845PE Neo

MS-6580 (v3.X) ATX Mainboard

Version 3.0
G52-M6580XH

Manual Rev: 3.0
Release Date: July 2003

$C \in$ **N1996**

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.
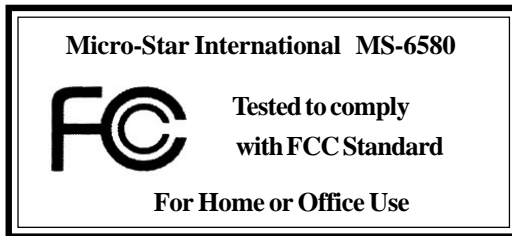
Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

> **Micro-Star International   MS-6580**
>
> FC   **Tested to comply
> with FCC Standard**
>
> **For Home or Office Use**

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Revision History

3.0	First release for 845PE Neo with PCB 3.x	July 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 60^0C (140^0F), IT MAY DAMAGE THE EQUIPMENT.

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

CONTENTS

1

Getting Started

Thank you for purchasing the 845PE Neo (MS-6580 v3.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** 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 processors
➤ Supports up to 3.06 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

Main Memory
➤ Supports two 184-pin DDR200/DDR266/DDR333/(DDR400) DIMMs (refer to Appendix B for details on DDR 400)
➤ Supports Max. memory size of 2GB

Slots
➤ One AGP (Accelerated Graphics Port) 4x slot (support 1.5v only)
➤ Six PCI 2.2 32-bit Master bus slots (support 3.3v/5v)

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 COM A

- 1 parallel port
- 1 RJ-45 LAN jack (Optional)
- audio ports in vertical
- 6 USB ports (Rear * 4/ Front * 2)

Audio
➤ 6 channels audio codec Realtek ALC650/655

LAN (Optional)
➤ Realtek® 8101L
   - 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 pe-
   ripheral devices and expansion cards of the board automatically.
➤ The mainboard provides a Desktop Management Interface (DMI) function
   which records your mainboard specifications.

Dimension
➤ ATX Form Factor: 30.5 cm (L) x 20 cm (W)

Mounting
➤ 6 mounting holes

Others
➤ ACPI support, including STR/STD (S3/S4)
➤ Support WOR/WOL
➤ PC2001 compliant
➤ Support D-Bracket 2/S-Bracket

Mainboard Layout
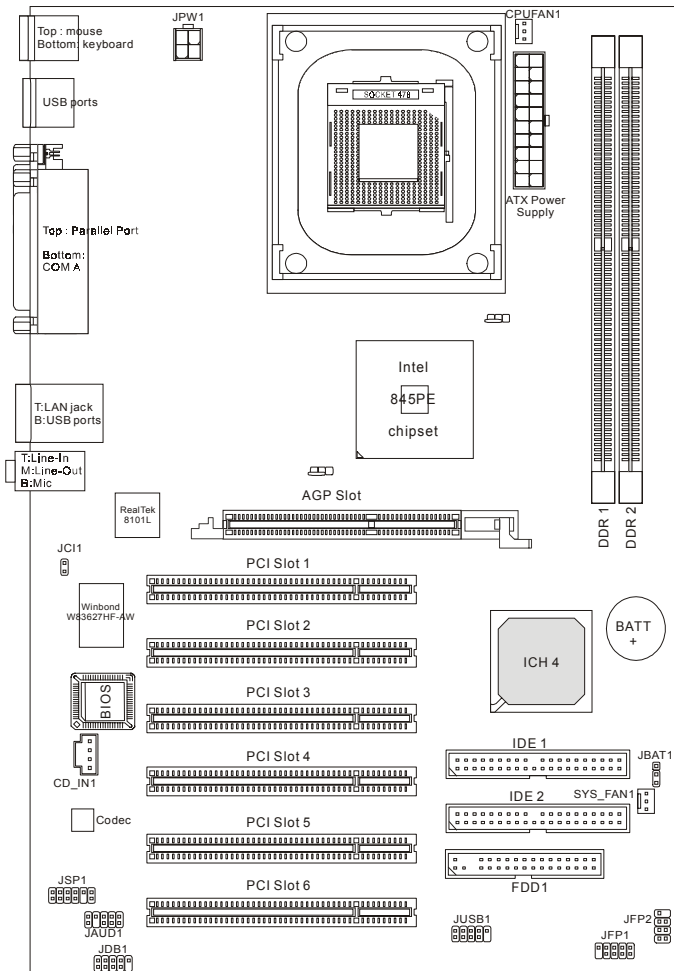
MS-6580 v3.X ATX Mainboard

MSI Special Features

PC Alert™ 4

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

✦ monitor CPU & system temperatures
✦ monitor fan speeds
✦ monitor system voltages

If one of the items above is abnormal, the program main screen will be immediately shown on the screen, with the abnormal item highlighted in red. This will continue to be shown until the condition returns to the normal status.
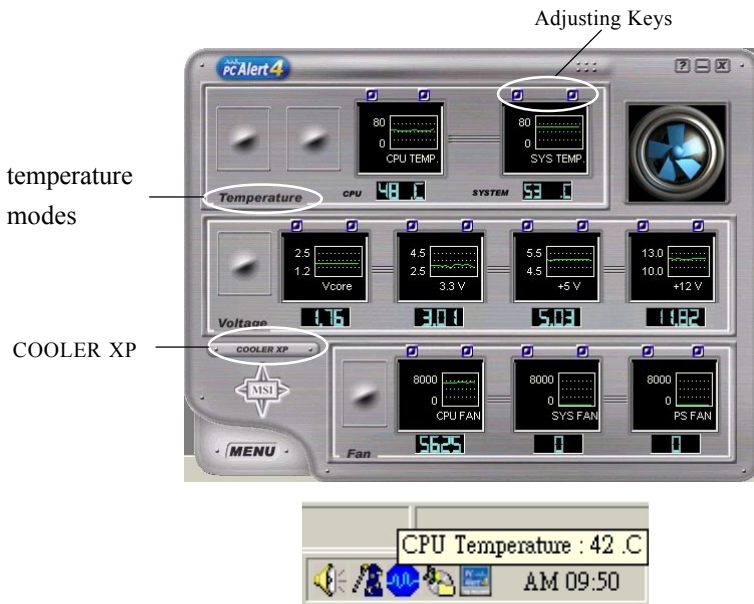
Users can use the Adjusting Keys to change the minimum and maximum threshold of each item for the system to send out a warning message. Click *Temperature* to select the temperature modes of either Fahrenheit (^{o}F) or Celsius (^{o}C). The PC Alert4 icon on the Status Area will show the current CPU temperature.

Fuzzy Logic™4

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

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

MSI Reminds You...

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

Live Monitor™

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

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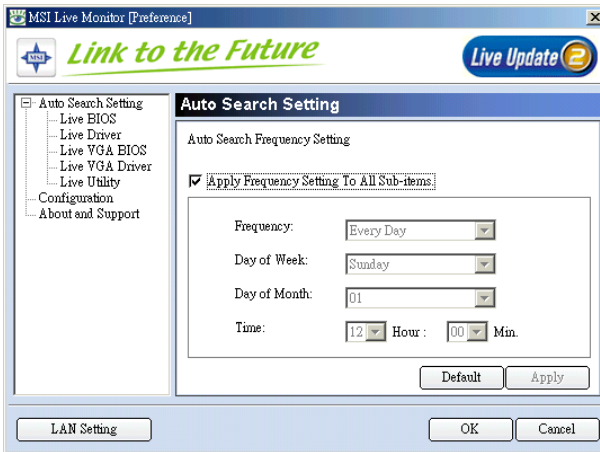
You can right-click the MSI Live Monitor icon to perform the functions listed below:

- ● **Auto Search** – Searches for the BIOS/drivers version you need immediately.

- ● **View Last Result** – Allows you to view the last search result if there is any.

- ● **Preference** – Configures the Search function, including the Search schedule.

- ● **Exit** – Exits the Live Monitor™ application.

- ● **FAQ**– Provides a link to a database which contents various possible questions about MSI's products for users to inquire.

D-Bracket™ 2 (Optional)
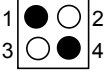
D-Bracket™ 2 is an external USB bracket integrating four Diagnostic LEDs, which use graphic signal display to help users understand their system. The LEDs provide up to 16 combinations of signals to debug the system. The 4 LEDs can debug all problems that fail the system, such as VGA, RAM or other failures. 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.
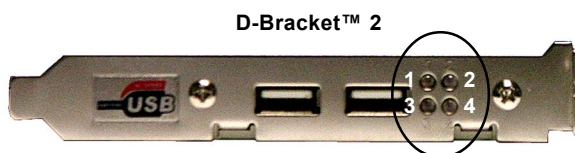
D-Bracket™ 2

● Red   ○ Green

D-Bracket™2	Description
1 ●● 2 3 ●● 4	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
1 ● ○ 2 3 ○ ● 4	Processor Initialization - This will show information regarding the processor (like brand name, system bus, etc…)
○ ○ ○ ●	Testing RTC (Real Time Clock)
● ● ● ○	Initializing Video Interface - This will start detecting CPU clock, checking type of video onboard. Then, detect and initialize the video adapter.
○ ● ● ○	BIOS Sign On - This will start showing information about logo, processor brand name, etc….
● ○ ● ○	Testing Base and Extended Memory - Testing base memory from 240K to 640K and extended memory above 1MB using various patterns.
○ ○ ● ○	Assign Resources to all ISA.
● ● ○ ○	Initializing Hard Drive Controller - This will initialize IDE drive and controller.
○ ● ○ ○	Initializing Floppy Drive Controller - This will initializing Floppy Drive and controller.
● ○ ○ ○	Boot Attempt - This will set low stack and boot via INT 19h.
○ ○ ○ ○	Operating System Booting

Live BIOS™/Live Driver™

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

Double click the "MSI Live Update 2" icon, and the following screen will appear:
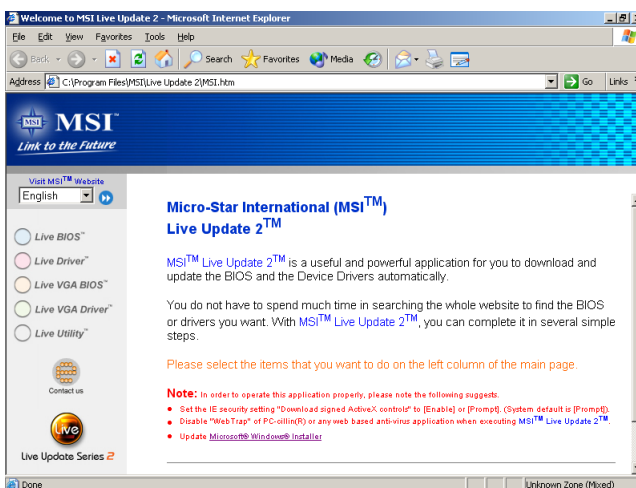
Five buttons are placed on the leftmost pane of the screen. Click the desired button to start the update process.

