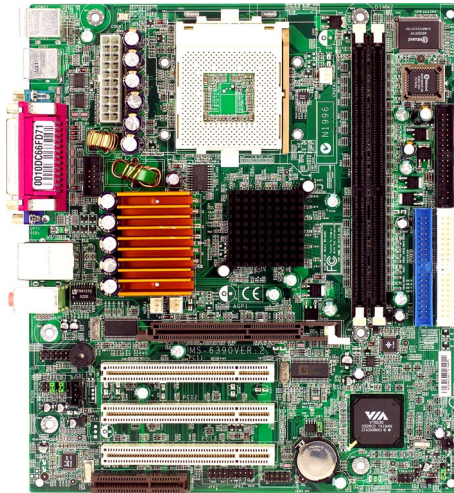




MS-6390 (v2.X) M-ATX Mainboard



Version 2.0
G52-M6390X1

Manual Rev: 2.0
Release Date: Sept. 2002



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 when the equipment is operated in a commercial environment. 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. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

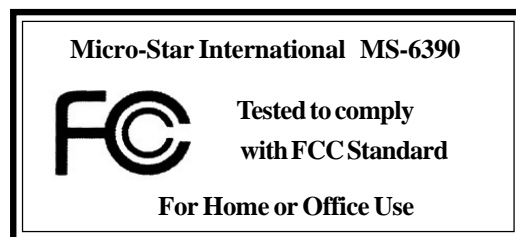
Notice 1

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.



Copyright Notice

The material in this document is the intellectual property of **MICRO-STAR INTERNATIONAL**. We take every care in the preparation of this document, but no guarantee is given as to the correctness of its contents. Our products are under continual improvement and we reserve the right to make changes without notice.

Trademarks

All trademarks are the properties of their respective owners.

AMD, Athlon™, Athlon™ XP, Thoroughbred™, and Duron™ are registered trademarks of AMD Corporation.

PS/2 and OS®/2 are registered trademarks of International Business Machines Corporation.

Windows® 95/98/2000/NT/XP are registered trademarks of Microsoft Corporation.

Netware® is a registered trademark of Novell, Inc.

Award® is a registered trademark of Phoenix Technologies Ltd.

AMI® is a registered trademark of American Megatrends Inc.

Revision History

| Revision | Revision History | Date |
|----------|---------------------------|------------|
| V2.0 | First release for PCB 2.X | Sept. 2002 |

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/>
- 🔍 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°C (140°F), IT MAY DAMAGE THE EQUIPMENT.**



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

CONTENTS

| | |
|---|------------|
| FCC-B Radio Frequency Interference Statement | iii |
| Copyright Notice | iii |
| Revision History | iii |
| Technical Support | iii |
| Safety Instructions | iv |
| Chapter 1. Getting Started | 1-1 |
| Mainboard Specifications | 1-2 |
| Mainboard Layout | 1-4 |
| MSI Special Features | 1-5 |
| Fuzzy Logic™ 4 | 1-5 |
| Live BIOS™/Live Driver™ | 1-6 |
| Live Monitor™ | 1-7 |
| PC Alert™ 4 | 1-8 |
| CPU Thermal Protection | 1-10 |
| S-Bracket (Optional) | 1-10 |
| Chapter 2. Hardware Setup | 2-1 |
| Quick Components Guide | 2-2 |
| Central Processing Unit: CPU | 2-3 |
| CPU Core Speed Derivation Procedure | 2-3 |
| CPU Installation Procedures for Socket 462 | 2-4 |
| Installing AMD Athlon CPU (Socket 462) Cooler Set | 2-5 |
| Setting CPU Clock Frequency through Jumper | 2-6 |
| Memory | 2-7 |
| Introduction to DDR SDRAM | 2-7 |
| DIMM Module Combination | 2-8 |
| Installing DDR Modules | 2-8 |
| Power Supply | 2-9 |
| ATX 20-Pin Power Connector: CONN1 | 2-9 |

| | |
|---|------|
| Back Panel | 2-10 |
| RJ-45 LAN Jack | 2-10 |
| Mouse/Keyboard Connector | 2-11 |
| USB Connectors | 2-11 |
| Serial Port Connectors: COM A, JCOM 2 | 2-12 |
| VGA DB 15 Pin Connector | 2-12 |
| Parallel Port Connector: LPT1 | 2-13 |
| Audio Port Connectors | 2-14 |
| Connectors | 2-15 |
| Floppy Disk Drive Connector: FDD1 | 2-15 |
| Hard Disk Connectors: IDE1 & IDE2 | 2-16 |
| Fan Power Connectors: CPUFA1/SYSFA1 | 2-17 |
| CD-In Connector: JCD1 | 2-18 |
| Chassis Intrusion Switch Connector: JCI1 | 2-18 |
| Power Saving Switch Connector: JSLP1 | 2-19 |
| IrDA Infrared Module Header: JIR1 | 2-19 |
| Front Panel Connectors: JFP1, JFP2 | 2-20 |
| Front Panel Audio Connector: JAUD1 | 2-21 |
| SPDIF Connector: JSP1 (Optional) | 2-22 |
| S-Bracket Connector: JSB1 (Optional) | 2-23 |
| Front USB Connector: JUSB1 | 2-24 |
| Jumpers | 2-25 |
| Clear CMOS Jumper: JBAT1 | 2-25 |
| FSB Clock Jumper: SW1 | 2-26 |
| Slots | 2-27 |
| AGP (Accelerated Graphics Port) Slot | 2-27 |
| PCI (Peripheral Component Interconnect) Slots | 2-27 |
| CNR (Communication Network Riser) Slot | 2-27 |
| PCI Interrupt Request Routing | 2-28 |

| | |
|---|------------|
| Chapter 3. BIOS Setup | 3-1 |
| Entering Setup | 3-2 |
| Control Keys | 3-2 |
| Getting Help | 3-3 |
| The Main Menu | 3-4 |
| Standard CMOS Features | 3-6 |
| Advanced BIOS Features | 3-8 |
| Advanced Chipset Features | 3-12 |
| Integrated Peripherals | 3-16 |
| Power Management Features | 3-21 |
| PNP/PCI Configurations | 3-25 |
| PC Health Status | 3-27 |
| Frequency/Voltage Control | 3-28 |
| Load Fail-Safe/Optimized Defaults | 3-29 |
| Set Supervisor/User Password | 3-30 |
| Appendix: Using 4- or 6-Channel Audio Function | A-1 |
| Installing the Audio Driver | A-2 |
| Installation for Windows 98SE/ME/2000/XP | A-2 |
| Using 4- or 6-Channel Audio Function | A-4 |
| Using the Optional S-Bracket | A-4 |
| Using the Back Panel only | A-10 |
| Testing the Connected Speakers | A-14 |
| Testing Each Speaker | A-14 |
| Playing KaraOK | A-16 |
| Playing KaraOK | A-16 |
| Troubleshooting | T-1 |
| Glossary | G-1 |

1

Getting Started

Thank you for purchasing the MS-6390 v2.X Micro ATX mainboard. The MS-6390 is based on **VIA® KM266 & VT8235** chipsets for optimal system efficiency. Designed to fit the advanced **AMD® Athlon™, Athlon™ XP** or **Duron™** processors, the MS-6390 delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU

- Supports Socket A (Socket-462) for AMD® Athlon™/Athlon™ XP /Duron™ processors.
- Supports up to 2600+ or higher speed.

Chipset

- VIA® KM266 North Bridge
 - 200/266MHz FSB.
 - Integrated ProSavage8 2D/3D graphic controller.
 - AGP 4x and high bandwidth V-link host controller.
 - Advanced memory controller supports PC1600/2100 DDR.
- VIA® VT8235 South Bridge
 - High bandwidth V-link client controller.
 - Direct sound ready AC97 digital audio controller.
 - Ultra DMA 66/100/133 master mode EIDE controller.
 - Supports both ACPI and legacy APM power management.
 - Hi-Speed USB 2.0 controller, 480Mb/sec.
 - Integrated Ethernet MAC.

MainMemory

- Supports four memory banks using two 184-pin DDR DIMMs.
- Supports up to 2GB PC2100/1600 DDR SDRAMs.
- Supports 2.5v DDR SDRAM.

Slots

- One AGP (Accelerated Graphics Port) slot.
- Three 32-bit PCI bus slots (support 3.3v/5v PCI bus interface).
- One CNR (Communication Network Riser) slot.

On-BoardIDE

- An IDE controller on the VT8235 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA 66/100/133 operation modes.
- Can connect up to four IDE devices.

On-Board Peripherals

- On-Board Peripherals include:
 - One floppy port supports 2 FDDs with 360K, 720K, 1.2M, 1.44M and

- 2.88Mbytes
- One serial port & one serial pinheader (COM A + JCOM2)
- One VGA port
- One parallel port supports SPP/EPP/ECP mode
- One RJ-45 LAN port
- Vertical audio ports
- One 3-pin SPDIF connector (Optional)
- One 12-pin S-Bracket connector (Optional)
- Six USB 2.0 ports (Rear * 4/ Front * 2)

Audio

- 5.1 channel AC'97 software audio integrated on VT8235 south bridge.
- RealTek ALC650 6-channel audio.

LAN

- VIA® VT8235 integrated MAC + VT6103 PHY.

BIOS

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

Dimension

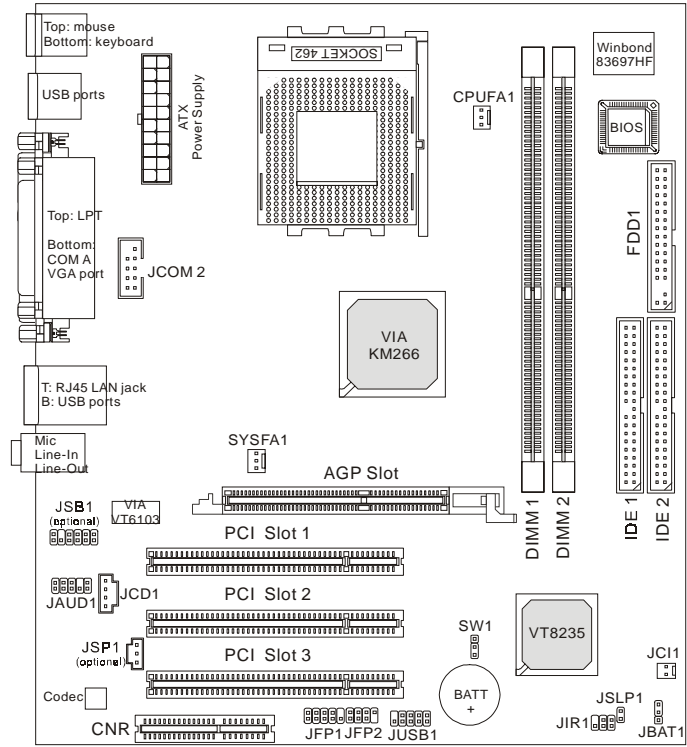
- Micro ATX Form Factor: 24.5cm x 21.7cm.

Mounting

- 6 mounting holes.

MS-6390 M-ATX Mainboard

Mainboard Layout



MS-6390 v2.X Micro ATX Mainboard

MSI Special Features

Fuzzy Logic™ 4

The *Fuzzy Logic™ 4* utility is a user friendly tool that allows users to view and adjust the current system status. To overclock the CPU FSB (Front Side Bus) frequency under the Windows operating system, click **FSB** and use the right and left arrow keys to select the desired FSB, and then click **Apply** to apply the new setup value. To enable the system running at the specified FSB every time when you click **Turbo**, click **Save** to save the desired FSB first. If you want to know the maximal CPU overclocking value, click **Auto** to start testing. The CPU FSB will automatically increase the testing value until the PC reboots. After rebooting, click **Turbo** to apply the test result. Click **Default** to restore the default values.



Features:

- ◆ MSI Logo links to the MSI Web site
- ◆ CPU Speed allows users to adjust the CPU speed through CPU Multiplier and FSB
- ◆ Voltage allows user to adjust the voltage of CPU/Memory/AGP
- ◆ MSI Info provides information about the mainboard, BIOS and OS
- ◆ CPU Info provides detailed information about the CPU
- ◆ CPU Fan Speed shows the current running speed of CPU Fan
- ◆ CPU Temp. shows the current CPU temperature



MSI Reminds You...

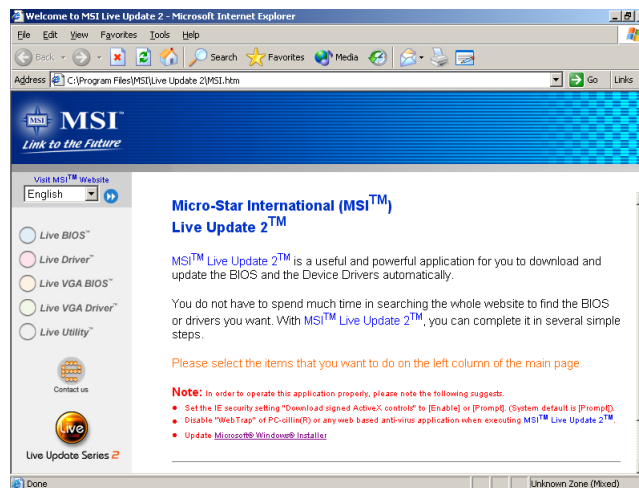
To adjust the options under *CPU Speed* and *Voltage*, use the right and left arrow keys to select the desired value and then click **Apply** to run the setup value.

Live BIOS™/Live Driver™

The Live BIOS™/Live Driver™ is a tool used to detect and update your BIOS/drivers online so that you don't need to search for the correct BIOS/driver version throughout the Web site. To use the function, you need to install the "MSI Live Update 2" application. After the installation, the "MSI Live Update 2" icon (as shown on the right) will appear on the screen.



Double click the "MSI Live Update 2" icon, and the following screen will appear:



Five buttons are placed on the leftmost pane of the screen. Click the desired button to start the update process.


- **Live BIOS** – Updates the BIOS online.
- **Live Driver** – Updates the drivers online.
- **Live VGA BIOS** – Updates the VGA BIOS online.
- **Live VGA Driver** – Updates the VGA driver online.
- **Live Utility** – Updates the utilities online.

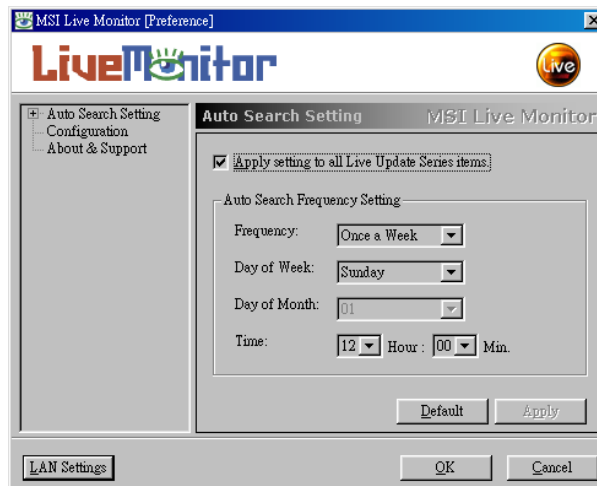
If the product you purchased does not support any of the functions listed above, a "sorry" message is displayed. For more information on the update instructions, insert the companion CD and refer to the "Live Update Guide" under the "Manual" Tab.

Live Monitor™

The Live Monitor™ is a tool used to schedule the search for the latest BIOS/drivers version on the MSI Web site. To use the function, you need to install the “MSI Live Update 2” application. After the installation, the “MSI Live Monitor” icon (as shown on the right) will appear on the screen. Double click this icon to run the application.



