shows a still image (EPA logo) on the screen at boot.ot.

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

[All Errors]   The system stops when any error is detected.
[No Errors]   The system doesn't stop for any detected error.
[All, But Keyboard]   The system doesn't stop for a keyboard error.
[All, But Diskette]   The system doesn't stop for a disk error.
[All, But Disk/Key]   The system doesn't stop for either a disk or a key-
                       board error.

Boot

Use this menu to arrange and specify the priority of the devices from which the BIOS will attempt to boot the Operating System.
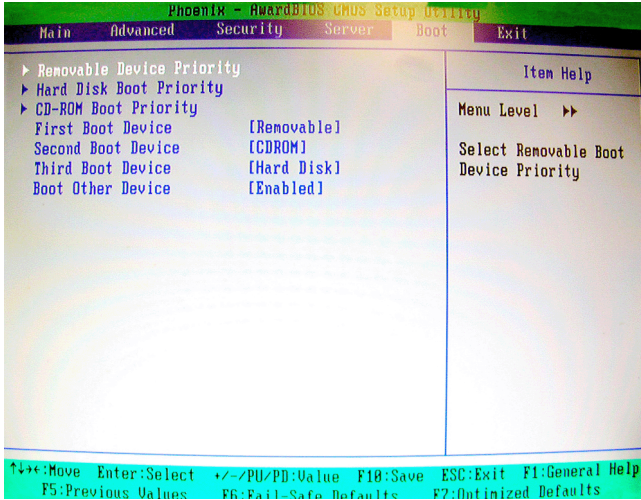
Removable Device Priority, Hard Disk Boot Priority, CD-ROM Boot Priority
These settings allow users to set the priority of the specified devices. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

First Boot Device, Second Boot Device, Third Boot Device
The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system.

Boot Other Device
Setting the option to [Enabled] allows the system to try to boot from other device if the system fails to boot from the first/second/third boot device.

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.
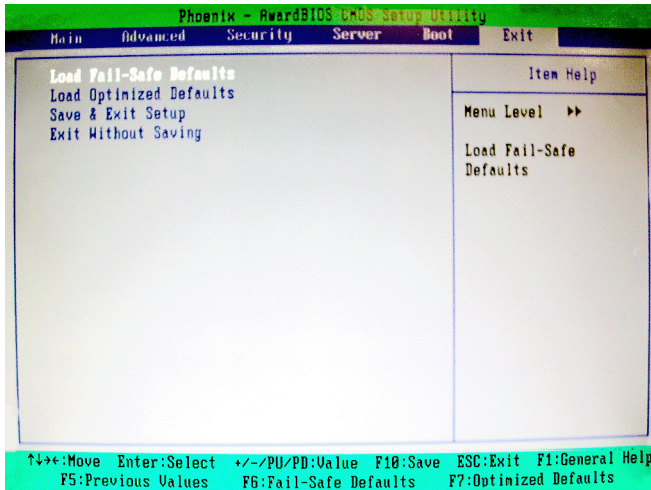
Load Fail-Safe Defaults
Use this menu to load the default values set by the BIOS vendor for stable system performance.

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

Save & Exit Setup
Save changes to CMOS and exit setup.

Exit Without Saving
Abandon all changes and exit setup.

Appendix A: Realtek ALC880 8-Channel Audio Function

The mainboard is equipped with Realtek ALC880 chip, which provides support for 8-channel audio output, including 2 Front, 2 Rear, 1 Center and 1 Subwoofer channel. ALC880 allows the board to attach 2, 4, 6 or 8 speakers for better surround sound effect. The section will tell you how to install and use 2-, 4-, 6- or 8-channel audio function on the board.

Installing the Realtek HD Audio Driver

You need to install the driver for Realtek ALC880 codec to function properly before you can get access to 2-, 4-, 6- or 8- 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. And 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 companion CD into the CD-ROM drive. The setup screen will automatically appear.
   2. Click **Realtek HD Audio Driver**.

Click here

Intel INF Update   Realtek HD Audio Driver
Intel 915G VGA Drivers   USB2.0 Driver Readme
Marvell LAN Drivers
Browse CD   Exit
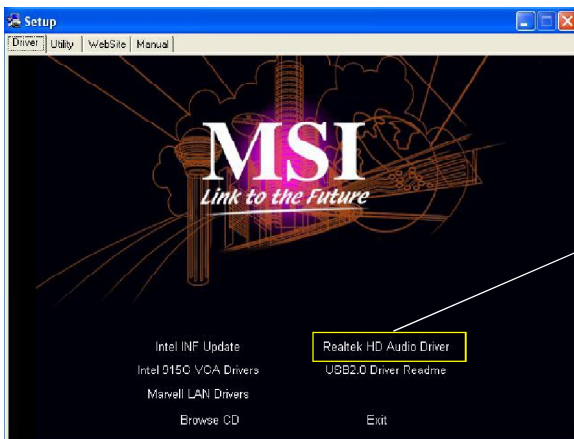
MSI Reminds You...
*The **HD Audio Configuration** software utility is under continuous update to enhance audio application. Hence, the program screens shown here in this appendix may be slightly different from the latest software utility and shall be held for reference only.*

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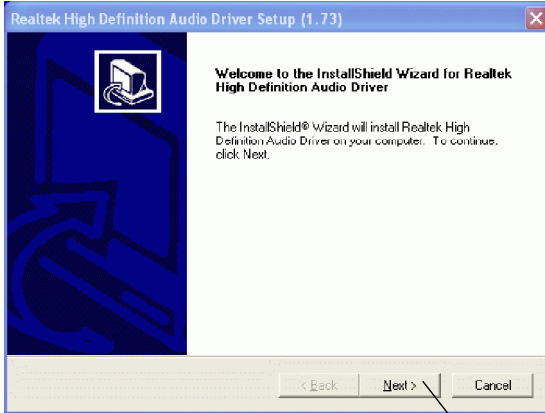
Click here

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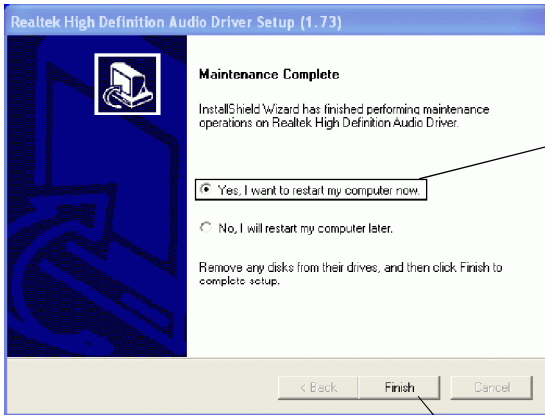

Select this option

Click here

Software Configuration

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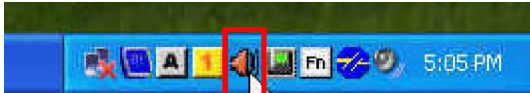
Double click
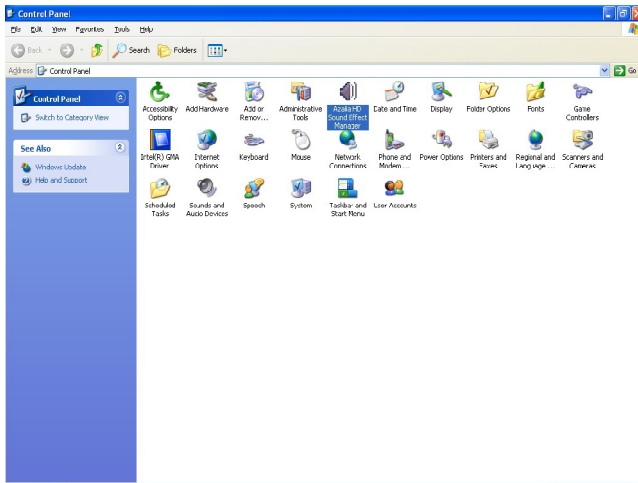
Sound Effect