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

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

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. Using 4- or 6-Channel Audio Function*.

S-Bracket

SPDIF jack (coaxial)

SPDIF jack (optical)

Analog Line-Out jacks
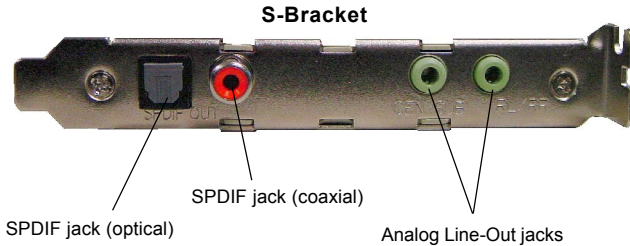
MSI DVD 5.1 Channel (Optional)

The motherboard comes with MSI DVD application which supports 5.1 channel (6-channel audio) operation. The accompanying MSI DVD is a convenient tool to meet increasing demands for home entertainment.

To play DVD with 6-channel audio output, you must configure both the MSI DVD application and the audio codec's software utility. Otherwise, the 6-channel audio function will not work properly. For information on how to select 6-channel mode in the audio software utility, refer to *Appendix. Using 4- or 6-Channel Audio Function*.

Follow the procedures below to enable 6-channel support with MSI DVD:

1. Click on this button [icon] from the control panel of MSI DVD.
2. Click the **Audio** tab.
3. Select **6 speaker mode (5.1 channel)**.

> **MSI Reminds You...**
> *MSI DVD supports Dolby Digital format only. To view DTS-formatted video, you should convert it to Dolby Digital format first.*
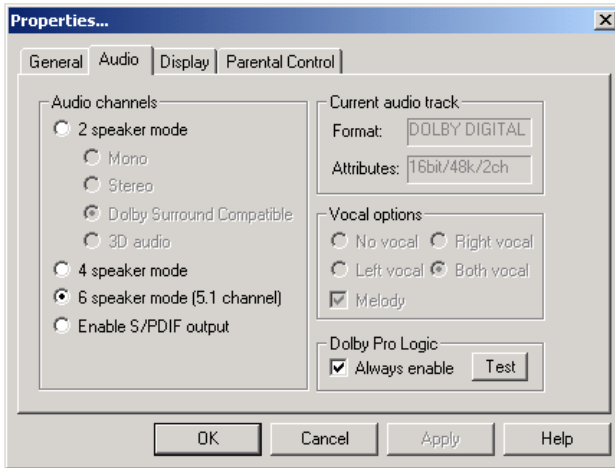
4. Click **OK**.

For more information about MSI DVD, you can refer to the online help coming with the application.
To enter the online help:

1. Click on the icon ![icon] at the bottom-right corner of the control panel.

2. The following window appears.

Click here
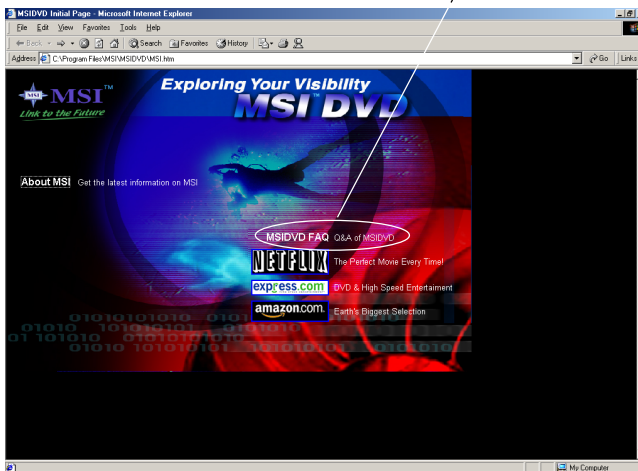
3. Click **MSIDVD FAQ**.

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

JPW1, *p.2-9* CPU, *p.2-3* CPUFAN1, *p.2-17*

DDR DIMMs, *p.2-7*

Back Panel I/O, *p.2-10*

PWR1, *p.2-9*

JCI1, *p.2-24*

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JBAT1, *p.2-25*
SYS_FAN1, *p.2-17*

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JAUD1, *p.2-18*

JFP2, *p.2-19*
JFP1, *p.2-19*

JDB1, *p.2-23* JUSB1, *p.2-22*
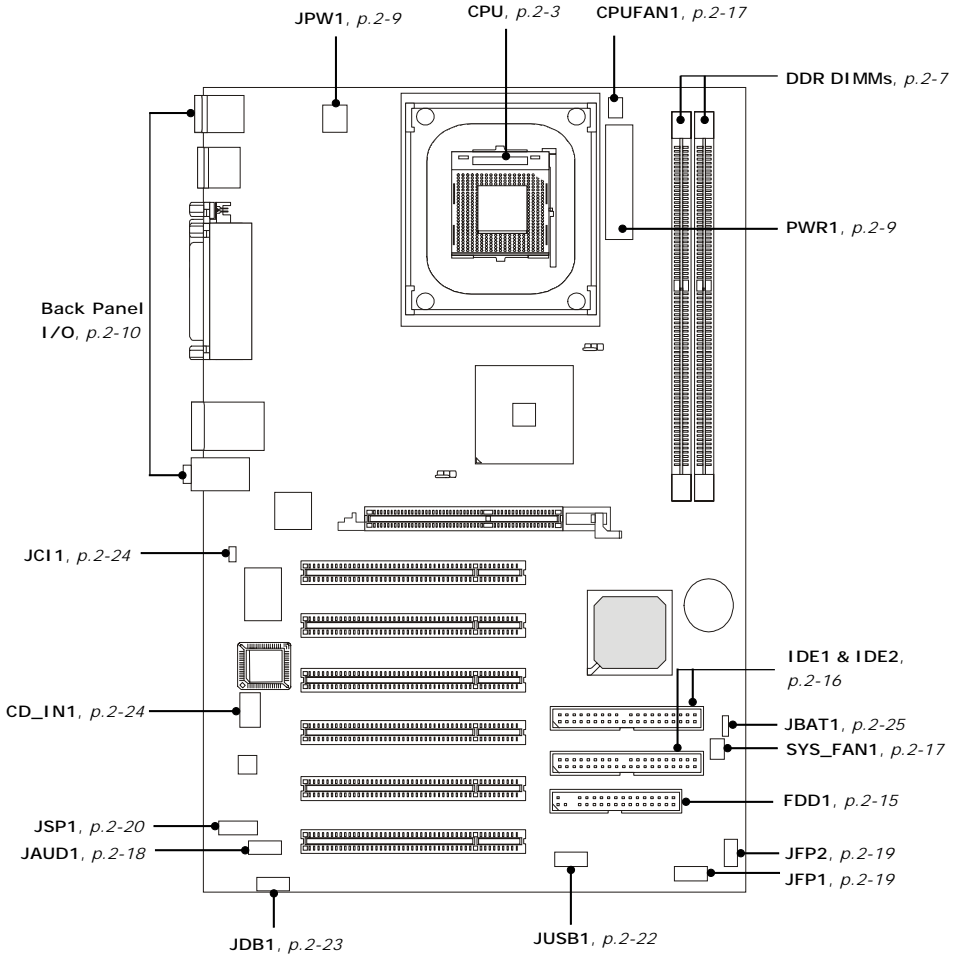
Central Processing Unit: CPU

The mainboard supports Intel® Pentium® 4 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	CPU Clock	=	100MHz
	Core/Bus ratio	=	14
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	100MHz x 14
		=	1.4 GHz

MSI

MSI Reminds You...

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

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.
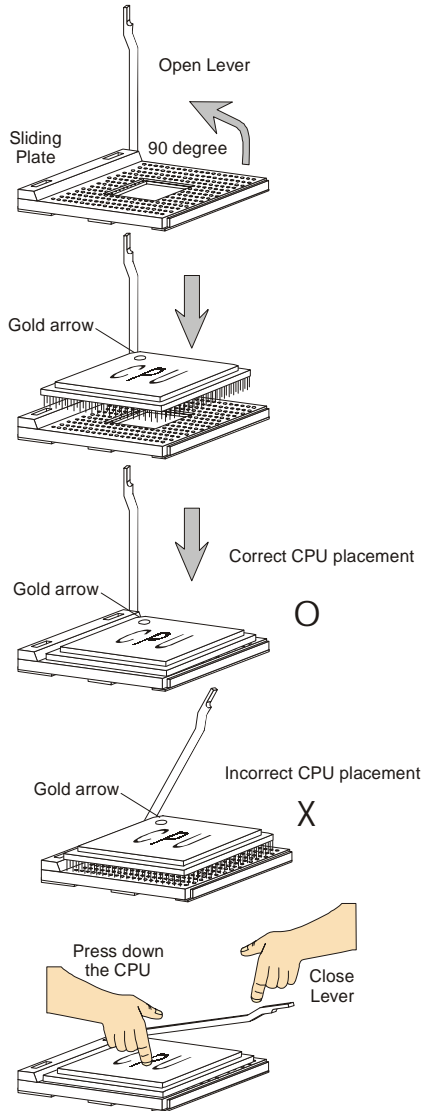
Installing the CPU Fan

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.

retention mechanism

2. Position the heatsink onto the retention mechanism.
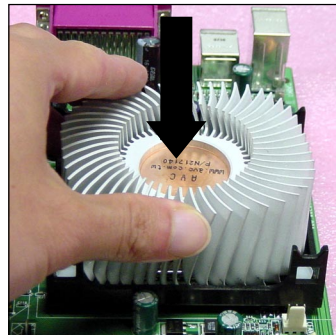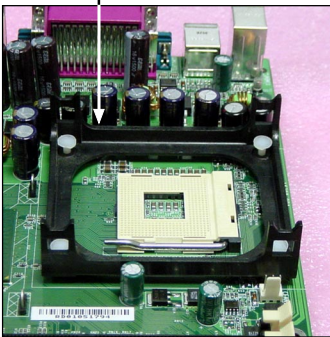
3. Mount the fan on top of the heatsink. Press down the fan until its four clips get wedged in the holes of the retention mechanism.

