945PL Neo

MS-7236 (v1.X) ATX Mainboard

G52-M7236X1

FCC-B Radio Frequency Interference Statement

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

= Reorient or relocate the receiving antenna.
= Increase the separation between the equipment and receiver.
= Connec 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-7236

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation

Copyright Notice

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Revision History

Revision	Revision History	Date
V1.0	First release for PCB 1.X	Nov. 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 homepage & FAQ site for technical guide, BIOS updates, driver updates, and other information: **http://www.msi.com.tw** & **http://www.msi.com.tw/program/service/faq/faq/esc_faq_list.php**

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

Safety Instructions

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

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

廢電池請回收

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

WEEE Statement

ENGLISH

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

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

DEUTSCH

Hinweis von MSI zur Erhaltung und Schutz unserer Umwelt

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

FRANÇAIS

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

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

РУССКИЙ

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

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

ESPAÑOL

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

NEDERLANDS

Om het milieu te beschermen, wil MSI u graag herinneren dat....
De richtlijn van de Europese Unie (EU) met betrekking tot Vervuiling van Electrische en Electronische producten (2002/96/EC), die op 13 Augustus 2005 in zal gaan kunnen niet meer beschouwd worden als vervuiling.
Fabrikanten van dit soort producten worden verplicht om producten retour te nemen aan het eind van hun levenscyclus. MSI zal overeenkomstig de richtlijn handelen voor de producten die de merknaam MSI dragen en verkocht zijn in de EU. Deze goederen kunnen geretourneerd worden op lokale inzamelingspunten.

SRPSKI

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

POLSKI

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

TÜRKÇE

Çevreci özelliğiyle bilinen MSI dünyada çevreyi korumak için hatırlatır:

Avrupa Birliği (AB) Kararnamesi Elektrik ve Elektronik Malzeme Atığı, 2002/96/EC Kararnamesi altında 13 Ağustos 2005 tarihinden itibaren geçerli olmak üzere, elektrikli ve elektronik malzemeler diğer atıklar gibi çöpe atılamayacak ve bu elektonik cihazların üreticileri, cihazların kullanım süreleri bittikten sonra ürünleri geri toplamakla yükümlü olacaktır. Avrupa Birliği'ne satılan MSI markalı ürünlerin kullanım 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 termékvisszavételel kapcsolatos követelményeket az MSI márkanév alatt az EU-n belül értékesített termékek esetében, azok élettartamának végén. Az ilyen termékeket a legközelebbi gyűjtőhelyre viheti.

ITALIANO

Per proteggere l'ambiente, MSI, da sempre amica della natura, ti ricorda che....

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

CONTENTS

FCC-B Radio Frequency Interference Statement ii
Copyright Notice iii
Technical Support iv
Safety Instructions iv
WEEE Statement v
Chapter 1. Getting Started 1-1
Mainboard Specifications 1-2
Mainboard Layout 1-4
Packing Contents 1-5
Core Center 1-6
Left-wing: Current system status 1-7
Right-wing: PC hardware status during real time operation 1-7
Chapter 2. Hardware Setup 2-1
Hardware Setup 2-1
Quick Components Guide 2-2
Central Processing Unit: CPU 2-3
Introduction to LGA 775 CPU 2-3
CPU & Cooler Installation 2-4
Memory 2-7
Memory Module Population Rules 2-7
Installing DDR2 Modules 2-8
Power Supply 2-9
ATX 24-Pin Power Connector: ATX1 2-9
ATX 12V Power Connector: JPW1 2-9
Mouse/Keyboard Connector 2-10
Back Panel 2-10
Serial Port Connector: COM Port 2-11
USB Connectors 2-11
LAN (RJ-45) Jack 2-12
Audio Port Connectors 2-12
Parallel Port Connector: LPT1 2-13
Floppy Disk Drive Connector: FDD1 2-14
Fan Power Connectors: CPUFAN1/SYSFAN1/PWRFAN1 2-14
Connectors 2-14
Hard Disk Connector: IDE1 2-15
Serial ATAII Connectors controlled by Intel ICH7: SATA1~SATA4 2-16
CD-In Connector: JCD1 2-17

