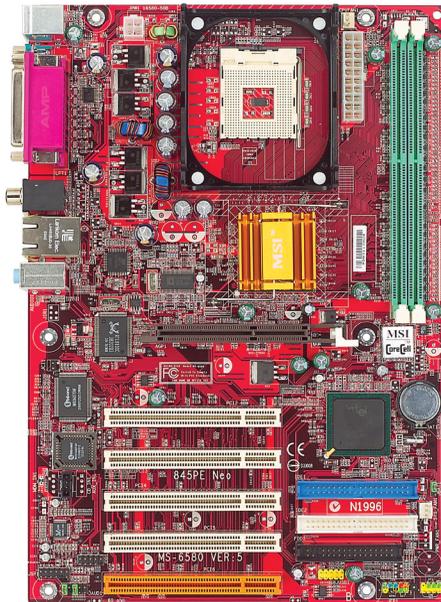




845PE Neo Series
MS-6580 (v5.X) ATX Mainboard



Version 5.0
G52-M6580XM

Manual Rev: 5.0

Release Date: December 2003



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.

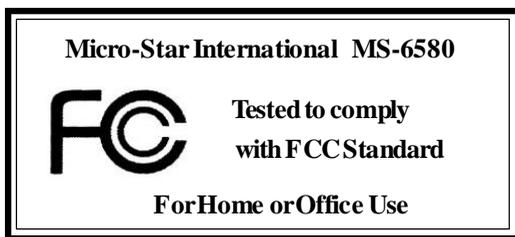
Notice 1

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

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AMI® is a registered trademark of American Megatrends Inc.

Revision History

| | | |
|-----|---------------------------|---------------|
| 5.0 | First release for PCB 5.X | December 2003 |
|-----|---------------------------|---------------|

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.**



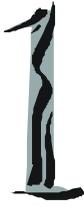
CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

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Getting Started

Thank you for purchasing the 845PE Neo (MS-6580 v5.X) ATX mainboard. The 845PE Neo is based on **Intel® 845PE & ICH4** chipsets for optimal system efficiency. Designed to fit the advanced **Intel® Pentium 4** Northwood/Prescott processor in the 478-pin package, the 845PE Neo delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU

- Supports Socket 478 for Intel® Pentium 4 Northwood/Prescott processors
- FSB 400/533/800MHz (over chipset spec.)
- Supports up to 3.4 GHz and higher speed

Chipsets

- Intel® 845PE chipsets
 - AGP 4x slot (1.5v only)
 - FSB 533/(800 MHz) (refer to Appendix B for details on FSB 800MHz)
 - Support DDR 200/266/333/(400) DDR technology (refer to Appendix B for details on DDR400)
 - Support 400/533 MHz Intel NetBurst micro-architecture bus
- Intel® ICH4 chipset
 - AC'97 2.2 interface
 - 6 USB 2.0/1.1 ports
 - 2 channel Ultra ATA/100 Bus Master IDE controller
 - SMBus 2.0 support
 - Integrated LAN controller

MainMemory

- Available bandwidth up to 2.7GB/s (DDR333 for single-channel mode, DDR400 over chipset spec.)
- Supports two unbuffered 184-pin DDR200/DDR266/DDR333/(DDR400) DIMMs (refer to Appendix B for details on DDR 400)
- Supports up to 2GB memory size without ECC

Slots

- One AGP (Accelerated Graphics Port) 4x slot (1.5v only)
- Five PCI 2.2 32-bit Master bus slots (3.3v/5v)
 - Supports multi-communication PCI Device (PCI5)

On-Board IDE

- An IDE controller integrated in ICH4
- Support PIO, Bus Master and Ultra ATA66/100 operation modes
- Can connect up to four IDE devices

On-Board Peripherals

- ▶ On-Board Peripherals include:
 - 1 floppy port supports 2 FDDs with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
 - 1 serial port connector **COMA**
 - 1 parallel port
 - 1 RJ-45 LAN Jack (Optional)
 - Audio ports in vertical stack
 - 1 rear coaxial SPDIF-Out
 - 6 USB ports (Rear * 4/ Front * 2)

Audio

- ▶ AC'97 link controller integrated in ICH4
- ▶ 6 channels audio codec Realtek ALC655

LAN(Optional)

- ▶ Realtek® 8100C
 - Integrated 10/100 Ethernet MAC and PHY in one chip
 - Supports 10Mb/s and 100Mb/s auto-negotiation operation
 - Compliant with PCI v2.2, mini PCi 1.0 and LAN on Motherboard (LOM) standard

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.

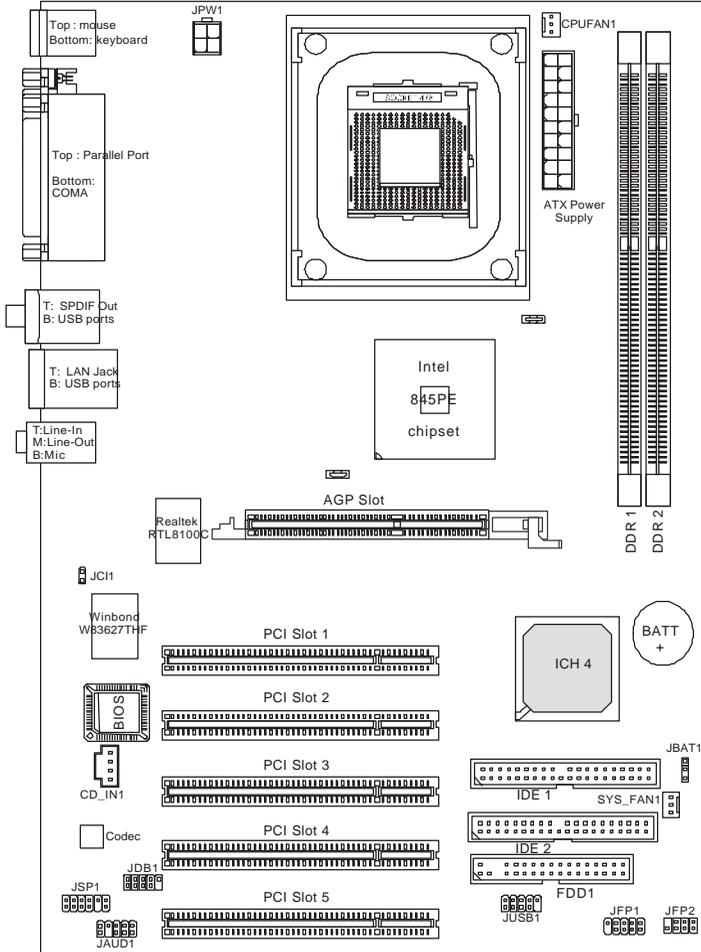
Dimension & Mounting

- ▶ ATX Form Factor: 29.5 cm (L) x 20.5 cm (W), 6 mounting holes

Others

- ▶ Supports STR/STD (S3/S4)
- ▶ PC2001 compliant
- ▶ D-Bracket 2/S-Bracket/Round Cable (Optional)

Mainboard Layout



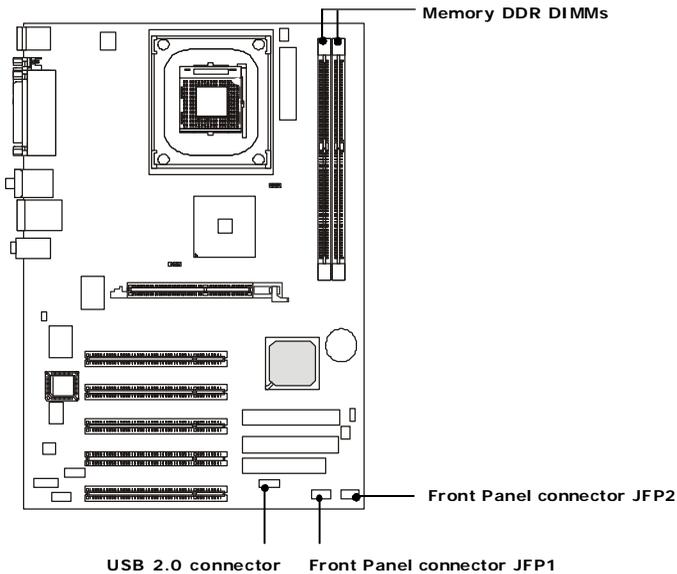
845PE Neo (MS-6580 v5.X) ATX Mainboard

MSI Special Features

Color Management

MSI has a unified color management rule for some connectors on the mainboards, which helps you to install the memory modules, expansion cards and other peripherals devices more easily and conveniently.

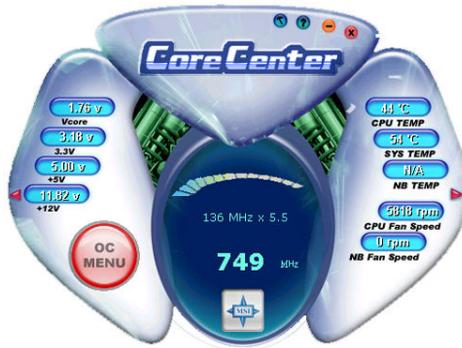
- Memory DDR DIMMs: light green
- USB 2.0 connector: yellow
- Front panel connector JFP1 : HDD LED is red, Reset Switch is blue, Power Switch in black, Power LED is light green.
- Front panel connector JFP2: Power LED is light green.



CoreCenter™

This all-in-one hardware console is advanced combination of the popular PC Alert and Fuzzy Logic. Including powerful function with hardware monitor, system alert and instinctive UI of overclocking, CoreCenter is just like your PC doctor that can detect, view and adjust the PC hardware and system status during real time operation.

In the left side it shows the current system status including the Vcore, 3.3V, +5V and 12V. In the right side it shows the current PC hardware status such as the CPU & system temperatures and all fans speeds.



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



Left-wing: Current system status

In the left sub-menu, you can configure the settings of FSB, Vcore, Memory Voltage and AGP Voltage by clicking the radio button in front of each item and make it available (the radio button will be lighted as yellow when selected), use the “+” and “-” buttons to adjust, then click “**OK**” to apply the changes. Then you can click *Save* to save the desired FSB you just configured.

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

Right-wing: PC hardware status during real time operation

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

Top-side: Usermode/Auto mode

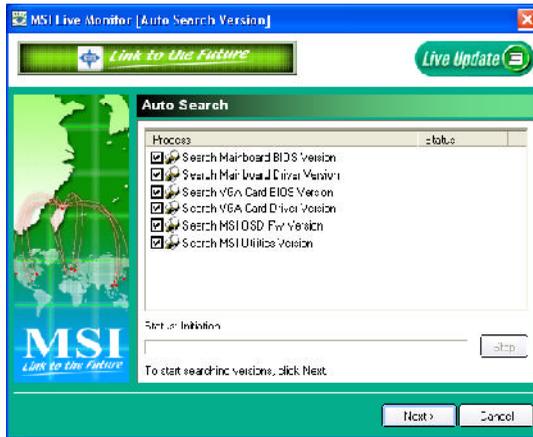
Here you may adjust the CPU fan speed. If you choose *User mode*, you may adjust the CPU fan speed in 8 different modes, from **Stop** to **Fullspeed**.

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 3” application. After 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:

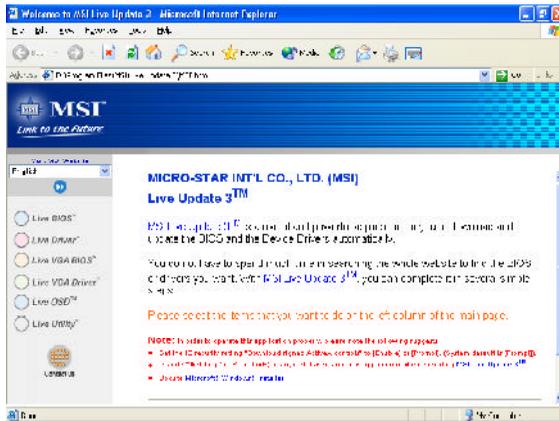
- **Auto Search** – Searches for the BIOS/drivers version you need immediately.
- **View Last Result** – Allows you to view the last search result if there is any.
- **Preference** – Configures the Search function, including the Search schedule.
- **Exit** – Exits the Live Monitor™ application.
- **FAQ** – Provides a link to a database which contains various possible questions about MSI's products for users to inquire.

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 whole Web site. To use the function, you need to install the “MSI Live Update 3” application. After the installation, the “MSI Live Update 3” icon (as shown on the right) will appear on the screen.



Double click the “MSI Live Update 3” icon, and the following screen will appear:



Five buttons are placed on the left column 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 OSD** – Updates the firmware of the OSD products 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.

D-Bracket™ 2 (Optional)

D-Bracket™ 2 is an external USB bracket integrating four Diagnostic LEDs, which use graphic signal display to help users understand their system. The LEDs provide up to 16 combinations of signals to debug the system. The 4 LEDs can debug all problems that fail the system, such as VGA, RAM or other failures. This special feature is very useful for the overclocking users. These users can use the feature to detect if there are any problems or failures.