4. Press the two levers down to fasten the fan. Each lever can be pressed down in only ONE direction.

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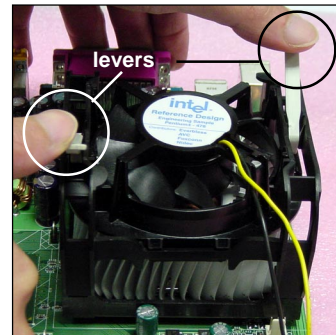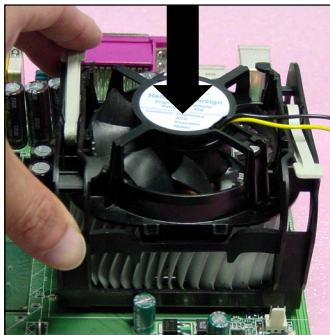
5. Connect the fan power cable from the mounted fan to the 3-pin fan power connector on the board.
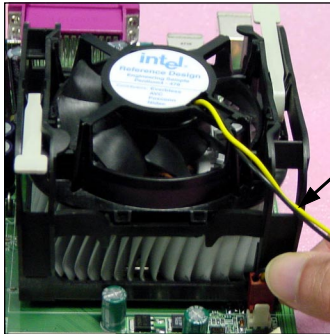
fan power cable

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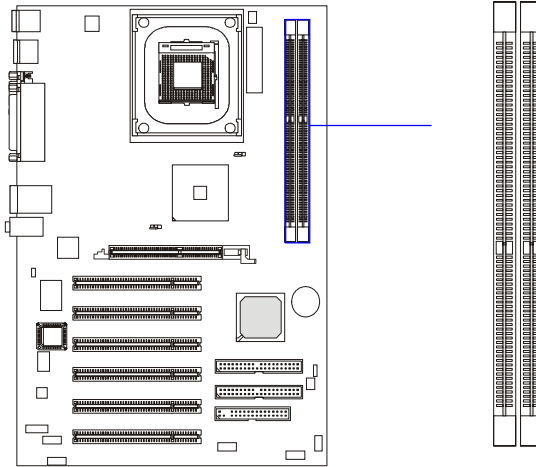
**DDR DIMM Slots
(DDR 1~2)**

Memory Speed/CPU FSB 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

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.

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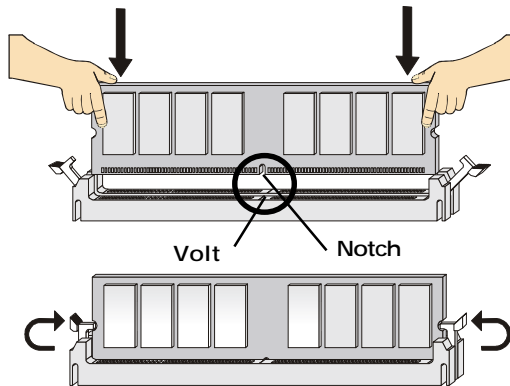
MSI Reminds You...
You can barely see the golden finger if the module is properly inserted in the socket.

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.
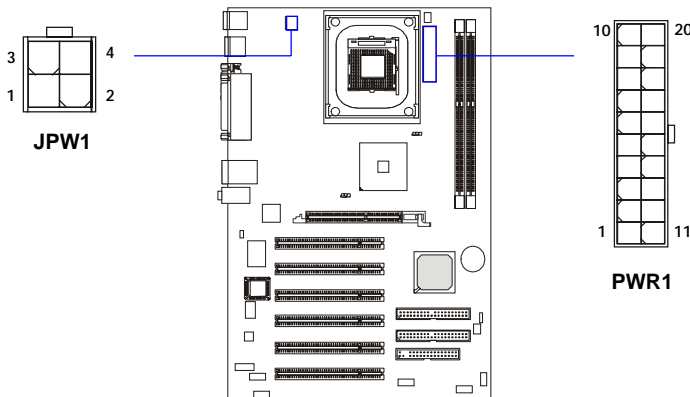
JPW1

PWR1

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

JPW1 Pin Definition

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

Back Panel

The back panel provides the following connectors:

Mouse   **Parallel**   **LAN**

USB   **L-in**

L-out

Keyboard   **COM A**   **USB**   **MIC**
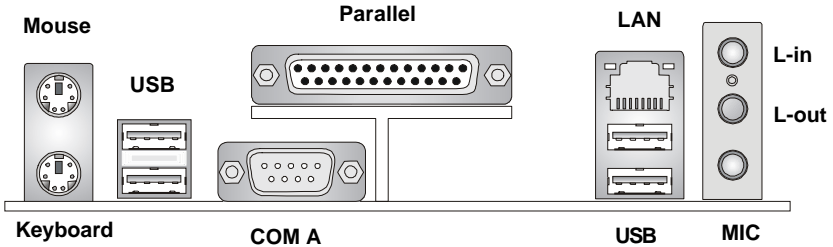
Keyboard Connector

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.

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
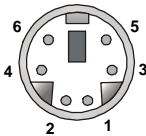
PS/2 Keyboard (6-pin Female)

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:
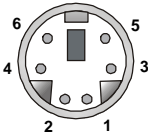
PS/2 Mouse (6-pin Female)

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.
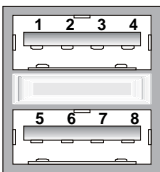
USB Ports

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.

LAN Jack
(RJ-45)

Activity Indicators
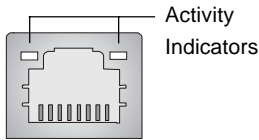
Pin	Signal	Description
1	TDP	Transmit differential pair
2	TDN	Transmit differential pair
3	RDP	Receive differential pair
4	NC	Not used
5	NC	Not used
6	RDN	Receive differential pair
7	NC	Not used
8	NC	Not used

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.
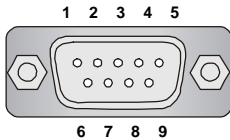
9-Pin Male DIN Connector

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.
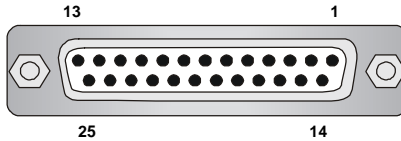
Pin Definition

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.

1/8" Stereo Audio Connectors

- Line In
- Line Out
- Mic In

MSI
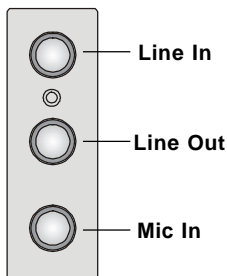
MSI Reminds You...

*For advanced audio application, **Realtek ALC650/655 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 4-or 6-Channel Audio Function.*

Connectors

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

Floppy Disk Drive Connector: FDD1

The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.
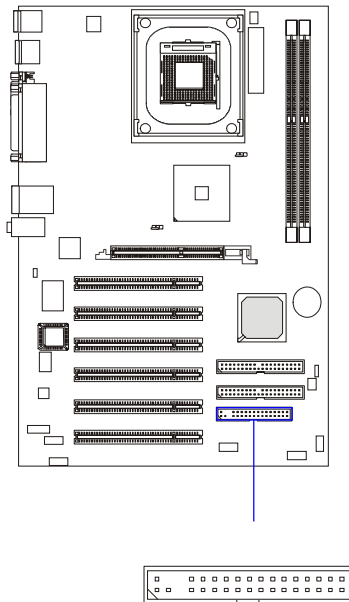
FDD1

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.
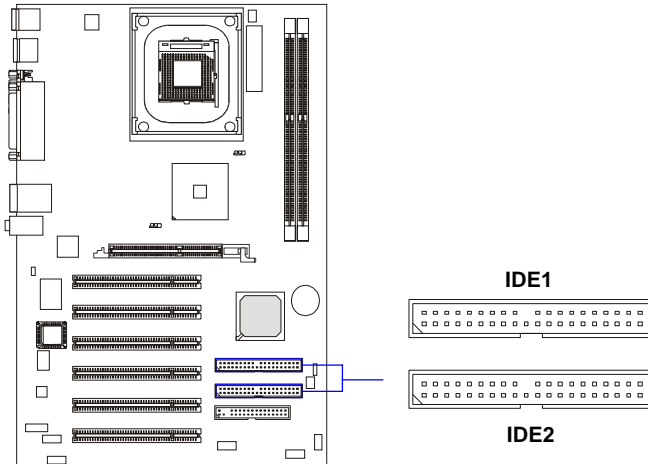
IDE1 (Primary IDE Connector)

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.

Fan Power Connectors: CPUFAN1/SYS_FAN1

The CPUFAN1 (processor fan), 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.

```
GND
+12V
SENSOR
```
CPUFAN1

```
GND
+12V
SENSOR
```
SYS_FAN1

MSI
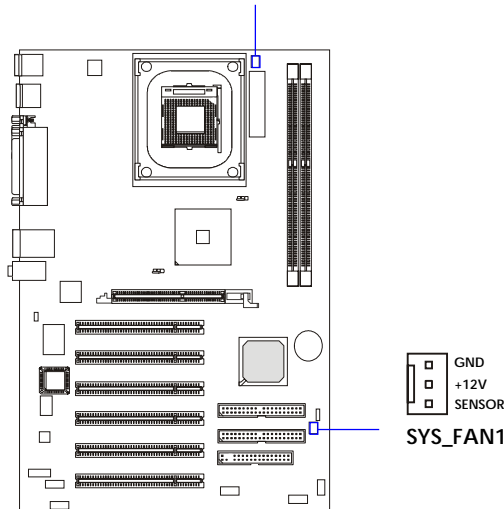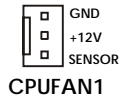
MSI Reminds You...
1. Always consult the vendors for proper CPU cooling fan.
2. CPUFAN1 supports the fan control. You can install the PC Alert utility that will automatically control the CPU fan speed according to the actual CPU temperature.

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.


```
9  □□□□□  1
10 □□□□□  2
```

JAUD1
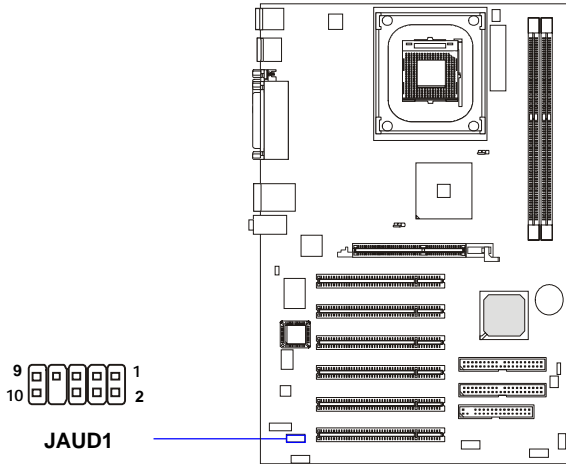
Pin Definition

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

MSI

MSI Reminds You...

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

```
9   5
□□ □□□
10  6
```

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.
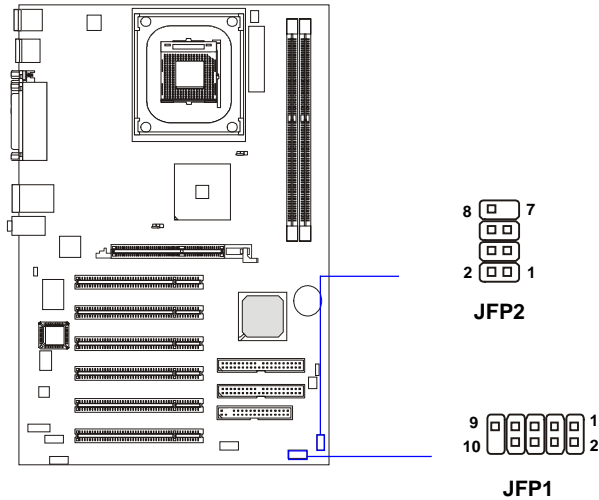
JFP2

JFP1

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

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 re-move the plug from the jack first. The two SPDIF jacks support *SPDIF output* only. For more information on the S-Bracket, refer to *Appendix. Using 4- or 6-Channel Audio Function*.