Front Panel Connectors: JFP1 / JFP2 2-17
Front USB Connectors: JUSB1 / JUSB2 2-18
Front Panel Audio Connector: JAUD1 2-18
Chassis Intrusion Switch Connector: JCI1 2-19
IrDA Infrared Module Header: JIR1 2-19
Serial Port Connector: JCOM1 2-19
Jumpers 2-20
Clear CMOS Jumper: JBAT1 2-20
Slots 2-21
PCI Express Slots (optional) 2-21
PCI (Peripheral Component Interconnect) Slots 2-22
PCI Interrupt Request Routing 2-22
Chapter 3. BIOS Setup 3-1
Entering Setup 3-2
Control Keys 3-2
Getting Help 3-2
Main Menu 3-2
Default Settings 3-2
The Main Menu 3-4
Standard CMOS Features 3-6
Advanced BIOS Features 3-8
Advanced Chipset Features 3-10
Integrated Peripherals 3-12
Power Management Features 3-15
PCI/PNP Resource Management 3-18
H/W Monitor 3-20
Cell Menu 3-20
Load Fail-Safe/Optimized Defaults 3-24
BIOS Setting Password 3-25
Chapter 4. Introduction to Realtek ALC850 4-1
Installing the Audio Driver 4-2
Installation for Windows 98SE/ME/2000/XP 4-2
Software Configuration 4-4
Sound Effect 4-5
Speaker Configuration 4-7
HRTF Demo 4-9
General 4-10
SPDIF 4-11
Using 2-, 4-, 6- & 8- Channel Audio Function 4-12

1

Getting Started

Thank you for choosing the **945PL Neo**(MS-7236) v1.x ATX mainboard. The **945PL Neo** mainboard is based on **Intel® 945PL** and **Intel® ICH7** chipset for optimal system efficiency. Designed to fit the advanced **Intel® Pentium 4 Prescott LGA775** processor, the **945PL Neo** mainboard delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU

† Supports Intel® Pentium 4 LGA775 processors in LGA775 package.
† Supports Intel Hyper-Threading Technology.
(For the latest information about CPU, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_cpu_support.php)

Chipset

† Intel® 945PL chipset
- Supports FSB 533/ 800MHz .
- Supports PCI Express x16 graphics interface.
- Supports DDR2 400/533

† Intel® ICH7 chipset
- Hi-Speed USB (USB2.0) controller, 480Mb/sec, up to 8 ports.
- 4 SATAII ports with transfer rate up to 3Gb/s.
- 1 channel Ultra ATA 100 bus Master IDE controller.
- PCI Master v2.3, I/O APIC.
- ACPI 2.0 Compliant.
- Integrated AHCI controller.

Main Memory

† Supports four unbuffered DIMM of 1.8 Volt DDR2 SDRAM.
† Supports up to 2GB memory size.
† Supports a maximum of 4 banks of memory modules.
† Supports Dual channel DDR memory architecture.
† Supports DDR2 400/533 memory interface.

Slots

† One PCI Express x16 slot.
† One PCI Express x1 slot.
† Four 32-bit v2.3 Master PCI bus slots (support 3.3v/5v PCI bus interface).

On-Board IDE

† One Ultra DMA 66/100 IDE controllers integrated in ICH7.
- Supports PIO, Bus Master operation modes.
- Can connect up to four Ultra ATA drives.

† SATAII controller integrated in ICH7.
- Up to 300MB/sec transfer speed.
- Can connect up to four SATAII devices.

On-Board Peripherals

† On-Board Peripherals include:
- 1 floppy port supports 1 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
- 2 serial ports (Rear* 1/ Front* 1)
- 1 parallel port supports SPP/EPP/ECP mode
- 1 Line-In / Line-Out / MIC-In / Rear Speaker Out / Center-Subwoofer Speaker Out/ SPDIF-Out

- 8 USB ports (Rear * 4/ Front * 4)
- 1 RJ-45 LAN jack

LAN

† Realtek RTL8110SB / RTC8110SC / RTL8100C(optional).
- Supports 10 / 100 / 1000 Mb/s.
- Compliane with PCI 2.2.
- Supports ACPI Power Management.

Audio

† AC97 link controller integrated in ICH7.

† Realtek ALC850 8 channels audio codec.
-Meet PC2001 audio performance requirement
-Compliance with AC97 V2.3 spec.

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.