Here you can select a sound effect you like from the **Environment** list.
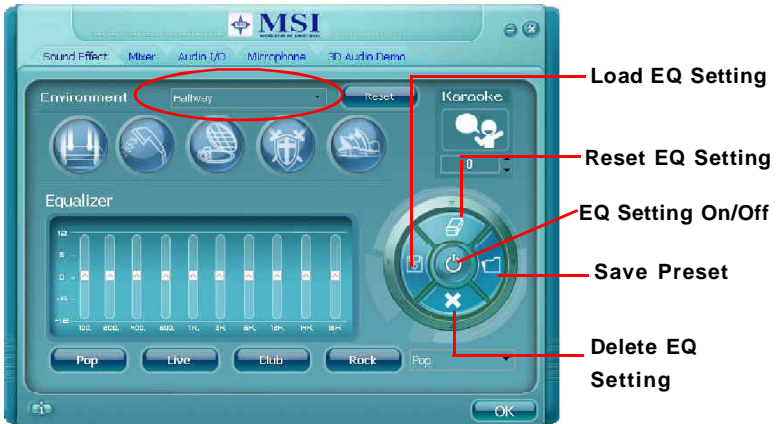
You may choose the provided sound effects, and the equalizer will adjust automatically. If you like, you may also load an equalizer setting or make an new equalizer setting to save as an new one by using the "**Load EQ Setting**" and "**Save Preset**" button, click "**Reset EQ Setting**" button to use 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.

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.

Equalizer Selection

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

10 bands of equalizer, ranging from 100Hz to 16KHz.
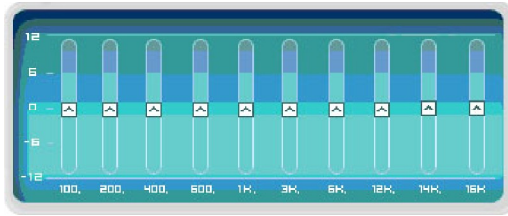
Save
The settings are saved permanently for future use

Reset
10 bands of equalizer would go back to the default setting

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

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

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

Frequently Used Equalizer Setting
Realtek 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.

Remove the human voice

Raise the key

Lower the key
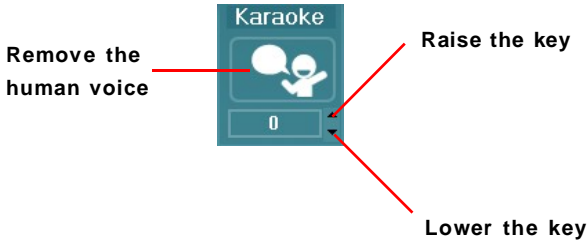
Mixer

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

1. Playback
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.

> **MSI** **MSI Reminds You...**
> *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
ALC880 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.

> **MSI** **MSI Reminds You...**
> *We **strongly** recommend that you plug the speakers into the audio jacks on the back & front panels before enabling the multi-stream function.*
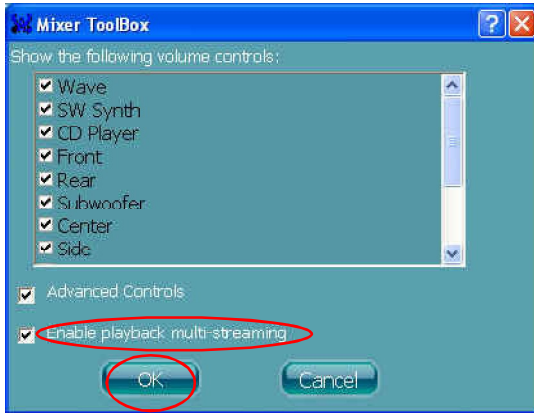
When you are playing the first audio source (for example: use Windows Media Player to play DVD/VCD), the output will be played from the rear panel, which is the default setting.

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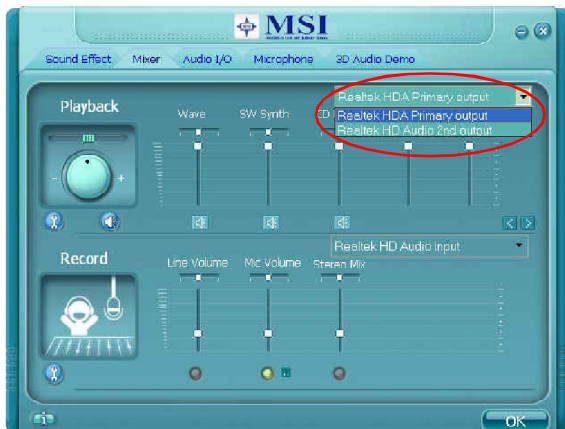
3. Playback control

Tool   **Mute**

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

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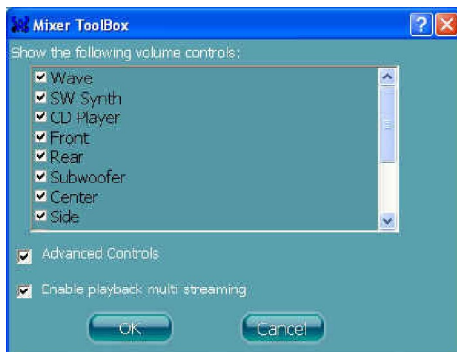You may choose to mute single or multiple volume controls or to completely mute sound output.

Tool
Show the following volume control

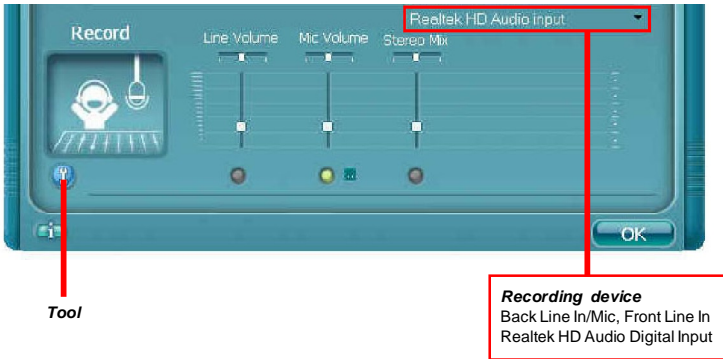This is to let you freely decide which volume control items to be displayed, total 13 items to be chosen.

Advanced controls
Enable playback multi-streaming

With this function, you will be able to have an audio chat with your friends via head-phone (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

Tool

Recording device
Back Line In/Mic, Front Line In
Realtek HD Audio Digital Input

Tool
Show the following volume controls

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

Advanced control is a "Microphone Boost" icon.

Once this item is checked, you will find "advanced" icon beside "Front Pink In" & "Mic Volume". With this, the input signal into "Front Pink In" & "Mic Volume" will be strengthen.

Enable recording multi-streaming

At any given period, you can have maximum 2 streams operating simultaneously.
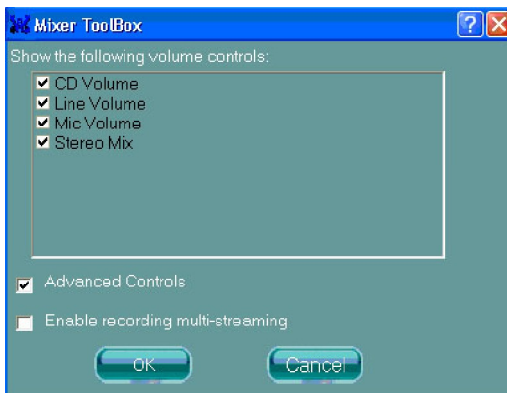
5. Recording

If you want to use microphone to record, usually the microphone is connected to the MIC jack (the pink one) in the rear panel. You can start recording in this case. If you'd like to connect your microphone to the front audio panel.

You may control the microphone volume by **Mic Volume** or **front mic-in** on the mixer.