Double click the “MSI Live Monitor” icon  at the lower-right corner of the taskbar, and the following dialog box will appear. You can specify how often the system will automatically search for the BIOS/drivers version, or change the LAN settings right from the dialog box.



You can right-click the MSI Live Monitor icon  to perform the functions listed below:

- ◆ **Auto Search** – Searches for the BIOS/drivers version you need immediately.
- ◆ **View Last Result** – Allows you to view the last search result if there is any.
- ◆ **Preference** – Configures the Search function, including the Search schedule.
- ◆ **Exit** – Exits the Live Monitor™ application.

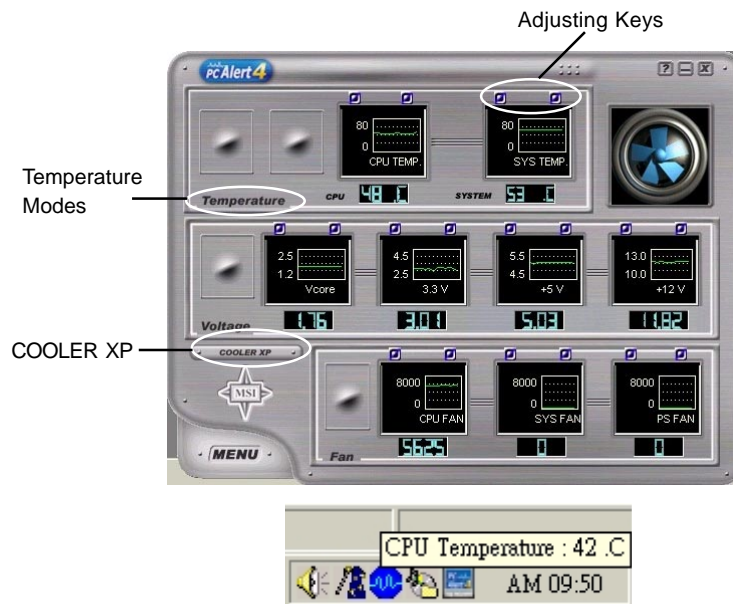
PC Alert™ 4

The PC Alert™ 4 is a utility you can find in the CD-ROM disk. The utility is just like your PC doctor that can detect the following PC hardware status during real time operation:

- ◆ monitor CPU & system temperatures
- ◆ monitor fan speeds
- ◆ monitor system voltages

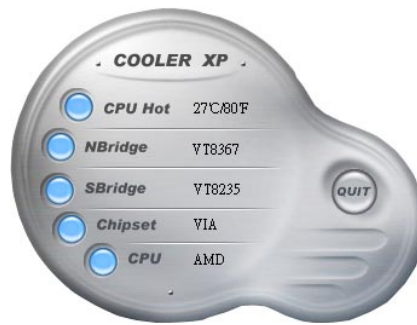


If one of the items above is abnormal, the program main screen will be immediately shown on the screen, with the abnormal item highlighted in red. This will continue to be shown until the condition returns to the normal status.



Users can use the Adjusting Keys to change the minimum and maximum threshold of each item for the system to send out a warning message. Click *Temperature* to select the temperature modes of either Fahrenheit () or Celsius (). The PC Alert™ 4 icon on the Status Area will show the current CPU temperature.

To better protect the CPU from overheating, a new feature, **COOLER XP**, has been added to decrease the temperature of AMD Athlon™ XP CPU. To do so, simply click **COOLER XP** and the screen will show the **Cute** skin (as shown below) with information about the CPU and chipset. Right-click the mouse to select the skin you want to switch to.



Cute



MSI Reminds You...

*The new feature **COOLER XP** will work only if your mainboard supports AMD Athlon™ XP CPU.
Items shown on PC Alert™ 4 vary depending on your system's status.*

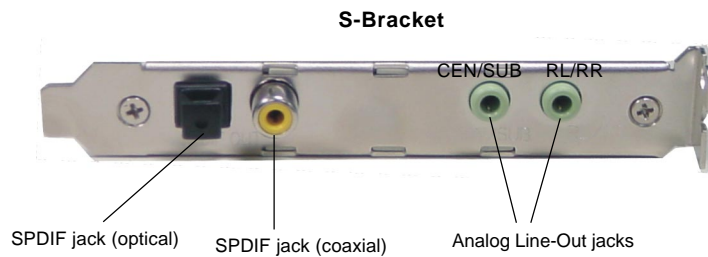
CPU Thermal Protection

Aimed to prevent the CPU from overheating, MSI has developed a CPU Thermal Protection mechanism for AMD Athlon™ XP CPU platform. This CPU Thermal Protection mechanism works on a thermal signal sensor. If the mechanism senses an abnormal temperature rise, it will automatically shut down the system and the CPU temperature will then drop down and resume normal. With this unique feature, users can better protect their CPU. Please note that this feature is for AMD Athlon™ XP CPU only.

S-Bracket (Optional)

S-Bracket is a bracket which provides 2 SPDIF jacks for digital audio transmission and 2 analog Line-Out connectors for additional 4-channel analog audio output. With the S-Bracket, your system will be able to perform 6-channel audio operation for wonderful surround sound effect, or connect to Sony & Philips Digital Interface (SPDIF) speakers for audio transmission with better quality.

The S-Bracket offers two types of SPDIF connectors: one for optical fiber and the other for coaxial connection. Select the appropriate one to meet your own need. For more information on S-Bracket, refer to *Appendix. Using 4- or 6-Channel Audio Function.*



2

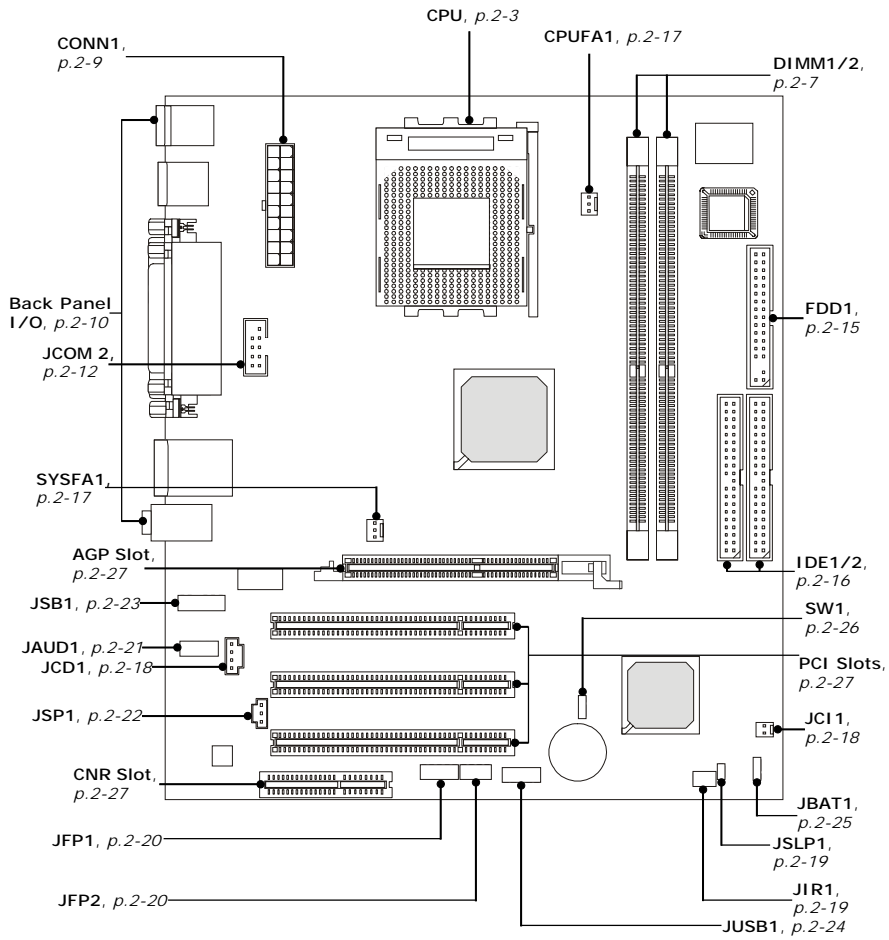


Hardware Setup

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



Central Processing Unit: CPU

The mainboard supports AMD® Athlon™, Athlon™ XP and Duron™ processors in the 462 pin package. The mainboard uses a CPU socket called Socket A 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 find the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

CPU Core Speed Derivation Procedure

| | | | |
|-------------|----------------|---|-----------------------------|
| If | CPU Clock | = | 100MHz |
| | Core/Bus ratio | = | 14 |
| then | CPU core speed | = | Host Clock x Core/Bus ratio |
| | | = | 100MHz x 14 |
| | | = | 1.4 GHz |



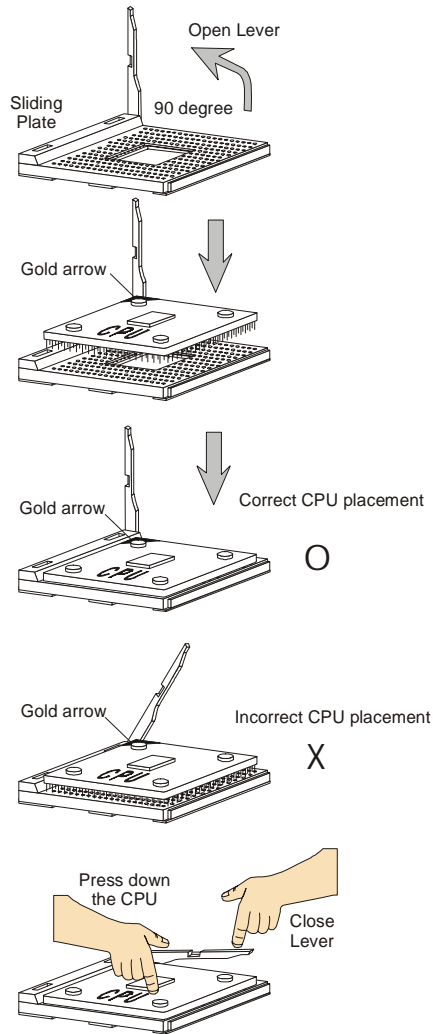
WARNING! Thermal Issue for CPU

As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly crucial when building computer systems. Maintaining the proper thermal environment is key to reliable operation. As such, the processor must be maintained in the specified thermal requirements.

AMD Athlon™/Duron™/Athlon™ XP processor with a speed of **600MHz and above** requires a LARGER heatsink and fan. You also need to add thermal grease between the CPU and heatsink to improve heat dissipation. Then, make sure that the CPU and heatsink are securely fastened and in good contact with each other. These are needed to prevent damaging the processor and ensuring reliable operation. If you want to get more information on the proper cooling, you can visit AMD's website for reference.

CPU Installation Procedures for Socket 462

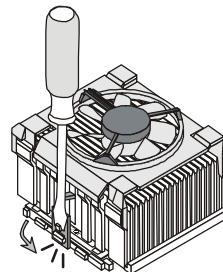
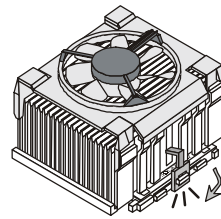
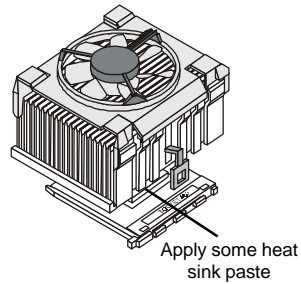
1. Please turn off the power and unplug the power cord before installing the CPU.
2. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.
3. Look for the gold arrow. The gold arrow should point towards the lever pivot. The CPU can only fit in the correct orientation.
4. If the CPU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your mainboard.
5. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



Installing AMD Athlon CPU (Socket 462) Cooler Set

The following instructions will guide you through the heat sink installation procedures. Please consult your agent for the proper CPU cooler set.

1. Position your CPU cooler set onto the CPU.
2. Use one end of the clip to hook the latch of the CPU sliding plate.
3. Hook the other latch to fix the cooling fan set. You may need a screw driver to press down the other side of the clip.
4. Connect the fan to the fan power connector provided on your mainboard.



MSI Reminds You...

Please apply some heat sink paste on top of CPU to dissipate the heat more effectively.

Setting CPU Clock Frequency through Jumper

The hardware configuration for CPU clock frequency of the motherboard is set to 133MHz by default. Therefore, to make a 100MHz CPU run at 100MHz when it is installed on the board, you have to adjust the CPU clock frequency through jumper.

To set the clock frequency of the installed CPU, refer to *Jumpers/FSB Clock Jumper: SW1* in later section of this chapter.



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

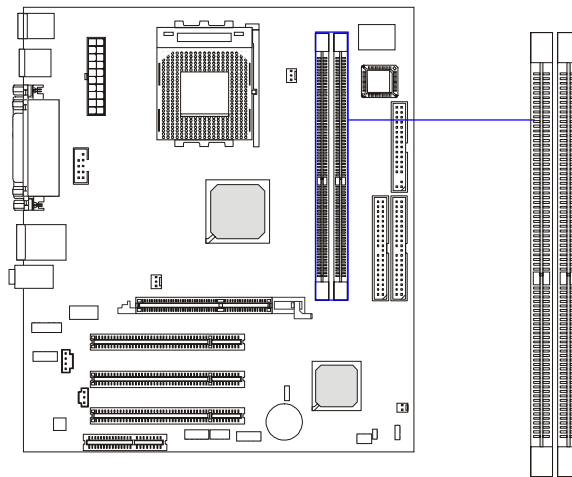
While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.

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.***

Memory

The mainboard provides 2 slots for 184-pin DDR SDRAM DIMM (Double In-Line Memory Module) modules and supports the memory size up to 2GB. You can install PC2100/DDR266 or PC1600/DDR200 modules on the DDR DIMM slots (DIMM 1~2).



**DDR DIMM Slots
(DIMM 1~2)**

Introduction to DDR SDRAM

DDR (Double Data Rate) SDRAM is similar to conventional SDRAM, but doubles the rate by transferring data twice per cycle. It uses 2.5 volts as opposed to 3.3 volts used in SDR SDRAM, and requires 184-pin DIMM modules rather than 168-pin DIMM modules used by SDR SDRAM. High memory bandwidth makes DDR an ideal solution for high performance PC, workstations and servers.

DIMM Module Combination

Install at least one DIMM module on the slots. Memory modules can be installed on the slots in any order. You can install either single- or double-sided modules to meet your own needs.

Memory modules can be installed in any combination as follows:

| Slot | Memory Module | Total Memory |
|--|---------------|--------------|
| DIMM 1 (Bank 0 & 1) | S/D | 64MB~1GB |
| DIMM 2 (Bank 2 & 3) | S/D | 64MB~1GB |
| Maximum System Memory Supported | | 64MB~2GB |

S: Single Side

D: Double Side

Installing DDR Modules

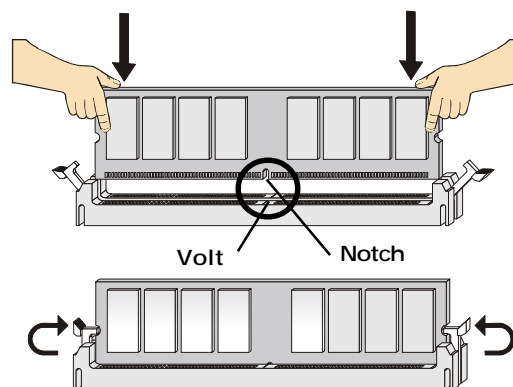
1. The DDR DIMM has only one notch on the center of module. The module will only fit in the right orientation.
2. Insert the DIMM memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the socket.



MSI 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.