Mounting and Dimension

† ATX Form Factor: 30.5 cm x 22.5 cm

† 6 mounting holes

Mainboard Layout

945PL Neo(MS-7236) v1.x ATX Mainboard

Packing Contents

MSI motherboard

MSI Driver/Utility CD

SATA Cable *1
(Optional)

Power Cable

Back IO Shield

Standard Cable for
IDE Devices
(Optional)

User's Guide

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

Core Center

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

CoreCenter is just like your PC doctor that can detect, view and adjust the PC hardware and system status during real time operation.
In the left side it shows the current system status including the Vcore, 3.3V, +5V and 12V. In the right side it shows the current PC hardware status such as the CPU & system temperatures and all fans speeds.

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

Left-wing: Current system status

In the left sub-menu, you can configure the settings of FSB, Vcore, Memory Voltage and AGP Voltage by clicking the radio button next to each item and make it available (the radio button will be lighted as yellow when selected), use the "**+**" and "**-**" buttons to adjust, then click **"OK"** to apply the changes. Then you can click **"Save"** to save the values you just configured.
Also you may click **"Auto"** to start testing the maximum CPU overclocking value. The CPU FSB will automatically increase the testing value until the PC reboots. Or you may click **"Default"** to restore the default values.

Right-wing: PC hardware status during real time operation

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

2

Hardware Setup

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

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

Quick Components Guide

Central Processing Unit: CPU

The mainboard supports Intel® Pentium 4 Prescott processor. The mainboard uses a CPU socket called LGA775. When you are installing the CPU, **make sure to install the cooler to prevent overheating.** If you do not have the CPU cooler, contact your dealer to purchase and install them before turning on the computer.

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

MSI Reminds You...

Overheating

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

Replacing the CPU

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

Overclocking

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

Introduction to LGA 775 CPU

The pin-pad side of LGA 775 CPU.

Yellow triangle is the Pin 1 indicator

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

Yellow triangle is the Pin 1 indicator

CPU & Cooler Installation

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

Follow the steps below to install the CPU & cooler correctly. Wrong installation will cause the damage of your CPU & mainboard.

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

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

3. The pins of socket reveal.

4. Open the load lever.

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

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

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

8. Cover the load plate onto the package.

MSI Reminds You...

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

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

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

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

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

MSI Reminds You...

1. *Check the information in **PC Health Status** in BIOS (Chapter 3) for the CPU temperature.*
2. *Whenever CPU is not installed, always protect your CPU socket pin with the plastic cap covered (shown in step 1) to avoid damaging.*
3. *Please note that the mating/unmating durability of the CPU is 20 cycles. Therefore we suggest you do not plug/unplug the CPU too often.*

Memory

The mainboard provides 4 slots for 240-pin DDR2 DIMM, which supports the memory size up to 2GB.

Since DDR2 modules are not interchangeable with DDR1 and the DDR2 standard is not backward compatible, you should always install DDR2 memory module in the DDR2 slot (DIMM1~DIMM4). Otherwise, you are not able to boot up your system and your mainboard might be damaged.

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

DIMM1,2 and DIMM3,4
(from left (Green) to right(Orange))

Channel A (DIMM1 & DIMM2): Green
Channel B (DIMM3 & DIMM4): Orange

Memory Module Population Rules

Install at least one DIMM module on the slots. Each channel supports up to a maximum size of 1GB and maximum 2 bank memory modules.

Important

1. *Each DIMM can work respectively for single-channel DDR, while both channels (in different color) populated with same amount of memory size will work as dual-channel DDR.*
2. *The mainboard supports up to **2** double- side or **4** single-side memory modules.*

MSI Reminds You...

- *Please select the identical memory modules to install on the dual channel, and DO NOT install three memory modules on three DIMMs, or it may cause some failure.*
- *Always insert the memory modules into the GREEN slots first, and it is strongly recommended not to insert the memory modules into the ORANGE slots while the GREEN slots are left empty.*
- *This mainboard DO NOT support the memory module installed with more than 18 pieces of IC (integrated circuit).*

Installing DDR2 Modules

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

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

Power Supply

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

ATX 24-Pin Power Connector: ATX1

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

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	PWR OK	20	Res
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

ATX 12V Power Connector: JPW1

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

JPW1

JPW1 Pin Definition

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

MSI Reminds You...

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

Back Panel

The back panel provides the following connectors:

Mouse/Keyboard Connector

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

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

Pin Definition

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

Serial Port Connector: COM Port

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

9-Pin Male DIN Connector COM Port

Pin Definition

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

USB Connectors

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

USB Ports

USB Port Description

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

LAN (RJ-45) Jack

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

RJ-45 LAN Jack

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-

Audio Port Connectors

The left 3 audio jacks are for 2-channel mode for stereo speaker output: **Line Out** is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones.