> **MSI**

> **MSI Reminds You...**
> *Only the speakers that plugged into the Line-Out jack (the green ne) on the back panel will be functional when you intend to listen to the audio that has been recorded from the microphone.*

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 8-Speaker Output (default setting)

Realtek HD Audio Manager frees you from default speaker settings. Different from before, for each jack, they are not limited to perform certain functions. Instead, now each jack is able to be chosen to perform either output (i.e. playback) function or input (i.e. Recording) function, we call this "Retasking".[1]

Audio I/O aims to help you set jacks right. Moreover, other than blue to blue, pink to pink, the way that you used to do, Audio I/O would guide you to other right jacks that can also serve as microphone / speaker / headphone.

Speaker Configuration

Step 1: Plug in the device in any available jack.

Step 2: Dialogue "connected device" will pop up for your selection. Please select the device you are trying to plug 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.

Correct Message

Assume to plug a headphone in the Green jack at back panel. The icon beside green jack become visible and the dialogue "connected device" pops up. Check the headphone, then click OK. As soon as OK is clicked, the icon beside green jack becomes "headphone" as your selection.


Error Message

Assume to plug a headphone in the Blue jack at back panel. The icon beside Blue jack becomes visible and the dialogue "connected device" pops up (the default setting of blue jack is "Line-in". Check the **headphone** anyway, then click OK. You should notice the icon beside blue jack remains the same without any change and the error message pops.

Pop-screen check list

2CH Speakers configutaion - check the **Front Speaker Out** anyway.

4CH Speakers configuration - check the **Front Speaker Out** & **Rear Speaker Out** anyway.

6CH Speakers configuraion - check the **Front Speaker Out** / **Rear Speaker Out** & **Center/ Subwoofer Speaker out** anyway.

8CH Speakers configuraion - check the **Front Speaker Out** / **Rear Speaker Out** / **Center/Subwoofer Speaker out** & **Side Speaker Out** anyway.

Global Connector Settings

Click 🔧 to access global connector settings.
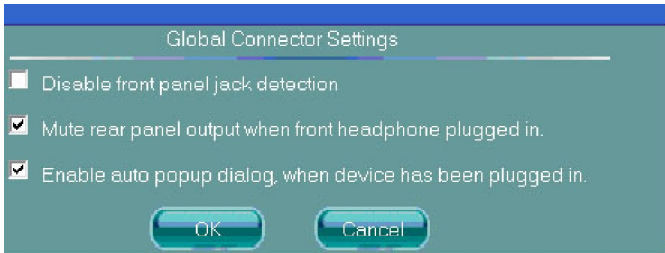
1. Mute rear panel output when front headphone plugged in

Once this item is checked, whenever front headphone is plugged, the music that is playing from the back panel, will be stopped.

2. 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.

3. Enable auto popup dialogue, when device has been plugged in

Once this item is checked, the dialog "Connected device" would not automatically pop up when device is 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.
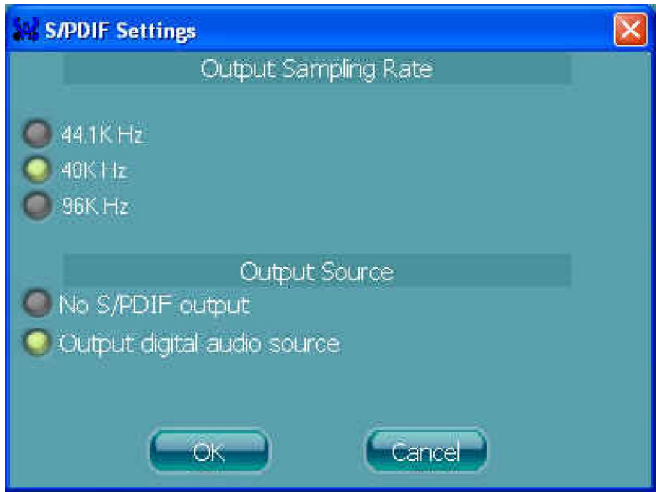
1. Output Sampling Rate

44.1KHz: This is recommended while playing CD

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

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

2. 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.
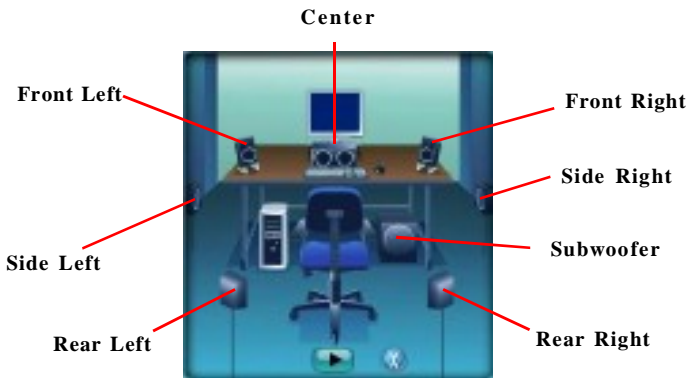
Microphone

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.

Also, please use the drop-down list to choose the recording source from **Realtek HD Audio real input** or **Realtek HD Audio front input**.
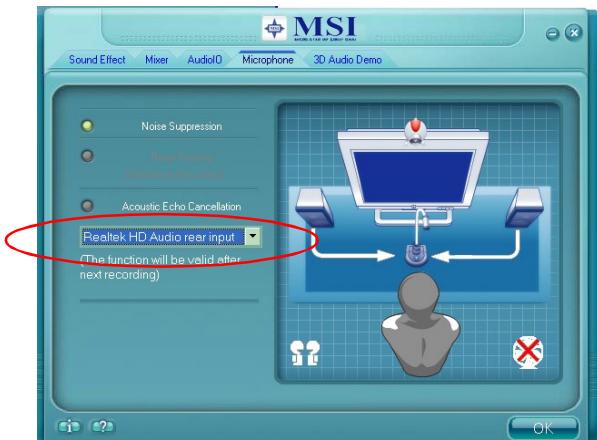
3D Audio Demo

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.

Before you begin using the front panel function, please complete the following steps:

1. Please install the pinheaders of the front panel according to Chapter 2.
2. Select **AC97** or **Azalia** in the BIOS setting (Chapter 3).
3. If you are using **Azalia** setting, the microphone function on the front panel is fixed, but the headphone jack will auto detect the device you connect and pop-up the selection window.
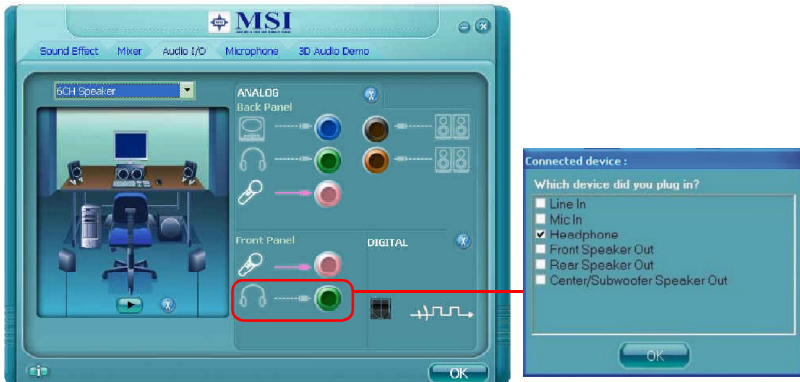
4. If you are using **AC97** setting, both microphone and headphone on the front panel are fixed.