D-Bracket™ 2 supports both USB 1.1 & 2.0 spec.



● Red ○ Green

| D-Bracket™2 | Description |
|-------------|--|
| | System Power ON - The D-LED will hang here if the processor is damaged or not installed properly. |
| | Early Chipset Initialization |
| | Memory Detection Test - Testing onboard memory size. The D-LED will hang if the memory module is damaged or not installed properly. |
| | Decompressing BIOS image to RAM for fast booting. |
| | Initializing Keyboard Controller. |
| | Testing VGA BIOS - This will start writing VGA sign-on message to the screen. |

| D-Bracket™2 | Description |
|---|--|
|  | <p>Processor Initialization</p> <p>- This will show information regarding the processor (like brand name, system bus, etc...)</p> |
|  | <p>Testing RTC (Real Time Clock)</p> |
|  | <p>Initializing Video Interface</p> <p>- This will start detecting CPU clock, checking type of video onboard. Then, detect and initialize the video adapter.</p> |
|  | <p>BIOS Sign On</p> <p>- This will start showing information about logo, processor brand name, etc....</p> |
|  | <p>Testing Base and Extended Memory</p> <p>- Testing base memory from 240K to 640K and extended memory above 1MB using various patterns.</p> |
|  | <p>Assign Resources to all ISA.</p> |
|  | <p>Initializing Hard Drive Controller</p> <p>- This will initialize IDE drive and controller.</p> |
|  | <p>Initializing Floppy Drive Controller</p> <p>- This will initializing Floppy Drive and controller.</p> |
|  | <p>Boot Attempt</p> <p>- This will set low stack and boot via INT 19h.</p> |
|  | <p>Operating System Booting</p> |

Core Cell™ Chip

By diagnosing the current system utilization, the CoreCell™ Chip automatically tunes your motherboard to the optimal state, leading to less noise, longer duration, more power-saving and higher performance.



Features of CoreCell™

Speedster

- Advanced O.C. design.
- Superior O.C. capability.
- Greater O.C. method.



PowerPro

- Saves up to 65% power.
- Assures motherboard stability.
- Empowers O.C. Capability.



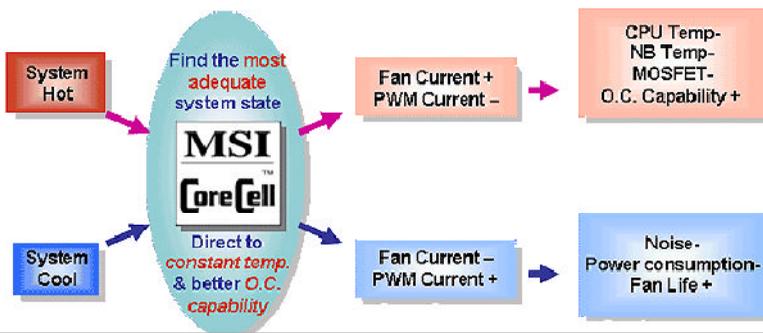
BuzzFree

- Diagnoses current system utilization & temperature.
- Controls both CPU and NorthBridge fans.
- Cuts up to 50% of system noise.



LifePro

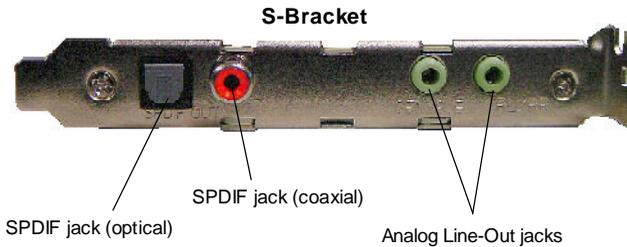
- Prolongs motherboard, CPU and fan life.
- Maintains motherboard & CPU in constant temperature.
- Prevents components from operating beyond specifications.



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 need. For more information on S-Bracket, refer to *Appendix A: Using 2-, 4- or 6-Channel Audio Function*.



CPU Thermal Protection

Aimed to prevent the CPU from overheating, MSI has developed a CPU Thermal Protection mechanism for Intel® 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 Intel® Pentium CPU only.

Round Cable (Optional)

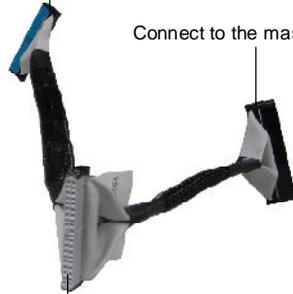
Round cable is an enhanced cable for PCI IDE and Ultra DMA controller. It has the following benefits:

- Data transfer rate started by 133MB/s
- Backward compatibility(ATA33/66/100/133)
- Higher performance than traditional Flat cable (data rate)
- Improved data robustness
- Better airflow due to thinner ATA/133 cable



Connect one end to the floppy disk drive connector (FDD1) and the other end to the standard floppy disk.

Connect to the system connectors on the mainboard.



Connect to the master drive.

Connect to the slave drive.

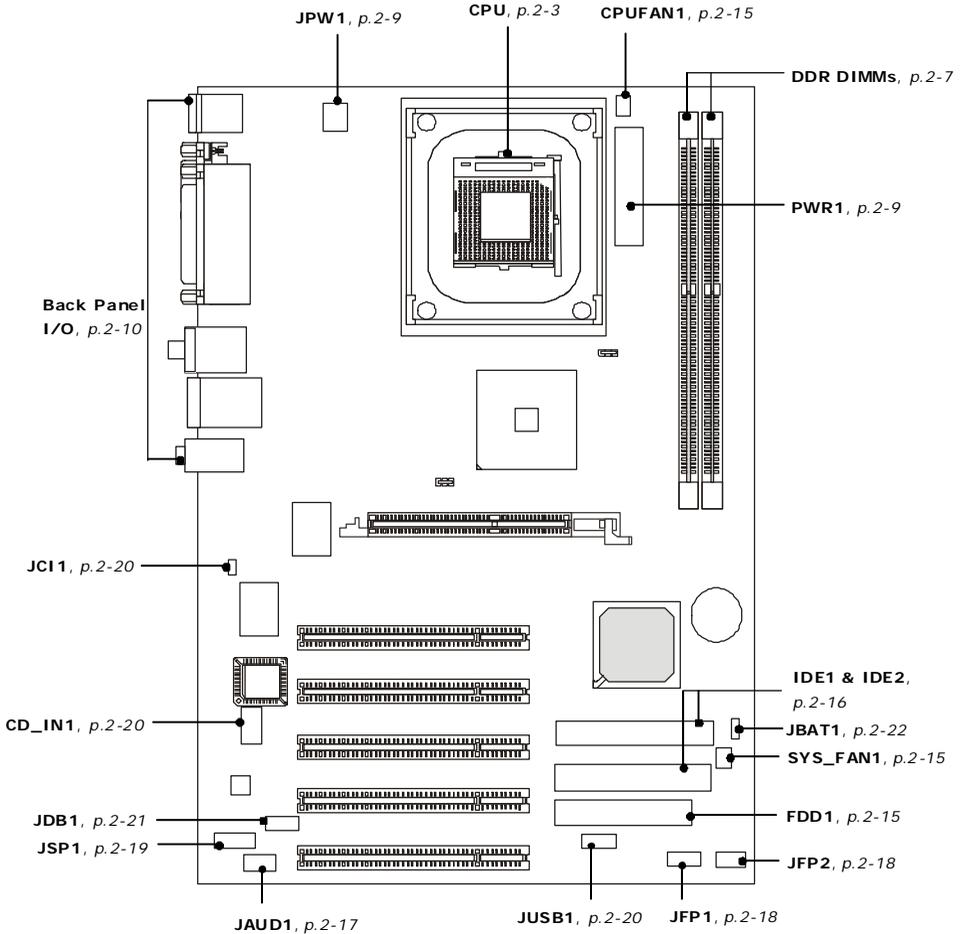
2

Hardware Setup

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

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

Quick Components Guide



Central Processing Unit: CPU

The mainboard supports Intel® Pentium® 4 Northwood/Prescott processor in the 478 pin package. The mainboard uses a CPU socket called PGA478 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 | <u>CPU Clock</u> | = | 100MHz |
| | <u>Core/Bus ratio</u> | = | 14 |
| then | <u>CPU core speed</u> | = | <u>Host Clock</u> x <u>Core/Bus ratio</u> |
| | | = | 100MHz x 14 |
| | | = | 1.4 GHz |



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

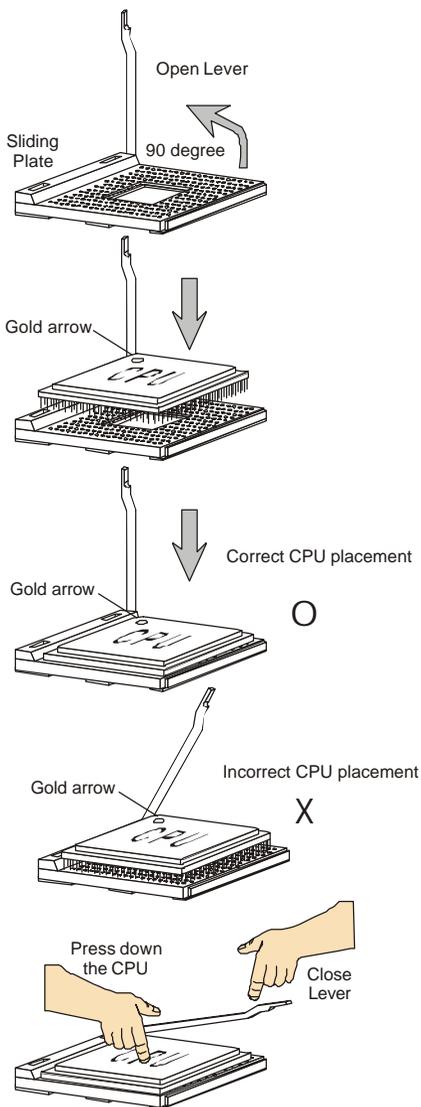
While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.

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.***

CPU Installation Procedures for Socket 478

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.

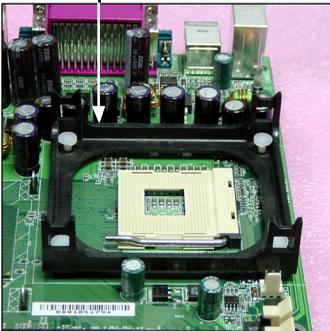


Installing the CPU Fan

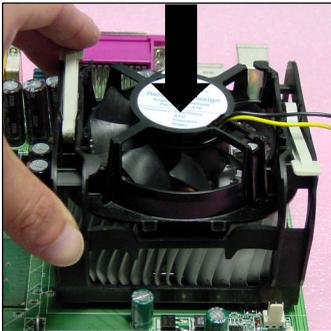
As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly important. To dissipate heat, you need to attach the CPU cooling fan and heatsink on top of the CPU. Follow the instructions below to install the Heatsink/Fan:

1. Locate the CPU and its retention mechanism on the motherboard.
2. Position the heatsink onto the retention mechanism.

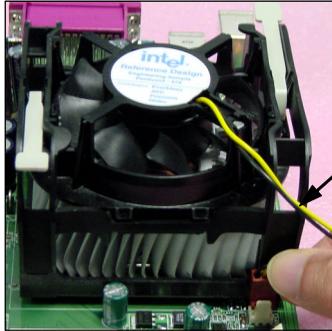
retention mechanism



3. Mount the fan on top of the heatsink. Press down the fan until its four clips get wedged in the holes of the retention mechanism.
4. Press the two levers down to fasten the fan. Each lever can be pressed down in only ONE direction.



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



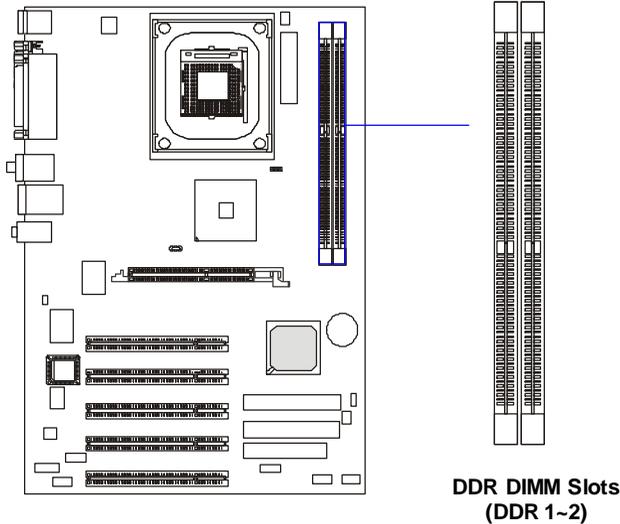
fan power cable



NOTES

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 PC3200/DDR400, PC2700/DDR333, PC2100/DDR266 or PC1600/DDR200 modules on the DDR DIMM slots (DDR 1~2). For more informaton on DDR400, please refer to Appendix B.