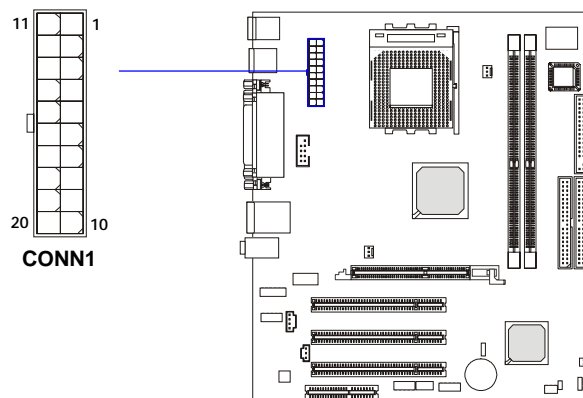


Power Supply

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 20-Pin Power Connector: CONN1

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

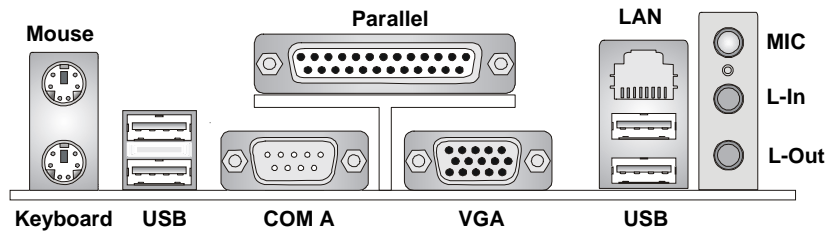


Pin Definition

| PIN | SIGNAL | PIN | SIGNAL |
|-----|--------|-----|--------|
| 1 | 3.3V | 11 | 3.3V |
| 2 | 3.3V | 12 | -12V |
| 3 | GND | 13 | GND |
| 4 | 5V | 14 | PS_ON |
| 5 | GND | 15 | GND |
| 6 | 5V | 16 | GND |
| 7 | GND | 17 | GND |
| 8 | PW_OK | 18 | -5V |
| 9 | 5V_SB | 19 | 5V |
| 10 | 12V | 20 | 5V |

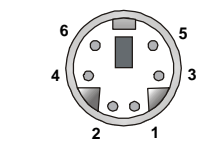
Back Panel

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:



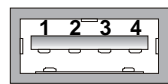
**PS/2 Mouse/Keyboard
(6-pin Female)**

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 |

USB Connectors

The mainboard 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 USB devices directly into the connectors.



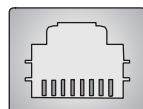
USB Ports

Pin Definition

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

RJ-45 LAN Jack

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



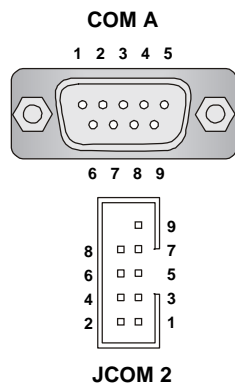
RJ-45 LAN Jack

Pin Definition

| PIN | SIGNAL | DESCRIPTION |
|-----|--------|----------------------------|
| 1 | TDP | Transmit Differential Pair |
| 2 | TDN | Transmit Differential Pair |
| 3 | RDP | Receive Differential Pair |
| 4 | NC | Not Used |
| 5 | NC | Not Used |
| 6 | RDN | Receive Differential Pair |
| 7 | NC | Not Used |
| 8 | NC | Not Used |

Serial Port Connectors: COM A, JCOM 2

The mainboard provides two 9-pin serial port connectors COM A & JCOM 2. The ports are 16550A high speed communication ports that send/receive 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connectors.

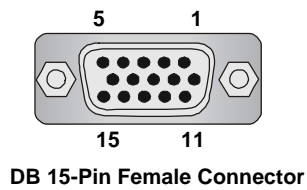


Pin Definition

| 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 |

VGA DB 15 Pin Connector

One DB 15-pin VGA connector is provided for connection to a VGA monitor.

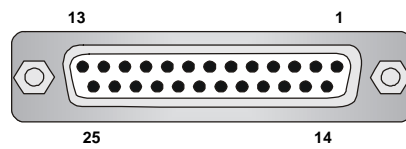


Pin Definition

| Analog Video Display Connector (DB-15S) | |
|---|--------------------|
| PIN | SIGNAL DESCRIPTION |
| 1 | Red |
| 2 | Green |
| 3 | Blue |
| 4 | Not used |
| 5 | Ground |
| 6 | Ground |
| 7 | Ground |
| 8 | Ground |
| 9 | Power |
| 10 | Ground |
| 11 | Not used |
| 12 | SDA |
| 13 | Horizontal Sync |
| 14 | Vertical Sync |
| 15 | SCL |

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.



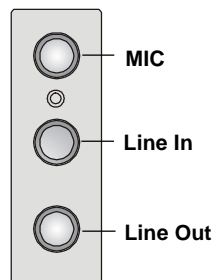
Pin Definition

| 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 |

Audio Port Connectors

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.

1/8" Stereo Audio Connectors



MSI Reminds You...

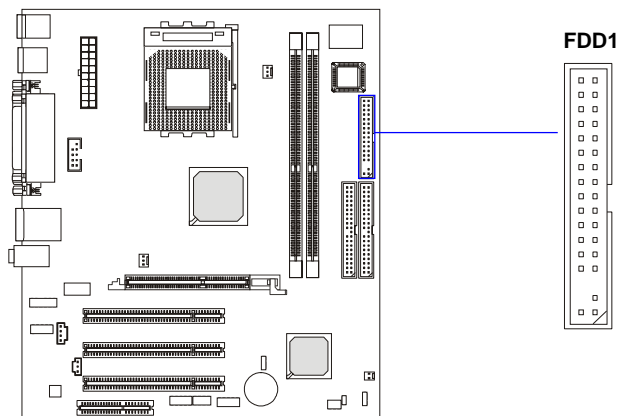
*For advanced audio application, **RealTek ALC650 audio chip** is provided as an option to offer support for **6-channel audio operation** and can turn rear audio connectors from 2-channel to 4-/6-channel audio. For more information on **6-channel audio operation**, please refer to Appendix. Using 4- or 6-Channel Audio Function.*

Connectors

The mainboard provides connectors to connect to FDD, IDE HDD, case, modem, LAN, USB Ports, IR module and CPU/System/Power Supply FAN.

Floppy Disk Drive Connector: FDD1

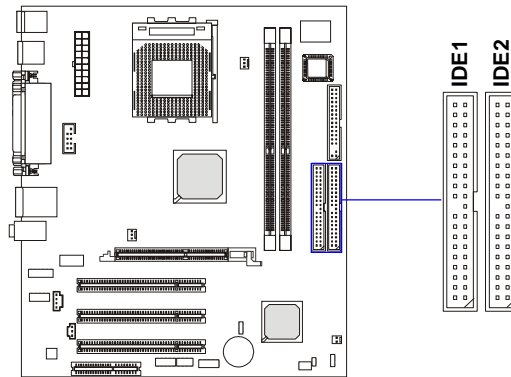
The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.



Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra ATA 66/100/133 controller that provides PIO mode 0~4, Bus Master, and Ultra ATA 66/100/133 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices.

The Ultra ATA 133 interface boosts data transfer rates between the computer and the hard drive up to 133 megabytes (MB) per second. The new interface is one-third faster than earlier record-breaking Ultra ATA/100 technology and is backwards compatible with the existing Ultra ATA interface.



IDE1 (Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

IDE2 (Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

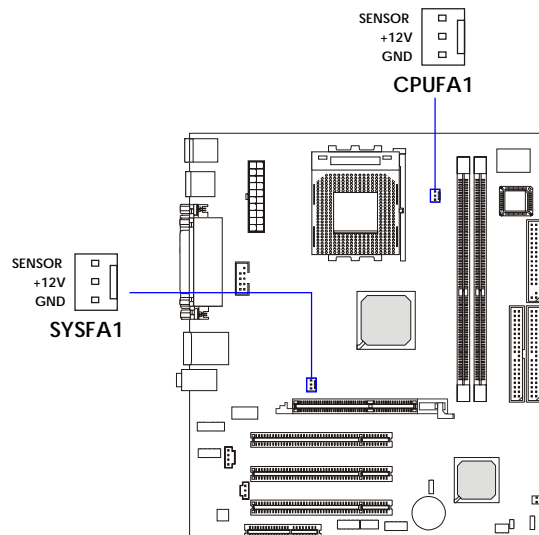


MSI Reminds You...

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

Fan Power Connectors: CPUFA1/SYSFA1

The CPUFA1 (processor fan) and SYSFA1 (system fan) support system cooling fan with +12V. It supports 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 onboard, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

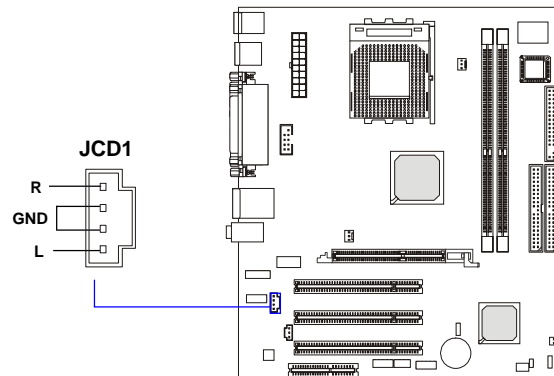


MSI Reminds You...

Always consult the vendors for proper CPU cooling fan.

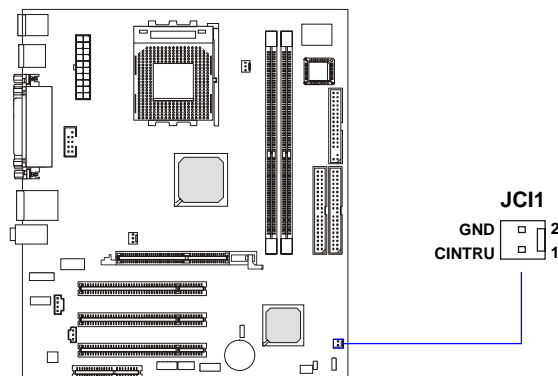
CD-In Connector: JCD1

This connector is provided for CD-ROM audio.



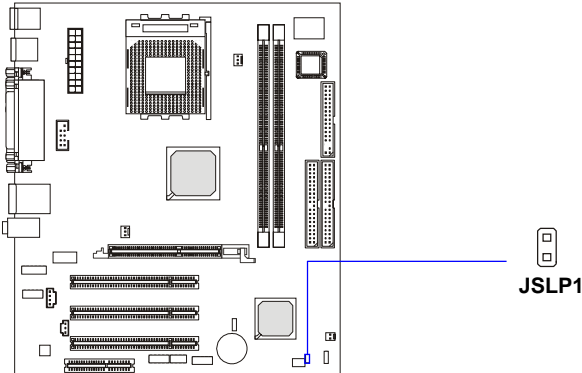
Chassis Intrusion Switch Connector: JCI1

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.



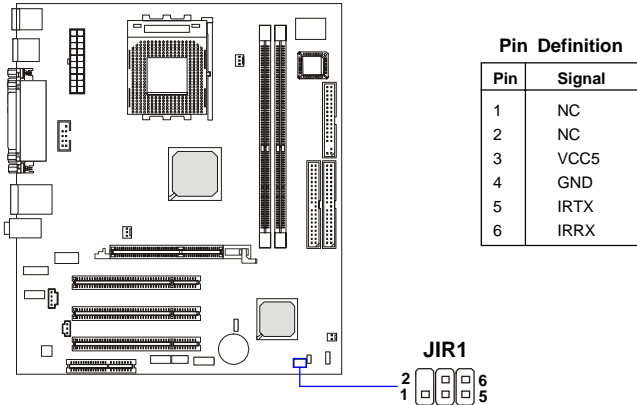
Power Saving Switch Connector: JSLP1

Attach a power saving switch to this connector. Pressing the switch once will have the system enter the sleep/suspend state.



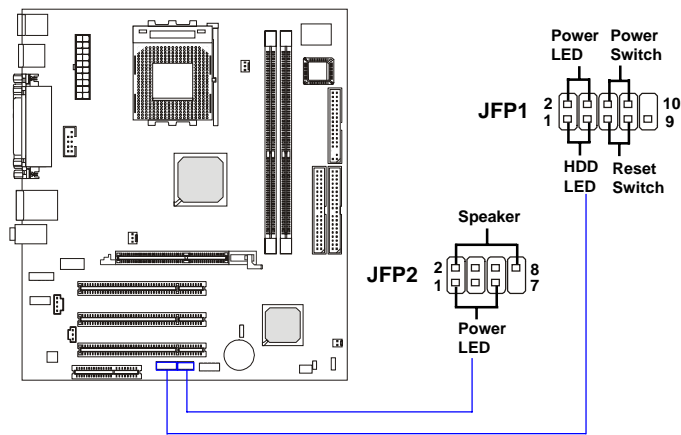
IrDA Infrared Module Header: JIR1

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.



Front Panel Connectors: JFP1, JFP2

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



JFP1 Pin Definition

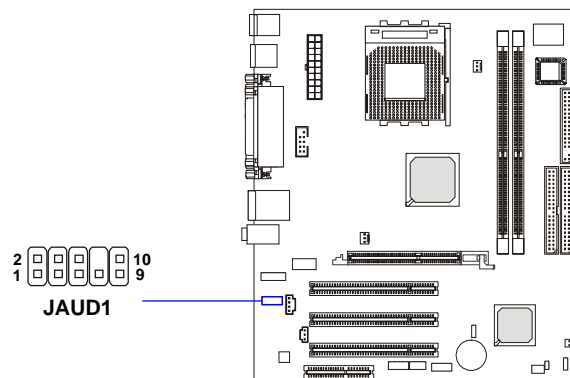
| PIN | SIGNAL | DESCRIPTION |
|-----|------------|---|
| 1 | HD_LED_P | Hard disk LED pull-up |
| 2 | FP_PWR/SLP | MSG LED pull-up |
| 3 | HD_LED_N | Hard disk active LED |
| 4 | FP_PWR/SLP | MSG LED pull-up |
| 5 | RST_SW_N | Reset Switch low reference pull-down to GND |
| 6 | PWR_SW_P | Power Switch 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 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.



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 |



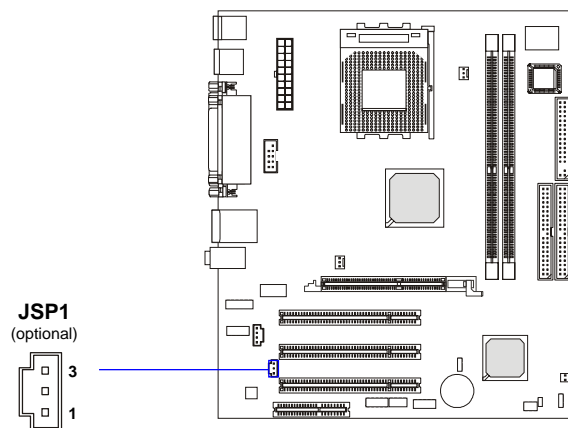
MSI Reminds You...

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.



SPDIF Connector: JSP1 (Optional)

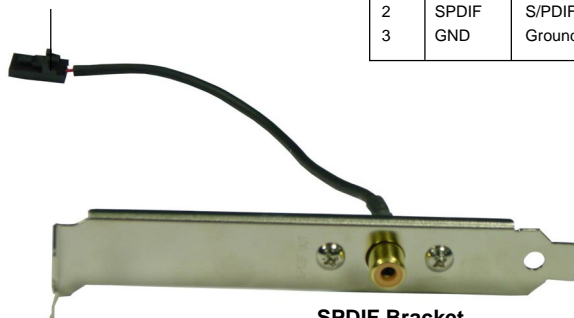
The connector is used to connect SPDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission. An optional SPDIF Bracket is available upon request.