However, there is an advanced audio application provided by Realtek ALC850 to offer support for **7.1-channel audio operation** and can turn rear audio connectors from 2-channel to 4-/5.1-/7.1- channel audio.

MSI Reminds You...
*For the advanced functions of the audio codec, please refer to the chapter **Introduction to Realtek ALC850** for details.*

Parallel Port Connector: LPT1

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

Pin Definition

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

Connectors

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

Floppy Disk Drive Connector: FDD1

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

Fan Power Connectors: CPUFAN1/SYSFAN1/PWRFAN1

The CPUFAN1 (processor fan), NBFAN1, SYSFAN1 and PWRFAN1 support system cooling fan with +12V. It supports four/three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

CPUFAN1

PWRFAN1

SYSFAN1

MSI Reminds You...

1. *Always consult the vendors for proper CPU cooling fan.*
2. *CPUFAN1 supports the fan control. Fan/heatsink with 3 or 4 fins are both available.*
3. *Please refer to the recommended CPU fans at Intel® official website.*

Hard Disk Connector: IDE1

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

IDE1 (blue)

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

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 ATAII Connectors controlled by Intel ICH7: SATA1~SATA4

The SouthBridge of this mainboard is Intel ICH7 which supports four serial ATAII connectors SATA1~SATA4.

SATA1~SATA4 are dual high-speed Serial ATAII interface ports. Each supports Serial ATAII data rates of 300MB/s.

Both connectors are fully compliant with SATA 1.0 and 2.0 specifications. Each Serial ATA connector can connect to 1 hard disk device.

SATA1~ SATA4 Pin Definition

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

Serial ATA cable

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

Connect to serial ATA ports

MSI Reminds You...

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

CD-In Connector: JCD1

The connector is for CD-ROM audio connector.

Front Panel Connectors: JFP1 / JFP2

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

JFP1 Pin Definition

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

JFP2 Pin Definition

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

Front USB Connectors: JUSB1 / JUSB2

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

JUSB1 / JUSB2
(USB 2.0/standard spec)

JUSB1 / JUSB2 Pin Definition

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

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

Front Panel Audio Connector: JAUD1

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

JAUD1

JAUD1 Pin Definition

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

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

IrDA Infrared Module Header: JIR1

The connector allows you to connect to IrDA Infrared module. You must configure the setting through the BIOS setup to use the IR function. JIR1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

JIR1

Pin Definition

Pin	Signal
1	IRRX
2	IRTX
3	GND
4	VCC5
5	NC
6	NC

Serial Port Connector: JCOM1

The mainboard offers one 9-pin male DIN connector COM 1 (on the rear panel), and one optional serial port JCOM1. Both are 16550A high speed communication ports that send/receive 16 bytes FIFOs. You can attach a serial mouse or other serial device directly to them.

JCOM1

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial in or receive data
3	SOUT	Receive Data Transmit
4	DTR	Serial out or transmit data
5	GND	Data
6	DSR	Data Set Ready
7	RTS	Request To Send Ring
8	CTS	Clear To Send
9	RI	Indicate
10	X	X

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

Jumpers

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

Clear CMOS Jumper: JBAT1

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

JBAT1

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.

Slots

The mainboard provides a PCI Express x16 slot, a PCI Express x1 slot and four 32-bit PCI bus slots.

PCI Express Slots

The PCI Express slots, as a high-bandwidth, low pin count, serial, interconnect technology, support Intel highest performance desktop platforms utilizing the Intel Pentium 4 processor with HT Technology.

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

You can insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first.

PCI Express x16 slot

PCI Express x1 slot

PCI (Peripheral Component Interconnect) Slots

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

PCI Slots

PCI Interrupt Request Routing

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

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

3

BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use. You may need to run the Setup program when:

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

MSI Reminds You...

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

2. While booting up, the BIOS version is shown in the 1st line appearing after the memory count. It is usually in the format:
example: A7236IMS V1.0BH 03/04/05

where:

1st digit refers to BIOS maker as A=AMI(R); W=AWARD(R)
2nd-5th digits refer to the model number.
6th digit refers to the customer, MS=all standard customers.
V1.0BH refers to the BIOS version.