Memory Speed/CPU FSB Overclocking Support Matrix

| Memory CPU FSB | DDR266/PC 2100 DDR 333/PC 2700 | DDR400/PC 3200 |
|-------------------|-----------------------------------|----------------|
| | 400MHz | Yes |
| 533MHz | Yes | N/A |
| 800MHz * | N/A | Overclocking |

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:

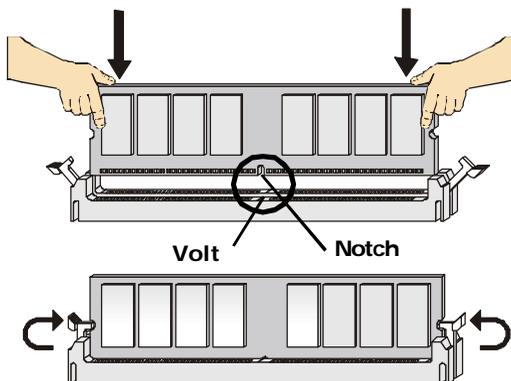
| Slot | Memory Module | Total Memory |
|--|---------------|--------------|
| DIMM 1 (Bank 0 & 1) | S/D | 64MB~1GB |
| DIMM 2 (Bank 2 & 3) | S/D | 64MB~1GB |
| Maximum System Memory Supported | | 64MB~2GB |

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



MSI Reminds You...

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

Power Supply

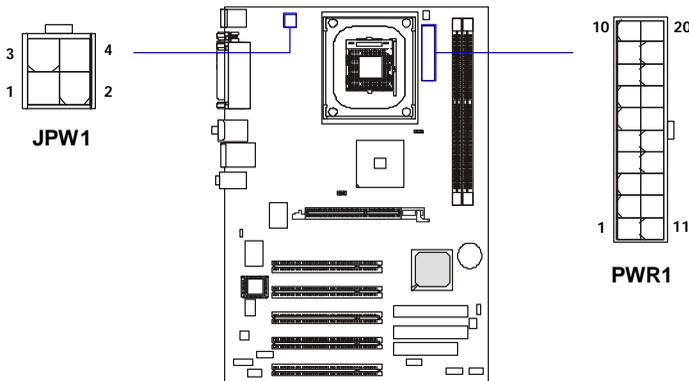
The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 20-Pin Power Connector: PWR1

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.

ATX 12V Power Connector: JPW1

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



JPW1 Pin Definition

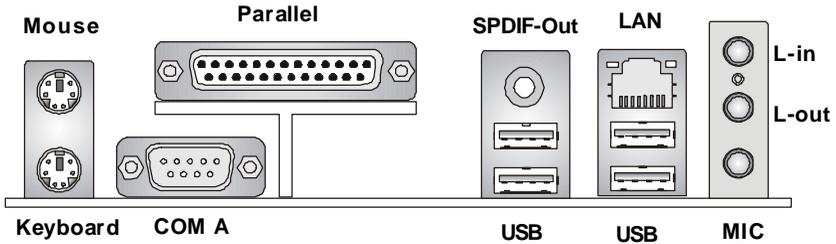
| PIN | SIGNAL |
|-----|--------|
| 1 | GND |
| 2 | GND |
| 3 | 12V |
| 4 | 12V |

PWR1 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 |

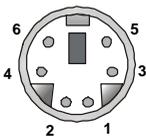
Back Panel

The back panel provides the following connectors:



Keyboard Connector

The mainboard provides a standard PS/2[®] keyboard mini DIN connector for attaching a PS/2[®] keyboard. You can plug a PS/2[®] keyboard directly into this connector.



PS/2 Keyboard (6-pin Female)

Pin Definition

| PIN | SIGNAL | DESCRIPTION |
|-----|----------------|----------------|
| 1 | Keyboard DATA | Keyboard DATA |
| 2 | NC | No connection |
| 3 | GND | Ground |
| 4 | VCC | +5V |
| 5 | Keyboard Clock | Keyboard clock |
| 6 | NC | No connection |

Mouse Connector

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



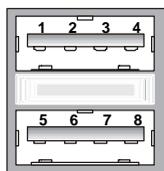
PS/2 Mouse (6-pin Female)

Pin Definition

| PIN | SIGNAL | DESCRIPTION |
|-----|-------------|---------------|
| 1 | Mouse DATA | Mouse DATA |
| 2 | NC | No connection |
| 3 | GND | Ground |
| 4 | VCC | +5V |
| 5 | Mouse Clock | Mouse clock |
| 6 | NC | No connection |

USB Connectors

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



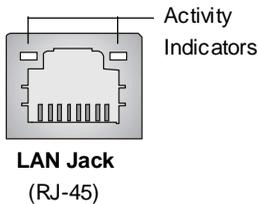
USB Ports

USB Port Description

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

RJ-45 LAN Jack (Optional)

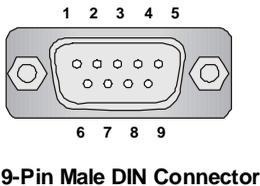
The mainboard provides a RJ-45 connector that allows your computer to be connected to a network environment.



| 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 Connector: COM A

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

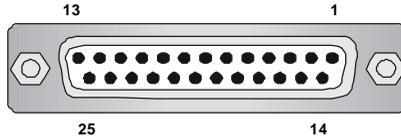


Pin Definition

| 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 |

Parallel Port Connector

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.



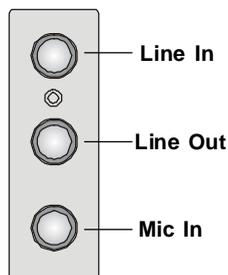
Pin Definition

| 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. **SPDIF-out** is a jack for coaxial fiber connection for digital audio transmission.

1/8" Stereo Audio Connectors



SPDIF-Out Coaxial



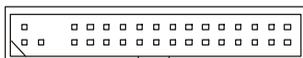
MSI Reminds You...

*For advanced audio application, **Realtek ALC655 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 A: Using 2-, 4- or 6-Channel Audio Function.*

Connectors, Jumpers and Slots

Floppy Disk Drive Connector: FDD1

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



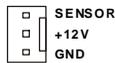
FDD1

Fan Power Connectors: CPUFAN1/SYS_FAN1

The CPUFAN1 (processor fan) and SYS_FAN1 (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 on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.



CPUFAN1



SYS_FAN1

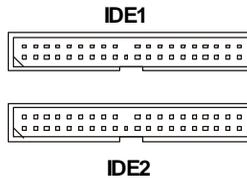


MSI Reminds You...

Always consult the vendors for proper CPU cooling fan.

Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra ATA66/100 controller that provides PIO mode 0~4, Bus Master, and Ultra ATA66/100 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices. These connectors support the provided IDE hard disk cable.



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.

Front Panel Audio Connector: JAUD1

You can connect an optional audio connector to the JAUD1 front panel audio connector. JAUD1 is compliant to Intel® Front Panel I/O Connectivity Design Guide.



JAUD1

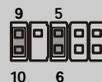
Pin Definition

| PIN | SIGNAL | DESCRIPTION |
|-----|--------------|--|
| 1 | AUD_MIC | Front panel microphone inputs 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 |



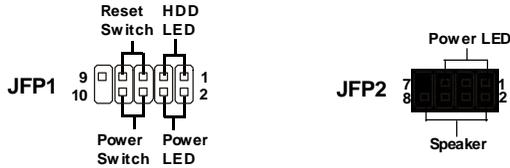
MSI Reminds You...

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.



Front Panel Connectors: JFP1 & JFP2

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



JFP2 Pin Definition

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

JFP1 Pin Definition

| PIN | SIGNAL | DESCRIPTION |
|-----|------------|---|
| 1 | HD_LED_P | Harddisk 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. |

S-Bracket Connector: JSP1

The connector allows you to connect a 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 A: Using 2-, 4- or 6-Channel Audio Function*.

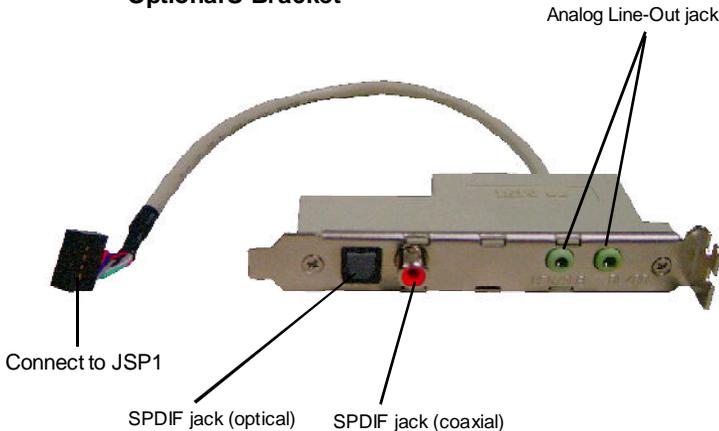


JSP1

JSP1 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 | Audiobass output | 8 | SOUT-R | Audio right surrounding output |
| 9 | CET-OUT | Audiocenter output | 10 | SOUT-L | Audio left surrounding output |
| 11 | GND | Ground | 12 | GND | Ground |

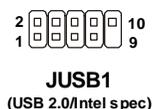
Optional S-Bracket



Front USB Connector: JUSB1

The mainboard provides one USB2.0 pinheader for users to connect to optional USB2.0 ports. The pinheader is compliant to 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.**



JUSB1 Pin Definition

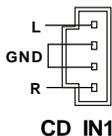
| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | VCC | 2 | VCC |
| 3 | USB0- | 4 | USB1- |
| 5 | USB0+ | 6 | USB1+ |
| 7 | GND | 8 | GND |
| 9 | Key | 10 | USBOC |

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 connected. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record. JCI1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

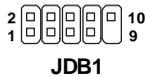
CD-In Connector: CD_IN1

The connectors are for CD-ROM audio connectors.



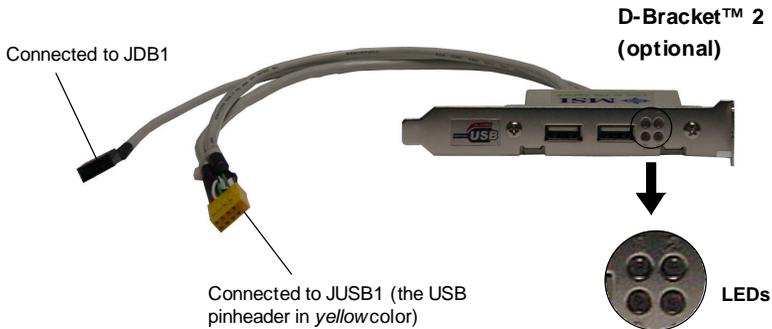
D-Bracket™ 2 Connector: JDB1

The mainboard comes with a JDB1 connector for you to connect to D-Bracket™ 2. D-Bracket™ 2 is a USB Bracket that supports both USB1.1 & 2.0 spec. It integrates four LEDs and allows users to identify system problem through 16 various combinations of LED signals. For definitions of 16 signal combinations, please refer to *D-Bracket™ 2 (Optional)* in Chapter 1.



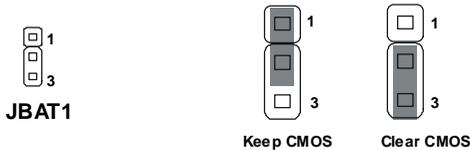
JDB1 Pin Definition

| Pin | Signal |
|-----|-----------------------------|
| 1 | DBG1 (high for green color) |
| 2 | DBR1 (high for red color) |
| 3 | DBG2 (high for green color) |
| 4 | DBR2 (high for red color) |
| 5 | DBG3 (high for green color) |
| 6 | DBR3 (high for red color) |
| 7 | DBG4 (high for green color) |
| 8 | DBR4 (high for red color) |
| 9 | Key |
| 10 | NC |



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. That battery has long life time for at least 5 years. 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.

AGP Slot

The AGP slot allows you to insert the AGP **1.5V** 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.

Please note that the AGP slot does not support 3.3V AGP card. Use of 3.3V AGP cards may result in a failure to restart the system.

PCISlots

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

PCI Interrupt Request Routing

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

| | Order1 | Order2 | Order3 | Order4 |
|----------------------------|--------|--------|--------|--------|
| PCI Slot 1 | INT B# | INT C# | INT D# | INT A# |
| PCI Slot 2 | INT C# | INT D# | INT A# | INT B# |
| PCI Slot 3 | INT D# | INT A# | INT B# | INT C# |
| PCI Slot 4 | INT B# | INT C# | INT D# | INT A# |
| PCI Slot 5 (Two Master) | INT A# | INT B# | INT C# | INT D# |
| 10/100 LAN | INT F# | | | |
| AGP Slot | 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.