Using 2-, 4-, 6- & 8- Channel Audio Function

Connecting the Speakers

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

n 2-Channel Mode for Stereo-Speaker Output

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

Back Panel

[1] Line In

[2] Line Out *(Front channels)*

[3] MIC
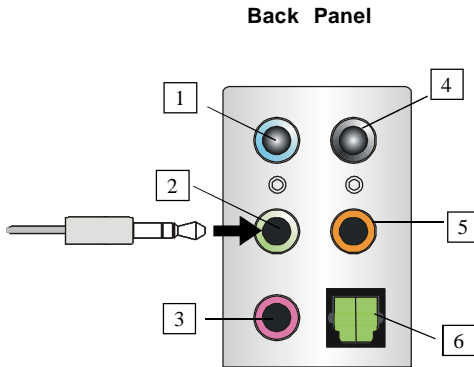
[4] Line Out *(Rear channels, but no functioning in this mode)*

[5] Line Out *(Center and Subwoofer channel, but no functioning in this mode)*

[6] Optical SPDIF Out *(in 7.1CH / 5.1CH)*

n 4-Channel Mode for 4-Speaker Output
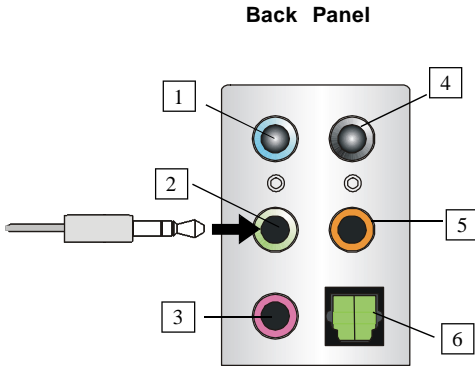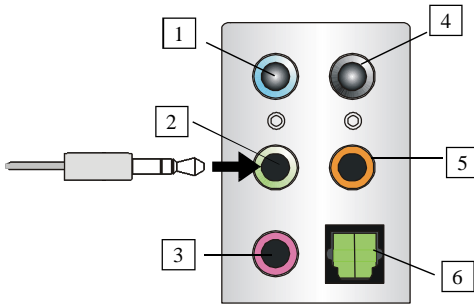
Back Panel

Description:
Connect two speakers to back
panel's Line Out connector and
two speakers to the real-chan-
nel 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 no functioning in this mode)*
6   Optical SPDIF Out *(in 7.1CH / 5.1CH)*

n 6-Channel Mode for 6-Speaker Output
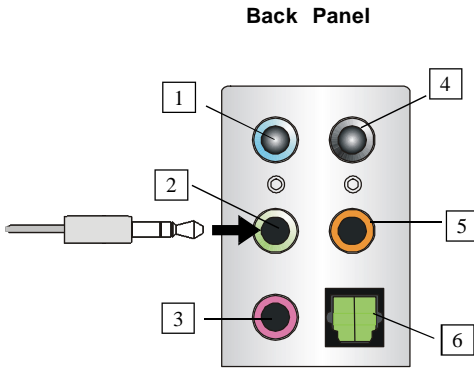
Back Panel

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. Optical SPDIF Out *(in 7.1CH / 5.1CH)*

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

n 8-Channel Mode for 8-Speaker Output

Back Panel

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

8-Channel Analog Audio Output

1 Line Out *(Side channels)*
2 Line Out *(Front channels)*
3 MIC
4 Line Out *(Rear channels)*
5 Line Out *(Center and Subwoofer channel)*
6 Optical SPDIF Out *(in 7.1CH / 5.1CH)*

Appendix B:
Intel ICH6R SATA RAID (Optional)

The optional southbridge ICH6R provides a hybrid solution that combines four independent SATA ports for support of up to four Serial ATA (Serial ATA RAID) drives. Serial ATA (SATA) is the latest generation of the ATA interface. SATA hard drives deliver blistering transfer speeds up to 150MB/sec. Serial ATA uses long, thin cables, making it easier to connect your drive and improving the airflow inside your PC. The most outstanding features are:

1. Supports 150 MB/s transfers with CRC error checking.
2. Supports Hot-plug-n-play feature.
3. Data handling optimizations including tagged command queuing, elevator seek and packet chain command.

Intel ICH6R includes the RAID level 0 (striping), RAID level 1 (mirroring), and a combination of the two called Intel Matrix RAID Technology, which has two volume in two hard disk.

RAID 0 breaks the data into blocks which are written to separate hard drives. Spreading the hard drive I/O load across independent channels greatly improves I/O performance. RAID 1 provides data redundancy by mirroring data between the hard drives and provides enhanced read performance. Intel Matrix RAID Technology is the advanced ability for two RAID volumes to share the combined space of two hard drives being used in unison.

> **MSI Reminds You...**
> *The maximum number of hard drives for RAID 0, RAID 1 or Matrix mode is 2.*
> *All the information/volumes listed in your system might differ from the illustrations in this appendix.*

BIOS Configuration

The Intel RAID Option ROM should be integrated with the system BIOS on all motherboards with a supported Intel chipset. The Intel RAID Option ROM is the Intel RAID implementation and provides BIOS and DOS disk services. Please use <Ctrl> + <I> keys to enter the "Intel(R) RAID for Serial ATA" status screen, which should appear early in system boot-up, during the POST (Power-On Self Test). Also, you need to enable the RAID function in BIOS (please to P.3-14 items *Onboard RAID control <Enhanced>* & *Configure SATA as <RAID>* for details) to create, delete and reset RAID volumes.

Using the Intel RAID Option ROM

1. Creating, Deleting and Resetting RAID Volumes:

The Serial ATA RAID volume may be configured using the RAID Configuration utility stored within the Intel RAID Option ROM. During the Power-On Self Test (POST), the following message will appear for a few seconds:

> **MSI** **MSI Reminds You...**
> *The "Driver Model", "Serial #" and "Size" in the following example might be different from your system.*

```
Intel(R) Application Accelerator RAID Option ROM v4.0.0.6211
Copyright(C) 2003-04 Intel Corporation.  All Rights Reserved.

 RAID Volumes:
 ID   Name              Level          Strip  Size     Status      Bootable
 0    RAID_Volume0      RAID0(Stripe)  128KB  68.9GB   Normal      Yes

 Physical Disks:
 Port Drive Model       Serial #                Size    Type/Status(Vol ID)
 0    WDC WD360GD-00FN   WD-WMAH91041833         34.4GB  Member Disk(0)
 1    WDC WD360GD-00FN   WD-WMAH91041807         34.4GB  Member Disk(0)
 2    HDS722500VLSA80    VNRB3EC2D549SL          76.6GB  Non-RAID Disk
 3    HDS722500VLSA80    VNRB3EC2D542XL          76.6GB  Non-RAID Disk

Press <CTRL-I> to enter Configuration Utility..
```
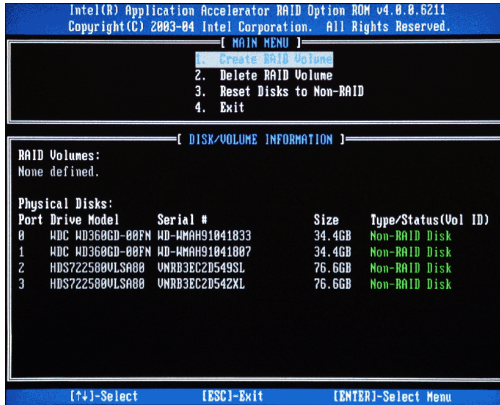
After the above message shows, press <Ctrl> and <I> keys simultaneously to enter the RAID Configuration Utility.
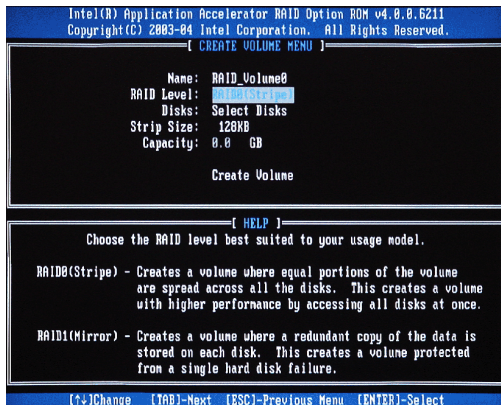
> **MSI** **MSI Reminds You...**
> *The following procedure is only available with a newly-built system or if you are reinstalling your OS. It should not be used to migrate an existing system to RAID 0 or RAID 1.*