03/04/05 refers to the date this BIOS is released.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup. Also you can press <F11> to enter boot menu.

Press DEL to enter SETUP

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

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
<F6>	Load Optimized Defaults
<F7>	Load Fail-Safe Defaults

Getting Help

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

Main Menu

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

Default Settings

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

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

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

General Help <F1>

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

The Main Menu

Once you enter AwardBIOS CMOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to move among the items and press <Enter> to enter the sub-menu.

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

Advanced BIOS Features
Use this menu to setup the items of Award® special enhanced features.

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

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

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

PNP/PCI Configurations
This entry appears if your system supports PnP/PCI.

H/W Monitor
This entry shows the status of your CPU, fan, warning for overall system status.

Cell Menu
Use this menu to specify your settings for CPU/AGP frequency/voltage control and overclocking.

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

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

BIOS Setting Password
Use these two menus to set the passwords for BIOS.

Save Changes and Exit
Save changes to CMOS and exit setup.

Exit Without Saving
Abandon all changes and exit setup.

Standard CMOS Features

The items in Standard CMOS Features Menu includes some basic setup items. Use the arrow keys to highlight the item and then use the <+> or <-> keys to select the value you want in each item.

Date (MM:DD:YY)

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

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

Time (hh:mm:ss)

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

IDE Primary/Secondary/Third Master/Slave

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

Type
This item allows you to select how to define the HHDD parameters.

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

Block (Multi-Sector Transfer)
Select **Auto** for a hard disk performance.

PIO Mode
This item allows you to enable or disable the PIO (Programmed Input/Output) mode.

DMA Mode
This item allows you to enable or disable the DMA (Direct Memory Access) mode.

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

32Bit Data Transfer
Enable 32bit to maximize the IDE hard disk data transfer rate.

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

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

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

Advanced BIOS Features

Quick Boot

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

CPU Configuration

Press <Enter> to enter the sub-menu.

****CPU Information****

Manufacturer/Frequency/FSB Speed/Cache L1/Cache L2/Ratio Value
These items show the CPU related information of your system (read only).

Max CPUID Value Limit

When CPUID instruction is executed, newer CPU may return a value greater than 3 which causes certain problem with specific operating systems. Enabling "Max CPUID Value Limit" will limit the returned value to 3 and less to get rid of the problem. The problem is not seen with Windows series operating systems so the default is set to disabled for it.

Virtualization Technology (Only for the CPU with dual core)
Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple “virtual” systems. With enhancements to Intel’s various platforms, Intel Virtualization Technology can improve the robustness and performance of today’s software-only solutions.Settings: [Enabled], [Disabled].

Execute Disable Bit
Execute-Disable Bit capability is a robust hardware feature, detectable using the CPUID instruction, that protects against malicious software executing code on IA-32 systems.Settings: [Enabled], [Disabled].

Single Logical Processor Mod
This item allows you to to force the dual core CPU only use single processor function. Setting options: [Enabled], [Disabled].

Intel(R) SpeedStep(tm) tech.
The Intel SpeedStep technology allows you to set the performance level of the microprocessor whether the computer is running on battery or AC power. This field will appear after you installed the CPU which support speedstep technology. Setting options: [Enabled], [Disabled].

Hardware Prefetcher
This item allows you to to enable/disable the hardware prefetcher, or in other words – hardware prefetch mechanism.Settings: [Enabled], [Disabled].

Adjacent Cache Line Prefetch
This item allows you to enable/disable the adjacent cache line prefetch mode. When disabled, only one 64 byte line from the 128 byte sector is prefetched (which contains the requested data). When enabled – both lines are prefetched no matter whether they have or have not the requested data. Setting options: [Enabled], [Disabled].

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

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

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

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

MPS Confuration
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].

PCI Express Confuration - Active State Power-Management
This field allows you to enable/disable PCI Express L0s and L1 link power stats. Settings: [Enabled], [Disabled].

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

Advanced Chipset Features

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

DRAM Frequency
Use this field to configure the clock frequency of the installed DRAM. Setting options: [Auto], [400], [533].

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

Memory Hole
In order to improve performance, certain space in memory can be reserved for ISA peripherals. This memory must be mapped into the memory space below 16MB. When this area is reserved, it cannot be cached. Settings: [Disabled], [15MB-16MB].

Initate Graphic Adapter
This item allows you to select which graphics controller to use as the primary boot device. Setting options: [PCI/PEG], [PEG/PCI].