Pin Definition

| PIN | SIGNAL | DESCRIPTION |
|-----|--------|---------------|
| 1 | VCC | VCC5V |
| 2 | SPDIF | S/PDIF Output |
| 3 | GND | Ground |

Connected to JSP1

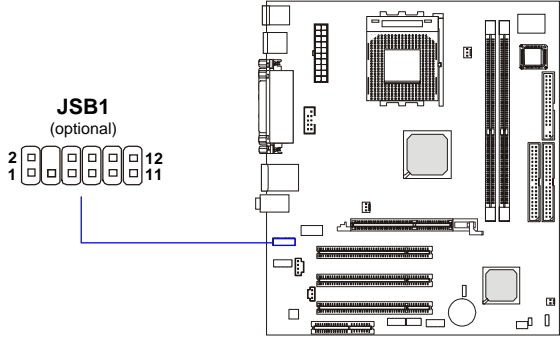


SPDIF Bracket
(optional)

S-Bracket Connector: JSB1 (Optional)

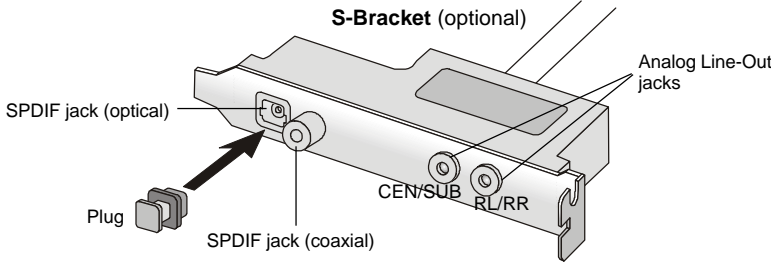
This connector allows you to connect the optional S-Bracket for Sony & Philips Digital Interface (SPDIF). The S-Bracket offers 2 SPDIF jacks for digital audio transmission (one for optical fiber connection and the other for coaxial), and 2 analog Line-Out jacks for 4-channel audio output.

To attach the fiber-optic cable to optical SPDIF jack, you need to remove the plug from the jack first. The two SPDIF jacks support *SPDIF output* only. For more information on the S-Bracket, refer to *Appendix. Using 4- or 6-Channel Audio Function.*



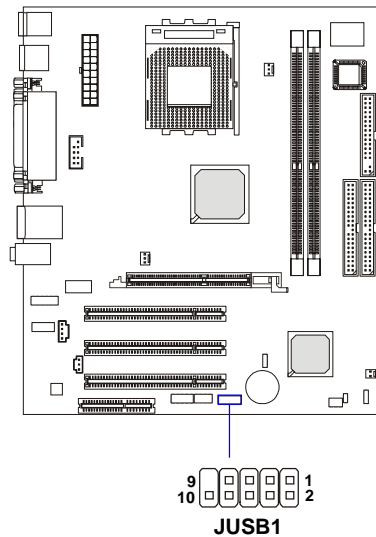
Pin Definition

| PIN | SIGNAL | DESCRIPTION | PIN | SIGNAL | DESCRIPTION |
|-----|---------|---------------------|-----|----------|--------------------------------|
| 1 | VCC5 | VCC 5V | 2 | VDD3 | VDD 3.3V |
| 3 | SPDFO | S/PDIF output | 4 | (No Pin) | Key |
| 5 | GND | Ground | 6 | SPDFI | S/PDIF input |
| 7 | LFE-OUT | Audio bass output | 8 | SOUT-R | Audio right surrounding output |
| 9 | CET-OUT | Audio center output | 10 | SOUT-L | Audio left surrounding output |
| 11 | GND | Ground | 12 | GND | Ground |



Front USB Connector: JUSB1

The mainboard provides one USB 2.0 pin header *JUSB1* (optional USB 2.0 bracket available) that is compliant with Intel® I/O Connectivity Design Guide. 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

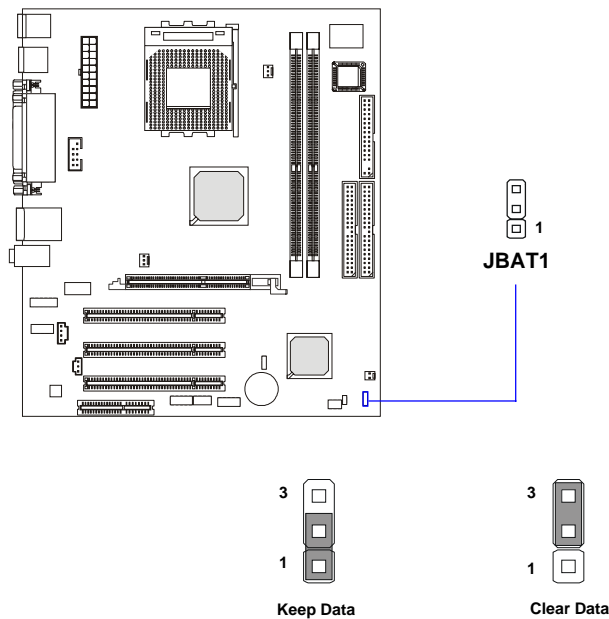
| PIN | SIGNAL | PIN | SIGNAL |
|-----|--------|-----|--------|
| 1 | USBPWR | 2 | USBPWR |
| 3 | USBP4- | 4 | USBP5- |
| 5 | USBP4+ | 6 | USBP5+ |
| 7 | GND | 8 | GND |
| 9 | NC | 10 | USBOC |

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 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 the JBAT1 (Clear CMOS Jumper) to clear data. Follow the instructions below to clear the data:

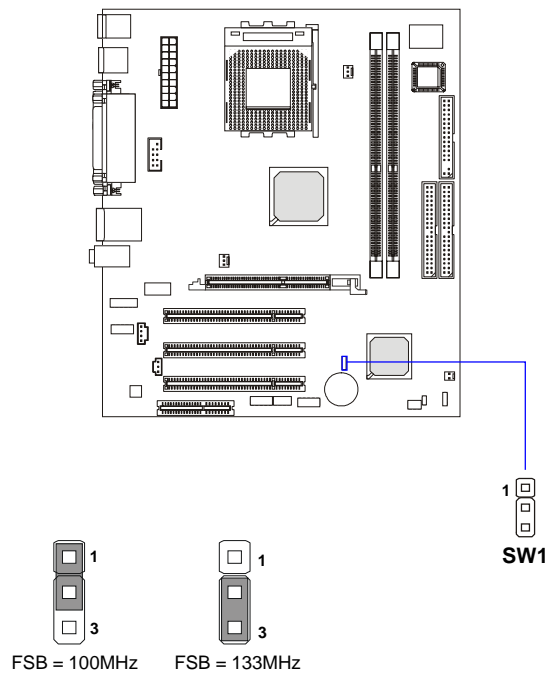


MSI Reminds You...

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.

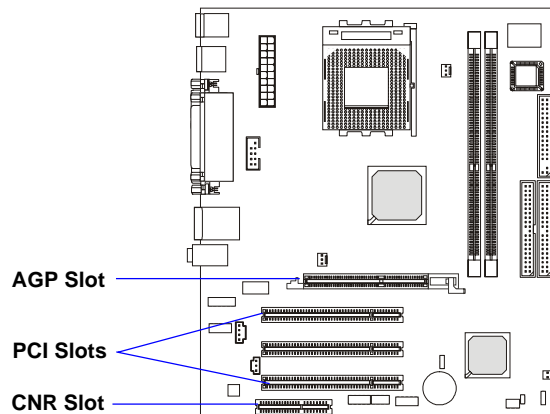
FSB Clock Jumper: SW1

These two jumpers provide 100MHz and 133MHz Front Side Bus frequency selection for overclocking purpose.



Slots

The motherboard provides one AGP slot, three 32-bit Master PCI bus slots, and one CNR slot.



AGP (Accelerated Graphics Port) Slot

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

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.

CNR (Communication Network Riser) Slot

The CNR slot allows you to insert the CNR expansion cards. CNR is specifically designed for audio or modem riser cards for ATX family motherboards. Its main processing is done through software and controlled by the motherboard's chipset.

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# | INT D# |
| PCI Slot 2 | INT B# | INT C# | INT D# | INT A# |
| PCI Slot 3 | INT C# | INT D# | INT A# | INT B# |

3

BIOS Setup

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

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

Entering Setup

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

Press DEL to enter SETUP

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

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> | Restore the previous CMOS value from CMOS, only for Option Page Setup Menu |
| <F6> | Load the default CMOS value from Fail-Safe default table, only for Option Page Setup Menu |
| <F7> | Load Optimized defaults |
| <F10> | Save all the CMOS changes and exit |

Getting Help


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

Main Menu

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

Sub-Menu

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



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

General Help <F1>

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

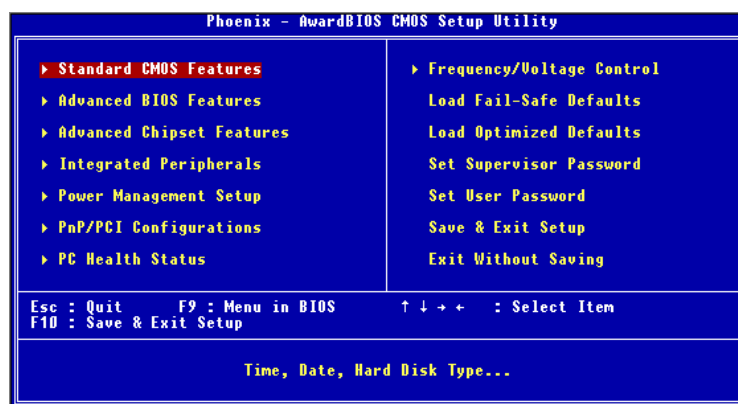


MSI Reminds You...

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

The Main Menu

Once you enter AwardBIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu displays twelve configurable functions and two exit choices. 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 configure the 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.

PC Health Status

This entry shows your PC health status.

Frequency/Voltage Control

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

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for minimal but stable system performance.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal system operations.

Set Supervisor/User Password

Use this menu to set user and supervisor passwords.

Save & Exit Setup

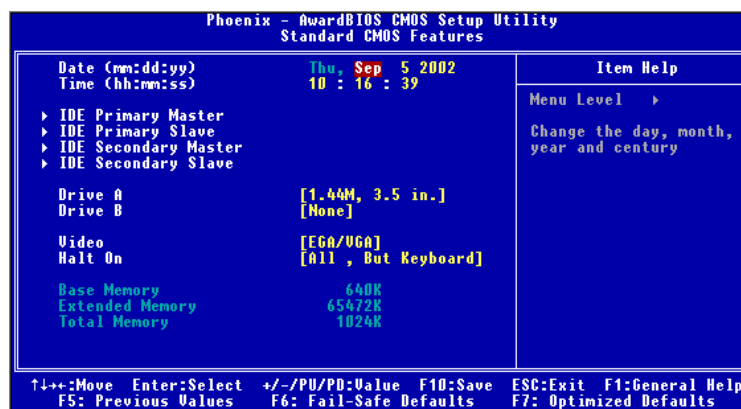
Save changes to CMOS and exit setup.

Exit Without Saving

Abandon all changes and exit setup.

Standard CMOS Features

The items inside Standard CMOS Features menu are divided into 10 categories. Each category includes none, one or more setup items. Use the arrow keys to highlight the item you want to modify and use the <PgUp> or <PgDn> keys to switch to the value you prefer.



Date (mm:dd:yy)

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

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

Time (hh:mm:ss)

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

IDE Primary/Secondary Master/Slave

Press PgUp/<+> or PgDn/<-> to select *Manual*, *None*, *Auto* type. Note that the specifications of your drive must match with the drive table. The hard disk

will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use *Manual* to define your own drive type manually.

If you select *Manual*, related information is asked to be entered to the following items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is SCSI, the selection shall be “None”. If the controller of HDD interface is CD-ROM, the selection shall be “None”.

| | |
|---------------------|---|
| Access Mode | The settings are <i>CHS, LBA, Large, Auto</i> . |
| Capacity | The formatted size of the storage device. |
| Cylinder | Number of cylinders. |
| Head | Number of heads. |
| Precomp | Write precompensation. |
| Landing Zone | Cylinder location of the landing zone. |
| Sector | Number of sectors. |

Drive A/B

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

Video

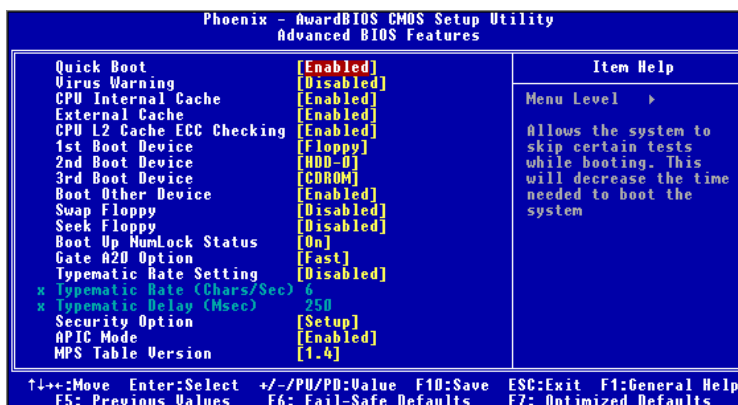
The setting controls the type of video adapter used for the primary monitor of the system. Available options are *EGA/VGA, CGA 40, CGA 80* and *Mono*.

Halt On

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

| | |
|--------------------------|--|
| <i>All Errors</i> | The system stops when any error is detected. |
| <i>No Errors</i> | The system doesn't stop for any detected error. |
| <i>All, But Keyboard</i> | The system doesn't stop for a keyboard error. |
| <i>All, But Diskette</i> | The system doesn't stop for a disk error. |
| <i>All, But Disk/Key</i> | The system doesn't stop for either a disk or 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*.

Virus Warning

The item is to set the Virus Warning feature for IDE Hard Disk boot sector protection. If the function is enabled and any attempt to write data into this area is made, BIOS will display a warning message on screen and beep. Settings: *Disabled* and *Enabled*.

CPU Internal/External Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. The settings enable/disable the internal cache (also known as L1 or level 1 cache) and external cache (also known as L2 or level 2 cache). Setting options: *Disabled, Enabled*.

CPU L2 Cache ECC Checking

This setting allows you to enable or disable the ECC (Error-Correcting Code) feature for error detection and correction when data passes through L2 cache memory. Setting options: *Enabled, Disabled*.

1st/2nd/3rd Boot Device

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. The settings are:

| | |
|------------------|--|
| <i>Floppy</i> | The system will boot from floppy drive. |
| <i>LS120</i> | The system will boot from LS-120 drive. |
| <i>HDD-0</i> | The system will boot from the first HDD. |
| <i>SCSI</i> | The system will boot from the SCSI. |
| <i>CDROM</i> | The system will boot from the CD-ROM. |
| <i>HDD-1</i> | The system will boot from the second HDD. |
| <i>HDD-2</i> | The system will boot from the third HDD. |
| <i>HDD-3</i> | The system will boot from the fourth HDD. |
| <i>ZIP100</i> | The system will boot from ATAPI ZIP drive. |
| <i>USB-FDD</i> | The system will boot from the floppy drive at USB ports. |
| <i>USB-ZIP</i> | The system will boot from the ZIP drive at USB ports. |
| <i>USB-CDROM</i> | The system will boot from the CD-ROM at USB ports. |
| <i>USB-HDD</i> | The system will boot from the HDD at USB ports. |
| <i>LAN</i> | The system will boot from the Network drive. |
| <i>Disabled</i> | Disable this sequence. |



MSI Reminds You...

