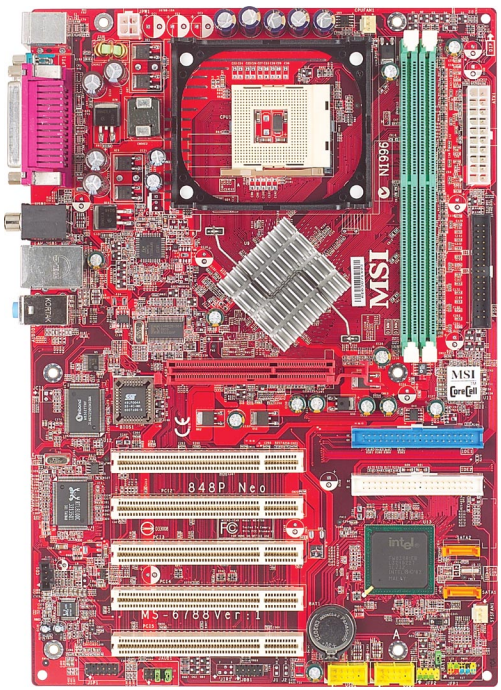
848P Neo

MS-6788 (v1.X) ATX Mainboard



Version 1.1
G52-M6788X5

Manual Rev: 1.1
Release Date: October 2003

CE 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-6788

FC **Tested to comply with FCC Standard**

For Home or Office Use

Copyright Notice

Trademarks

Revision History

Revision	Revision History	Date
V1.0	First release for PCB 1.X with Intel® 848P & Intel® ICH5	August 2003
V1.1	Audio driver updates	October 2003

Safety Instructions

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

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Getting Started

Thank you for choosing the 848P Neo (MS-6788) v1.X ATX mainboard. The 848P Neo is based on **Intel® 848P** and **ICH5** chipsets for optimal system efficiency. Designed to fit the advanced **Intel® Pentium® 4** processors in 478 pin package, the 848P Neo delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU

- ➤ Supports Intel® P4 Northwood (Socket 478) processors.
- ➤ FSB 400MHz/533MHz/800MHz depending on the North Bridge integrated.
- ➤ Supports up to 3.2GHz or higher speed P4 processor.

Chipset

- ➤ Intel® 848P chipset
  - Supports 400/533/800MHz Intel NetBurst micro-architecture bus.
  - Supports AGP 8X/4X at 0.8V (AGP 3.0) or 4X at 1.5V (not support 3.3V) interface.
  - Supports PC2100/PC2700 /PC3200 memory.
- ➤ Intel® ICH5 chipset
  - 8 Hi-Speed USB ports (USB2.0/1.1) controller, 480Mb/sec.
  - 2 Serial ATA/150 ports.
  - 2 channel Ultra ATA 100 bus Master IDE controller.
  - PCI Master v2.3.
  - I/O APIC.
  - Supports both ACPI and legacy APM power management.

MainMemory

- ➤ Supports two 64-bit wide DDR data channels.
- ➤ Available bandwidth up to 3.2 GB/s (DDR 400) for single-channel mode.
- ➤ Supports two unbuffered DIMM of 2.5 Volt DDR SDRAM.
- ➤ Supports up to 2GB memory size without ECC.
- ➤ Supports only x8, x16 DDR devices with 4-bank.

Slots

- ➤ One AGP slot supports 8x/4x at 0.8V (AGP 3.0) or 4x at 1.5V (3.3V not supported).
- ➤ Five 32-bit v2.3 Master PCI bus slots (support 3.3v/5v PCI bus interface).

On-Board IDE

- ➤ Dual Ultra DMA 66/100 IDE controllers integrated in ICH5.
  - Supports PIO, Bus Master operation modes.
  - Can connect up to four Ultra ATA drives.
- ➤ Serial ATA/150 controller integrated in ICH5.
  - Up to 150MB/sec transfer rate.
  - Can connect up to 2 Serial ATA drives.