11 **1**
12 **2**
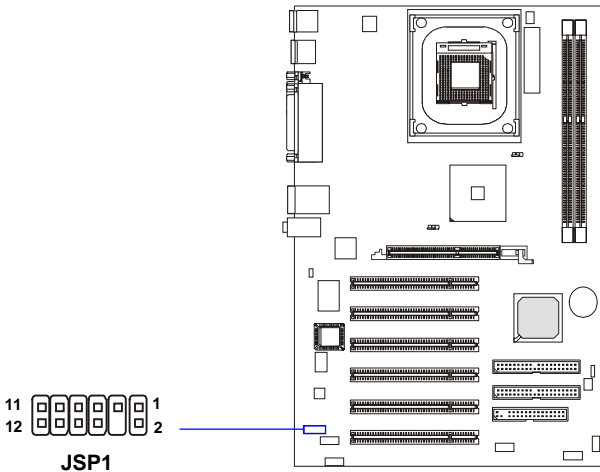
JSP1

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	Audio bass output	8	SOUT-R	Audio right surrounding output
9	CET-OUT	Audio center output	10	SOUT-L	Audio left surrounding output
11	GND	Ground	12	GND	Ground

Optional S-Bracket

Analog Line-Out jack

Connect to JSP1

SPDIF jack (optical)   SPDIF jack (coaxial)
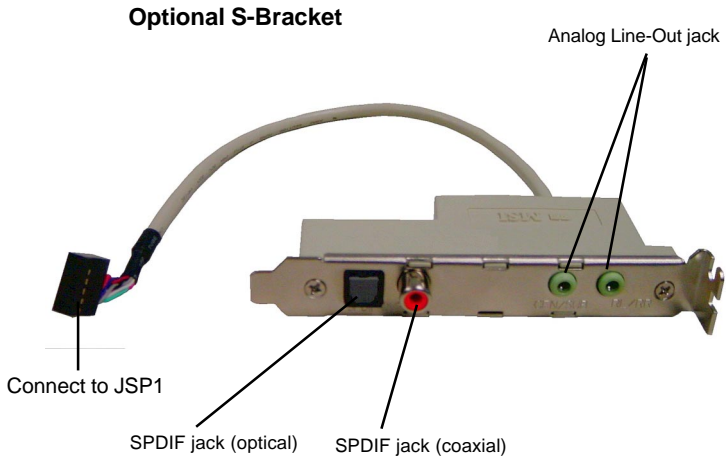
Front USB Connector: JUSB1

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**.


```
2 □□□□□ 10
1 □□□□□ 9
```

JUSB1
(USB 2.0/Intel spec)
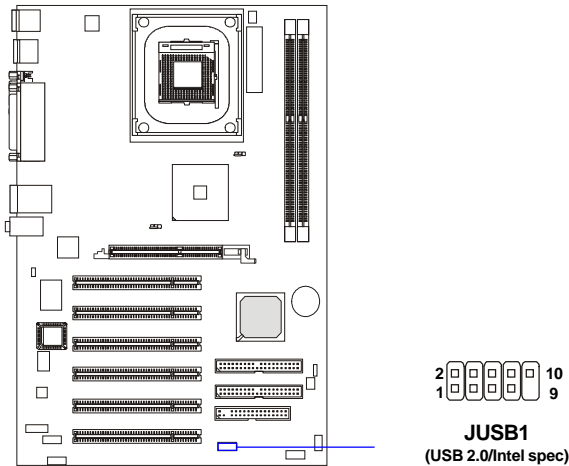
JUSB1 Pin Definition

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

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

JDB1

Connected to JDB1

D-Bracket™ 2

Connected to JUSB1 (the USB pinheader in *yellow* color)

LEDs
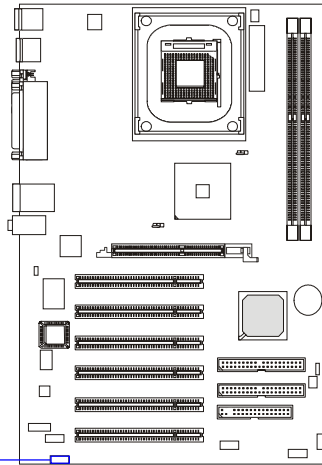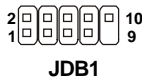
Chassis Intrusion Switch Connector: JCI1

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.

CINTRU
GND

JCI1
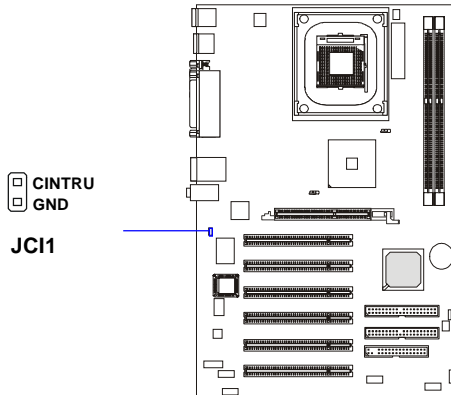
CD-In Connector: CD_IN1

The connectors are for CD-ROM audio connectors.

L
GND
R

CD_IN1
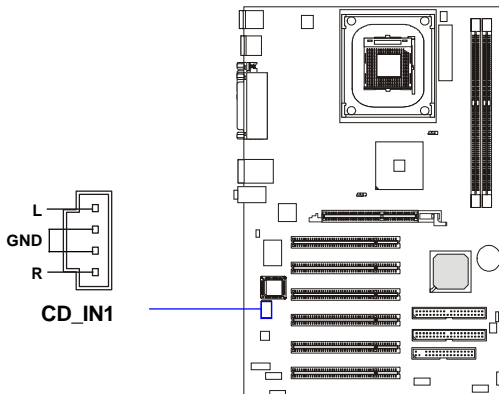
Jumpers

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

Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. 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:

Keep CMOS   **Clear CMOS**

JBAT1

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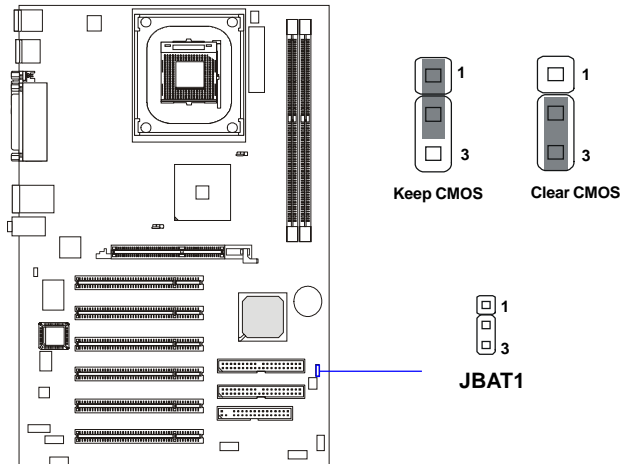
MSI Reminds You...
You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Slots

The motherboard provides one AGP slot and six 32-bit Master PCI bus slots.
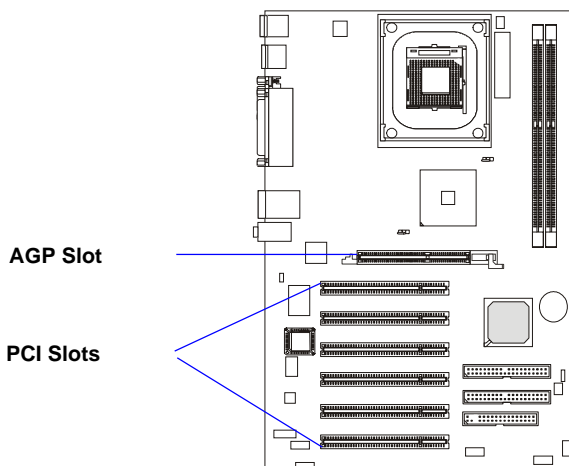
AGP (Accelerated Graphics Port) Slot

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.

PCI Slots

Six 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/USB/LAN" IRQ pins are typically connected to the PCI bus INT A# ~ INT H# pins as follows:

	Order 1	Order 2	Order 3	Order 4
AGP	INT A#	INT B#		
PCI Slot 1	INT A#	INT B#	INT C#	INT D#
PCI Slot 2	INT B#	INT C#	INT D#	INT A#
PCI Slot 3	INT C#	INT D#	INT A#	INT B#
PCI Slot 4	INT D#	INT A#	INT B#	INT C#
PCI Slot 5	INT B#	INT C#	INT D#	INT A#
PCI Slot 6	INT A#	INT B#	INT C#	INT D#
USB1.1 Controller 1	INT A#			
USB1.1 Controller 2	INT D#			
USB1.1 Controller 3	INT C#			
USB2.0 Controller	INT H#			
LAN Controller	INT E#			

AGP & PCI Slot 1 & PCI Slot 6 & USB1.1 Controller 1 shared INT A#.
PCI Slot 2 & PCI Slot 5 shared INT B#.
PCI Slot 3 & USB1.1 Controller 3 shared INT C#.
PCI Slot 4 & USB1.1 Controller 2 shared INT D#.