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

Boot Other Device

Setting the option to *Enabled* allows the system to try to boot from other devices if the system fails to boot from the 1st/2nd/3rd boot device.

Swap Floppy

Setting to *Enabled* will swap floppy drives A: and B:.

Seek Floppy

This setting causes the BIOS to search for floppy disk drives at boot time. When enabled, the BIOS will activate the floppy disk drives during the boot process: the drive activity light will come on and the head will move back and forth once. First A: will be done and then B: if it exists. Setting options: *Disabled, Enabled*.

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*.

Gate A20 Option

This item is to set the Gate A20 status. A20 refers to the first 64KB of extended memory. When the default value *Fast* is selected, the Gate A20 is controlled by Port92 or chipset specific method resulting in faster system performance. When *Normal* is selected, A20 is controlled by a keyboard controller or chipset hardware.

Typematic Rate Setting

This item is used to enable or disable the typematic rate setting including Typematic Rate & Typematic Delay.

Typematic Rate (Chars/Sec)

After *Typematic Rate Setting* is enabled, this item allows you to set the rate (characters/second) at which the keys are accelerated. Settings: *6, 8, 10, 12, 15, 20, 24* and *30*.

Typematic Delay (Msec)

This item allows you to select the delay between when the key was first pressed and when the acceleration begins. Settings: *250, 500, 750* and *1000*.

Security Option

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

| Option | Description |
|---------------|--|
| <i>Setup</i> | The password prompt appears only when end users try to run Setup. |
| <i>System</i> | A password prompt appears every time when the computer is powered on or when end users try to run Setup. |

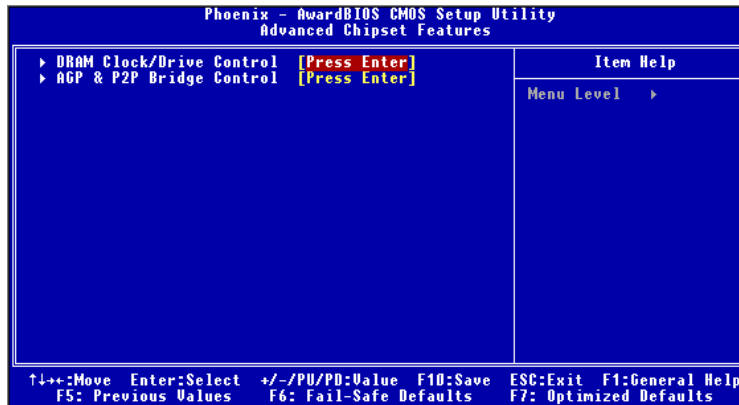
APIC Mode

This setting is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance to PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQs resources for the system. Setting options: *Enabled, Disabled*.

MPS Table Version

This setting allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Setting options: *1.4, 1.1*.

Advanced Chipset Features

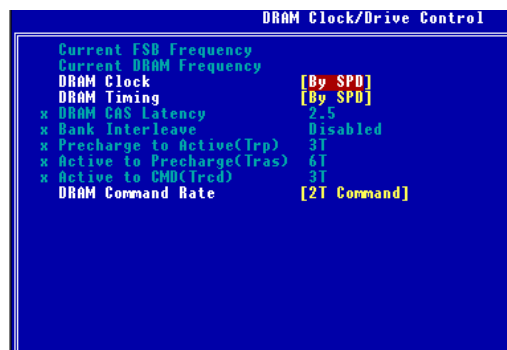


MSI Reminds You...

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

DRAM Clock/Drive Control

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



Current FSB/DRAM Frequency

This item shows the current clock frequency of the specified components.

DRAM Clock

Use this item to configure the clock frequency of the installed DRAM. Settings options: *By SPD, 100MHz, 133MHz*.

DRAM Timing

Selects whether DRAM timing is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to *By SPD* enables *DRAM CAS Latency, Bank Interleave, Precharge to Active (Trp), Active to Precharge (Tras), and Active to CMD (Trcd)* automatically to be determined by BIOS based on the configurations on the SPD. Selecting *Manual* allows users to configure these fields manually.

DRAM CAS Latency

This setting controls the timing delay (in clock cycles) before SDRAM starts a read command after receiving it. Setting options: *2, 2.5 (clocks)*. *2 (clocks)* increases the system performance the most while *2.5 (clocks)* provides the most stable performance.

Bank Interleave

This field selects 2-bank or 4-bank interleave for the installed SDRAM. Disable the function if 16MB SDRAM is installed. Setting options: *Disabled, 2 Bank, 4 Bank*.

Precharge to Active (Trp)

This item allows you to control the number of SDRAM clocks used for SDRAM parameter Trp. Trp specifies the minimum clock cycles required for the precharge command to be transferred to the active command. Setting options: *2T, 3T*.

Active to Precharge (Tras)

This item allows you to control the number of SDRAM clocks used for SDRAM parameters Tras. Tras specifies the minimum clock cycles required for the active command to be transferred to the precharge command. Setting options: *5T, 6T*.

Active to CMD (Trcd)

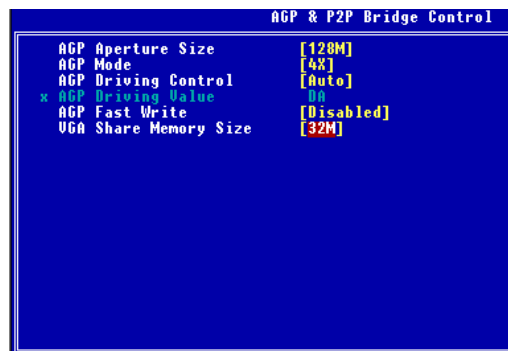
This item allows you to control the number of SDRAM clocks used for SDRAM parameters Trcd. Trcd specifies the minimum clock cycles required for the active command to be transferred to the re-active command. Setting options: *2T, 3T*.

DRAM Command Rate

This setting controls the SDRAM command rate. Selecting *1T Command* allows SDRAM signal controller to run at 1T (T=clock cycles) rate. Selecting *2T Command* makes SDRAM signal controller run at 2T rate. *1T* is faster than *2T*. Setting options: *1T Command*, *2T Command*.

AGP & P2P Bridge Control

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



AGP Aperture Size

This setting controls just how much system RAM can be allocated to AGP for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The option allows the selection of an aperture size of *4M*, *8M*, *16M*, *32M*, *64M*, *128M*, and *256 M*.

AGP Mode

This setting specifies an appropriate mode for the installed AGP card. Setting options: *1X*, *2X*, *4X*. Setting to *4X* only when your AGP card supports *4X* speed.

AGP Driving Control

This field is used to adjust the AGP driving force. Selecting *Manual* allows you to select an AGP driving force in **AGP Driving Value**. It is strongly recommended to select *Auto* to avoid causing any system error.

AGP Driving Value

This item specifies an AGP driving force.

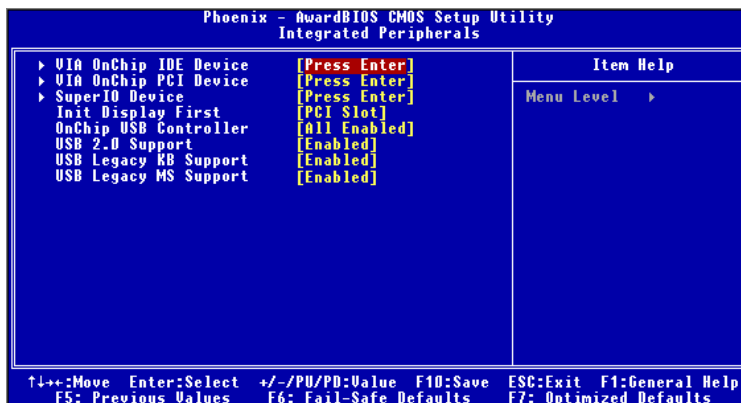
AGP Fast Write

This field enables or disables the AGP Fast Write feature. The Fast Write technology allows the CPU to write directly to the graphics card without passing anything through the system memory and improves the AGP speed. Select *Enabled* only when the installed AGP card supports the function.

VGA Share Memory Size

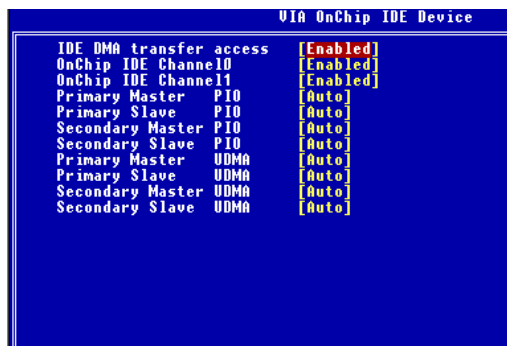
This setting controls just how much system memory can be allocated to onboard video controller for video purposes. Setting options: *Disabled, 8M, 16M, 32M.*

Integrated Peripherals



VIA OnChip IDE Device

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



IDE DMA Transfer Access

Set this option to *Enabled* to specify that the IDE controller on the PCI local bus has bus mastering capability. Setting options: *Disabled, Enabled*.

OnChip IDE Channel 0/1

This setting enables or disables the internal primary and secondary IDE controllers. Setting options: *Disabled, Enabled*.

Primary/Secondary Master/Slave PIO

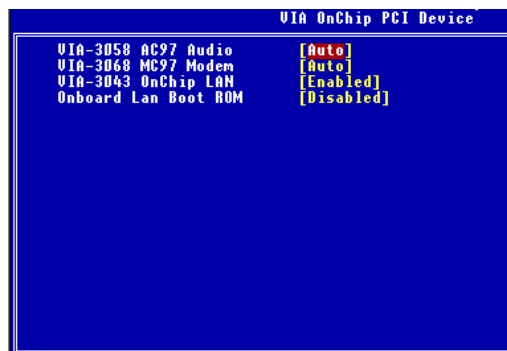
The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device. The settings are: *Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.*

Primary/Secondary Master/Slave UDMA

Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, Ultra DMA/66 and Ultra DMA/100 select Auto to enable BIOS support. The settings are: *Auto, Disabled.*

VIA OnChip PCI Device

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



VIA-3058 AC97 Audio

Auto allows the mainboard to detect whether an audio device is used. If the device is detected, the onboard AC'97 (Audio Codec'97) controller will be enabled; if not, it is disabled. Disable the controller if you want to use other controller cards to connect an audio device. Setting options: *Auto, Disabled.*

VIA-3068 MC97 Modem

Auto allows the mainboard to detect whether a modem is used. If a mo-

dem is used, the onboard MC'97 (Modem Codec'97) controller will be enabled; if not, it is disabled. Disable the controller if you want to use other controller cards to connect to a modem. Setting options: *Auto*, *Disabled*.

VIA-3043 OnChip LAN

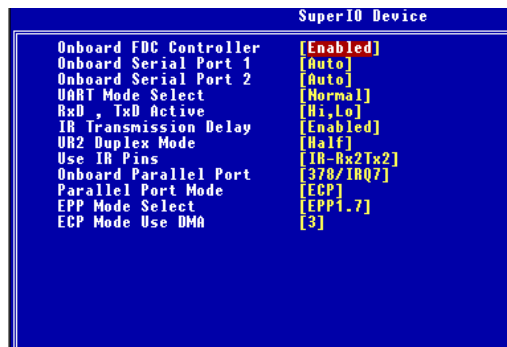
The field determines whether the onchip LAN controller will be activated. Setting options: *Disabled*, *Enabled*.

Onboard LAN Boot ROM

This setting enables/disables the initialization of the onboard LAN Boot ROM during bootup. Selecting *Disabled* will speed up the boot process.

Super IO Device

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



Onboard FDC Controller

Select *Enabled* if your system has a floppy disk controller (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/Port 2

Select an address and corresponding interrupt for the first and second serial ports. The settings are: *3F8/IRQ4*, *2E8/IRQ3*, *3E8/IRQ4*, *2F8/IRQ3*, *Disabled*, *Auto*.

UART Mode Select

This setting allows you to specify the operation mode for serial port 2. Setting options: *IrDA*, *ASKIR*, *Normal*.

| | |
|---------------|-------------------------------------|
| <i>Normal</i> | RS-232C Serial Port |
| <i>IrDA</i> | IrDA-compliant Serial Infrared Port |
| <i>ASKIR</i> | Amplitude Shift Keyed Infrared Port |

RxD, TxD Active

This setting controls the receiving and transmitting speed of the IR peripheral in use. Setting options: *Hi/Hi*, *Hi/Lo*, *Lo/Hi*, *Lo/Lo*.

IR Transmission Delay

This setting determines whether the IR transmission rate will be delayed while converting to receiving mode. Setting options: *Disabled*, *Enabled*.

UR2 Duplex Mode

This setting controls the operating mode of IR transmission/reception. Setting options: *Full*, *Half*. Under Full Duplex mode, synchronous, bi-directional transmission/reception is allowed. Under Half Duplex mode, only asynchronous, bi-directional transmission/reception is allowed.

Use IR Pins

Please consult your IR peripheral documentation to select the correct setting of the TxD and RxD signals. Setting options: *RxD2/TxD2*, *IR-Rx2Tx2*.

Onboard Parallel Port

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:

| | |
|-----------------|---------------------|
| <i>Disabled</i> | |
| <i>3BC/IRQ7</i> | Line Printer port 0 |
| <i>278/IRQ5</i> | Line Printer port 2 |
| <i>378/IRQ7</i> | 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.

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*.

Init Display First

This item specifies which VGA card is your primary graphics adapter. Settings: *PCI Slot* and *AGP*.

OnChip USB Controller

This setting is used to enable/disable the on-chip USB controller. Setting options: *All Disabled*, *All Enabled*.

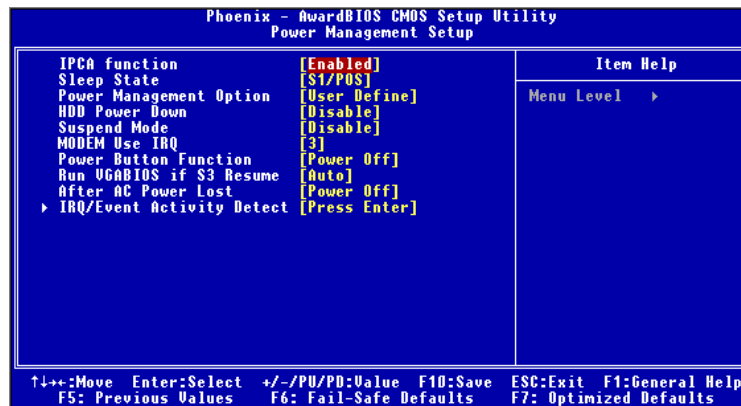
USB 2.0 Support

This setting disables/enables the support for USB 2.0 technology. 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. Setting options: *Disabled*, *Enabled*.

USB Legacy KB/MS Support

Set to *Enabled* if your need to use a USB keyboard/mouse in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix.

Power Management Features



MSI Reminds You...

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

IPCA 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*. Available options: *Enabled*, *Disabled*.

Sleep 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.

Power Management Option

This item is used to select the degree (or type) of power saving and is related to these modes: *Suspend Mode* and *HDD Power Down*. There are three options for power management:

- Min Saving* Minimum Power Management. Suspend Mode = 1 Hour.
- Max Saving* Maximum Power Management. Suspend Mode = 1 Min.
- User Define* Allows end users to configure each mode separately.

HDD Power Down

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active. The settings are: *Disable, 1~15 Min.*

Suspend Mode

If system activity is not detected for the length of time specified in this field, all devices except CPU will be shut off. Settings are *Disabled, 1 Min, 2 Min, 4 Min, 6 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min* and *1 Hour*.

Modem Use IRQ

Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system. Settings are *3, 4, 5, 7, 9, 10, 11* and *NA*.