PEG Force X1
This setting determines whether the PCI Express x16 graphic is used. When setting to Enable, force the bandwidth frome x16 down to x1. Setting options: [Enabled] and [Disabled].

Integrated Peripherals

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

USB 2.0 Controller
Set to [Enabled] if you need to use any USB 2.0 device in the operating system that does not support or have any USB 2.0 driver installed, such as DOS and SCO Unix. Setting options: [Disabled], [Enabled].

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

USB Keyboard Legacy Support
Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

USB Mouse Legacy Support
Select [Enabled] if you need to use a USB-interfaced mouse in the operating system. The settings are: [Enabled], [Disabled].

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

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

IDE Configuration
Press <Enter> to enter the sub-menu:

PCI IDE BusMaster
This item allows you to enable/ disable the PCI IDE busmaster. Setting options: [Disabled], [Enabled].

ATA(PI) 80Pin Cable Detectio
This item allows you to select the mechanism for detecting 80Pin ATA(PI) Cable. Setting options: [Host & Device], [Host], [Device].

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

ATA/IDE Configuration, Configure SATA as
These 2 items allow you to select the ATA/IDE and SATA configuration. Select [Disabled] in ***ATA/IDE Configuration*** if you want to disable both ATA/IDE configuration. Select [Compatible] or [Enhanced] to use the IDE, S-ATA and P-ATA devices. Refer to the following tables for details.

	ATA/IDE Configuration (Compatible)
SATA Only	*[SATA 1/3/2/4]*
PATA Pri, SATA Sec	*[IDE1, SATA2/4]*
SATA Pri, PATA Sec	*[SATA1/3, IDE1]*
PATA Only	*[IDE1]*

For the setting options of ***Configure SATA as***, select [IDE] if you want to have SATA as IDE function.

Audio Controller
This item allows you to enable/ disable the audio controller. Disable the function if you want to use other controller cards to connect an audio device. Setting options: [Enabled], [Disabled].

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

Onboard Floppy Controller
Select [Enabled] if your system has a floppy disk controller (FDC) 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. Setting options: [Enabled], [Disabled].

Serial Port1/2 Address
These items specify the base I/O port addresses of the onboard Serial Port 1 . Selecting [Auto] allows BIOS to automatically determine the correct base I/O port address. Settings: [3F8/IRQ4], [2F8/IRQ3], [3E8/IRQ4], [2E8/IRQ3] and [Disabled].

Serial Port2 Mode
This item allows you to select mode for Serial Port2. Setting options: [Normal], [IrDA], [ASK IR].

Parallel Port Address
There is a built-in parallel port on the on-board Super I/O chipset that provides Standard, ECP, and EPP features. It has the following options:
[Disabled]
[3BC/IRQ7] Line Printer port 0
[278/IRQ5] Line Printer port 2
[378/IRQ7] Line Printer port 1

Parallel Port Mode

[SPP]	Standard Parallel Port
[EPP]	Enhanced Parallel Port
[ECP]	Extended Capability Port
[ECP+EPP]	Extended Capability Port + Enhanced Parallel Port

To operate the onboard parallel port as Standard Parallel Port only, choose [SPP]. To operate the onboard parallel port in the EPP mode simultaneously, choose [EPP]. By choosing [ECP], the onboard parallel port will operate in ECP mode only. Choosing [ECP + EPP] will allow the onboard parallel port to support both the ECP and EPP modes simultaneously.

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

Power Management Features

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

ACPI Function
This item is to activate the ACPI (Advanced Configuration and Power Management Interface) Function. If your operating system is ACPI-aware, such as Windows 98SE/2000/ME/XP, select [Enabled]. Settings: [Enabled] and [Disabled].

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

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

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

Re-Call VGA BIOS from S3

When ***ACPI Standby State*** is set to [S3/STR], users can select the options in this field. Selecting [Yes] allows BIOS to call VGABIOS to initialize the VGA card when system wakes up (resumes) from S3 sleep state. The system resume time is shortened when you disable the function, but system will need an AGP driver to initialize the VGA card. Therefore, if the AGP driver of the card does not support the initialization feature, the display may work abnormally or not function after resuming from S3. Options: [Auto], [Yes], [No].

Suspend Time Out

If system activity is not detected for the length of time specified in this field, all devices except CPU will be shut off. Settings: [Disabled], [1min], [2min], [4min], [8min], [10min], [20min], [30min], [40min], [50min], [60min].