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 <DEL> 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.

```
         AMIBIOS NEW SETUP UTILITY - VERSION 3.31a

  ▶ Standard CMOS Features        ▶ Frequency/Voltage Control

  ▶ Advanced BIOS Features          Set Supervisor Password

  ▶ Advanced Chipset Features       Set User Password

  ▶ Power Management Features        Load High Performance Defaults

  ▶ PNP/PCI Configurations          Load BIOS Setup Defaults

  ▶ Integrated Peripherals          Save & Exit Setup

  ▶ PC Health Status                Exit Without Saving


  F1:Help      ↑↓:Select Item    +/-:Change Values      F7:Setup Defaults
  Esc:Exit     ↔:Select Menu     Enter:Select ▶Sub-Menu  F10:Save & Exit

    Set Time ,Date ,Hard Disk Type ...
```

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.

```
            AMIBIOS NEW SETUP UTILITY - VERSION 3.31a
      Standard CMOS Features                  [  Setup Help  ]

   System Date              Jul 22 2002 Mon    Month:  Jan - Dec
   System Time              14:23:11             Day:   01 - 31
                                                 Year: 1901 - 2099
 ▶ Primary IDE Master
 ▶ Primary IDE Slave
 ▶ Secondary IDE Master
 ▶ Secondary IDE Slave

 Floppy Drive A            1.44 MB 3½
 Floppy Drive B            Not Installed

 Boot Sector Virus Protection   Disabled




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

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

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

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.

Type	Select how to define the HDD parameters
Cylinders	Enter cylinder number
Heads	Enter head number
Write Precompensation	Enter write precomp cylinder
Sectors	Enter sector number
Maximum Capacity	Read the maximal HDD capacity
LBA Mode	Select *Auto* for a hard disk > 512 MB under Windows and DOS, or *Disabled* under Netware and UNIX
Block Mode	Select *Auto* to enhance the hard disk performance
Fast Programmed I/O Modes	Select Auto to enhance hard disk performance by optimizing the hard disk timing
32 Bit Transfer Mode	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**   **MSI Reminds You...**
> This feature only protects the boot sector, not the whole hard disk.

Advanced BIOS Features

```
         AMIBIOS NEW SETUP UTILITY - VERSION 3.31a

   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:

Silent	Shows a still image (logo) on the full screen at boot.
BIOS	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
```
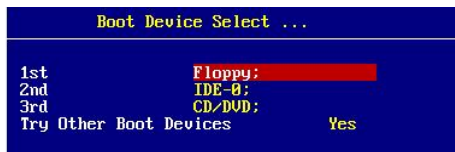
1st/2nd/3rd Boot Device

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...**
>
> **MSI** *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*.

Hyper Threading 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**　**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

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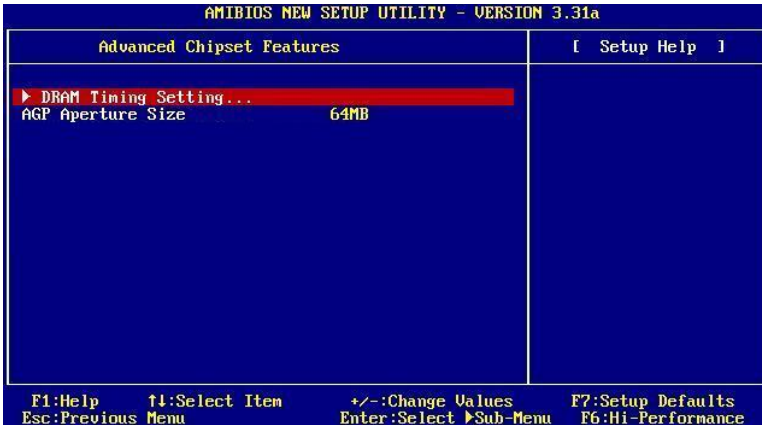
MSI **MSI Reminds You...**
Change these settings only if you are familiar with the chipset.

DRAM Timing Setting
Press <Enter> and the following sub-menu appears.
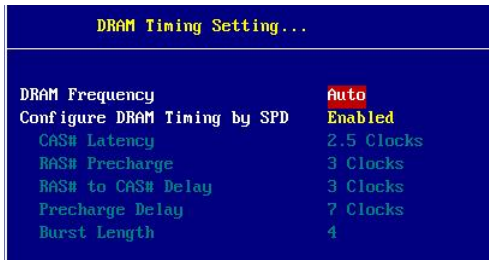
DRAM Frequency
Use this field to configure the clock frequency of the installed DRAM.
Settings are: *SPD, 200MHz, 266MHz, 333MHz, Auto*.

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

```
AMIBIOS NEW SETUP UTILITY - VERSION 3.31a

Power Management Features                    [  Setup Help  ]

IPCA Function                  Yes
ACPI Standby State             S1/POS
Re-Call VGA BIOS at S3 Resuming Disabled
Power Management/APM           Enabled
Suspend Time Out (Minute)      Disabled
Power Button Function          On/Off
Restore on AC/Power Loss       Last State
▶ Set Monitor Events ...
▶ Set Wake Up Events ...

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

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.
    S3/STR   The S3 sleep mode is a lower power state where the in formation 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 re
store the system when a "wake up" event occurs.

Auto   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:

On/Off   The power button functions as normal power off button.

Suspend   When you press the power button, the computer enters
the suspend/sleep mode, but if the button is pressed for
more than four seconds, the computer is turned off.

Restore on AC/Power Loss

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

Power Off   Leaves the computer in the power off state.

Power On   Leaves the computer in the power on state.

Last State   Restores the system to the previous status before power
failure or interrupt occurred.

Set Monitor Events

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

```
              Set Monitor Events ...

    FDC/LPT/COM Ports            Monitor
    Primary Master IDE           Monitor
    Primary Slave IDE            Ignore
    Secondary Master IDE         Monitor
    Secondary Slave IDE          Ignore
```
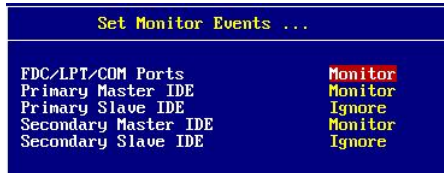
FDC/LPT/COM Ports, Primary/Secondary master/Slave IDE

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#               Enabled
    Resume On RTC Alarm          Disabled
     RTC Alarm Date              15
     RTC Alarm Hour              12
     RTC Alarm Minute            30
     RTC Alarm Second            30
    USB Wakeup From S3           Disabled
    Keyboard Wakeup From S3      Disabled
     Specific Key for Wakeup     N/A
    Mouse Wakeup From S3         Disabled
```
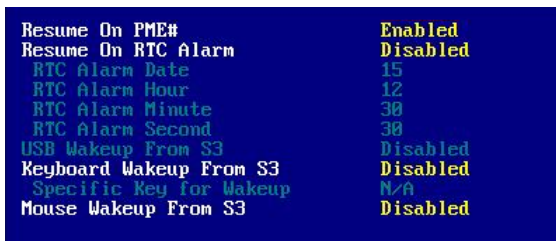
Resume On PME#

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 By 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*.

Alarm Date/Hour/Minute/Second

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

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

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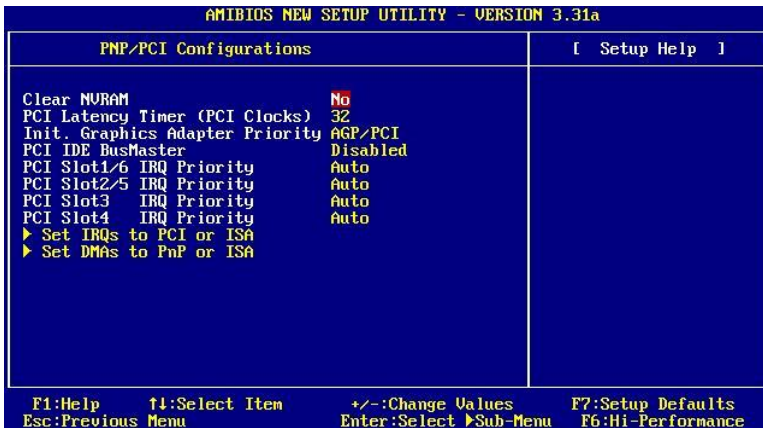
Specific Key for Wakeup
This setting allows users to set a password (max. 5 letters) for the *Keyboard Wakeup From S3* function.

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, (double-click) Left-button, (double-click) 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.

```
              AMIBIOS NEW SETUP UTILITY - VERSION 3.31a

       PNP/PCI Configurations                  [  Setup Help  ]

   Clear NVRAM                    No
   PCI Latency Timer (PCI Clocks) 32
   Init. Graphics Adapter Priority AGP/PCI
   PCI IDE BusMaster              Disabled
   PCI Slot1/6 IRQ Priority       Auto
   PCI Slot2/5 IRQ Priority       Auto
   PCI Slot3   IRQ Priority       Auto
   PCI Slot4   IRQ Priority       Auto
 ▶ Set IRQs to PCI or ISA
 ▶ Set DMAs to PnP or ISA




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

Clear NVRAM
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.

PCI Latency 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 transactions 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:

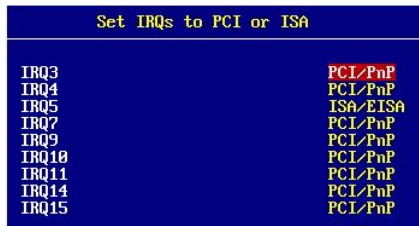|	
PCI/AGP	The system initializes the installed PCI VGA card first. If the PCI VGA card is not available, it will initialize the AGP card.
AGP/PCI	The system initializes the installed AGP card first. If the AGP card is not available, it will initialize the PCI VGA card.

PCI IDE 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*.

PCI Slot 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:


```
         Set IRQs to PCI or ISA

    IRQ3                         PCI/PnP
    IRQ4                         PCI/PnP
    IRQ5                         ISA/EISA
    IRQ7                         PCI/PnP
    IRQ9                         PCI/PnP
    IRQ10                        PCI/PnP
    IRQ11                        PCI/PnP
    IRQ14                        PCI/PnP
    IRQ15                        PCI/PnP
```
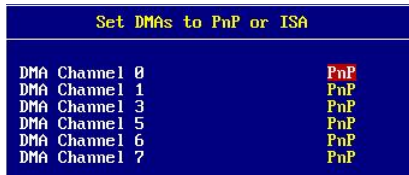
IRQ 3/4/5/7/9/10/11/14/15
These items specify the bus where the specified IRQ line is used.
The settings determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. 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 PCI IDE, 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:

```
            Set DMAs to PnP or ISA

     DMA Channel 0                    PnP
     DMA Channel 1                    PnP
     DMA Channel 3                    PnP
     DMA Channel 5                    PnP
     DMA Channel 6                    PnP
     DMA Channel 7                    PnP
```

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

```
AMIBIOS NEW SETUP UTILITY - VERSION 3.31a

      Integrated Peripherals                    [  Setup Help  ]

  USB Controller              Enabled
  USB Legacy Support          Disabled
  OnBoard IDE                 Both
  OnBoard LAN                 Enabled
   Load OnBoard LAN BIOS      Enabled
  AC'97 Audio                 Auto
  ▶ Set Super I/O



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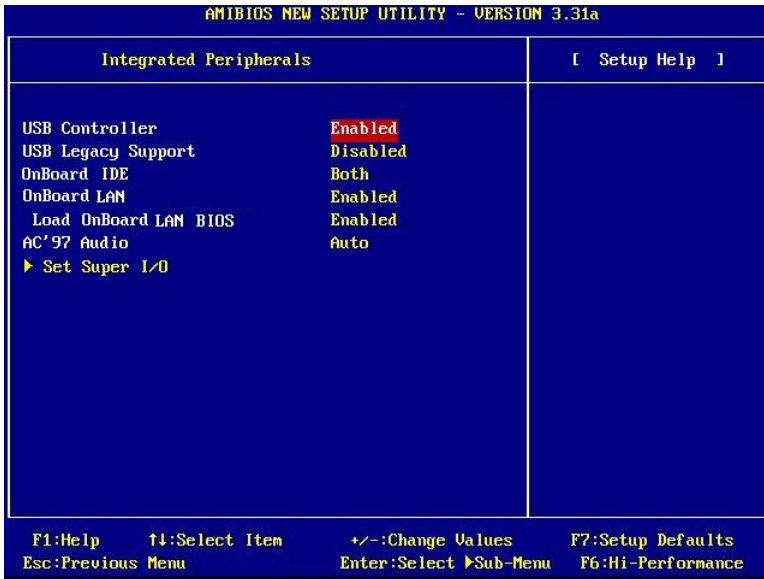
USB Controller

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*.

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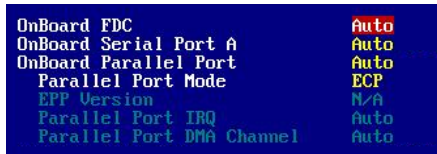
Load Onboard LAN BIOS
This feature gives you the option to load the onboard LAN BIOS or not. Setting options: *Enabled, Disabled*.

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                  Auto
OnBoard Serial Port A        Auto
OnBoard Parallel Port        Auto
  Parallel Port Mode         ECP
  EPP Version                N/A
  Parallel Port IRQ          Auto
  Parallel Port DMA Channel  Auto
```

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*.