Power Button Function

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

- Power Off* The power button functions as normal power 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.

Run VGA BIOS If S3 Resume

Selecting *Yes* allows BIOS to call VGA BIOS to initialize the VGA card when system wakes up (resumes) from S3 sleep state. The system resume time is shortened when you disable the function, but system will need an AGP driver to initialize the VGA card. Therefore, if the AGP driver of the card does not support the initialization feature, the display may work abnormally or not function after resuming from S3. Setting options: *Yes, No, Auto*.

After AC Power Lost

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

- Power Off* Leaves the computer in the power off state.
- Power On* Reboots the computer.
- Last State* Restores the system to the status before power failure or interrupt occurs.

IRQ/Event Activity Detect

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



PS2KB Wakeup Select, PS2KB/MS Wakeup from S3, USB Resume from S3, VGA, LPT & COM, HDD & FDD, PCI Master, Wake Up On PME, Wake Up On Ring

These fields specify whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected.



MSI Reminds You...

You need to install a modem card supporting power on function for "Wake Up On Ring" function.

Resume By Alarm

This setting is used to enable or disable the feature of booting up the system on a scheduled time/date from S3/S4/S5 state. Setting options: *Enabled, Disabled.*

Date (of Month)/Resume Time (hh:mm:ss)

If *Resume By Alarm* is set to *Enabled*, the system will automatically resume (boot up) on a specific date/hour/minute/second specified in these fields. Available settings for each item are:

| | |
|--------------|--------------------|
| Alarm Date | 01 ~ 31, Every Day |
| Alarm Hour | 00 ~ 23 |
| Alarm Minute | 00 ~ 59 |
| Alarm Second | 00 ~ 59 |

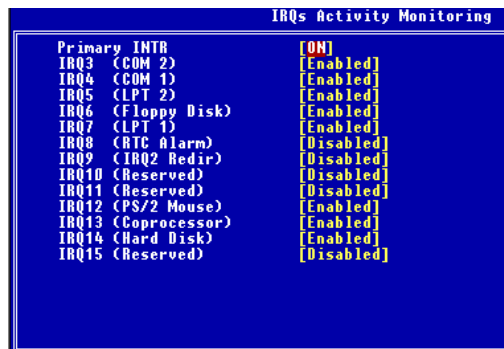


MSI Reminds You...

If you have changed this setting, you must let the system boot up until it enters the operating system, before this function will work.

IRQs Activity Monitoring

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

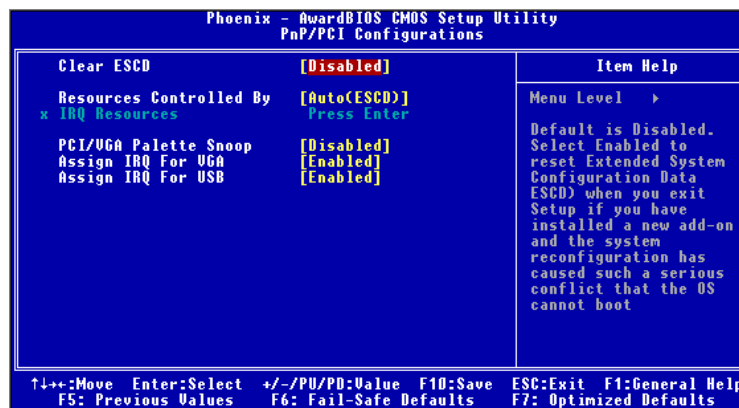


Primary INTR, IRQ3 (COM2), IRQ4 (COM1), IRQ5 (LPT2), IRQ6 (Floppy Disk), IRQ7 (LPT1), IRQ8 (RTC Alarm), IRQ9 (IRQ2 Redir), IRQ10 (Reserved), IRQ11 (Reserved), IRQ12 (PS/2 Mouse), IRQ13 (Coprocessor), IRQ14 (Hard Disk), IRQ15 (Reserved)

These settings disable/enable the monitoring of the specified IRQ's activity.

PNP/PCI Configurations

This section describes configuring the PCI bus system and PnP (Plug & Play) feature. PCI, or Peripheral Component Interconnect, 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 ESCD

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system can not boot. Setting options: *Enabled, Disabled*.

Resource Controlled By

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95/98. If you set this field to “manual” choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a “>”). The settings are: *Auto (ESCD), Manual*.

IRQ Resources

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:

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

PCI/VGA Palette Snoop

When set to *Enabled*, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two VGA devices in the computer (one PCI and one ISA) and the:

| VGA Palette Snoop Bit Setting | Action |
|--------------------------------------|--|
| <i>Disabled</i> | Data read or written by the CPU is only directed to the PCI VGA device's palette registers. |
| <i>Enabled</i> | Data read or written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device's palette registers, permitting the palette registers of both VGA devices to be identical. |

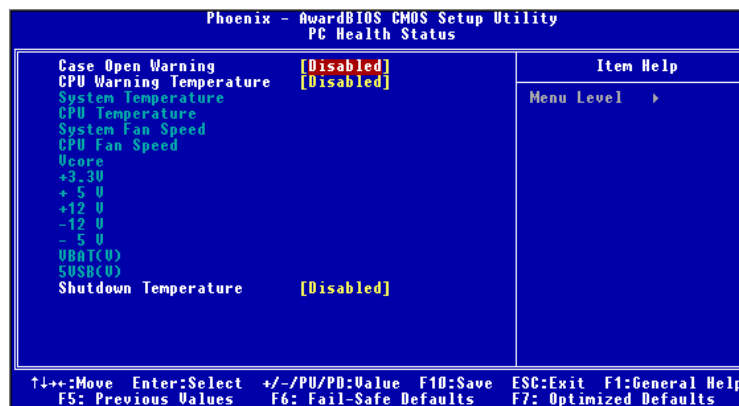
The setting must be set to *Enabled* if any ISA bus adapter in the system requires VGA palette snooping.

Assign IRQ For VGA/USB

These settings specify the IRQ line for specified VGA/USB device. Setting options: *Disabled, Enabled*.

PC Health Status

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.



Case Open Warning

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: *Enabled*, *Reset*, *Disabled*.

CPU Warning Temperature

If the CPU temperature reaches the upper limit preset in this setting, the warning mechanism will be activated. This helps you to prevent the CPU overheat problem.

System/CPU Temperature, System/CPU Fan Speed, Vcore, +3.3V, +5V, +12V, -12V, -5V, VBAT (V), 5VSB (V)

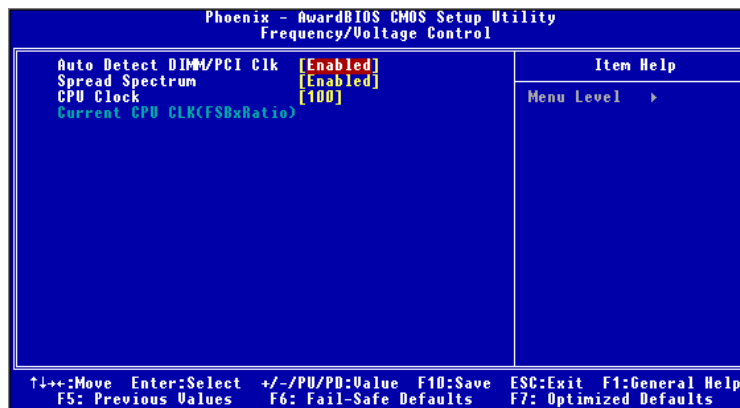
These items display the current status of all of the monitored hardware devices/components such as CPU voltages, temperatures and all fans' speeds.

Shutdown Temperature

This option is for setting the shutdown temperature level for the processor. When the processor reaches the temperature you set, the system will be shut down.

Frequency/Voltage Control

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



Auto Detect DIMM/PCI Clk

This item is used to auto detect the PCI/DIMM slots. When set to *Enabled*, the system will remove (turn off) clocks from empty PCI/DIMM slots to minimize the electromagnetic interference (EMI). Setting options: *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. 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, setting to *Enabled* for EMI reduction. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clockspeed which may just cause your overclocked processor to lock up.

CPU Clock

This setting specifies the clock frequency of the CPU host bus (FSB) for overclocking purpose.

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:



Load Fail-Safe Defaults (Y/N)? [N]

Pressing *Y* loads the BIOS default values for the most stable, minimal system performance.

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



Load Optimized Defaults (Y/N)? [N]

Pressing *Y* loads the default factory settings for optimal system performance.

Set Supervisor/User Password

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

Enter Password:

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.

Additionally, when a password is enabled, you can also have Award BIOS to request a password each time the system is booted. This would prevent unauthorized use of your computer. The setting to determine when the password prompt is required is the *Security Option* of the *ADVANCED BIOS FEATURES* menu. If the *Security Option* is set to *System*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when you try to enter Setup.



MSI Reminds You...

About Supervisor Password & User Password:

Supervisor password: Can enter and change the settings of the setup menu.

User password: Can only enter but do not have the right to change the settings of the setup menu.

Appendix: Using 4- or 6-Channel Audio Function

The motherboard is equipped with Realtek ALC650 chip, which provides support for 6-channel audio output, including 2 Front, 2 Rear, 1 Center and 1 Subwoofer channel. ALC650 allows the board to attach 4 or 6 speakers for better surround sound effect. The section will tell you how to install and use 4-/6-channel audio function on the board.

TOPICS

| | |
|--|-------------|
| <i>Installing the Audio Driver</i> | <i>A-2</i> |
| <i>Using 4-/6-Channel Audio Function</i> | <i>A-4</i> |
| <i>Testing the Connected Speakers</i> | <i>A-14</i> |
| <i>Playing KaraOK</i> | <i>A-16</i> |

Installing the Audio Driver

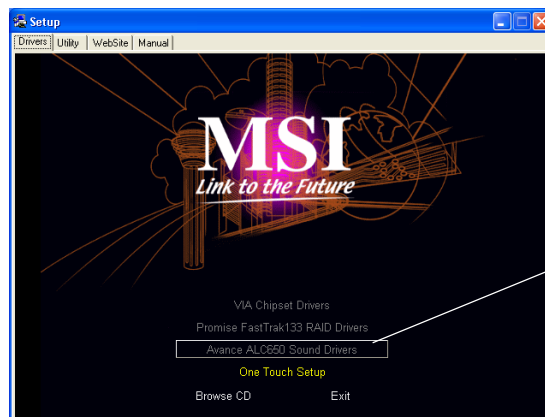
You need to install the driver for Realtek ALC650 chip to function properly before you can get access to 4-/6-channel audio operations. Follow the procedures described below to install the drivers for different operating systems.

Installation for Windows 98SE/ME/2000/XP

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

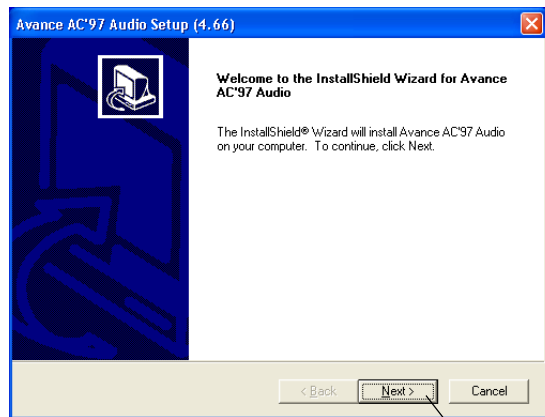
The following illustrations are based on Windows® XP environment and could look slightly different if you install the drivers in different operating systems.

1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click **Avance ALC650 Sound Drivers**.



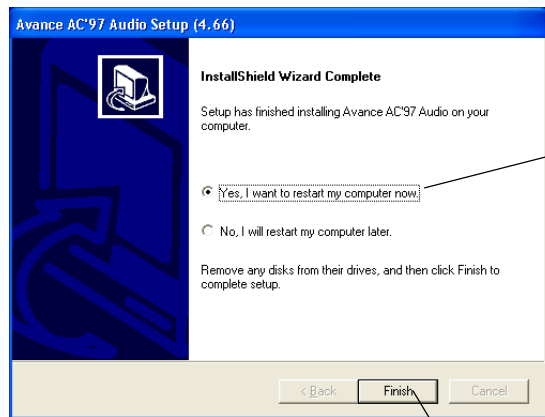
Click here

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



Click here

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



Select this option

Click here

Using 4- or 6-Channel Audio Function

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

There are two ways to utilize the function and connect the speakers to your computer:

- **Using the optional S-Bracket**

If your motherboard supports S-Bracket and you have installed S-Bracket in the computer, you can connect two speakers to back panel's Line-Out connector, and the rest of speakers to S-Bracket.

- **Using the back panel only**


If you do not have a S-Bracket, you can connect all speakers to the audio connectors on the back panel.

Using the Optional S-Bracket

S-Bracket integrates the SPDIF (Sony & Philips Digital Interface) and analog LINE OUT connectors together. With this optional accessory, users will be able to decide either analog or digital audio output when applying the speakers to the connectors.

Read the following instructions to have the Multi-Channel Audio Function mode properly set in the software utility, and then have your speakers correctly connected to the S-Bracket:

Configuration in the Software Utility

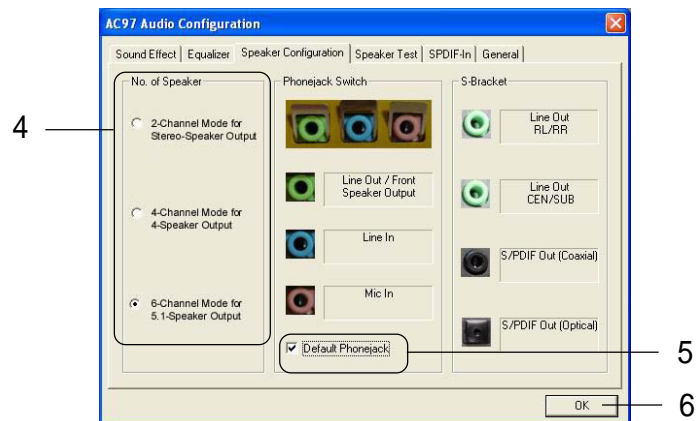
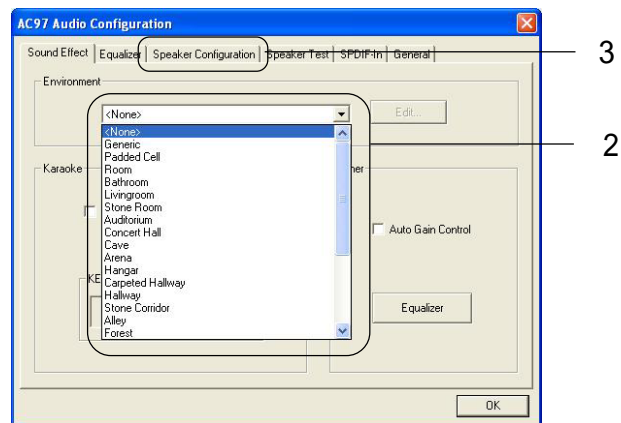
1. Click the audio icon  from the window tray at the lower-right corner of the screen.
2. Select a desired surround sound effect from the "Environment" drop-down menu.
3. Click the *Speaker Configuration* tab.
4. Select a desired multi-channel operation from *No. of Speaker*.
 - a. 2-Channel Mode for Stereo-Speaker Output
 - b. 4-Channel Mode for 4-Speaker Output
 - c. 6-Channel Mode for 5.1-Speaker Output

Using 4- or 6-Channel Audio Function

5. Select or clear the **Default Phonejack** check box to decide which audio devices you wish to use for audio outputs.

The instructions shown on the **Speaker Configuration** screen may vary depending on how you set the options of **No. of Speaker** and **Default Phonejack**. To ensure proper hardware installation, connect your speakers to the correct phonejacks in accordance with the setting in software utility.