After pressing the <Ctrl> and <I> keys simultaneously, the following window will appear:

```
Intel(R) Application Accelerator RAID Option ROM v4.0.0.6211
Copyright(C) 2003-04 Intel Corporation.  All Rights Reserved.
                        =[ MAIN MENU ]=
                      1.  Create RAID Volume
                      2.  Delete RAID Volume
                      3.  Reset Disks to Non-RAID
                      4.  Exit

                  =[ DISK/VOLUME INFORMATION ]=
RAID Volumes:
None defined.

Physical Disks:
Port Drive Model     Serial #            Size      Type/Status(Vol ID)
0    WDC WD360GD-00FN WD-WMAH91041833     34.4GB    Non-RAID Disk
1    WDC WD360GD-00FN WD-WMAH91041007     34.4GB    Non-RAID Disk
2    HDS722580VLSA80  VNRB3EC2D549SL      76.6GB    Non-RAID Disk
3    HDS722580VLSA80  VNRB3EC2D542XL      76.6GB    Non-RAID Disk



        [↑↓]-Select       [ESC]-Exit       [ENTER]-Select Menu
```

(1) Create RAID Volume

1. Select option 1 "Create RAID Volume" and press <Enter> key. The following screen appears. Then in the **Name** field, specify a RAID Volume name and then press the <TAB> or <Enter> key to go to the next field.
2. Use the arrow keys to select the RAID level (RAID0 or RAID1) best suited to your usage model in **RAID Level**.

```
Intel(R) Application Accelerator RAID Option ROM v4.0.0.6211
Copyright(C) 2003-04 Intel Corporation.  All Rights Reserved.
                   =[ CREATE VOLUME MENU ]=
                 Name:   RAID_Volume0
           RAID Level:   RAID0(Stripe)
                Disks:   Select Disks
           Strip Size:   128KB
             Capacity:   0.0   GB

                       Create Volume

                          =[ HELP ]=
              Choose the RAID level best suited to your usage model.

     RAID0(Stripe) - Creates a volume where equal portions of the volume
                     are spread across all the disks.  This creates a volume
                     with higher performance by accessing all disks at once.

     RAID1(Mirror) - Creates a volume where a redundant copy of the data is
                     stored on each disk.  This creates a volume protected
                     from a single hard disk failure.

        [↑↓]Change   [TAB]-Next  [ESC]-Previous Menu  [ENTER]-Select
```

3. In the **Disk** field, press <Enter> key and the following screen appears. Use <Space> key to select the disks you want to create for the RAID volume, then click <Enter> key to finish selection.
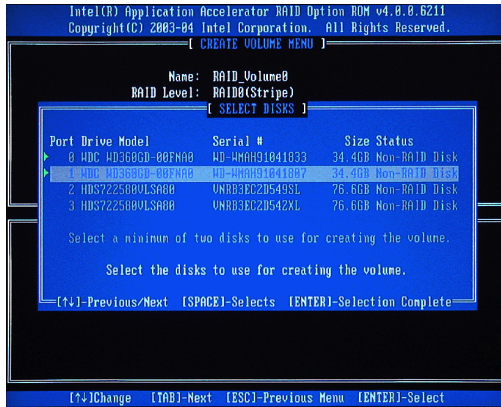
4. Then select the strip value for the RAID 0 or RAID 1 array by using the "upper arrow" or "down arrow" keys to scroll through the available values, and pressing the <Enter> key to select and advance to the next field. The available values range from 4KB to 128 KB in power of 2 increments. The strip value should be chosen based on the planned drive usage. Here are some suggested selections:
   16 KB – Best for sequential transfers
   64 KB – Good general purpose strip size
   128 KB – Best performance for most desktops and workstations. The default value.

5. Then select the capacity of the volume in the **Capacity** field. The default value is the maximum volume capacity of the selected disks.
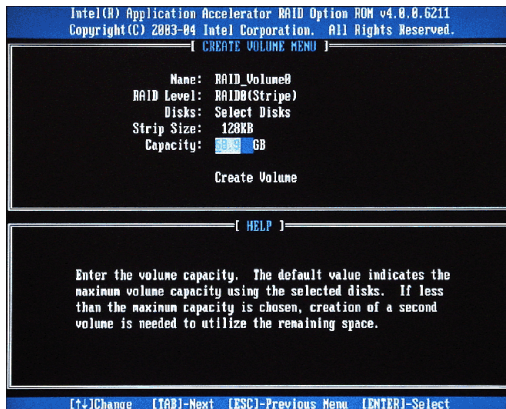
MSI Reminds You...
Since you want to create two volumes (Intel Matrix RAID Technology), this default size (maximum) needs to be reduced. Type in a new size for the first volume. As an example: if you want the first volume to span the first half of the two disks, re-type the size to be half of what is shown by default. The second volume, when created, will automatically span the remainder of two hard drives.

6. Then the following screen appears for you to confirm if you are sure to create the RAID volume. Press <Y> to continue.
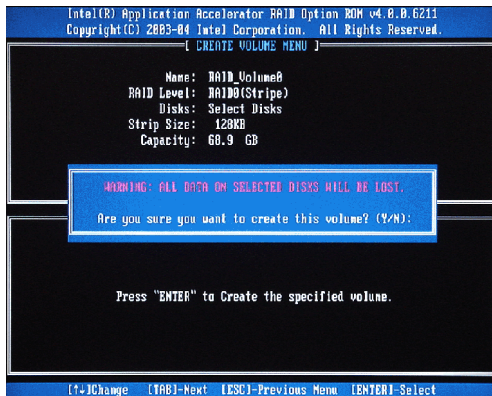
7. Then the following screen appears to indicate that the creation is finished.

(2) Delete RAID Volume

Here you can delete the RAID volume, but please be noted that all data on RAID drives will be lost.

MSI Reminds You...
If your system currently boots to RAID and you delete the RAID volume in the Intel RAID Option ROM, your system will become unbootable.

Select option 2 **Delete RAID Volume** from the main menu window and press <Enter> key to select a RAID volume for deletion. Then press <Delete> key to delete the selected RAID volume. The following screen appears.
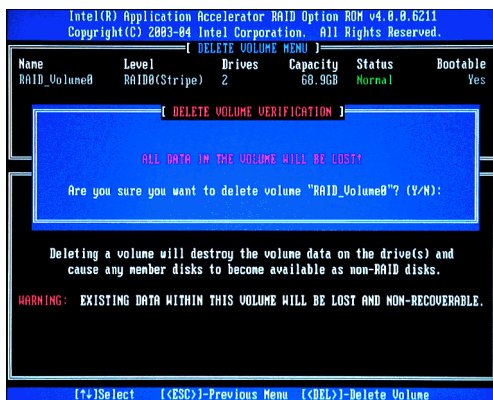
Press <Y> key to accept the volume deletion.

(3) Reset Disks to Non-RAID

Select option 3 **Reset Disks to Non-RAID** and press <Enter> to delete the RAID volume and remove any RAID structures from the drives. The following screen appears:
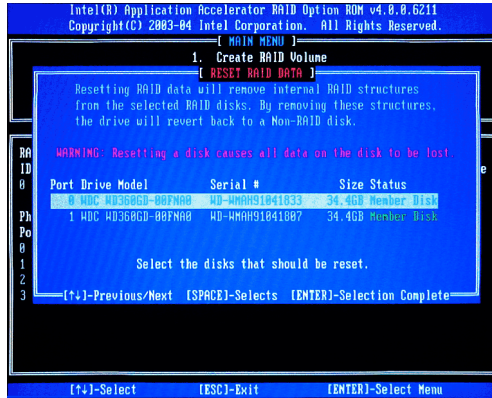
Press <Y> key to accept the selection.

MSI Reminds You...

1. You will lose all data on the RAID drives and any internal RAID structures when you perform this operation.

2. Possible reasons to 'Reset Disks to Non-RAID' could include issues such as incompatible RAID configurations or a failed volume or failed disk.

Installing Software

Install Driver in Windows XP / 2000

† **New Windows XP / 2000 Installation**
The following details the installation of the drivers while installing Windows XP /
2000.