Parallel Port 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.

```
           AMIBIOS NEW SETUP UTILITY - VERSION 3.31a

        PC Health Status                      [  Setup Help  ]


  Chassis Intrusion          Disabled
    CPU Temperature          80°C/176°F
    System Temperature       39°C/102°F
    CPU Fan Speed
    System Fan Speed
    Vcore
      3.3V
    + 5.0V
    +12.0V
    -12.0V
    - 5.0V
    Battery
    +5V SB




   F1:Help        ↑↓:Select Item       +/-:Change Values    F7:Setup Defaults
   Esc:Previous Menu                    Enter:Select ▶Sub-Menu  F6:Hi-Performance
```
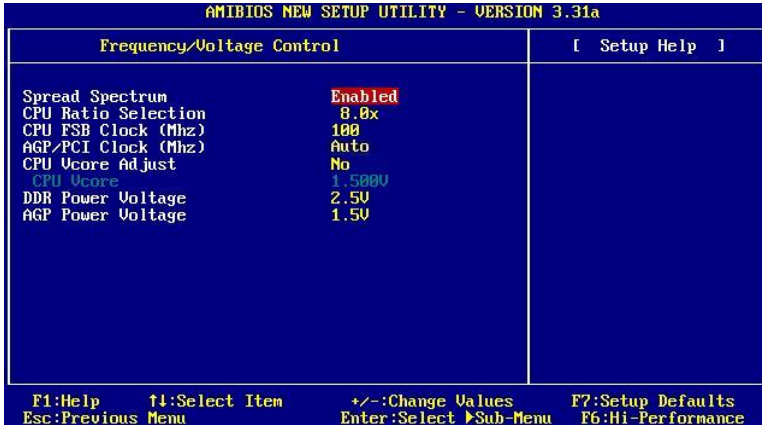
Chassis Intrusion
The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to *Reset*. The setting of the field will automatically return to *Enabled* later. Settings: *Enabled*, *Reset*, *Disabled*.