DEL:Setup F11:Boot Menu F12:Network boot TAB:Logo

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.

Selecting the First Boot Device

You are allowed to select the 1st boot device without entering the BIOS setup utility by pressing <F11>. When the same message as listed above appears on the screen, press <F11> to trigger the boot menu.

The POST messages might pass by too quickly for you to respond in time. If so, restart the system and press <F11> after around 2 or 3 seconds to activate the boot menu similar to the following.

| Select First Boot Device | | |
|--------------------------|---------------|--------------------------|
| Floppy | : | 1st Floppy |
| IDE-0 | : | IBM-DTLA-307038 |
| CDROM | : | ATAPI CD-ROM DRIVE 40X M |
| [Up/Dn] Select | [RETURN] Boot | [ESC] cancel |

The boot menu will list all the bootable devices. Select the one you want to boot from by using arrow keys and then pressing <Enter>. The system will boot from the selected device. The selection will not make changes to the settings in the BIOS setup utility, so next time when you power on the system, it will still use the original first boot device to boot up.

Control Keys

| | |
|---------|--|
| <↑> | Move to the previous item |
| <↓> | Move to the next item |
| <←> | Move to the item on the left-hand side |
| <→> | Move to the item on the right-hand side |
| <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 |
| <F6> | Load the default CMOS value from Load High Performance Defaults |
| <F7> | Load BIOS Setup Defaults |
| <F10> | Save all the CMOS changes and exit |

Getting Help

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

Main Menu

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

Default Settings

The BIOS setup program contains two kinds of default settings: the BIOS Setup and High Performance defaults. BIOS Setup defaults provide stable performance settings for all devices and the system, while High Performance defaults provide the best system performance but may affect the system stability.

The Main Menu

Once you enter AMIBIOS NEW 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 setup the items of AMI® special enhanced features.

Advanced Chipset Features

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

Power Management Features

Use this menu to specify your settings for power management.

PNP/PCI Configurations

This entry appears if your system supports PnP/PCI.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

PC Health Status

This entry shows your PC health status.

Frequency/Voltage Control

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

Set Supervisor Password

Use this menu to set Supervisor Password.

Set User Password

Use this menu to set User Password.

Load High Performance Defaults

Use this menu to load the BIOS values for the best system performance, but the system stability may be affected.

Load BIOS Setup Defaults

Use this menu to load factory default settings into the BIOS for stable system performance operations.

Save & Exit Setup

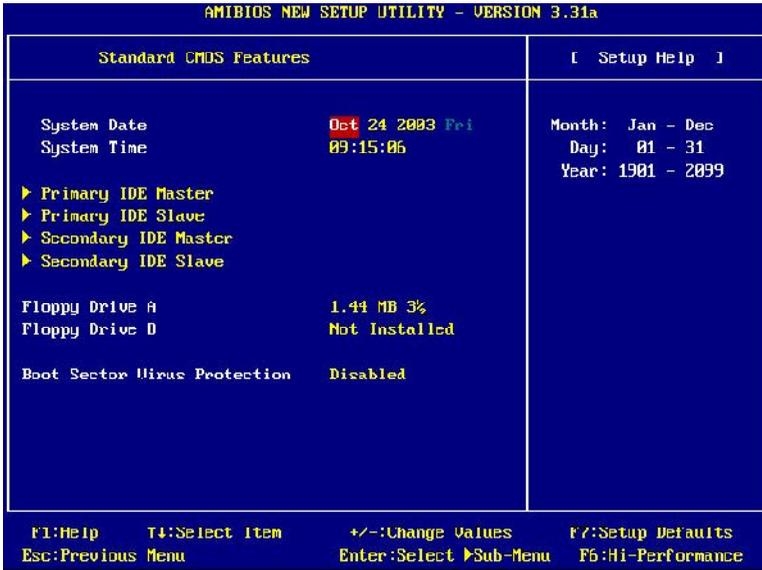
Save changes to CMOS and exit setup.

Exit Without Saving

Abandon all changes and exit setup.

Standard CMOS Features

The items inside STANDARD CMOS FEATURES menu are divided into 9 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.



System Date

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

- 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.
- day** Day of the week, from Sun to Sat, determined by BIOS. Read-only.

System Time

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

Primary/Secondary IDE Master/Slave

Press PgUp/<+> or PgDn/<-> to select the hard disk drive type. The specification of hard disk drive will show up on the right hand according to your selection.

| | |
|--------------------------------------|--|
| <u>Type</u> | Select how to define the HDD parameters |
| <u>Cylinders</u> | Enter cylinder number |
| <u>Heads</u> | Enter head number |
| <u>Write Precompensation</u> | Enter write precomp cylinder |
| <u>Sectors</u> | Enter sector number |
| <u>Maximum Capacity</u> | Read the maximal HDD capacity |
| <u>LBA Mode</u> | Select <i>Auto</i> for a hard disk > 512 MB under Windows and DOS, or <i>Disabled</i> under Netware and UNIX |
| <u>Block Mode</u> | Select <i>Auto</i> to enhance the hard disk performance |
| <u>Fast Programmed I/O Modes</u> | Select <i>Auto</i> to enhance hard disk performance by optimizing the hard disk timing |
| <u>32 Bit Transfer Mode</u> | Enable 32 bit to maximize the IDE hard disk data transfer rate |

Floppy Drive A:/B:

This item allows you to set the type of floppy drives installed. Available options: *Not Installed*, *1.2 MB 5¼*, *720 KB 3½*, *1.44 MB 3½* and *2.88 MB 3½*.

Boot Sector Virus Protection

The item is to set the Virus Warning feature for IDE Hard Disk boot sector protection. When *Enabled*, BIOS will issue a virus warning message and beep if a write to the boot sector or the partition table of the HDD is attempted. Setting options: *Disabled* and *Enabled*.



MSI Reminds You...

This feature only protects the boot sector, not the whole hard disk.

Advanced BIOS Features

| Advanced BIOS Features | | [Setup Help] |
|---------------------------|-----------|----------------|
| Quick Boot | Enabled | |
| Full Screen LOGO Show | Silent | |
| ▶ Boot Device Select ... | | |
| S.M.A.R.T. for Hard Disks | Disabled | |
| BootUp Num-Lock | On | |
| Swap Floppy | Disabled | |
| Seek Floppy | Disabled | |
| Password Check | Setup | |
| Boot OS/2 for DRAM > 64MB | No | |
| Hyper Threading Function | Enabled | |
| APIC Interrupt Mode | Enabled | |
| MPS Revision | 1.4 | |
| CPU L1 & L2 Cache | WriteBack | |
| Flash Protection | Enabled | |
| System BIOS Cacheable | Disabled | |
| C000,32k Shadow | Enabled | |

F1:Help ↑:Select Item +/-:Change Values F7:Setup Defaults
 Esc:Previous Menu Enter:Select ▶Sub-Menu F6:Hi-Performance

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*.

Full Screen Logo Show

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

| | |
|---------------|--|
| <i>Silent</i> | Shows a still image (logo) on the full screen at boot. |
| <i>BIOS</i> | Shows the POST messages at boot. |

Boot Device Select

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

| Boot Device Select ... | |
|------------------------|---------|
| 1st | Floppy: |
| 2nd | IDE-0: |
| 3rd | CD/DVD: |
| Try Other Boot Devices | Yes |

1st/2nd/3rd Boot Device

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

- IDE-0* The system will boot from the first HDD.
- IDE-1* The system will boot from the second HDD.
- IDE-2* The system will boot from the third HDD.
- IDE-3* The system will boot from the fourth HDD.
- Floppy* The system will boot from floppy drive.
- ARMD-FDD* The system will boot from any ARMD device, such as LS-120 or ZIP drive, that functions as a floppy drive.
- ARMD-HDD* The system will boot from ARMD device, such as MO or ZIP drive, that functions as hard disk drive.
- CD/DVD* The system will boot from the CD-ROM/DVD-ROM.
- Legacy SCSI* The system will boot from the SCSI.
- Legacy Network* The system will boot from the Network drive.
- BBS-0* The system will boot from the first BBS (BIOS Boot Specification) compliant device.
- BBS-1* The system will boot from the second BBS (BIOS Boot Specification) compliant device.
- BBS-2* The system will boot from the third BBS (BIOS Boot Specification) compliant device.
- BBS-3* The system will boot from the fourth BBS (BIOS Boot Specification) compliant device.
- USB FDD* The system will boot from USB-interfaced floppy drive.
- USB CDROM* The system will boot from the USB-interfaced CD-ROM.
- USB HDD* The system will boot from the USB-interfaced HDD.
- USB RMD-FDD* The system will boot from any USB-interfaced ARMD device, such as LS-120 or ZIP drive, that functions as a floppy drive.
- USB RMD-HDD* The system will boot from USB-interfaced ARMD device, such as MO or ZIP drive, that functions as hard disk drive.
- Disabled* Disable this sequence.



MSI Reminds You...

1. 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.
2. If you want to boot from any of the USB-interfaced devices, please set **USB Legacy Support** to **All Device**.

Try Other Boot Devices

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

S.M.A.R.T. for Hard Disks

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

BootUp Num-Lock

This item 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 end users to use the arrow keys on the numeric keypad. Setting options: *On, Off*.

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*.

Password Check

This specifies the type of AMIBIOS password protection that is implemented. Setting options are described below.

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

Boot To OS/2 for DRAM > 64MB

This allows you to run the OS/2® operating system with DRAM larger than 64MB. When you choose *No*, you cannot run the OS/2® operating system with DRAM larger than 64MB. But it is possible if you choose *Yes*.

HyperThreading Function

This field is used to enable or disable the Hyper Threading function. Setting to Enabled will increase the system performance. Settings: *Enabled, Disabled*.



MSI Reminds You...

Enabling the functionality of Hyper-Threading Technology for your computer system requires ALL of the following platform Components:

- *CPU: An Intel® Pentium® 4 Processor with HT Technology;
- *Chipset: An Intel® Chipset that supports HT Technology;
- *BIOS: A BIOS that supports HT Technology and has it enabled;
- and
- *OS: An operating system that supports HT Technology.

For more information on Hyper-threading Technology, go to:
www.intel.com/info/hyperthreading

APICInterrupt Mode

This field 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. Settings: *Enabled, Disabled*.

MPS Revision

This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS

version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Settings: *1.4, 1.1*.

CPU L1 & L2 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 setting controls 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, WriteBack, WriteThru*. *WriteBack* & *WriteThru* refer to the cache's write policy, which determines how it handles writes to memory locations that are currently being held in cache. The *WriteBack* cache policy will produce the best performance.

Flash Protection

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

System BIOS Cacheable

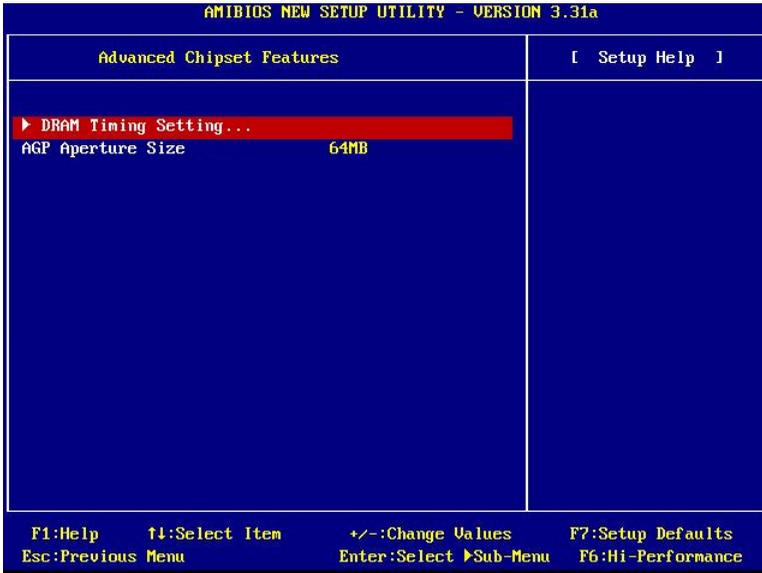
Selecting *Enabled* allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Setting options: *Enabled, Disabled*.

C000, 32k Shadow

This item specifies how the contents of the adapter ROM named in the item are handled. Settings are described below:

| Option | Description |
|---------------|--|
| Disabled | The specified ROM is not copied to RAM. |
| Enabled | The contents of specified ROM are copied to RAM for faster system performance. |
| Cached | The contents of specified ROM are not only copied to RAM, the contents of the ROM area can be written to and read from cache memory. |

Advanced Chipset Features



MSI Reminds You...

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

DRAM Timing Setting

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



DRAM Frequency

Use this field to configure the clock frequency of the installed DRAM. Settings are: *SPD, 200MHz, 266MHz, 333MHz, Auto.*

Configure SDRAM Timing by SPD

Selects whether DRAM timing is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to *Enabled* enables the following fields automatically to be determined by BIOS based on the configurations on the SPD. Selecting *Disabled* allows users to configure these fields manually.