1. Start the installation:
   Boot from the CD-ROM. Press F6 when the message "Press F6 if you need
   to install third party SCSI or RAID driver" appears.
2. When the Windows XP Setup window is generated, press S to specify an
   Additional Device(s).
3. Insert the driver diskette *Intel IAA RAID XP Driver For ICH6R (FW82801FR)*
   into drive A: and press <Enter>.
4. Choose the driver *Intel(R) 82801FR SATA RAID Controller* from the drop-
   down list that appears on Windows XP Setup screen, and press the <Enter>
   key.
5. Press <Enter> to continue with installation or if you need to specify any
   additional devices to be installed, do so at this time. Once all devices are
   specified, press <Enter> to continue with installation.
6. From the Windows XP/2000 Setup screen, press the <Enter> key. Setup will
   now load all device files and then continue the Windows XP/2000 installation.

† **Existing Windows XP/2000 Driver Installation**
1. Insert the MSI CD into the CD-ROM drive.
2. The CD will auto-run and the setup screen will appear.
3. Under the Driver tab, click on *Intel IAA RAID Edition*.
4. The drivers will be automatically installed.

† **Confirming Windows XP/2000 Driver Installation**
1. From Windows XP/2000, open the **Control Panel** from **My Computer** fol-
   lowed by the System icon.
2. Choose the **Hardware** tab, then click the **Device Manager** tab.
3. Click the "**+**" in front of the **SCSI and RAID Controllers** hardware type. The
   driver *Intel(R) 82801FR SATA RAID Controller* should appear.

Installation of Intel Application Accelerator RAID Edition

The Intel Application Accelerator RAID Edition driver may be used to operate the hard drive from which the system is booting or a hard drive that contains important data. For this reason, you cannot remove or un-install this driver from the system after installation; however, you will have the ability to un-install all other non-driver components.
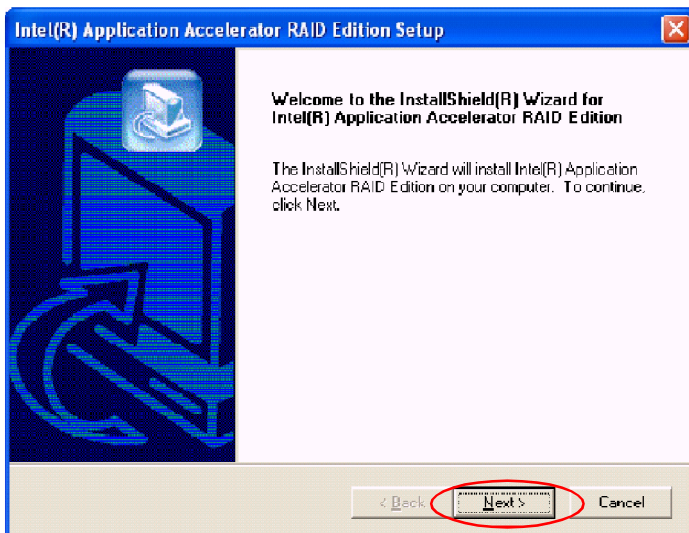
Insert the MSI CD and click on the **Intel IAA RAID Edition** to install the software.
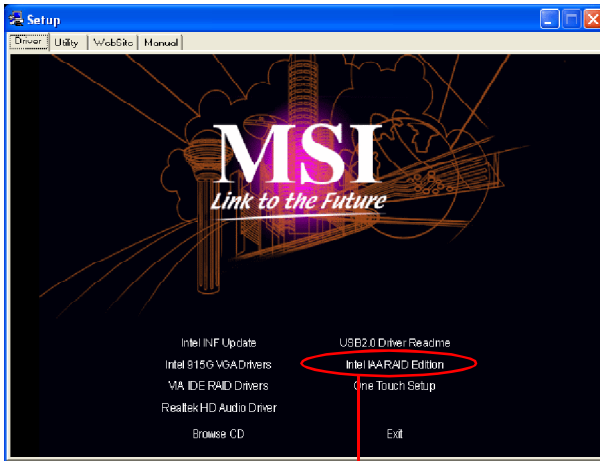
Click on this item

The **InstallShield Wizard** will begin automatically for installation showed as following:

Click on the **Next** button to proceed the installation in the welcoming window.

The window shows the components to be installed. Click **Next** button to continue.
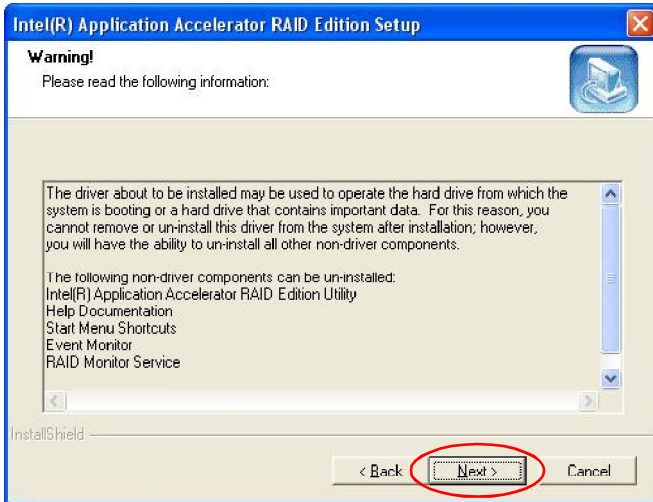
After reading the license agreement in the following window, click **Yes** button to continue.
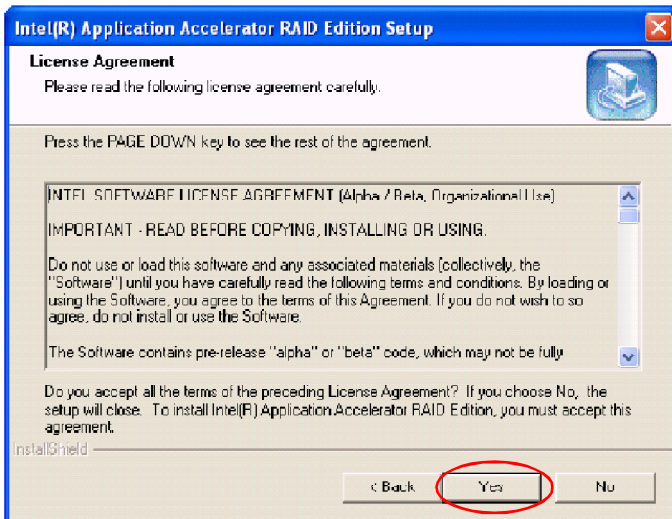
Select the folder in which you want the program to be installed in the following window, and click **Next** button to start installation.
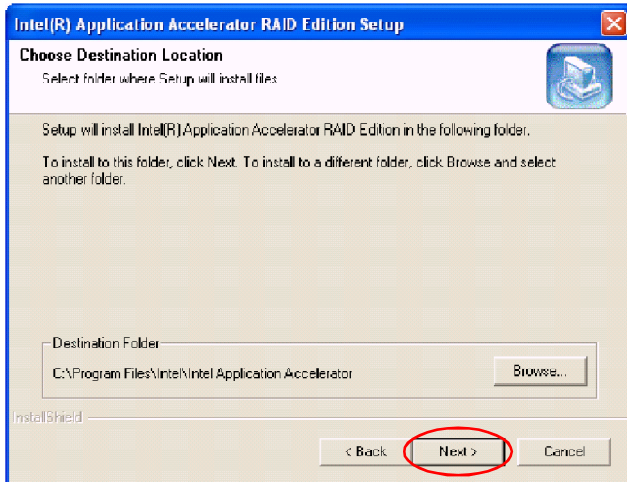
Select a program folder in the following window where you want Setup to add the program icon.
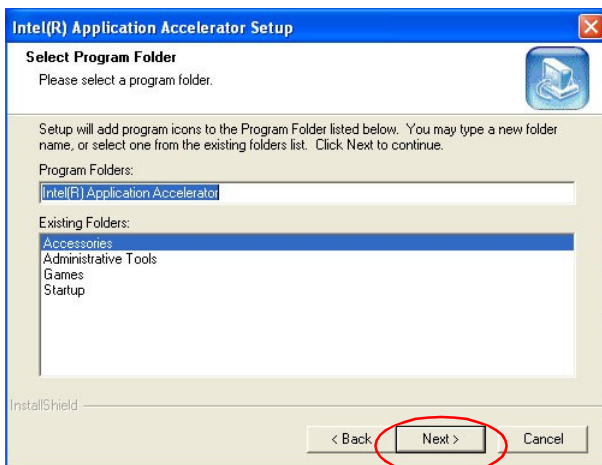
The following window appears to show the Intel Application Accelerator RAID Edition Setup installation status.
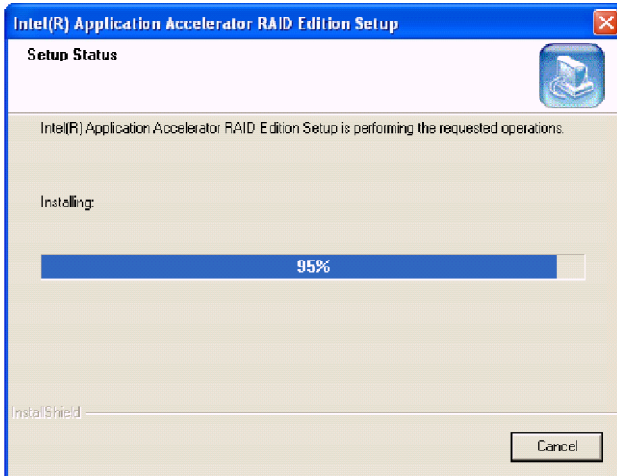
Once the installation is complete, the following window appears.
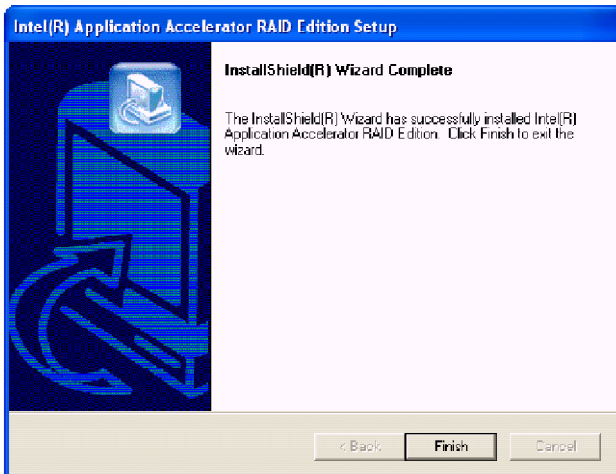
RAID Migration Instructions