Power Button Mode

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

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

Restore on AC Power Loss

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

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

Wakeup Event Setup

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

USB Device Wake-Up from S3

This setting allows USB device wake up the system from S3 state. Settings are: [Enable], [Disabled].

Keyboard Wakeup

The item specifies how the system will be awakened from power saving mode when input signal of the keyboard is detected. Setting options: [Disabled], [Specific Key], [Any Key].

Specific Key for PowerOn
This item is available when **Keyboard Wakeup** is enabled. This controls how and whether the keyboard is able to power on the system. Press Enter, and then you must press a key for power on the system.

Mouse WakeUp
This setting determines whether the system will be awakened from what power saving modes when input signal of the mouse is detected. Setting options: [Disabled], [Enabled].

Resume On PCI PME#
When setting to [Enabled], this setting allows your system to be awakened from the power saving modes through any event on PME (Power Management Event). Setting options: [Disabled], [Enabled].

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

PCI/PNP Resource Management

This section describes configuring the PCI bus system and PnP (Plug & Play) feature. PCI, or **P**eripheral **C**omponent **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

Clear NVRAM

The NVRAM (Non-volatile Random Access Memory) is where the BIOS stores resource information for both PNP and non-PNP devices in a bit string format. When the item is set to [Yes], the system will reset NVRAM right after the system is booted up and then set the setting of the item back to [No] automatically.

Plug & Play O/S

When set to *Yes*, BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Windows 98, 2000, ME or XP. When set to *No*, BIOS will initialize all the PnP cards. Select *Yes* if the operating system is Plug & Play.

PCI Latency Timer

This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values. Setting options: [32], [64], [96], [128], [160], [192], [224], [248].

PCI Slot1~4 IRQ Preference

These items specify the IRQ line for each PCI slot. Setting options: [3], [4], [5], [7], [9], [10], [11], [12], [14], [15], [Auto]. Selecting [Auto] allows BIOS to automatically determine the IRQ line for each PCI slot.

RQ Resources Setup

The items are adjustable only when *Resources Controlled By* is set to *Manual*. Press <Enter> and you will enter the sub-menu of the items. IRQ Resources list IRQ 3/4/5/7/9/10/11/12/14/15 for users to set each IRQ a type depending on the type of device using the IRQ. Settings are:

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

DMA Resources Setup

Press <Enter> and you will enter the sub-menu of the items.DMA Resources 0/1/3/5/6/7 for setting determine if BIOS should remove a DMA from the available DMAs passed to devices that are configurable by the system BIOS. The available DMA pool is determined by reading the NVRAM. If more DMAs must be removed from the pool, the end user can reserve the DMA.

H/W Monitor

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

Chassis Intrusion

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

Smart Fan Target

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

Smart Fan Tolerance

You can select a fan tolerance value here for the specific range for the “Smart Fan Target Temp. (°C)” item. If the current temperature of the fan reaches to the maximum threshold (the temperatures set in the “Smart Fan Target Temp. (°C)” plus the tolerance values you set here), the fan will speed up for cooling down. On the contrary, if the current temperature reaches to the minimum threshold (the set temperatures minus the tolerance value), the fan will slow down to keep the temperature stable.

System/CPU Temperature, CPU/SYS/NB FAN Speed, Vcore, +3.3V, +5.0V, +12.0V, +5VSB

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

Cell Menu

The items here includes some important settings of CPU and PCI functions.

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

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

Adjust NB Voltage (V)
NorthBridge voltage is adjustable in the field, allowing you to increase the performance of your NorthBridge when overclocking, but stability may be affected.

MSI Reminds You...
The settings shown in different color in CPU Voltage, DDR Voltage and NB Voltage help to verify if your setting is proper for your system.
Gray: Default setting.
White: Safe setting.
Yellow: High performance setting.
Red: Not recommended setting and the system may be unstable.
*Changing CPU Voltage, DDR Voltage and NB Voltage may result in the instability of the system; therefore, it is **NOT** recommended to change the default setting for long-term usage.*

Spread Spectrum

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

Adjust CPU FSB Frequency

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

Adjust PCI Express Frequency

This item allows you to select the PCI Express frequency (in MHz). Select the number between [100]~[133] for needed frequency.