CAS# Latency

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

RAS# Precharge

This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Available settings: *2 clocks, 3 clocks.*

RAS# to CAS# Delay

When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance. Setting options: *3 clocks, 2 clocks.*

Precharge Delay

This setting controls the precharge delay, which determines the timing delay for DRAM precharge. Settings: *5 clocks, 6 clocks, 7 clocks.*

Burst Length

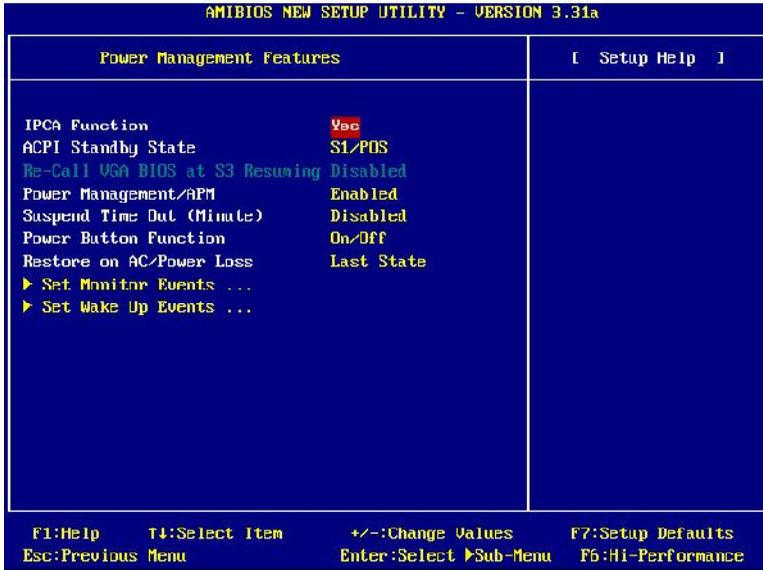
This setting allows you to set the size of Burst-Length for DRAM. Bursting feature is a technique that DRAM itself predicts the address

of the next memory location to be accessed after the first address is accessed. To use the feature, you need to define the burst length, which is the actual length of burst plus the starting address and allows internal address counter to properly generate the next memory location. The bigger the size, the faster the DRAM performance. Available settings: 4, 8.

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 *4MB, 8MB, 16MB, 32MB, 64MB, 128MB, and 256 MB*.

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 *Yes*. Available options: *Yes, No*.

ACPI Standby State

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

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

| | |
|---------------|--|
| <i>S3/STR</i> | 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. |
| <i>Auto</i> | BIOS determines the best mode automatically. |

Re-Call VGA BIOS at S3 Resuming

Selecting *Enabled* 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.

Power Management/APM

Setting to *Enabled* will activate an Advanced Power Management (APM) device to enhance Max Saving mode and stop CPU internal clock. Settings: *Disabled, Enabled*.

Suspend Time Out (Minute)

After the selected period of system inactivity, all devices except the CPU shut off. Settings: *Disabled, 1, 2, 4, 8, 10, 20, 30, 40, 50, 60*.

Power Button Function

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

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

Restore on AC/Power Loss

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

| | |
|-------------------|--|
| <i>Power Off</i> | Leaves the computer in the power off state. |
| <i>Power On</i> | Leaves the computer in the power on state. |
| <i>Last State</i> | Restores the system to the previous status before power failure or interrupt occurred. |

Set Monitor Events

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

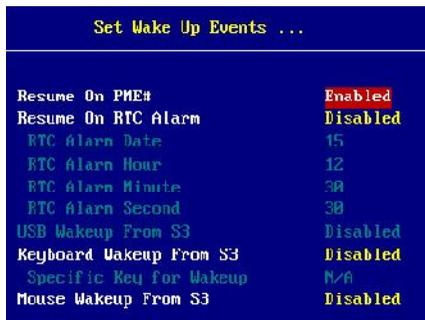


FDC/LPT/COM Ports, Primary/Secondary master/Slave IDE

These items specify if the BIOS will monitor the activity of the specified hardware peripheral or component. If set to *Monitor*, any activity detected on the specified hardware peripheral or component will wake up the system or prevent the system from entering the power saving modes. Settings: *Monitor, Ignore*.

Set WakeUp Events

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



Resume On PME#

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

Resume On RTC Alarm

This is used to enable or disable the feature of booting up the system on

a scheduled time/date from the soft off (S5) state. Settings: *Enabled, Disabled*.

RTC Alarm Date/Hour/Minute/Second

If *Resume On RTC 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.

USB Wakeup From S3

This item allows the activity of the USB device to wake up the system from S3 (Suspend to RAM) sleep state. Settings: *Enabled, Disabled*.

Keyboard Wakeup From S3

This item allows the activity of the keyboard to wake up the system from S3 (Suspend to RAM) sleep state. Settings: *Disabled, Any Key, Specific Key*.

Specific Key for Wakeup

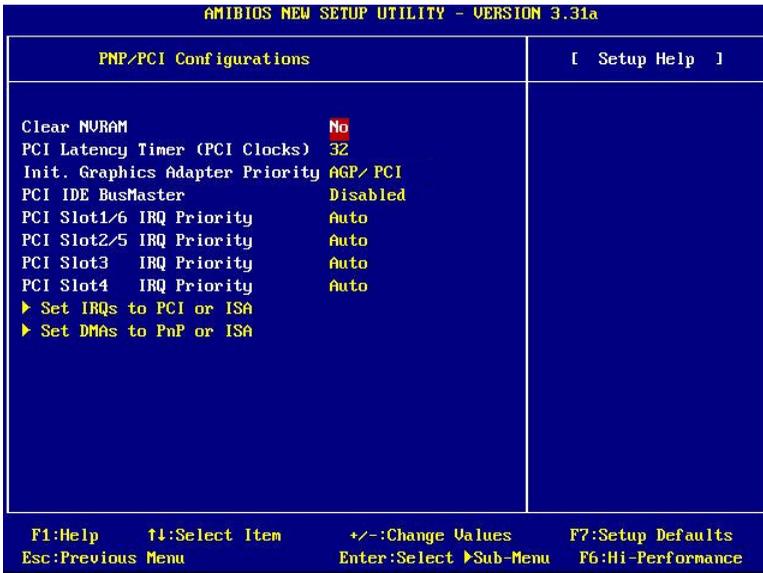
This setting allows users to set a password (max. 5 letters) for the *Keyboard Wakeup From S3* function.

Mouse Wakeup From S3

This item allows the activity of the mouse to wake up the system from S3 (Suspend to RAM) sleep state. Settings: *Disabled, Any Action, Left-button, Right-button*.

PNP/PCI Configurations

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



ClearNVRAM

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

PCILatency Timer (PCI Clocks)

This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can conduct transac-

tions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values. Settings range from 32 to 248 at a 32 increment.

Init. Graphics Adaptor Priority

This setting specifies which VGA card is your primary graphics adapter. Setting options are:

| | |
|----------------|---|
| <i>PCI/AGP</i> | The system initializes the installed PCI VGA card first. If the PCI VGA card is not available, it will initialize the AGP card. |
| <i>AGP/PCI</i> | The system initializes the installed AGP card first. If the AGP card is not available, it will initialize the PCI VGA card. |

PCIIDE BusMaster

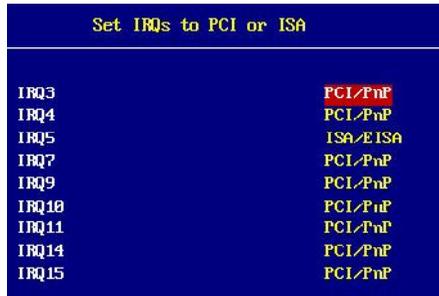
Set this option to *Enabled* to specify that the IDE controller on the PCI local bus has bus mastering capability. Settings options: *Disabled, Enabled*.

PCISlot 1/6, 2/5, 3, 4 IRQ Priority

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

Set IRQs to PCI or ISA

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



IRQ 3/4/5/7/9/10/11/14/15

These items specify the bus where the specified IRQ line is used. The settings determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the IRQ pool, the end user can use these settings to reserve the IRQ by assigning an *ISA/EISA* setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as *PCI/PnP*. If all IRQs are set to *ISA/EISA*, and IRQ 14/15 are allocated to the onboard PCIIDE, IRQ 9 will still be available for PCI and PnP devices. Available settings: *ISA/EISA*, *PCI/PnP*.

Set DMAs to PnP or ISA

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

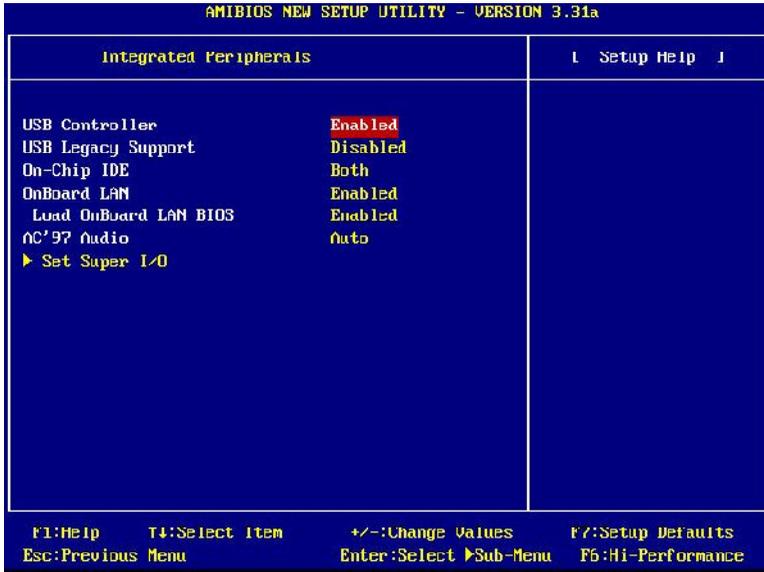


DMA Channel 0/1/3/5/6/7

These items specify the bus that the system DMA (Direct Memory Access) channel is used.

The settings determine if AMIBIOS should remove a DMA from the available DMAs passed to devices that are configurable by the system BIOS. The available DMA pool is determined by reading the ESCD NVRAM. If more DMAs must be removed from the pool, the end user can reserve the DMA by assigning an *ISA/EISA* setting to it.

Integrated Peripherals



USB Controller

This setting is used to enable/disable the onboard USB controllers. Setting options: *Enabled, Disabled*.

USB Legacy Support

Set to *All Device* if you need to use a USB device in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix. Set to *No Mice* if you want to use any USB device except the mouse. Setting options: *Disabled, No Mice, All Device*.

On-Chip IDE

This setting controls the onboard IDE controller. Setting options: *Disabled, Primary, Secondary, Both*.

OnBoard LAN

The field determines whether the onboard LAN controller is activated. Setting options: *Enabled, Disabled*.

LoadOnBoardLANBIOS

This feature gives you the option to load the onboard LAN BIOS or not. Setting options: *Enabled, Disabled*.

AC'97 Audio

Auto allows the mainboard to detect whether an audio device is used. If an audio 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. Settings: *Auto, Disabled*.

Set Super I/O

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



OnBoard FDC

This is used to enable or disable the onboard Floppy controller.

| Option | Description |
|---------------|---|
| Auto | BIOS will automatically determine whether to enable the onboard Floppy controller or not. |
| Enabled | Enables the onboard Floppy controller. |
| Disabled | Disables the onboard Floppy controller. |

OnBoard Serial Port A

These items specify the base I/O port addresses of the onboard Serial Port A (COM A). Selecting *Auto* allows AMIBIOS to automatically determine the correct base I/O port address. Settings: *Auto, 3F8/COM1, 2F8/COM2, 3E8/COM3, 2E8/COM4, Disabled*.

OnBoard Parallel Port

This field specifies the base I/O port address of the onboard parallel port. Selecting *Auto* allows AMIBIOS to automatically determine the correct base I/O port address. Settings: *Auto, 378, 278, 3BC, Disabled*.

ParallelPort Mode

This item selects the operation mode for the onboard parallel port: *ECP, Normal, Bi-Dir* or *EPP*.

EPP Version

The item selects the EPP version used by the parallel port if the port is set to *EPP* mode. Settings: *1.7, 1.9*.

Parallel Port IRQ

When parallel port is set to *Auto*, the item shows *Auto* indicating that BIOS determines the IRQ for the parallel port automatically.

Parallel Port DMA Channel

This feature needs to be configured only when *Parallel Port Mode* is set to the *ECP* mode. When parallel port is set to *Auto*, the field will show *Auto* indicating that BIOS automatically determines the DMA channel for the parallel port.