The Intel Application Accelerator RAID Edition offers the flexibility to upgrade from a single Serial ATA (SATA) hard drive to a two drive RAID 0 or RAID 1 configuration when an additional SATA hard drive is added to the system. This process will create a new RAID volume from an existing disk. However, several important steps must be followed at the time the system is first configured in order to take advantage of RAID when upgrading to a second SATA hard drive:

1. BIOS must be configured for RAID before installing Windows* XP on the single SATA hard drive. Refer to **OnChip SATA Setting** for properly setting of the BIOS.
2. Install the Intel Application Accelerator RAID Driver during Windows Setup. Refer to P.5-8 **Installing Software** for instructions on installing the driver during Windows Setup.
3. Install the Intel Application Accelerator RAID Edition after the operating system is installed.
   To create a volume from an existing disk, complete the following steps:

MSI Reminds You...
*A **Create from Existing Disk** operation will delete all existing data from the added disk and the data cannot be recovered. It is critical to backup all important data on the added disk before proceeding. However, during the migration process, the data on the source disk is preserved.*

After the Intel Application Accelerator RAID Edition has been successfully installed and the system has rebooted, click on the Intel Application Accelerator shortcut link (**Start --> All Programs --> Intel(R) Application Accelerator --> Intel Application Accelerator**) and the following window will appear:
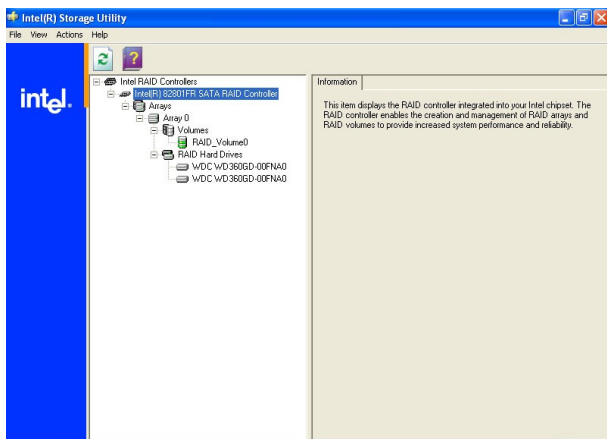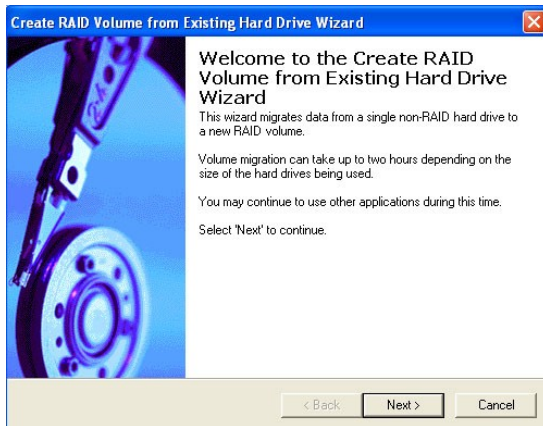
Create RAID Volume from Existing Disk

To create a RAID volume from an existing disk, choose **Action --> Create RAID Volume from Existing Hard Drive**.
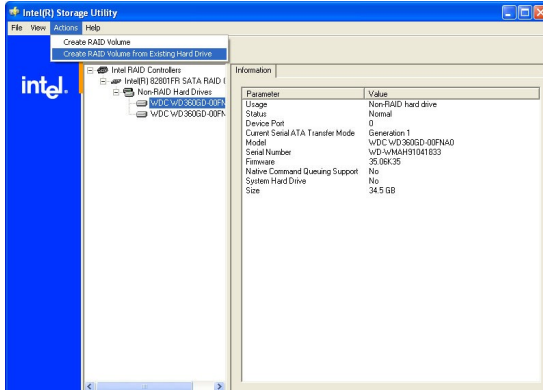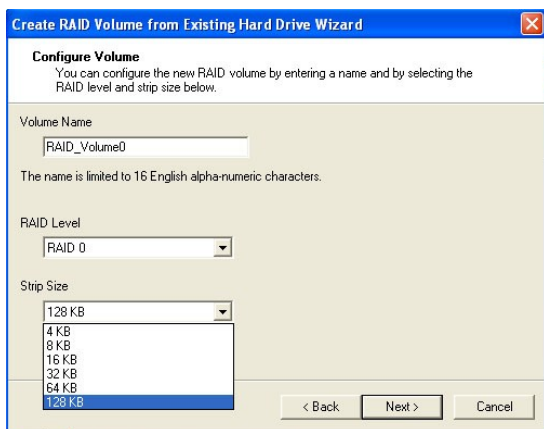

The **Create RAID Volume from Existing Hard Drive Wizard** pops up to lead you for the following procedure. Click **Next** to continue.

(1) Step 1: Configure Volume

Here you can configure the new RAID volume by entering the volume name, selecting the RAID level and strip size.

† **RAID Volume Name:**

A desired RAID volume name needs to be typed in where the 'RAID_Volume1' text currently appears above. The RAID volume name has a maximum limit of 16 characters. The RAID volume name must also be in English alphanumeric ASCII characters.

† **RAID Level:**

Select the desired RAID level:

RAID 0 (Performance) – A volume optimized for performance will allow you to access your data more quickly.

RAID 1 (Redundancy) – A volume optimized for data redundancy will provide you with a realtime duplicate copy of your data. Note: Only half of the available volume space will be available for data storage.