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 COM1
- 1 parallel port supports SPP/EPP/ECP mode
- 8 USB 2.0 ports (Rear * 4/ Front * 4)
- 1 Line-In/Line-Out/Mic-In port
- 1 RJ45 LAN jack (Optional)
- 1 RCA SPDIF Out

Audio

➤ AC'97 link controller integrated in ICH5.

➤ 6 channels software audio codec ALC655.
- Compliance with AC97 v2.2 Spec.
- Meet PC2001 audio performance requirement.

LAN (Optional)

➤ Realtek® 8110S/8100C Dual layout.
- Integrated Fast Ethernet MAC and PHY in one chip.
- Supports 10Mb/s, 100Mb/s and 1000Mb/s (1000Mb/s is only for Realtek 8110S) auto-negotiation operation.
- Compliant with PCI v2.2.
- Supports ACPI Power Management.

BIOS

➤ The mainboard BIOS provides "Plug & Play" BIOS which detects the peripheral devices and expansion cards of the board automatically.

➤ The mainboard provides a Desktop Management Interface (DMI) function which records your mainboard specifications.

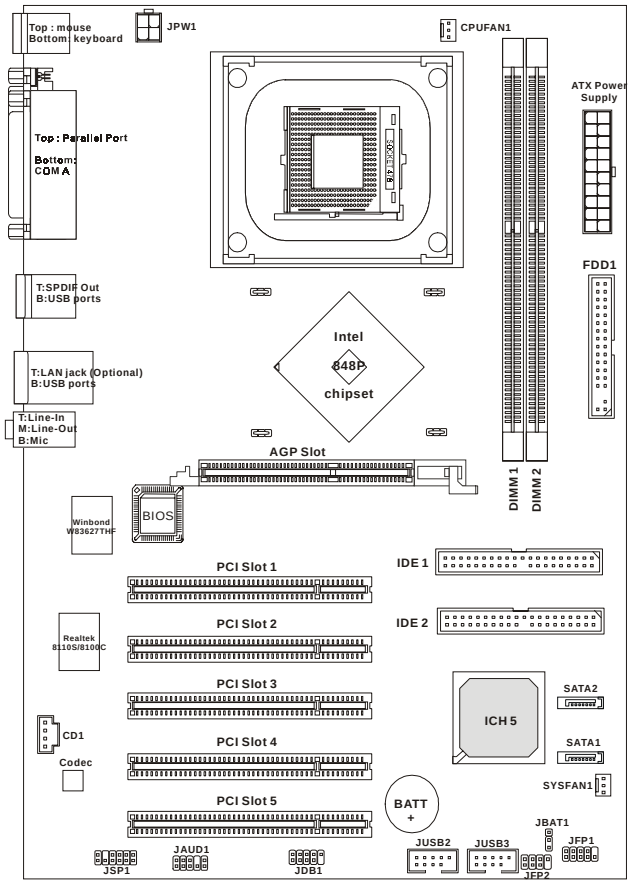
Dimension

➤ ATX Form Factor: 30.5 cm (L) x 21.0 cm (W).

Mounting

➤ 6 mounting holes.