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.

| PC Health Status | | Setup Help |
|--------------------|------------|------------|
| Chassis Intrusion | Disabled | |
| CPU Temperature | 88°C/176°F | |
| System Temperature | 39°C/102°F | |
| CPU Fan Speed | | |
| System Fan Speed | | |
| Vcore | | |
| 3.3V | | |
| +5.0V | | |
| +12.0V | | |
| -12.0V | | |
| Battery | | |
| +5V SB | | |

F1:Help T4:Select Item +/-:Change Values F7:Setup Defaults
 Esc:Previous Menu Enter:Select Sub-Menu F6:Hi-Performance

Chassis Intrusion

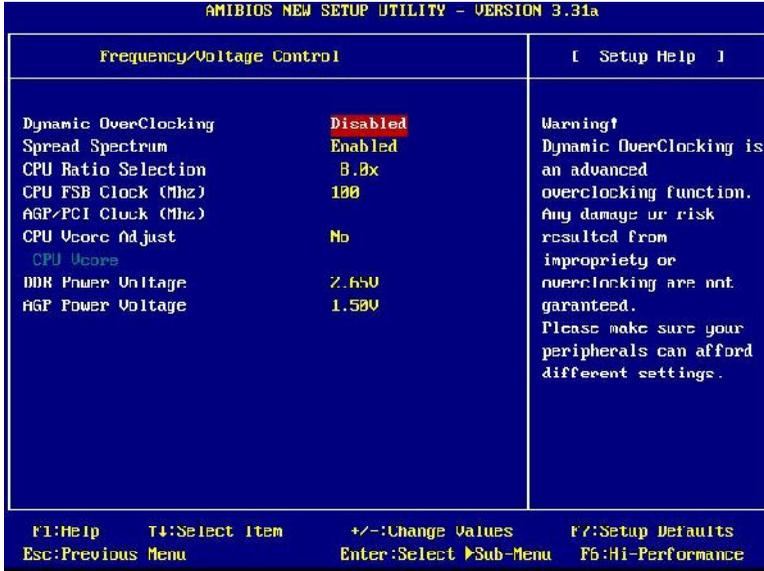
The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to *Reset*. The setting of the field will automatically return to *Enabled* later. Settings: *Enabled, Reset, Disabled*.

CPU/System Temperature, CPU/System Fan Speed, Vcore, 3.3V, +5.0V, +12.0V, -12.0V, Battery, +5V SB

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

Frequency/Voltage Control

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



Dynamic OverClocking

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

| | |
|-----------------|----------------------------------|
| <i>Disabled</i> | disable Dynamic Overclocking |
| <i>Private</i> | increase the CPU frequency by 1% |
| <i>Sergeant</i> | increase the CPU frequency by 3% |

| | | |
|----------------|----------|--------------------------|
| <i>Captain</i> | increase | the CPU frequency by 5% |
| <i>Colonel</i> | increase | the CPU frequency by 7% |
| <i>General</i> | increase | the CPU frequency by 10% |



MSI Reminds You...

Dynamic OverClocking is an advanced overclocking function. Any damage or risk resulted from impropriety or overclocking is not guaranteed.

Spread Spectrum

When the motherboard clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at *Disabled* for optimal system stability and performance. But if you are plagued by EMI, select *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. Available settings: *Enabled, Disabled*.

CPU Ratio Selection

This setting controls the multiplier that is used to determine the internal clock speed of the processor relative to the external or motherboard clock speed.

CPU FSB Clock (Mhz)

This item allows you to select the CPU Front Side Bus clock frequency. The field also allows you to overclock the processor by adjusting the FSB clock to a higher frequency.

AGP/PCIClock (MHz)

This item allows you to select the AGP/PCI clock frequency.

CPU Vcore Adjust

This setting is used to enable or disable the ability to adjust CPU Vcore for overclocking purpose. Setting options: *Yes, No*.

CPU Vcore

Users can specify preferred CPU core voltage (Vcore) in this field if **CPU Vcore Adjust** is preset to *Yes*.



MSI Reminds You...

*Changing CPU Ratio/Vcore could result in the instability of the system; therefore, it is **NOT** recommended to change the default setting for long-term usage.*

DDR/AGP Power Voltage

Adjusting the DDR/AGP voltage can increase the DDR/AGP speed. Any changes made to these settings may cause a stability issue, so ***changing the DDR/AGP voltage for long-term purpose is NOT recommended.***

Set Supervisor/User Password

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

| | |
|-----------------------------------|-----------------------------|
| [Enter new supervisor password] | [Enter new user 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 AMIBIOS 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 PASSWORD CHECK option of the ADVANCED BIOS FEATURES menu. If the PASSWORD CHECK option is set to *Always*, 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.

Load High Performance/BIOS Setup Defaults

The two options on the main menu allow users to restore all of the BIOS settings to High Performance defaults or BIOS Setup defaults. The High Performance Defaults are the values set by the mainboard manufacturer for the best system performance but probably will cause a stability issue. The BIOS Setup Defaults are the default values also set by the mainboard manufacturer for stable performance of the mainboard.

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

```
[ Load High Performance Defaults ]
WARNING! This default might have potential reliability risk.
Press [Enter] to Continue
Or [ESC] to Abort
```

Pressing ‘Enter’ loads the default BIOS values that enable the best system performance but may lead to a stability issue.



MSI Reminds You...

The option is for power or overclocking users only. Use of high performance defaults will tighten most timings to increase the system performance. Therefore, a high-end system configuration is a must, which means you need high-quality VGA adapter, RAM and so on. We don't recommend that users should apply the high performance defaults in their regular systems. Otherwise, the system may become unstable or even crash. If the system crashes or hangs after enabling the feature, please CLEAR CMOS DATA to resolve the problem. For more information, refer to “Clear CMOS Jumper:JBAT1” in Chapter 2.

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

```
[ Load BIOS Setup Defaults ]
Press [Enter] to Continue
Or [ESC] to Abort
```

Pressing ‘Enter’ loads the default values that are factory settings for stable system performance.

Appendix A: Using 2-, 4- & 6-Channel Audio Function

The mainboard is equipped with Realtek ALC655 chip, which provides support for 6-channel audio output, including 2 Front, 2 Rear, 1 Center and 1 Subwoofer channel. ALC655 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.

Installing the Audio Driver

You need to install the driver for Realtek ALC655 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 **Realtek AC97 Audio Drivers**.



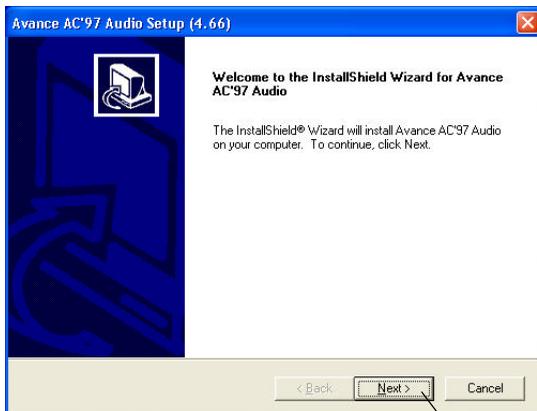
Click here



MSI Reminds You...

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

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



Click here

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



Select this option

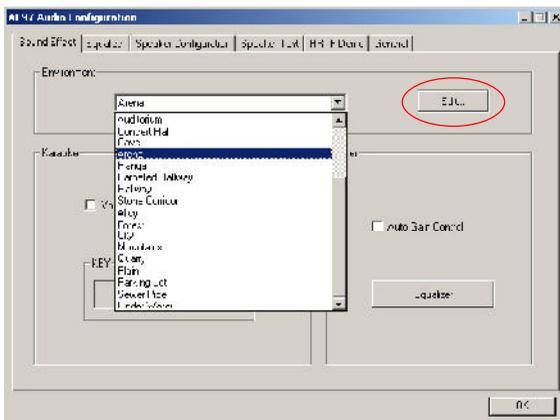
Click here

Software Configuration

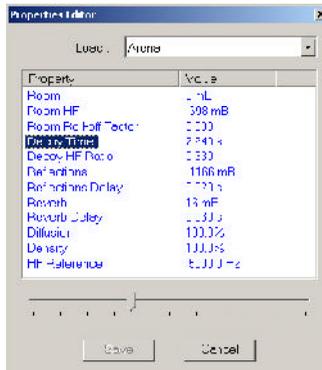
After installing the audio driver, you are able to use the 4-/6-channel audio feature now. Click the audio icon  from the window tray at the lower-right corner of the screen to activate the **AC97 Audio Configuration**.

Sound Effect

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

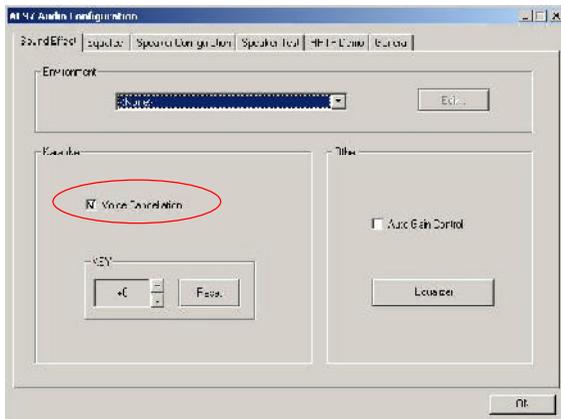


You may also edit the properties for an environment as you wish by clicking the **Edit** button, then just scroll the bar in the bottom for each property to adjust.



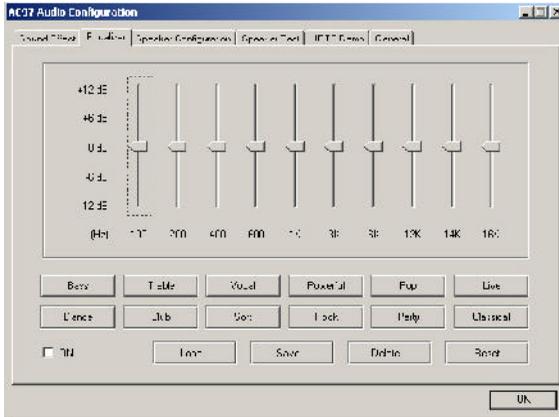
Here it provides the Karaoke function which will automatically remove human voice (lyrics) and leave melody for you to sing the song. Note that this function applies only for 2-channel audio operation.

Just check the **Voice Cancellation** box and then click **OK** to activate the Karaoke function.

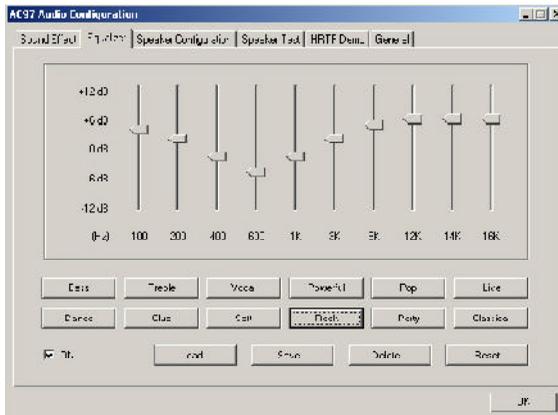


Equalizer

Here you regulate each equalizer for current playing digital sound sources.



You may choose the provided sound effects, and the equalizer will adjust automatically. If you like, you may also load an equalizer setting or make an new equalizer setting to save as an new one by using the buttons **Load** and **Save**. Or you may click **Reset** to use the default value.

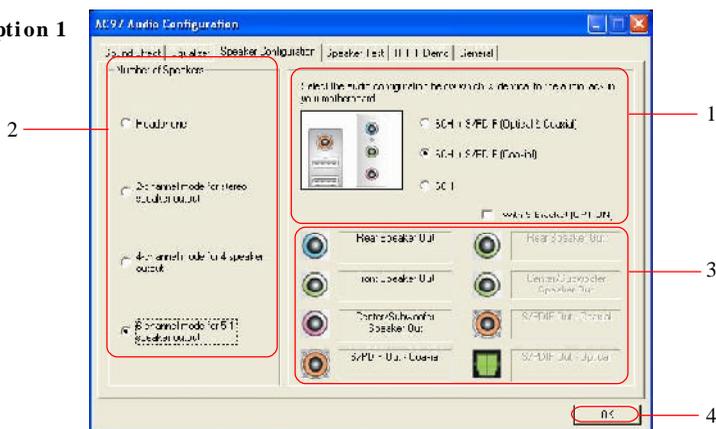


Speaker Configuration

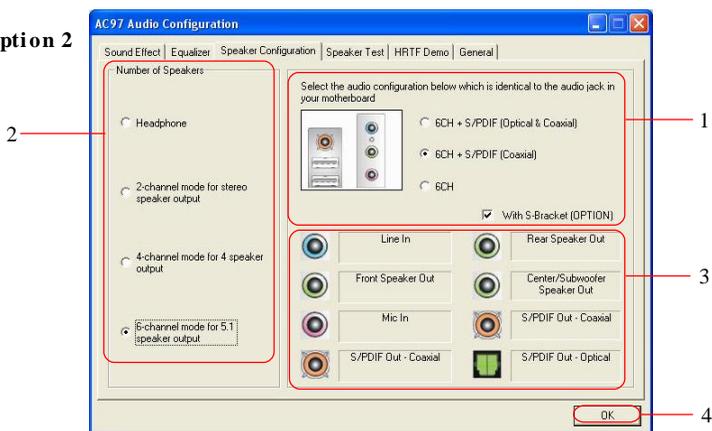
In this tab, you can easily configure your multi-channel audio function and speakers.