CPU/System Temperature, CPU/System Fan Speed, Vcore, 3.3V, +5.0V, +12.0V, -12.0V, -5.0V, 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.

```
                AMIBIOS NEW SETUP UTILITY - VERSION 3.31a

        Frequency/Voltage Control              [  Setup Help  ]

 Spread Spectrum                  Enabled
 CPU Ratio Selection                8.0x
 CPU FSB Clock (Mhz)                100
 AGP/PCI Clock (Mhz)               Auto
 CPU Vcore Adjust                   No
    CPU Vcore                      1.500V
 DDR Power Voltage                 2.5V
 AGP Power Voltage                 1.5V




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

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/PCI Clock (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 **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

MSI Reminds You...
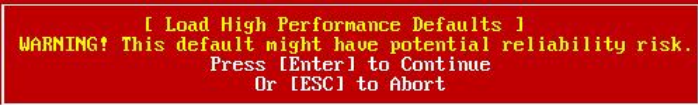***About Supervisor Password & User Password:***
Supervisor password: *Can enter and change the settings of the setup menu.*
User password: *Can only enter but do not have the right to change the settings of the setup menu.*

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 4- or 6-Channel Audio Function

The motherboard is equipped with Realtek ALC650/655 chip, which provides support for 6-channel audio output, including 2 Front, 2 Rear, 1 Center and 1 Subwoofer channel. ALC650/655 allows the board to attach 4 or 6 speakers for better surround sound effect. The section will tell you how to install and use 4-/6-channel audio function on the board.

TOPICS

Installing the Audio Driver

You need to install the driver for Realtek ALC650/655 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 Driver**.
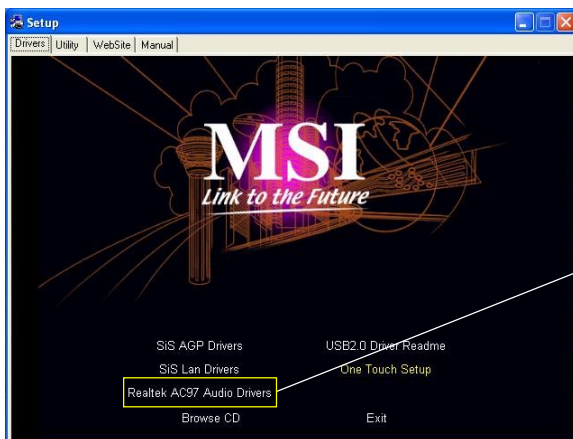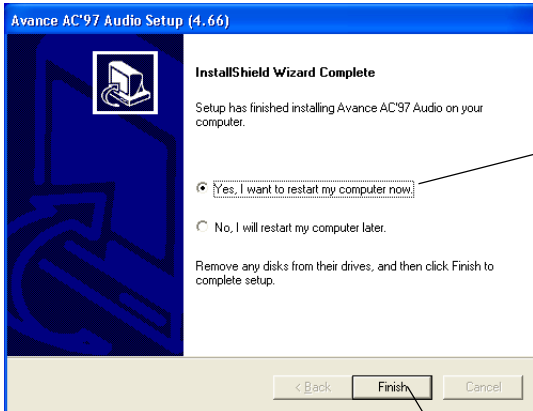

Click here

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 start installing files into the system.
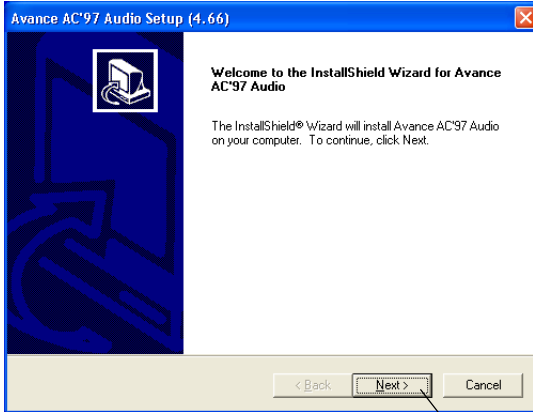
Click here

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

Select this option

Click here

Using 4- or 6-Channel Audio Function

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

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

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

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

Using the Optional S-Bracket

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

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

Configuration in the Software Utility

1. Click the audio icon from the window tray at the lower-right corner of the screen.

2. Select a desired surround sound effect from the "*Environment*" drop-down menu.

3. Click the *Speaker Configuration* tab.

4. Select a desired multi-channel operation from *No. of Speaker*.

   a. 2-Channel Mode for Stereo-Speaker Output

   b. 4-Channel Mode for 4-Speaker Output

   c. 6-Channel Mode for 5.1-Speaker Output

5. Select or clear the *Default Phonejack* check box to decide which

audio devices you wish to use for audio outputs.

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

6. The *S/PDIF In -Coaxial (OPTION), S/PDIF In -Optical (OPTION)*, *S/PDIF In -Coaxial* and *S/PDIF In -Optical* are not supported by this mainboard, therefore the icons are in black to represent unavailable.
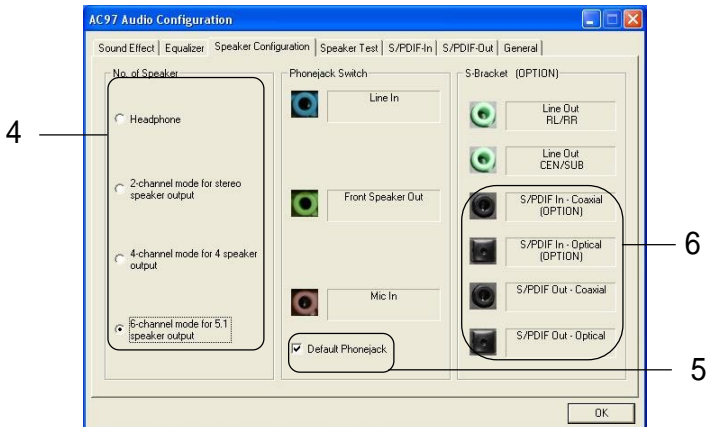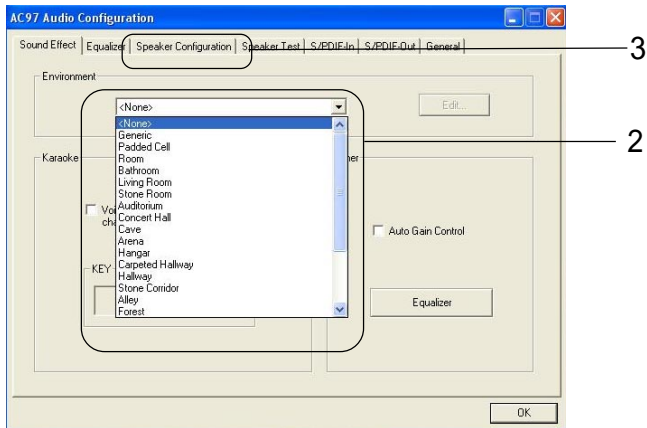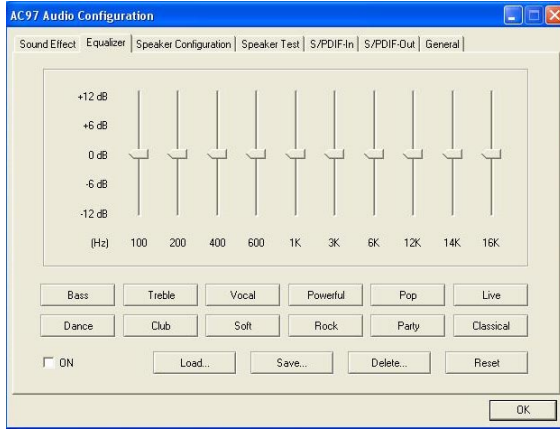
7. On the *S/PDIF-In* tab, it shows the current status. Since this mainboard does not support the S/PDIF-in function, no selection is available.

— 7
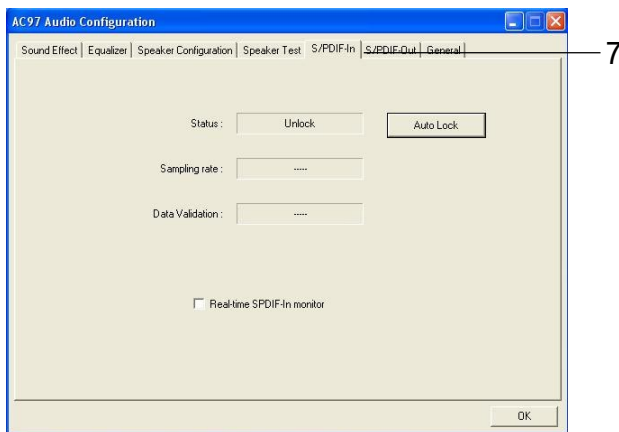
8. On the *S/PDIF-Out* tab, you may slelect the format of SPDIF out.

— 8
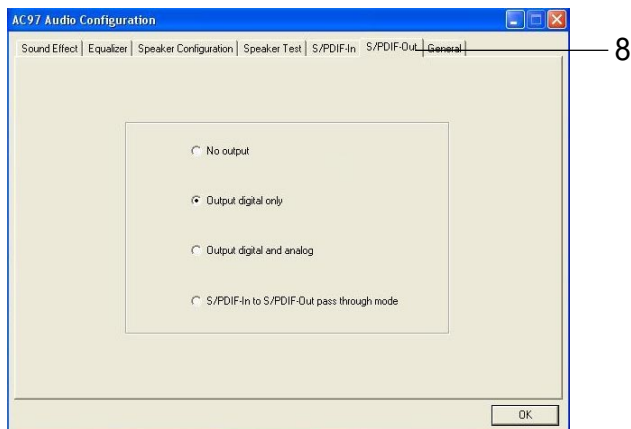
9. On the *Equalizer* tab, you can adjust each volume of the speaker for current playing digital sound sources.

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**

When this mode is selected, it is recommended to attach the speakers to the Line Out connector on the back panel instead of the Line Out connector on the S-Bracket.
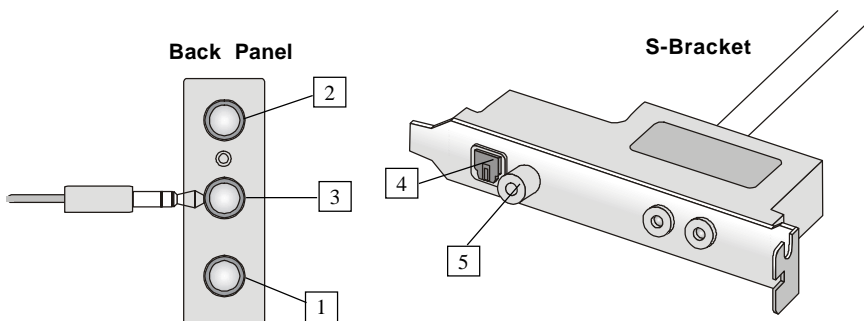
Refer to the following diagram and caption for the function of each phone jack on the back panel when 2-Channel mode is selected.

Select "Default Phone jack"   Deselect "Default Phone jack"

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

Back Panel   **S-Bracket**

MSI Reminds You...
When any Multi-Channel Audio Mode is selected, you may also connect your speakers to the Optical or Coaxial SPDIF phone jack on the S-Bracket to exprience digital surround sound effect.

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

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

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

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

Back Panel   **S-Bracket**

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

When this mode is selected, plug the two front speakers to the Line Out connector on the back panel, and the other two rear speakers to the Line Out connector on the S-Bracket.
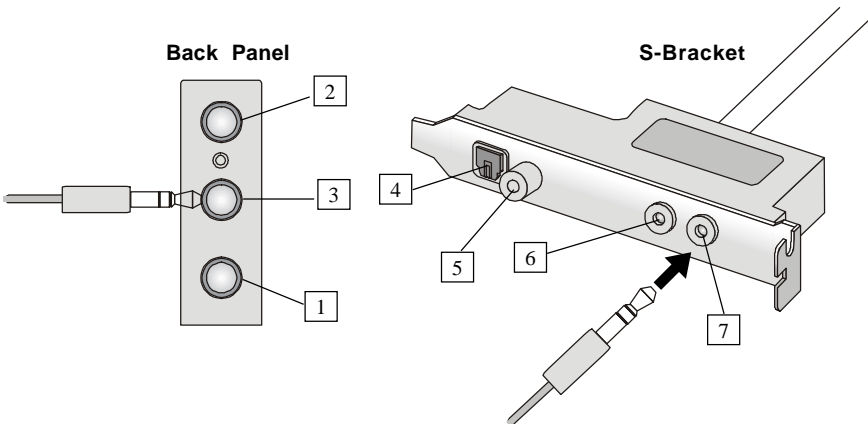
Refer to the following diagram and caption for the function of each phone jack on the back panel and S-Bracket when 6-Channel mode is selected.

Select "Default Phone jack"	Deselect "Default Phone jack"
1 MIC	1 Center/Subwoofer Speaker Out *(Center and Subwoofer channels)*
2 Line In	2 Rear Speaker Out *(Rear channels)*
3 Line Out *(Front channels)*	3 Line Out *(Front channels)*
4 Optical SPDIF jack	4 Optical SPDIF jack
5 Coaxial SPDIF jack	5 Coaxial SPDIF jack
6 Line Out *(Center and Subwoofer channels)*	6 Line Out *(Center and Subwoofer channels)*
7 Line Out *(Rear channels)*	7 Line Out *(Rear channels)*
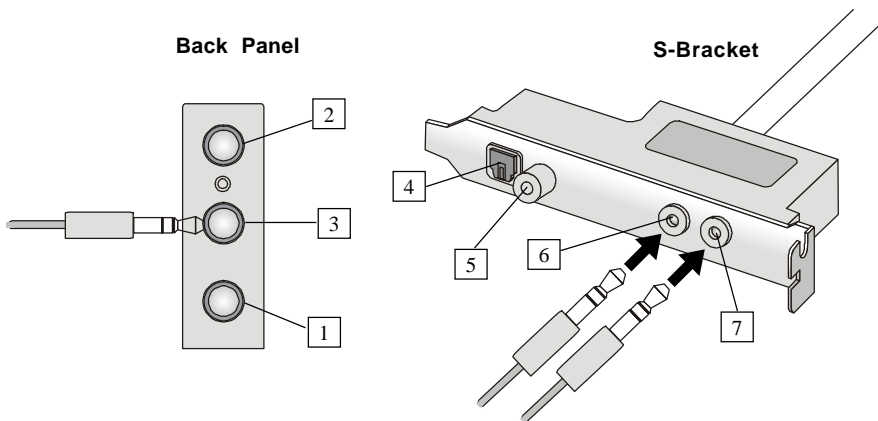
Back Panel   **S-Bracket**


MSI Reminds You...

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

■ **Digital Audio Output**

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

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

1 Optical SPDIF jack
2 Coaxial SPDIF jack

S-Bracket
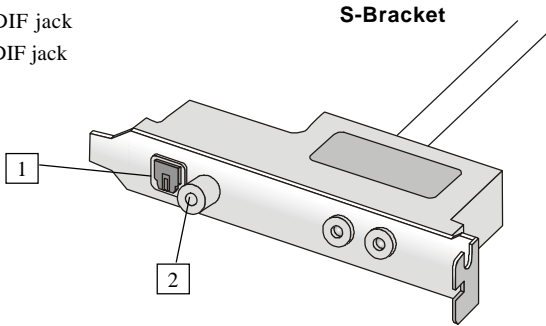
Using the Back Panel only

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

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

Configuration in the Software Utility

1. Click the audio icon 📀 from the window tray at the lower-right corner of the screen.

2. Select a desired surround sound effect from the "Environment" drop-down menu.

3. Click the **Speaker Configuration** tab.

4. Select **Synchronize the phone jack switch with the settings**.

5. Select a desired multi-channel operation from **No. of Speakers**.

   a. 2-Channel Mode for Stereo-Speaker Output

   b. 4-Channel Mode for 4-Speaker Output

   c. 6-Channels Mode for 5.1-Speaker Output

6. Click **OK** to close this window.
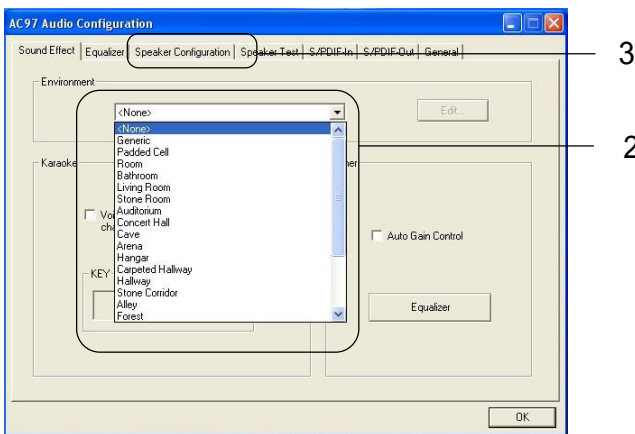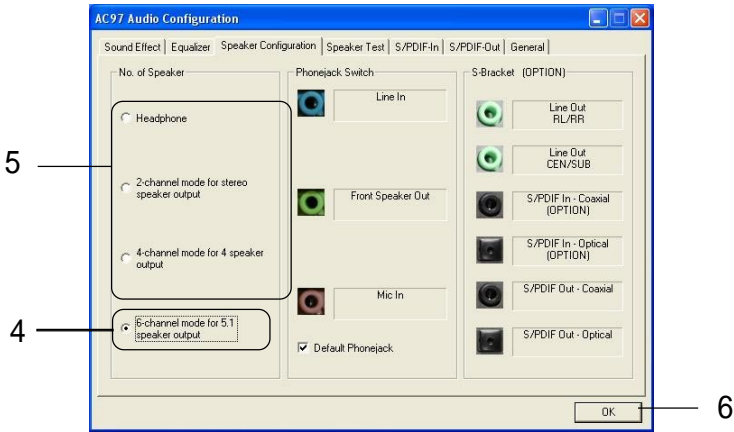
5 —
4 —
6 —

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.

Back Panel

1 MIC
2 Line In
3 Line Out *(Front channels)*
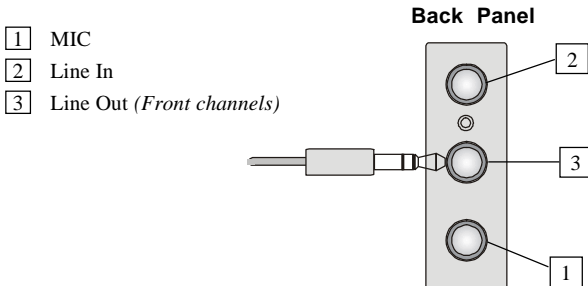
■ **4-Channel Mode for 4-Speaker Output**
The audio jacks on the back panel always provide 2-channel analog
audio output function, however these audio jacks can be transformed
to 4- or 6- channel analog audio jacks by selecting the corresponding
multi-channel operation from **No. of Speakers**.

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

Back Panel

1 MIC
2 * Line Out *(Rear channels)*
3 Line Out *(Front channels)*

* 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.
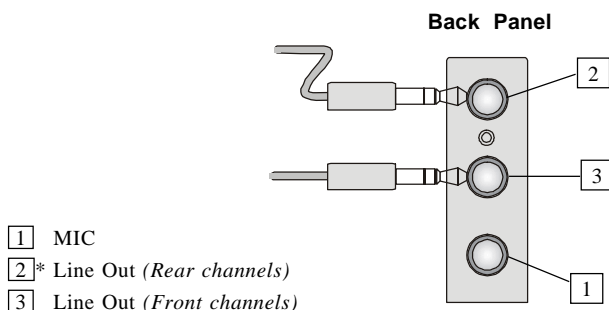
1*   Line Out *(Center and Subwoofer channel)*
2*   Line Out *(Rear channels)*
3   Line Out *(Front channels)*

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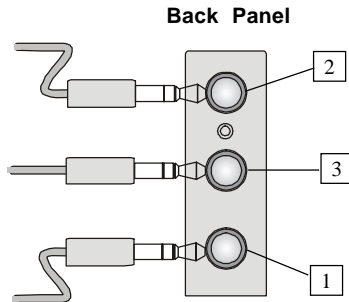
* Both Line In and MIC function are converted to Line Out function when 4-Channel Mode for 6-Speaker Output is selected.

MSI

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

Testing the Connected Speakers

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

Testing Each Speaker

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

Center

Front Left

Front Right

Rear Right

Rear Left

Subwoofer

Select this function
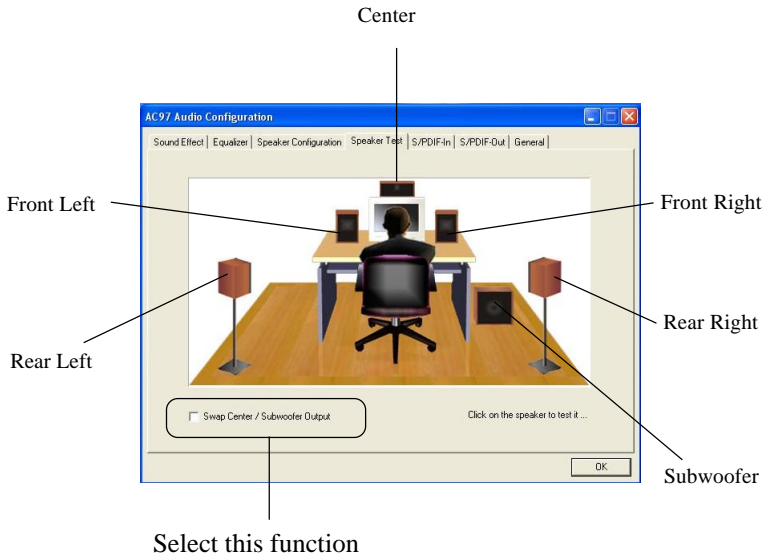
MSI **MSI Reminds You...**
6 speakers appear on the "Speaker Test" window only when you select "6-Channel Mode" in the "No. of Speakers" column. If you select "4-Channel Mode", only 4 speakers appear on the window.

A-16

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

Playing KaraOK

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

Playing KaraOK

1. Click the audio icon from the window tray at the lower-right corner of the screen.
2. In the Sound Effect tab, select **Voice Cancellation** under "KaraOK."
3. Click **OK** to close this window.
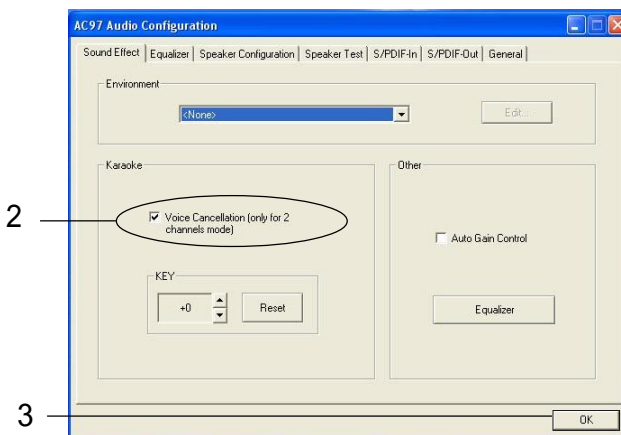
Appendix B:
The explanation for overspecification and overclocking on Intel® 845PE chipset

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/CPU FSB 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 opeartion, 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 Frequence" to "*Auto*".