Mainboard Layout



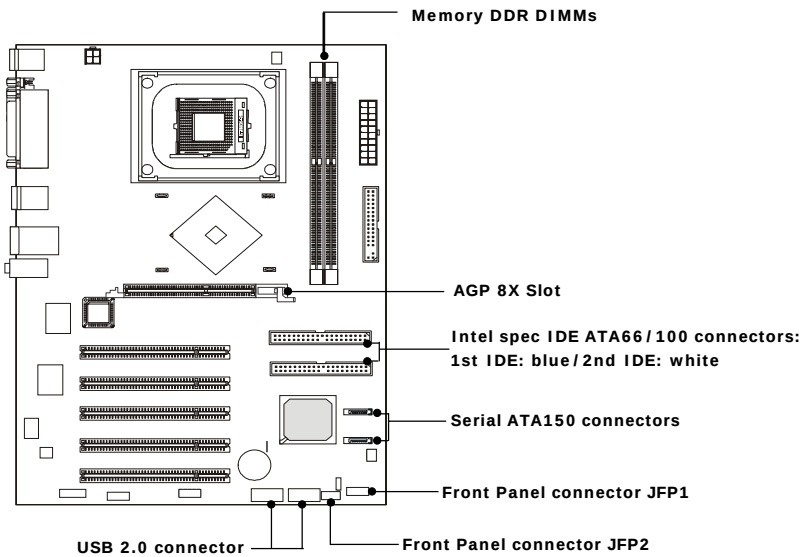
848P Neo (MS-6788 v1.X) ATX Mainboard

MSI Special Features

Color Management

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

- Memory DDR DIMMs: light green
- Intel spec IDE ATA66/100 connector: 1st IDE is blue, 2nd IDE is white
- Serial ATA150 connector: orange
- AGP 8X slot: red
- USB 2.0 connector: yellow
- Front panel connector JFP1 : HDD LED is red, Reset Switch is blue, Power Switch in black, Power LED is light green.
- Front panel connector JFP2: Power LED is light green.



CoreCenter

CoreCenter (TM)- contains OC Menu panel, users can determine their processor and memory type to optimize its memory capacity. This all-in-one hardware console is advanced combination of the popular PC Alert and Fuzzy Logic. Including powerful function with hardware monitor, system alert and instinctive UI of overclocking, CoreCenter is just like your PC doctor that can detect, view and adjust the PC hardware and system status during real time operation.

In the left side it shows the current system status including the Vcore, 3. 3V, +5V and 12V. In the right side it shows the current PC hardware status such as the CPU & system temperatures and all fans speeds.

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

Left-wing: Current system status

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

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

Right-wing: PC hardware status during real time operation

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

Top-side: User mode/Auto mode

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

OC Menu

The exclusive OC Menu is fully developed to support DDR400+ memory modules. By comprehensive validation of over 67 DDR400+ memory modules, MSI concluded best parameters for DRAM voltage, Vio and other BIOS settings. You can select DDR433, DDR450, DDR466 and DDR500 from DRAM frequency in **BIOS setting**. Or you can just click on **OC Menu** button to configure in the OC Menu at CoreCenter. OC Menu will adjust the necessary parameters of voltage and frequency simultaneously. The only limitation was the margin of processor from overclocking.

Live Monitor™

The Live Monitor™ is a tool used to schedule the search for the latest BIOS/drivers version on the MSI Web site. To use the function, you need to install the "MSI Live Update 3" application. After installation, the "MSI Live Monitor" icon (as shown on the right) will appear on the screen. Double click this icon to run the application.

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

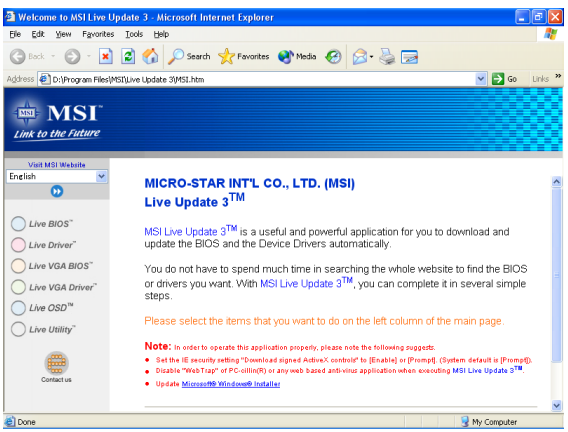
You can right-click the MSI Live Monitor icon to perform the functions listed below:

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

Live BIOS™/Live Driver™

The Live BIOS™/Live Driver™ is a tool used to detect and update your BIOS/drivers online so that you don't need to search for the correct BIOS/driver version throughout the whole Web site. To use the function, you need to install the "MSI Live Update 3" application. After the installation, the "MSI Live Update 3" icon (as shown on the right) will appear on the screen.