1. Select the audio configuration below which is identical to the audio jack on your mainboard. Option 1 is **6CH+ S/PDIF (Coaxial)** without S-Bracket. Option 2 is **6CH+ S/PDIF (Coaxial)** with S-Bracket.

Option 1



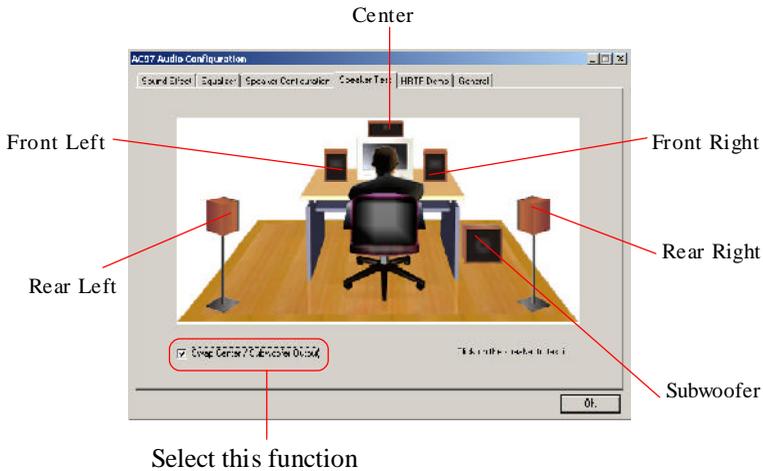
Option 2



2. Select a desired multi-channel operation from *Number of Speakers*.
 - a. Headphone for the common headphone
 - b. 2-Channel Mode for Stereo-Speaker Output
 - c. 4-Channel Mode for 4-Speaker Output
 - d. 6-Channel Mode for 5.1-Speaker Output
3. Here it shows the multi-channel setting for the audio jack. Please connect your speakers to the correct phone jack in accordance with the setting displayed here.
4. Then click **OK** to apply the configuration.

Speaker Test

You can use this tab to test each connected speaker to ensure if 4- or 6-channel audio operation works properly. If any speaker fails to make sound, then check whether the cable is inserted firmly to the connector or replace the bad speakers with good ones.



Select the speaker by clicking it to test its functionality. The one you select will light up and make testing sound.



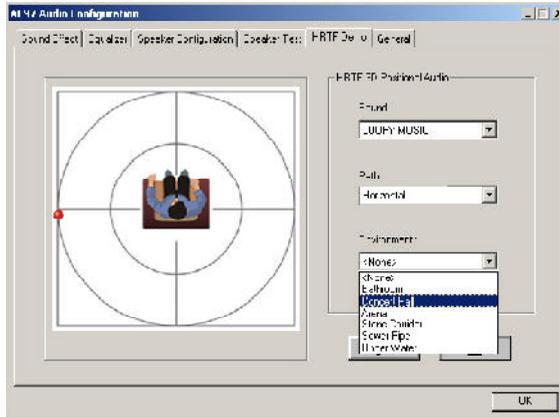


MSI Reminds You...

1. *6 speakers appear on the “Speaker Test” tab only when you select “**6-Channel Mode**” in the “Number of Speakers” column in “Speaker Configuration” tab. If you select “4-Channel Mode”, only 4 speakers appear on the window.*
2. *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.*

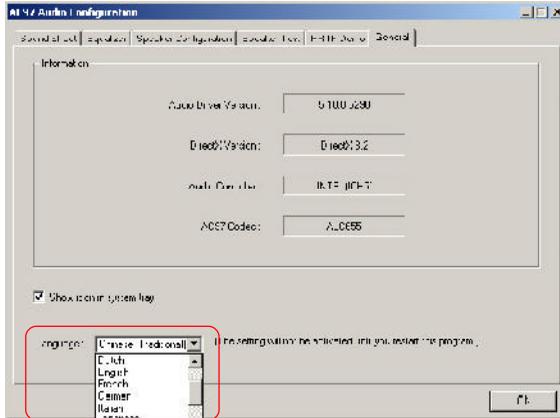
HRTF Demo

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



General

In this tab it provides some information about the AC97 Audio Configuration utility, including Audio Driver Version, DirectX Version, Audio Controller & AC97 Codec. You may also select the language of this utility by choosing from the **Language** list.



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

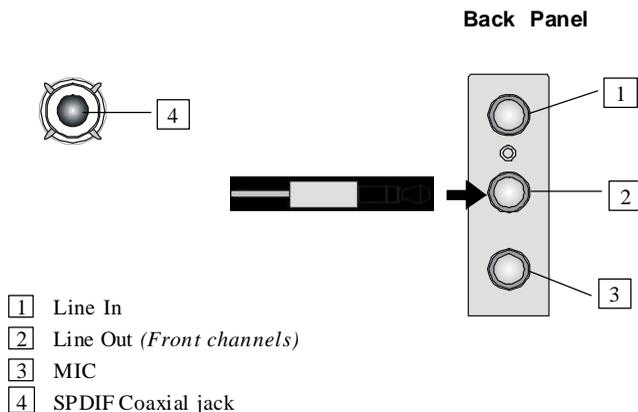
Option 1: 6CH+SPDIF (coaxial) without S-Bracket

Connecting the Speakers

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

■ 2-Channel Mode for Stereo-Speaker Output

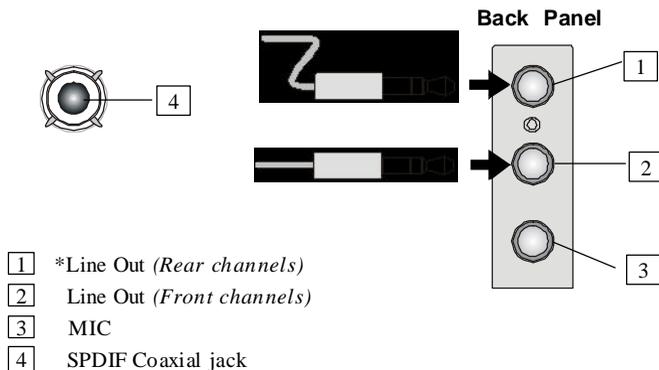
Refer to the following diagram and caption for the function of each phone jack on the back panel when 2-Channel Mode is selected.



■ 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**.

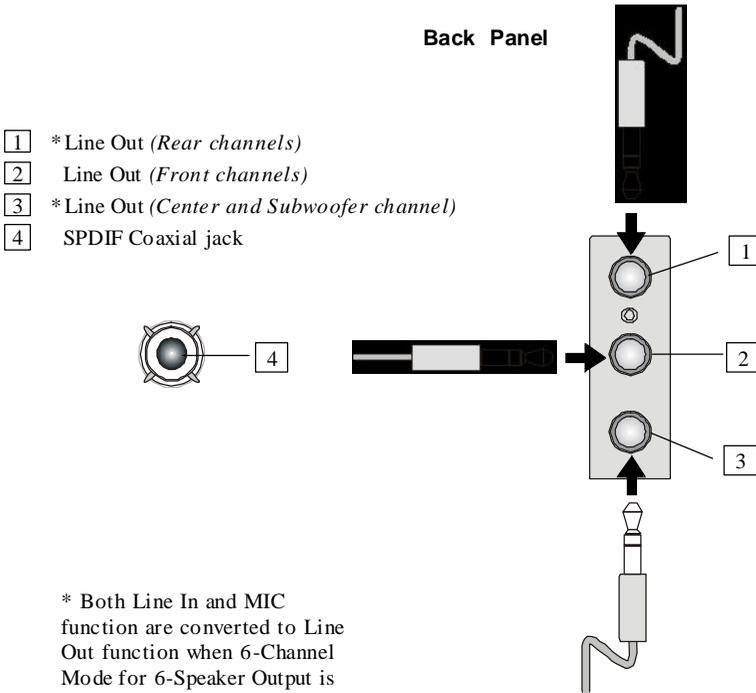
Refer to the following diagram and caption for the function of each jack on the back panel when 4-Channel Mode is selected.



* 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.



MSI Reminds You...

If the audio signals coming from the Center and Subwoofer speaker are swapped when you play video or music on the computer, a converter may be required to exchange center and subwoofer audio signals. The converter can be purchased from a speaker store.

Option 2: 6CH+SPDIF (coaxial) with S-Bracket

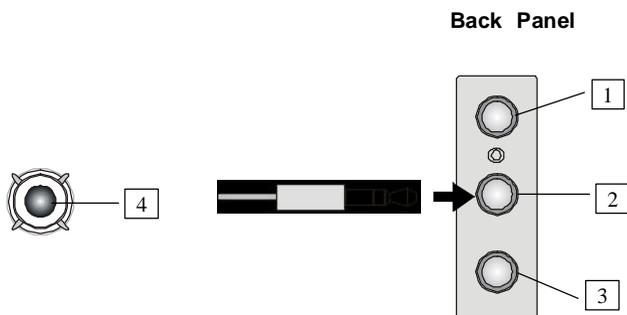
S-Bracket is an optional accessory. It gives access to analog and digital audio output by integrating both SPDIF (Sony & Philips Digital Interface) and analog LINE OUT connectors. To use the S-Bracket, you should select correct setting in the software utility. For information about the setting, refer to *Selecting 2-, 4- or 6-Channel Setting* later in the section.

Connector configurations for 2-, 4- and 6-channel using S-Bracket are described below:

2-Channel Analog Audio Output

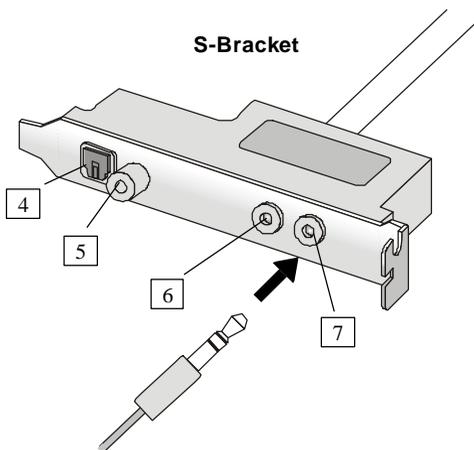
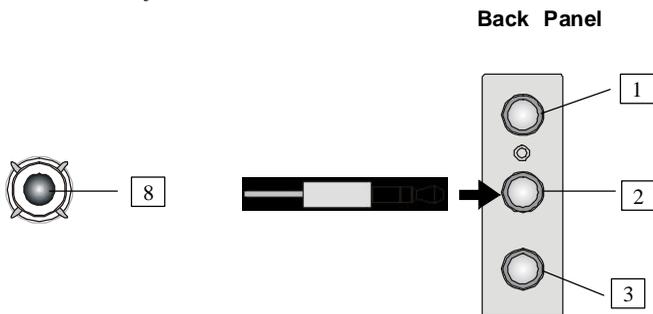
We recommend that you should still attach the speakers to BACK PANEL's Line Out connector during 2-channel audio mode even though S-Bracket's Line Out connectors function properly.

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



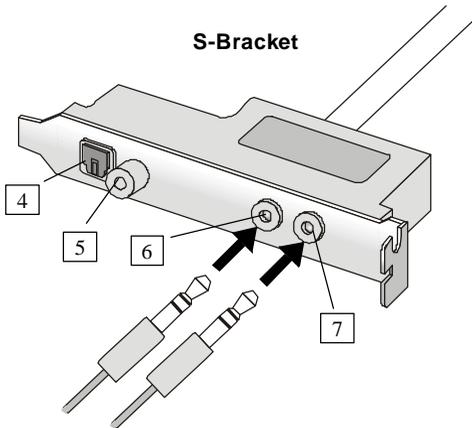
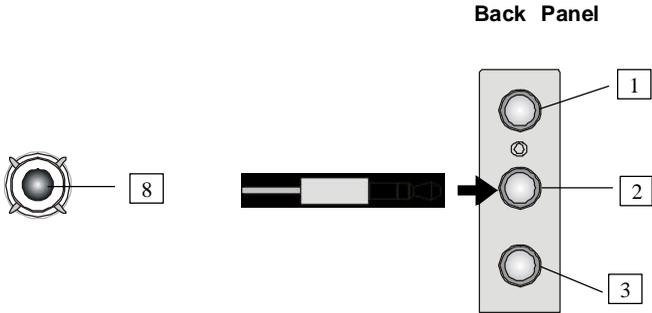
4-Channel Analog Audio Output

- 1 Line In
- 2 Line Out (Front channels)
- 3 MIC
- 4 Optical SPDIF jack
- 5 Coaxial SPDIF jack
- 6 Line Out (Center and Subwoofer channels, but no function in this mode)
- 7 Line Out (Rear channels)
- 8 Coaxial SPDIF jack



6-Channel Analog Audio Output

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

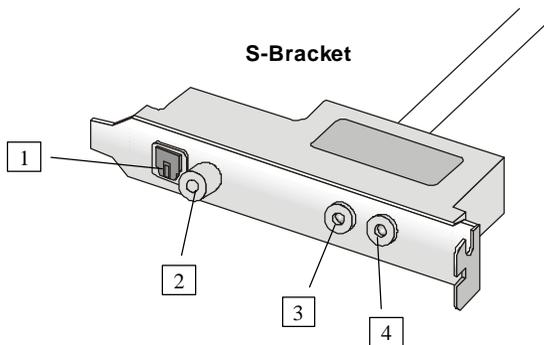


Digital Audio Output (2-Channel only)

For digital audio output, use the SPDIF (Sony & Philips Digital Interface) connectors supplied by *S-Bracket*. First, connect the SPDIF speakers to the appropriate SPDIF jack, and then select the audio channel you desire through the control panel of speakers. The SPDIF connectors support 2-channel audio operation only.