6. Click **OK** to close this window.



Connecting the Speakers

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

■ **2-Channel Mode for Stereo-Speaker Output**

When this mode is selected, it is recommended to attach the speakers to the Line Out connector on the back panel instead of the Line Out connector on the S-Bracket.

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

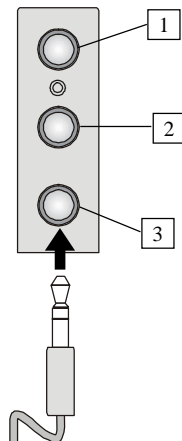
Select “Default Phonejack”

- 1 MIC
- 2 Line In
- 3 Line Out (Front channels)
- 4 Optical SPDIF jack
- 5 Coaxial SPDIF jack

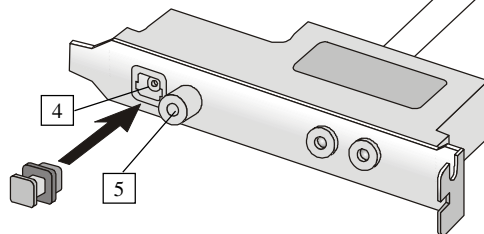
Deselect “Default Phonejack”

- 1 MIC
- 2 Line In
- 3 Line Out (Front channels)
- 4 Optical SPDIF jack
- 5 Coaxial SPDIF jack

Back Panel



S-Bracket



MSI Reminds You...

When any Multi-Channel Audio Mode is selected, you may also connect your speakers to the Optical or Coaxial SPDIF phonejack on the S-Bracket to experience digital surround sound effect.

■ **4-Channel Mode for 4-Speaker Output**

When this mode is selected, plug the two front speakers to the Line Out connector on the back panel, and the other two rear speakers to the Line Out connector on the S-Bracket.

Refer to the following diagram and caption for the function of each phonejack on the back panel and S-Bracket when 4-Channel mode is selected.

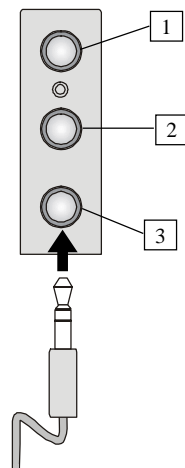
Select "Default Phonejack"

- 1 MIC
- 2 Line In
- 3 Line Out (Front channels)
- 4 Optical SPDIF jack
- 5 Coaxial SPDIF jack
- 6 Line Out (Reserved for Center and Subwoofer channel, but it is not functioning here)
- 7 Line Out (Rear channels)

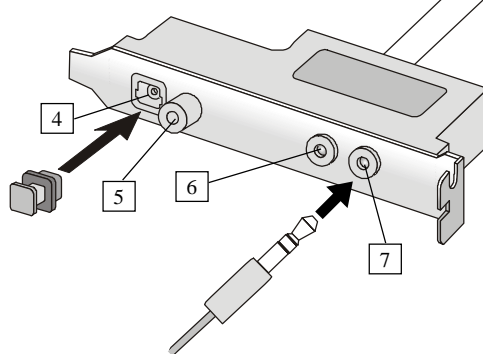
Deselect "Default Phonejack"

- 1 MIC
- 2 Rear Speaker Out (Rear channels)
- 3 Line Out (Front channels)
- 4 Optical SPDIF jack
- 5 Coaxial SPDIF jack
- 6 Line Out (Reserved for Center and Subwoofer channel, but it is not functioning here)
- 7 Line Out (Rear channels)

Back Panel



S-Bracket



■ **6-Channel Mode for 6-Speaker Output**

When this mode is selected, plug the two front speakers to the Line Out connector on the back panel, and the other two rear speakers to the Line Out connector on the S-Bracket.

Refer to the following diagram and caption for the function of each phonejack on the back panel and S-Bracket when 6-Channel mode is selected.

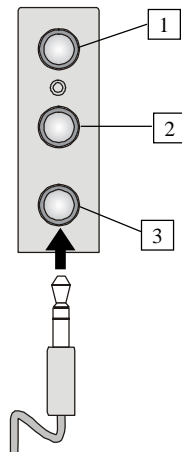
Select "Default Phonejack"

- 1 MIC
- 2 Line In
- 3 Line Out (Front channels)
- 4 Optical SPDIF jack
- 5 Coaxial SPDIF jack
- 6 Line Out (Center and Subwoofer channels)
- 7 Line Out (Rear channels)

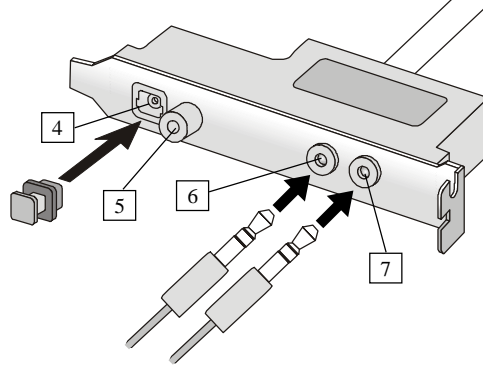
Deselect "Default Phonejack"

- 1 Center/Subwoofer Speaker Out (Center and Subwoofer channels)
- 2 Rear Speaker Out (Rear channels)
- 3 Line Out (Front channels)
- 4 Optical SPDIF jack
- 5 Coaxial SPDIF jack
- 6 Line Out (Center and Subwoofer channels)
- 7 Line Out (Rear channels)

Back Panel



S-Bracket



MSI Reminds You...

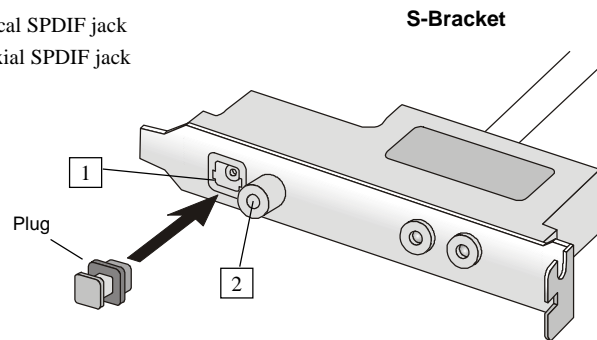
If the Center and Subwoofer speaker exchange their audio channels when you play video or music on the computer, a converter may be required to exchange center and subwoofer audio signals. You can purchase the converter from a speaker store.

■ Digital Audio Output

When any Multi-Channel Audio Function mode is selected, you may also connect your speakers to the Optical or Coaxial SPDIF phonejack on the S-Bracket to experience digital surround sound effect.

Remove the plug from the optical SPDIF phonejack before inserting the fiber-optic cable, and read the following diagram and captions for the function of each phonejack on the S-Bracket.

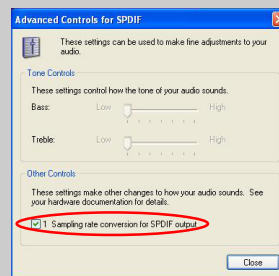
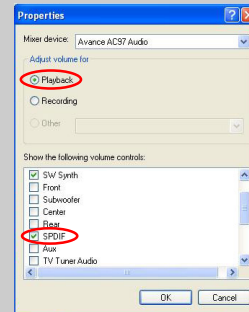
- 1 Optical SPDIF jack
- 2 Coaxial SPDIF jack



MSI Reminds You...

Some commonly-used audio output formats (midi, wav,...etc.) may not be able to be output from the SPDIF jacks of the S-Bracket. To convert these audio formats as SPDIF output:

1. Click the **Volume Control** icon at the taskbar (or go to Control Panel/Sounds and Audio Devices/Volume Control).
2. Click **Properties** on the **Options** menu. Under **Adjust volume for**, click **Playback**, and select the **SPDIF** check box in the **Show the following volume controls** list.
3. Click **Advanced Controls for SPDIF** on the **Options** menu. Under **Other Controls**, select the **Sampling rate conversion for SPDIF output** check box.
4. Click **Close** to exit **Volume Control**.




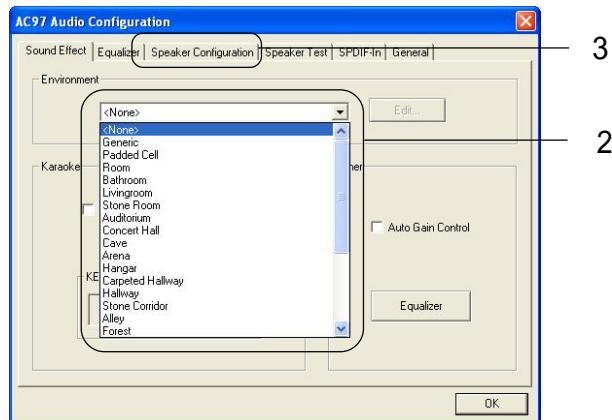
Using the Back Panel only

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

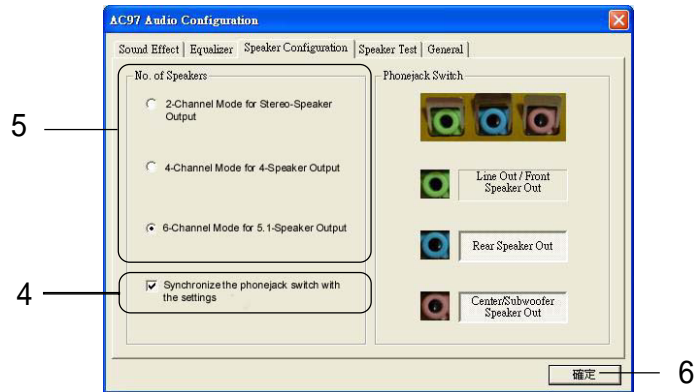
Read the following steps to have the Multi-Channel Audio Function properly set in the software utility, and have your speakers correctly connected to the Back Panel.

Configuration in the Software Utility

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



Using 4- or 6-Channel Audio Function



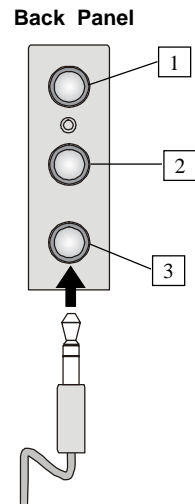
Connecting the Speakers

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

■ 2-Channel Mode for Stereo-Speaker Output

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

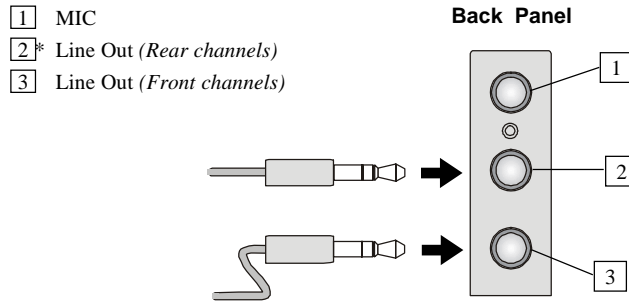
- 1 MIC
- 2 Line In
- 3 Line Out (Front channels)



■ **4-Channel Mode for 4-Speaker Output**

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

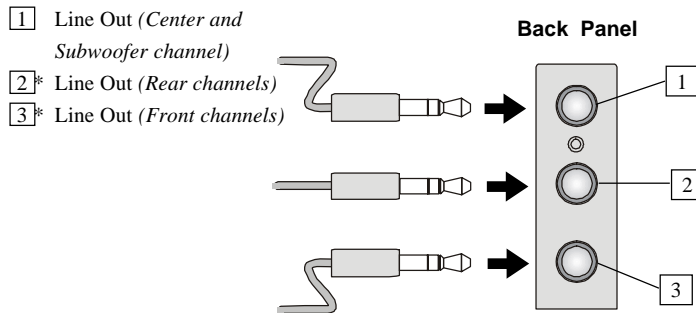
Refer to the following diagram and caption for the function of each jack on the back panel when 4-Channel Mode is selected.



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

■ **6-Channel Mode for 6-Speaker Output**

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



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




MSI Reminds You...

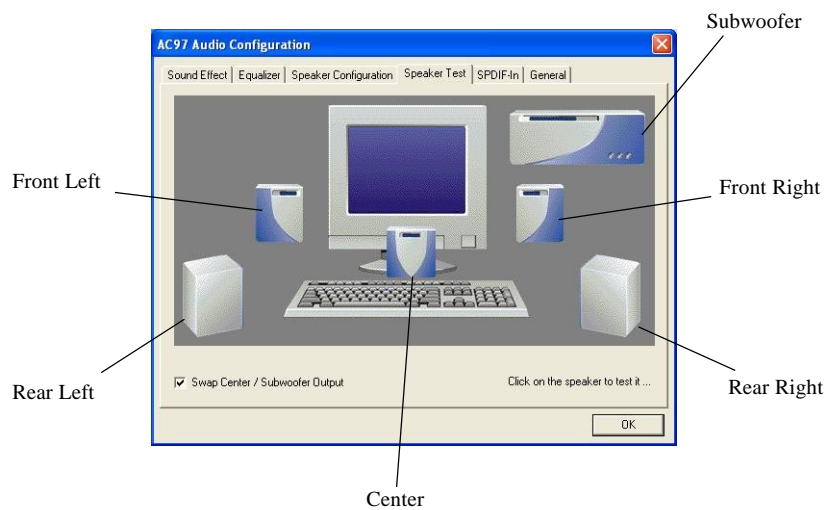
If the Center and Subwoofer speaker exchange their audio channels when you play video or music on the computer, a converter may be required to exchange center and subwoofer audio signals. You can purchase the converter from a speaker store.

Testing the Connected Speakers

To ensure that 4- or 6-channel audio operation works properly, you may need to test each connected speaker to make sure every speaker work properly. If any speaker fails to sound, then check whether the cable is inserted firmly to the connector or replace the bad speakers with good ones.

Testing Each Speaker

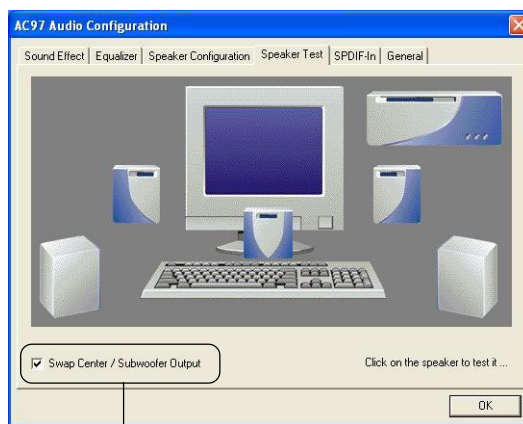
1. Click the audio icon  from the window tray at the lower-right corner of the screen.
2. Click the **Speaker Test** tab.
3. The following window appears. Select the speaker which you want to test by clicking it.



MSI Reminds You...

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

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




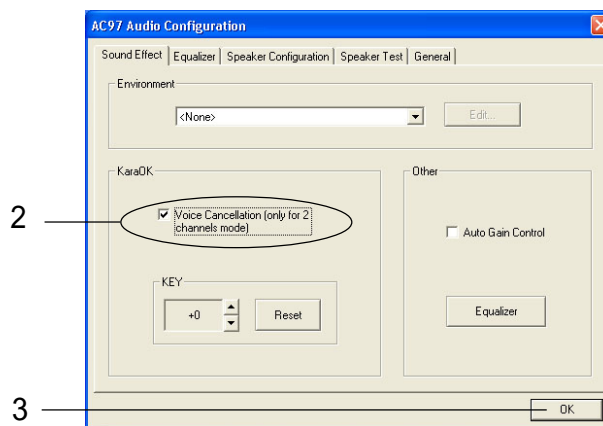
Select this function

Playing KaraOK

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

Playing KaraOK

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



Troubleshooting

Q: Where can I find the model number of the mainboard?