CPU Dynamic OverClocking

Dynamic Overclocking Technology is the automatic overclocking function, included in the MSI™'s newly developed CoreCell™ Technology. It is designed to detect the load balance of CPU while running programs, and to adjust the best CPU frequency automatically. When the motherboard detects CPU is running programs, it will speed up CPU automatically to make the program run smoothly and faster. When the CPU is temporarily suspending or staying in the low load balance, it will restore the default settings instead. Usually the Dynamic Overclocking Technology will be powered only when users' PC need to run huge amount of data like 3D games or the video process, and the CPU frequency need to be boosted up to enhance the overall performance.

Setting options:

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

MSI Reminds You...

1. *Even though the Dynamic Overclocking Technology is more stable than manual overclocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overclock regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to disable the Dynamic Overclocking or to lower the level of overclocking options. By the way, if you need to conduct overclocking manually, you also need to disable the Dynamic OverClocking first.*
2. *Meanwhile, there are two functions to protect user's system from crashing.*
   - *There is a safe key "Ins" in BIOS. In case the overclocking fails, you can press "Ins" key while system rebooting to restore to the BIOS defaults.*
   - *If the system incidentally reboot for four times, the BIOS will also be restored to the defaults.*

Auto Detect PCI Clock

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].

Adjust PCI Frequency

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

Load Fail-Safe/Optimized Defaults

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

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

Pressing *[OK]* loads the BIOS default values for the most stable, minimal system performance.

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

Pressing *[OK]* loads the default factory settings for optimal system performance.

BIOS Setting Password

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

Type the password, up to six characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

4

Introduction to Realtek ALC850

The mainboard is equipped with Realtek ALC850 chip, which provides support for 8-channel audio output, including 2 Front, 2 Rear, 1 Center and 1 Subwoofer channel. ALC850 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 Audio Driver

You need to install the driver for Realtek ALC850 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 98SE/ME/2000/XP

For Windows® 2000, you must install Windows® 2000 Service Pack2 or later before installing the driver.

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

1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click **Realtek AC97 Audio Drivers**.

MSI Reminds You...

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

3. Click **Next** to install the AC'97 Audio software.

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

Software Configuration

After installing the audio driver, you are able to use the 2-, 4-, 6- or 8- channel audio feature now. Click the audio icon from the system tray at the lower-right corner of the screen to activate the **AC97 Audio Configuration**. It is also available to enable the audio driver by clicking the **Sound Effect Manager** from the **Control Panel**.

Sound Effect

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

You may also edit the properties for an environment as you wish by clicking the "**Edit**" button, then just scroll the bar in the bottom for each property to adjust.

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.

Here it provides the Karaoke function which will automatically remove human voice (lyrics) and leave melody for you to sing the song. You may use the "up arrow" and "down arrow" button to raise/lower the key, and press the lower button to remove the human voice.

Speaker Configuration

In this tab, you can easily configure your multi-channel audio function and speakers.

1. First you have to select the audio configuration below which is identical to the audio jack on your mainboard. In this model it uses Realtek ALC850 codec which supports 8-channel S/PDIF, therefore you should choose **8CH-S/PDIF (Optical & Coaxial).**

2. Select 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

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.

3. While you are testing the speakers in 8-Channel / 6-Channel Mode, if the sound coming from the center speaker and subwoofer is swapped, you should select **Swap Center/Subwoofer Output** to readjust these two channels.

HRTF Demo

In this tab you may adjust your HRTF (Head Related Transfer Functions) 3D positional audio before playing 3D audio applications like gaming. You may also select different environment to choose the most suitable environment you like.

General

In this tab it provides some information about this AC97 Audio Configuration utility, including Audio Driver Version, DirectX Version, Audio Controller & AC97 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.

SPDIF

In this tab it provides options about SPDIF-Out for you to configure.

† **No Output:** With this option, there is no S/PDIF output signal while playing analog and digital audio.

† **Output digital only:** With this option, only digital audio will be allowed to play via SPDIF out while playing analog and digital audio.

† **Output digital and analog:** With this option, both digital and analog audio will be allowed to play via SPDIF out while playing analog and digital audio.

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 SPDIF Out Optical jack

n 4-Channel Mode for 4-Speaker Output

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

4-Channel Analog Audio Output

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

n 6-Channel Mode for 6-Speaker Output

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

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 jack

n 8-Channel Mode for 8-Speaker Output

Description:
Connect two speakers to back panel's Line Out connector, two speakers to the rear-channel, 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 jack