S-Bracket offers two types of SPDIF jacks: one for fiber-optic cable and the other for coaxial cable. Select the connector according to the type of your SPDIF speakers.

- 1 Optical SPDIF jack
- 2 Coaxial SPDIF jack
- 3 Line Out
- 4 Line Out



Description:

Select the correct type of SPDIF jack to connect SPDIF speakers. For optical connection, remove the plug from the S-Bracket before inserting the fiber-optic cable to it.

Appendix B: The explanation for overspecification and overclocking on Intel® 845PE chipset

The default specification of Intel® 845PE chipset is only able to support FSB 400/533MHz CPU and DDR 266/333 DRAM technology. However, we have spent engineering efforts to allow the overspecification and overclocking of 845PE Max under certain conditions. Here is the information which could help you to achieve overclocking more easily.

Should you decide to overspec the mainboard, the following conditions shall be satisfied in order to make overspecification possible.

1. Memory Speed/CPUFSB Overclocking Support Matrix

| Memory CPU FSB | DDR 266 / PC 2100 DDR 333 / PC 2700 | DDR 400 / PC 3200 |
|-------------------|--|-------------------|
| 400MHz | Yes | N/A |
| 533MHz | Yes | N/A |
| 800MHz* | N/A | Overclocking |

*: CPU FSB 800MHz/DDR400 is not the default specification of this mainboard. If you decided to use Intel's FSB 800MHz CPU to overclock on this mainboard, DDR400 DRAM modules should be used, and have them populated in the suggested configuration.

Because Intel's CPU & chipset only support synchronous mode operation, if you decided to use DDR333 DRAM with FSB 800MHz CPU, the BIOS will automatically adjust the CPU ratio to the FSB frequency comparable to DDR333 DRAM, which prevents the CPU from running at FSB800MHz speed.

Overclocking: Overclocking on this mainboard is only available with this combination. With this combination, the 800MHz FSB CPU could be used.

Note: If you want to upgrade to 800MHz FSB with a 533MHz CPU, then you need to manually set the CPU external frequency to 200MHz. However, make sure the CPU ratio multiplier is unlocked.

2. Configure BIOS settings

You also need to configure BIOS settings for overclocking.

A. In the “Advanced Chipset Features”, go to the sub-menu “DRAM Timing Settings” and set the “DRAM Frequency” to “Auto”.

| AMIBIOS NEW SETUP UTILITY - DRAM TIMING | |
|---|----------------|
| DRAM Timing Setting... | [Setup Help] |
| DRAM Frequency | Auto |
| Configure DRAM Timing by SPD | Enabled |
| CAS# Latency | 2.5 Clocks |
| RAS# Precharge | 4 Clocks |
| RAS# to CAS# Delay | 4 Clocks |
| Precharge Delay | 8 Clocks |
| Burst Length | 4 |

B. In the “Frequency/Voltage Control”, set “CPU FSB Clock (MHz)” as 200, which will make CPU FSB runs at 800 MHz.

| AMIBIOS NEW SETUP UTILITY - FREQUENCY/VOLTAGE | |
|---|----------------|
| Frequency/Voltage Control | [Setup Help] |
| Spread Spectrum | Disabled |
| CPU Ratio Selection | 0.0X |
| CPU FSB Clock (MHz) | 200 |
| AGP/PCI Clock (MHz) | AUTO |
| CPU Voltage Adjust. | No |
| CPU Voltage | 1.525V |
| DDR Power Voltage | 2.5V |
| AGP Power Voltage | 1.5V |

3. System configuration and DDR 400/PC 3200 Qualified Memory Test List

When using DDR400 memory modules, a maximum of 2 DIMMs are recommended. Please refer to the system configuration and DDR400/PC3200 DIMMs listed below for overclocking.

Table 1: System Configuration

| System Configuration | | | | |
|----------------------|--------------|--------------|-----------------|----------------|
| Device Configuration | Processor | Manufacturer | Model No. Spec. | |
| | Memory | As Follows | | |
| | VGA Card | MSI | MS-8826 | G2MX400 |
| | Lan Card | Onboard | | |
| | Sound Card | Onboard | | |
| | Hard Drive | WD | Caviar 205BA | 20.5GB, ATA-66 |
| | CD-ROM | Teac | CD-540E | 40X |
| | Floppy Drive | Teac | FD-235HF | |
| | Power Supply | FSP | 250-60GTA | |
| | Mouse | Logitech | PS2 | |
| | Keyboard | Nax | KB-6868 PS2 | |
| | Monitor | Decaview | G387 | |
| SW/Info | VGA BIOS | 3.11.01.30 | | |
| | VGA Driver | 2.9.5.8 | | |

Table 2: DDR400/PC3200 Memory Test List

| Model | | Size | Memory Slot | | | | Memory Bandwidth Benchmark | R.S.T |
|---------------|-----------------------------|-------|-------------|---|---|---|-------------------------------|-------|
| | | | 1 | 2 | 3 | 4 | | |
| Infineon * | HYS64D16301GU-5-B | 128MB | √ | √ | | | OK | OK |
| | (Infineon HYB25D256160BT-5) | | | √ | | | OK | OK |
| Nanya * | NT128D64SH4B1G-5 | 128MB | √ | √ | | | OK | OK |
| | (Nanya NT5DS16M16BT-5) | | | √ | | | OK | OK |
| Nanya * | NT128D64SH4B1G-5T | 128MB | √ | √ | | | OK | OK |
| | (NT5DS16M16BT-5T) | | | √ | | | OK | OK |

| Model | | Size | Memory Slot | | | | Memory Bandwidth Benchmark | R.S.T |
|----------------|-------------------------------|-------|-------------|---|---|---|-------------------------------|-------|
| | | | 1 | 2 | 3 | 4 | | |
| A-DATA | MD0M05F3G31JB1EAZ | 256MB | √ | √ | | | OK | OK |
| | (Mosel V58C2256804SAT5) | | | √ | | | OK | OK |
| A-DATA | MD0WB5F3G31JD1EZZ | 256MB | √ | √ | | | OK | OK |
| | (WinBond W942508CH-5) | | | √ | | | OK | OK |
| Apacer | 73.85397.460 | 256MB | √ | √ | | | OK | OK |
| | (SEC K4H560838D-TCC4) | | | √ | | | OK | OK |
| Apacer | 77.10636.115 | 256MB | √ | √ | | | OK | OK |
| | (Infineon HYB25D256800BT-5B) | | | √ | | | OK | OK |
| Apacer | 77.10639.535 | 256MB | √ | √ | | | OK | OK |
| | (PSC A2S56D30ATP-5) | | | √ | | | OK | OK |
| ATP * | AG32L72T8SQC4S | 256MB | √ | √ | | | OK | OK |
| | (SEC K4H560838D-TCC4) ECC | | | √ | | | OK | OK |
| CORSAIR * | CMX256A-3500C2PT XMS3502 V1.1 | 256MB | √ | √ | | | OK | OK |
| | | | | √ | | | OK | OK |
| CORSAIR | CMX256A-3200LL XMS3205V1.2 | 256MB | √ | √ | | | OK | OK |
| | | | | √ | | | OK | OK |
| Crucial/Micron | BQ1118L.FT | 256MB | √ | √ | | | OK | OK |
| | (Micron MT46V32M8TG-5B) | | | √ | | | OK | OK |
| Elixir | M2U25664DS88B3G-5T | 256MB | √ | √ | | | OK | OK |
| | (Elixir N2DS25680BT-5T) | | | √ | | | OK | OK |
| GeIL | GL2563200U | 256MB | √ | √ | | | OK | OK |
| | (GeIL GL3LC32G88TG-5A) | | | √ | | | OK | OK |
| GeIL | GE2563200B | 256MB | √ | √ | | | OK | OK |
| | | | | √ | | | OK | OK |
| GeIL | GD3200-512DC | 256MB | √ | √ | | | OK | OK |
| | | | | √ | | | OK | OK |

The explanation for overspecification and overclocking

| Model | | Size | Memory Slot | | Memory Bandwidth | R.S.T |
|----------------|---|-------|-------------|---|------------------|-------|
| | | | 1 | 2 | Benchmark | |
| Apacer | 77.10736.583 (Winbond W942508BH-5) | 512MB | | | - | - |
| | | | √ | | OK | OK |
| ATP | AG64L64T8SOC4S (SEC K4H560838E -TCCC) | 512MB | √ | √ | OK | OK |
| CORSAIR | CMX512-3500C2PT XMS3502 V1.1 | 512MB | √ | √ | OK | OK |
| | | | | √ | OK | OK |
| Crucial/Micron | BG111DB.FB (Micron MT46V32M8TG-5B) ECC | 512MB | √ | √ | OK | OK |
| | | | | √ | OK | OK |
| GeIL | GE5123200B GD3200-1GBDC | 512MB | | | - | - |
| | | | √ | | OK | OK |
| Hynix | HYMD264646A8J-D43 (Hynix HY5DU56822AT-D43) | 512MB | | | - | - |
| | | | | √ | OK | OK |
| Hynix | HYMD264646B8J-D43 (Hynix HY5DU56822BT-D43) | 512MB | √ | √ | OK | OK |
| | | | | √ | OK | OK |
| Infineon | HYS64D64320UH-5-C (Infineon HYB25D256800CE-5C) | 512MB | √ | √ | OK | OK |
| | | | | √ | OK | OK |
| KingMax | MPXC22D-38KT3R | 512MB | | | - | - |
| | | | | √ | OK | OK |
| Kingston | KVR400X64C25/512 (Winbond W942508BH-5) | 512MB | | | - | - |
| | | | | √ | OK | OK |
| Micron | MT16VDDT6464AG-40BC4 (Micron MT46V32M8TG-5B C) | 512MB | √ | √ | OK | OK |
| | | | | √ | OK | OK |
| Nanya | NT512D64S8HB1G-5T (Nanya NT5DS32M8BT-5T) | 512MB | √ | √ | OK | OK |
| | | | | √ | OK | OK |
| ProMOS | V826664K24SBTG-D3 (ProMOS V58C2256804SBT-5) | 512MB | √ | √ | OK | OK |
| | | | | √ | OK | OK |
| PSC | AL6D8A53TK1-5B (PSC A2S56D30ATP-5) | 512MB | √ | √ | OK | OK |
| | | | | √ | OK | OK |
| PSC | AL6D8B53T-5B1K (PSC A2S56D30BTP-5) | 512MB | √ | √ | OK | OK |
| | | | | √ | OK | OK |
| SEC | M368L6423DTM-CC4 (SEC K4H560838D-TCC4) | 512MB | √ | √ | OK | OK |
| | | | | √ | OK | OK |
| SEC | M368L6423ETM-CCC (SEC K4H560838E -TCCC) | 512MB | √ | √ | OK | OK |
| | | | | √ | OK | OK |
| Siemens | SDU03264B4B31MT-50 (Micron MT46V32M8TG-5B) | 512MB | √ | √ | OK | OK |
| | | | | √ | OK | OK |

| Model | | Size | Memory Slot | | | | Memory Bandwidth | R.S.T |
|-----------|------------------------------|-------|-------------|---|---|---|------------------|-------|
| | | | 1 | 2 | 3 | 4 | Benchmark | |
| Siemens | SDU06464H1B22IN-50 | 512MB | √ | √ | | | OK | OK |
| | (Infineon HYB25D256800BT-5B) | | | √ | | | OK | OK |
| Transcend | TS64MLD64V4F3 | 512MB | √ | √ | | | OK | OK |
| | (SEC K4H560838D-TCCC) | | | √ | | | OK | OK |
| Winbond | W9451GCDB-5 | 512MB | | | | | - | - |
| | (WinBond W942508CH-5) | | | √ | | | OK | OK |

[-] : Not Support