A: There are two places where you can find the model number of the mainboard:
1. Somewhere between the PCI slots you shall find MS-xxxx or the marketing name like "K7T Turbo". You can also find the version number beside it. 2. At the back cover of the user's manual.

Q: What do you mean by PCB version 1?

A: PCB is printed circuit board. Saying PCB version 1 is the same as saying motherboard version 1.

Q: Why can't my AMD 133FSB be autodetected by the mainboard?

A: Due to AMD CPU design, CPU FSB 133 will not be autodetected by the motherboard. So user need to set the FSB manually to 133.

Q: Why is my motherboard BIOS sticker "Phoenix BIOS" while I see "Award BIOS" during system boot-up?

A: Phoenix & Award already merged as one company. All MSI motherboards using Award BIOS come with Phoenix logo stickers.

Q: I used my MSI motherboard and got an error message, "Primary IDE Channel No 80 Conductor Cable Installed" while the system detected hard drives.

A: This is not a problem. It merely means that you're using an ATA-66 or ATA-100 HDD, but you're using the conductor 40 ATA-33 cable.

Q: I have high speed CPU cooling fan like Taisol CGK760092, Vantec CCK-6035D & GlobalWin WBK38. Can I install the fan directly to the motherboard?

A: We strongly recommend that you do NOT connect those described CPU fan directly to your motherboard, as it draws so much power, that it could damage it. Please use a 3-Pin to 4-Pin Cable that comes together with the fan.

Q: Can I use more than 512MB memory on Win9x or WinME?

A: No, you can't. You can only use more than 512MB memory on Win2000 or WinXP. This is a Microsoft OS issue. Please check <http://support/microsoft.com/support/kb/articles/Q108/0/79.ASP>

Q: I have tried to download the MSI Live Update utility from <http://www.msi.com.tw/support/liveupdate/livedriver.htm> but it keeps on failing?

A: This can be solved by one of the following suggestions: 1. Dont install zonealarm 2. Disable "WebTrap" of PC-cillion 2000 3. Disable any web based anti-virus Software.

Q: Can Live Update Series support WinXP?

A: Live Update Series version 215 can support WinXP. Download it from <http://www.msi.com.tw/support/liveupdate/livedriver.htm>

Q: After flashing the BIOS, my system for unknown reason fails to boot. What should I do?

A: Please refer to the following suggestions: 1. Try the BIOS boot recovery feature as described in <http://www.msi.com.tw/support/bios/boot.htm> 2. Try to clear the CMOS If problem still persists, ask your reseller for new BIOS chip or contact one of MSI office near your place for new BIOS chip <http://www.msi.com.tw/contact/main.htm>

Q: Should I update my BIOS, once a new BIOS is released?

A: A new BIOS is usually released due to the following reasons:
1. New function is supported

2. New BIOS source code
3. Bugs are found
4. Customer-specific request

When we release a new BIOS, there's usually a release note attached which lists the reason for the release. Refer to this release note and decide for yourself if upgrading to the new BIOS will be worth it. A word of advice, though, do not upgrade to the new BIOS, unless you really have to.

Q: How do I update the BIOS?

A: Please refer to <http://www.msi.com.tw/support/bios/note.htm> for details.

Q: How do I identify the BIOS version?

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

1. For older model number:

AG76091096 where:

1st digit refers to BIOS maker as A = AMI(R) W = AWARD(R) P = PHOENIX (R).

2nd digit refers to the internal chipset code.

3rd digit refers to the processor class as 5 = 486, 7 = 586, 8 = 686.

4th digit is incremental.

091096 refers to the date this BIOS is released.

2. For newer model number:

W5139MS V1.0091096 where:

1st digit refers to BIOS maker as A = AMI(R) W = AWARD(R) P = PHOENIX (R).

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

6th - 7th digit refers to the customer as MS = all standard customers.

V1.0 refers to the BIOS version.

091096 refers to the date this BIOS is released.

Q: After I flashed the BIOS and rebooted the system, the screen went blank.

A: *For AMI BIOS*

Rename the desired AMI BIOS file to AMIBOOT.ROM and save it on a floppy disk. e.g. Rename A569MS23.ROM to AMIBOOT.ROM

Insert this floppy disk in the floppy drive. Turn On the system and press and hold Ctrl-Home to force update. It will read the AMIBOOT.ROM file and recover the BIOS from the A drive.

When 4 beeps are heard you may remove the floppy disk and restart the computer.

For Award BIOS

Make a bootable floppy disk

Copy the Award flash utility & BIOS file to the said floppy disk

Create an autoexec.bat with "awdf1535 biosfilename" in the content e.g.
awdf1535a619mj21.bin

Boot up system with the said floppy (it will take less than 2 minutes before screen comes out)

Re-flash the BIOS & reboot.

Glossary

ACPI (*Advanced Configuration & Power Interface*)

This power management specification enables the OS (operating system) to control the amount of power given to each device attached to the computer. Windows 98/98SE, Windows 2000 and Windows ME can fully support ACPI to allow users managing the system power flexibly.

AGP (*Accelerated Graphics Port*)

A new, high-speed graphics interface that based on PCI construction and designed especially for the throughput demands of 3-D graphics. AGP provides a direct channel (32-bit wide bus) between the display controller and main memory for high graphics quality and performance.

Bluetooth

Bluetooth refers to a worldwide standard for the wireless exchange of data between two devices. Bluetooth requires that a low-cost transceiver chip be included in each device. The transceiver transmits and receives in a previously unused frequency band of 2.45 GHz that is available globally (with some variation of bandwidth in different countries). In addition to data, up to three voice channels are available. Each device has a unique 48-bit address from the IEEE 802 standard. Connections can be point-to-point or multipoint. The maximum range is 10 meters. Data can be exchanged at a rate of 1 megabit per second (up to 2 Mbps in the second generation of the technology).

BIOS (*Basic Input/Output System*)

On PCs, an essential software that contains all the control code of input/output interface (such as keyboard, disk drives, etc.). It executes hardware test on booting the system, starts the OS, and provides an interface between the OS and the components. The BIOS is stored in a ROM chip.

Bus

A set of hardware lines within the computer system, through which the data is transferred among different components. In a PC, the term *bus* usually refers to a local bus that connects the internal components to the CPU and main memory.

Cache

A special memory subsystem that is used to speed up the data transfer. It stores the

contents of frequently accessed RAM locations and the addresses where these data items are stored.

Chipset

A collection of integrated chips designed to perform one or more related functions. For example, a modem chipset contains all the primary circuits for transmitting and receiving data; a PC chipset provides the electronic interfaces between all subsystems.

Clock Cycle

Clock cycle (or tick) is the smallest unit of time recognized by a device. For personal computers, clock cycles generally refer to the main system clock, which runs at 66 MHz. This means that there are 66 million clock cycles per second. Since modern CPUs run much faster (up to 533 MHz), the CPU can execute several instructions in a single clock tick.

CMOS (*Complementary Metal-Oxide Semiconductor*)

CMOS is a widely used type of semiconductor, which features high speed and low power consumption. PCs usually contain a small amount of battery-powered CMOS memory to retain the date, time, and system setup parameters.

DRAM (*Dynamic RAM*)

A most common type of computer memory. It usually uses one transistor and a capacitor to represent a bit. As the development of technology, the memory type and specification used in computer becomes variety, such as SDRAM, DDR SDRAM, and RDRAM. For further instruction, please see the table below:

| Dynamic RAM (DRAM) Memory Technologies | | | | | |
|--|------------|------------|------------|----------------|-------|
| Type | First Used | Clock Rate | Bus* Width | Peak Bandwidth | Volts |
| FPM (60,70ns) | 1990 | 25MHz | 64 bits | 200 MBps | 5v |
| EDO (50,60,70ns) | 1994 | 40MHz | 64 bits | 320 MBps | 5v |
| SDRAM (66MHz) | 1996 | 66MHz | 64 bits | 528 MBps | 3.3v |
| SDRAM (100MHz) | 1998 | 100MHz | 64 bits | 800 MBps | 3.3v |
| SDRAM (133MHz) | 1999 | 133MHz | 64 bits | 1.1 GBps | 3.3v |
| RDRAM (Direct Rambus) | 1999 | 400MHz | 16 bits | 1.6 GBps | 2.5v |
| DDR SDRAM (100MHz) | 2000 | 100MHz | 64 bits | 1.6 GBps | 3.3v |
| DDR SDRAM (133MHz) | 2000 | 133MHz | 64 bits | 2.1 GBps | 3.3v |

* Memory channel width (64 bits started with 75MHz Pentium)

Source: *Computer Desktop Encyclopedia*

ECC Memory (*Error Correcting Code Memory*)

A type of memory that contains special circuitry for testing the accuracy of data and correcting the errors on the fly.

EEPROM

Acronym for Electrically Erasable Programmable Read-Only Memory. An EEPROM is a special type of PROM that can be erased by exposing it to an electrical charge. Like other types of PROM, EEPROM retains its contents even when the power is turned off. Also like other types of ROM, EEPROM is not as fast as RAM. EEPROM is similar to flash memory (sometimes called flash EEPROM). The principal difference is that EEPROM requires data to be written or erased one byte at a time whereas flash memory allows data to be written or erased in blocks. This makes flash memory faster.

EIDE

Short for Enhanced IDE, a newer version of the IDE mass storage device interface standard developed by Western Digital Corporation. It supports data rates of between 4 and 16.6 MBps, about three to four times faster than the old IDE standard. In addition, it can support mass storage devices of up to 8.4 gigabytes, whereas the old standard was limited to 528 MB. Because of its lower cost, enhanced EIDE has replaced SCSI in many areas. There are four EIDE modes defined. The most common is Mode 4, which supports transfer rates of 16.6 MBps. There is also a new mode, called ATA-3 or Ultra ATA, that supports transfer rates of 33 MBps.

EISA (*Extended Industry Standard Architecture*)

EISA is a standard bus (computer interconnection) architecture that extends the ISA standard to a 32-bit interface. It was developed in part as an open alternative to the proprietary Micro Channel Architecture (MCA) that IBM introduced in its PS/2 computers. EISA data transfer can reach a peak of 33 megabytes per second.

ESCD (*Extended System Configuration Data*)

It is a format for storing information about Plug-and-Play (PnP) devices in the BIOS. Windows and the BIOS access the ESCD area each time you re-boot your computer

External Cache

Short for Level 2 cache, cache memory that is external to the microprocessor. In general, L2 cache memory, also called the secondary cache, resides on a separate chip from the microprocessor chip. Although, more and more microprocessors are including L2 caches into their architectures.

IDE (*Integrated Drive Electronics*)

A type of disk-drive interface widely used to connect hard disks, CD-ROMs and tape drives to a PC, in which the controller electronics is integrated into the drive itself, eliminating the need for a separate adapter card. The IDE interface is known as the ATA (AT Attachment) specification.

IEEE 1394

A new, high speed external bus standard, also known as *FireWire* or *iLink*, which supports data transfer rates of up to 400 Mbps for connecting up to 63 external devices.

Internal Cache

Short for Level 1 cache, a memory cache built into the microprocessor. The L1 cache is also called the primary cache.

IrDA (*Infrared Data Association*)

A group of device vendors, including computer, component and telecommunications, who have developed a standard for transmitting data via infrared light waves. This enables you to transfer data from one device to another without any cables.

IRQ (*Interrupt Request Line*)

IRQs are hardware lines over which devices can send interrupt signals to the microprocessor. When you add a new device to a PC, you sometimes need to set its IRQ number by setting a DIP switch. This specifies which interrupt line the device may use. IRQ conflicts used to be a common problem when adding expansion boards, but the Plug-and-Play specification has removed this headache in most cases.

ISA (*Industry Standard Architecture*)

ISA is a standard bus (computer interconnection) architecture that is associated with the IBM AT motherboard. It allows 16 bits at a time to flow between the motherboard circuitry and an expansion slot card and its associated device(s). Also see EISA and MCA.

LAN (*Local Area Network*)

A computer network that covers a relatively smaller area, such as in a building or an enterprise. It is made up of servers, workstations, shared resources, a network operating system and a communications link. These individual PCs and devices on a LAN are known as “nodes”, and are connected by cables to access data and devices anywhere on the LAN, so that many users can share expensive devices and data.

LBA (*Logical Block Addressing*)

Logical block addressing is a technique that allows a computer to address a hard disk larger than 528 megabytes. A logical block address is a 28-bit value that maps to a specific cylinder-head-sector address on the disk. 28 bits allows sufficient variation to specify addresses on a hard disk up to 8.4 gigabytes in data storage capacity. Logical block addressing is one of the defining features of Enhanced IDE (EIDE), a hard disk interface to the computer bus or data paths.

LED (*Light Emitting Diode*)

A semiconductor device that converts electrical energy into light. Since it lights up (usually red) when electricity is passed through it, it is usually used for the activity lights on computer's component, such as disk drivers.

LPT (*Line Printer Terminal*)

Logical device name for a line printer; a name reserved by the MS-DOS for up to three parallel printer ports: LPT1, LPT2, and LPT3. It is frequently used by the OS to identify a printer.

Overclocking

Overclocking is resetting your computer so that the microprocessor runs faster than the manufacturer-specified speed (for example, setting an Intel 166 MHz (megahertz) microprocessor to run at 200 Mhz).

PCI (*Peripheral Component Interconnect*)

A local bus standard developed by Intel that first appeared on PCs in late 1993. PCI provides "plug and play" capability and allows IRQs to be shared. The PCI controller can exchange data with the system's CPU either 32 bits or 64 bits at a time.

PnP (*Plug and Play*)

A set of specifications that allows a PC to configure itself automatically to work with peripherals. The user can "plug" in a peripheral device and "play" it without configuring the system manually. To implement this useful feature, both the BIOS that supports PnP and a PnP expansion card are required.

POST (*Power On Self Test*)

During booting up your system, the BIOS executes a series of diagnostic tests, include checking the RAM, the keyboard, the disk drives, etc., to see if they are properly connected and operating.

PS/2 Port

A type of port developed by IBM for connecting a mouse or keyboard to a PC. The PS/2 port supports a mini DIN plug containing just 6 pins. Most modern PCs equipped with PS/2 ports so that the special port can be used by another device, such as a modem.

RAID

RAID (Redundant Array of Independent Disks; originally Redundant Array of Inexpensive Disks) is a way of storing the same data in different places (thus, redundantly) on multiple hard disks. By placing data on multiple disks, I/O operations can overlap in a balanced way, improving performance. Since multiple disks increases the mean time between failure (MTBF), storing data redundantly also increases fault-tolerance.

SCSI

Acronym for Small Computer System Interface. Pronounced "scuzzy," SCSI is a parallel interface standard used by Apple Macintosh computers, PCs, and many UNIX systems for attaching peripheral devices to computers. SCSI interfaces provide for faster data transmission rates (up to 80 megabytes per second) than standard serial and parallel ports. In addition, you can attach many devices to a single SCSI port, so that SCSI is really an I/O bus rather than simply an interface.

USB (*Universal Serial Bus*)

A hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, etc. USB provides a maximum bandwidth of 12 Mbit/sec (Mbps) for connecting up to 127 peripheral devices to PC. USB features hot swap capability and multiple data streams, allows external devices to be plugged in and unplugged without turning the system off.

Virus

A program or a piece of code that infects computer files by inserting in those files copies of itself. The virus code is buried within an existing program, and is activated when that program is executed. All the viruses are man-made, and often have damaging side effects.

WLAN

Acronym for wireless local-area network. Also referred to as LAWN. A type of local-area network that uses high-frequency radio waves rather than wires to communicate between nodes.