† **Strip Sizes:**

Select the desired strip size setting. As indicated, the optimal setting is 128KB. Selecting any other option may result in performance degradation. Even though 128KB is the recommended setting for most users, you should choose the strip size value which is best suited to your specific RAID usage model. The most typical strip size settings are:

4KB: For specialized usage models requiring 4KB strips

8KB: For specialized usage models requiring 8KB strips

16KB: Best for sequential transfers

32KB: Good for sequential transfers

64KB: Good general purpose strip size

128KB: Best performance for most desktops and workstations

(2) Select the source disk

Then select the source disk that you wish to use and then click **"--->"** to move it to the **Selected** field. Then click **Next** to continue.

It is very important to note which disk is the source disk (the one containing all of the information to be migrated) and which one is the target disk. On a RAID Ready system, this can be determined by making a note during POST of which port (e.g. Port 0 or Port 1) the single disk is attached to.

You can also use the Intel Application Accelerator RAID Edition utility before the second disk is installed to verify the Port and serial number of the drive that contains all the data.
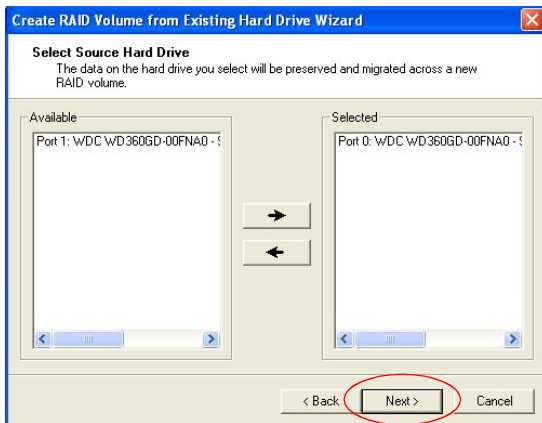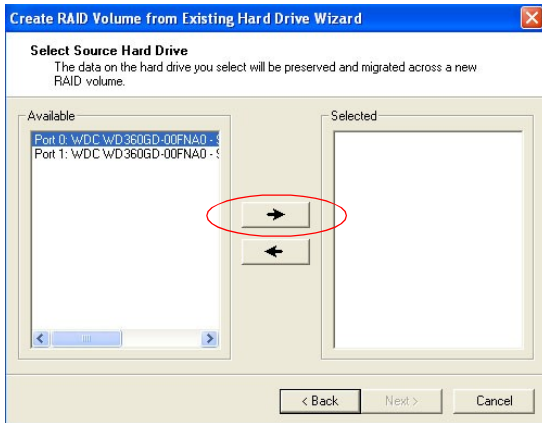
(3) Select Member Hard Drive(s)

Then select the member disk (the target disk) that you wish to use and then click **"--->"** to move it to the **Selected** field. Then click **Next** to continue. Please note that the existing data on the selected hard drive(s) will be deleted permanently. Do not forget to back up all the important data before continuing.
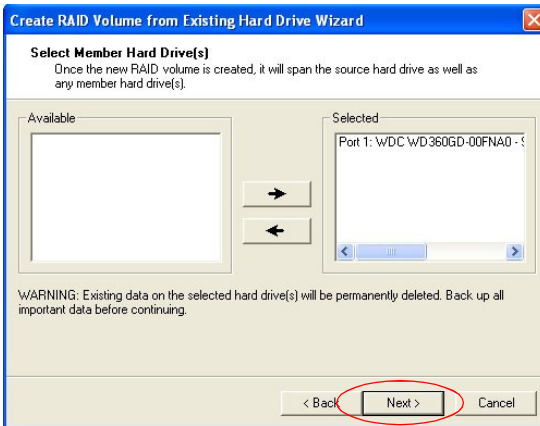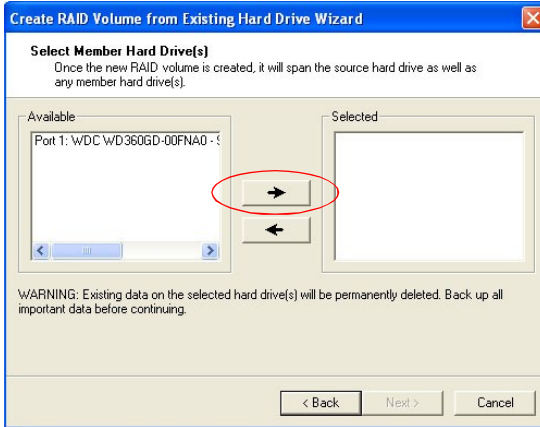
(4) Specify Volume Size

Specify the amount of available array space to be used by the new RAID volume. You may enter the amount in the space or use the slider to specify. It is recommended you use 100% of the available space for the optimized usage, either for RAID 0 or RAID1 volume. For RAID 0 volume, if you do not specify 100% of the hard drive space, the rest hard drive space will be worked as RAID 1 volume, which is the new technology called Intel Matrix RAID. Then click **Next** to continue.
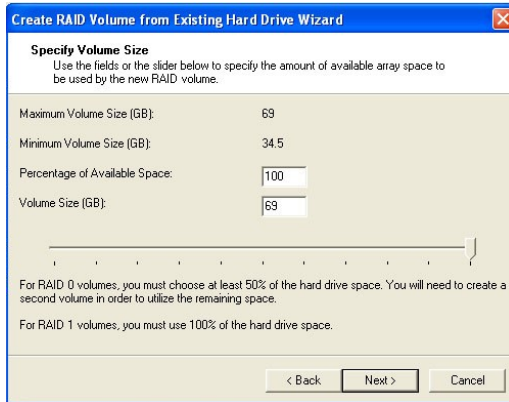

(5) Start Creating RAID Volume from Existing Hard Drive Wizard

Before you continue the procedure of RAID volume creation from existing hard drive, read the dialogue box below carefully. Please note that once you click **Finish**, the existing data on the selected hard drive(s) will be deleted permanently and this operation cannot be undone. It is critical that you backup all important data before selecting **Finish** to start the migration process.
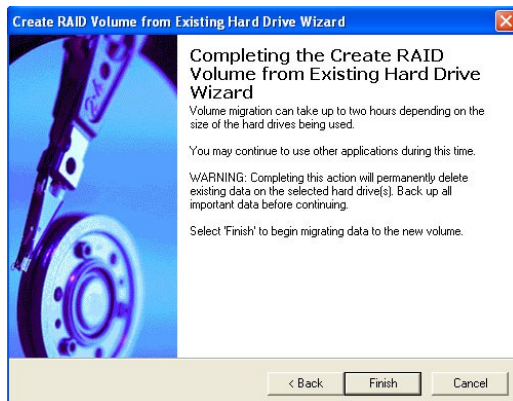
(6) Start Migration

The migration process may take up to two hours to complete depending on the size of the disks being used and the strip size selected. A dialogue window will appear stating that the migration process may take considerable time to complete, meanwhile a popup dialogue at the taskbar will also show the migration status. While you can still continue using your computer during the migration process, once the migration process starts, it cannot be stopped. If the migration process gets interrupted and your system is rebooted for any reason, it will pick up the migration process where it left off. You will be provided with an estimated completion time (the remaining time will depend on your system) once the migration process starts.
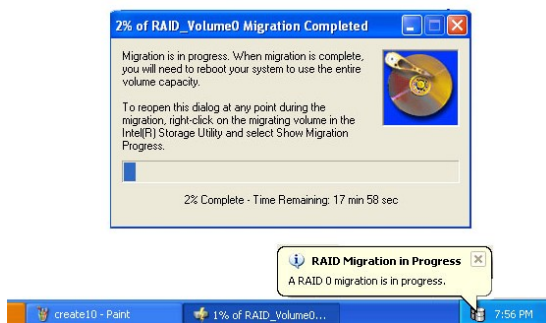
The following screen appears if the migration process is completed successfully. Then you have to reboot your system to use the full capacity of the new volume.