```
AMIBIOS NEW SETUP UTILITY - VERSION 3.31a

     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 - VERSION 3.31a

     Frequency/Voltage Control       [  Setup Help  ]


Spread Spectrum                Disabled
CPU Ratio Selection             8.0x
CPU FSB Clock (Mhz)            200
AGP/PCI Clock (Mhz)            AUTO
CPU Vcore Adjust              No
  CPU Vcore                    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				
		Manufacturer	Model No.	Spec.
Device Configuration	Processor	*Intel*	*P4 2.8GHz*	*800MHz*
	Memory	*As Follows*		
	VGA Card	*MSI*	*MS-8826*	*G2MX400*
	Lan Card	*Onboard*		
	Sound Card	*Onboard*		
	Hard Drive	*WD*	*Cariar 205BA*	*20.5GB, ATA66*
	CD-ROM	*Teac*	*CD-540E*	*40X*
	Floppy Drive	*Teac*	*FD-235HF*	
	Power Supply	*Delta*	*DPS-300KB-1A*	
	Mouse	*Logitech*	*PS2*	
	Keyboard	*Nax*	*KB-6868*	
	Monitor	*Hitachi*	*CM640ET*	
SW Info	VGA BIOS			
	VGA Driver			

Table 2: DDR400/PC3200 Memory Test List

Model		Size	Memory Slot		Memory Bandwidth Benchmark	R.S.T
			1	2		
Infineon	HYS64D16301GU-5-B	128MB	√	√	OK	OK
	(Infineon HYB25D256160BT-5)			√	OK	OK
Nanya	NT128D64SH4B1G-5	128MB	√	√	OK	OK
	(Nanya NT5DS16M16BT-5)			√	OK	OK
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
ATP	AG32L72T8SQC4S	256MB	√	√	OK	OK
	(SEC K4H560838D-TCC4)			√	OK	OK
CORSAIR	CMX256A-3500C2PT XMS3502 V1.1	256MB	√	√	OK	OK
				√	OK	OK
GeIL	AMIR0305	256MB	√	√	OK	OK
	(Geil GL3LC32G88TG-5A)			√	OK	OK
Hynix	HYMD232646B8J-D43	256MB	√	√	OK	OK
	(Hynix HY5DU56822BT-D43)			√	OK	OK
Infineon	HYS64D32300GU-5-B	256MB	√	√	OK	OK
	(Infineon HYB25D256800BT-5)			√	OK	OK
Kingston	KVR400X64C25/256	256MB	√	√	OK	OK
	(Winbond W942508BH-5)			√	OK	OK
Micron	MT8VDDT3264AG-40BC4	256MB	√	√	OK	OK
	(Micron MT46V32M8TG-5B C)			√	OK	OK
Nanya	NT256D64S88B1G-5T	256MB	√	√	OK	OK
	(Nanya NT5DS32M8BT-5T)			√	OK	OK

Model		Size	Memory Slot		Memory Bandwidth Benchmark	R.S.T
			1	**2**		
PSC	AL5D8A53TK1-5B	256MB	√	√	OK	OK
	(PSC A2S56D30ATP-5)	*		√	OK	OK
SEC	M368L3223DTM-CC4	256MB	√	√	OK	OK
	(SEC K4H560838D-TCC4)	*		√	OK	OK
SEC	M368L3223ETM-CCC	256MB	√	√	OK	OK
	(SEC K4H560838E-TCCC)			√	OK	OK
TwinMos	M2G9I08AFATT9F0811DDT	256MB	√		OK	OK
	(TwinMOS TMD7608F8E50B)			√	OK	OK
TwinMos	M2S9108AFAPS9F0811A-T	256MB	√	√	OK	OK
	(PSC A2SS6D30ATP)			√	OK	OK
Transcend	TS32MLD64V4F3	256MB	√	√	OK	OK
	(SEC K4H560838D-TCCC)			√	OK	OK
Winbond	W9425GCDB-5	256MB	√	√	OK	OK
	(WinBond W942508CH-5)	*		√	OK	OK
Geil	GD3200-100DC	256MB	√	√	OK	OK
				√	OK	OK
Geil	GE2563200B	256MB	√	√	OK	OK
				√	OK	OK
Apacer	77.10736.583	512MB	√	√	OK	OK
	(Winbond W942508BH-5)			√	OK	OK
Apacer	77.10736.554	512MB	√	√	OK	OK
	(Hynix HY5DU56822BT-D43)			√	OK	OK
Apacer	77.10739.534	512MB	√	√	OK	OK
	(PSC A2S56D30ATP 3099LADT)			√	OK	OK
Apacer	77.10736.464	512MB	√	√	OK	OK
	(SEC K4H560838D-TCCC)			√	OK	OK
ATP	AG64L64T8SQC4S	512MB	√	√	OK	OK
	(SEC K4H560838D-TCC4)			√	OK	OK
CORSAIR	CMX512-3500C2PT XMS3502 V1.1	512MB	√		OK	OK
				√	OK	OK
elixir	M2U51264DS8HB3G-5T	512MB	√	√	OK	OK
	(elixir N2DS25680BT-5T)			√	OK	OK
Hynix	HYMD264646B8J-D43	512MB	√	√	OK	OK
	(Hynix HY5DU56822BT-D43)			√	OK	OK

Model		Size	Memory Slot		Memory Bandwidth Benchmark	R.S.T
			1	2		
Kingston	KVR400X64C25/512	512MB	√	√	OK	OK
	(Winbond W942508BH-5)			√	OK	OK
Micron	MT16VDDT6464AG-40BC4	512MB	√	√	OK	OK
	(Micron MT46V32M8TG-5B C)			√	OK	OK
Nanya	NT512D64S8HB1G-5T	512MB	√	√	OK	OK
	(Nanya NT5DS32M8BT-5T)			√	OK	OK
PSC	AL6D8A53TK1-5B	512MB	√	√	OK	OK
	(PSC A2S56D30ATP-5)	*		√	OK	OK
Transcend	TS64MLD64V4F3	512MB	√	√	OK	OK
	(SEC K4H560838D-TCCC)			√	OK	OK
Winbond	W9451GCDB-5	512MB	√	√	OK	OK
	(WinBond W942508CH-5)	*		√	OK	OK