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



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

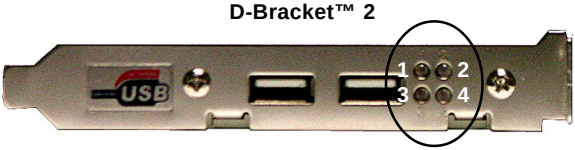
- **Live BIOS** – Updates the BIOS online.
- **Live Driver** – Updates the drivers online.
- **Live VGA BIOS** – Updates the VGA BIOS online.
- **Live VGA Driver** – Updates the VGA driver online.
- **Live OSD** – Updates the firmware of the OSD products online.
- **Live Utility** – Updates the utilities online.

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

D-Bracket™ 2 (Optional)

D-Bracket™ 2 is a 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 detect all problems that fail the system, such as VGA, RAM or other failures. This special feature is very useful for 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**

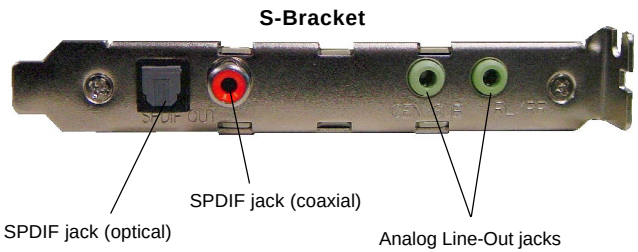
D-Bracket™ 2	Description
1 2 3 4	System Power ON - The D-LED will hang here if the processor is damaged or not installed properly.
	Early Chipset Initialization
	Memory Detection Test - Testing onboard memory size. The D-LED will hang if the memory module is damaged or not installed properly.
	Decompressing 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
	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

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*.



CPU Thermal Protection

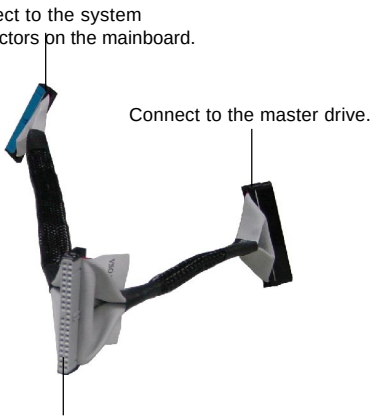
Aimed to prevent the CPU from overheating, MSI has developed a CPU Thermal Protection mechanism for Intel® CPU platform. This CPU Thermal Protection mechanism works on a thermal signal sensor. If the mechanism senses an abnormal temperature rise, it will automatically shut down the system and the CPU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

Round Cable (Optional)

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

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

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



Core Cell™ Chip

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

Features of CoreCell™

Speedster

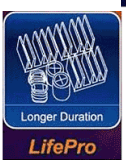
-- Advanced O.C. design.
-- Superior O.C. capability.
-- Greater O.C. method.

PowerPro

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

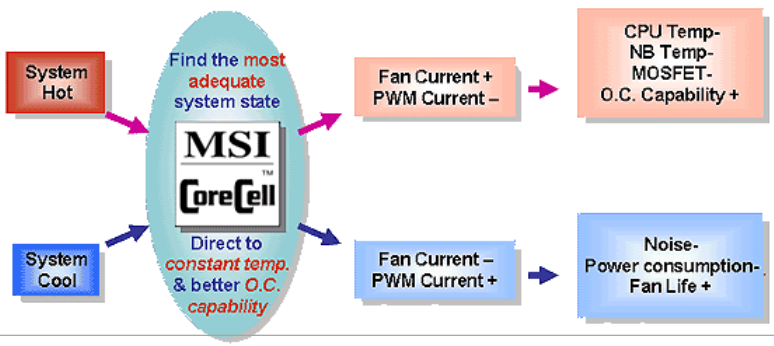
BuzzFree

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



LifePro

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

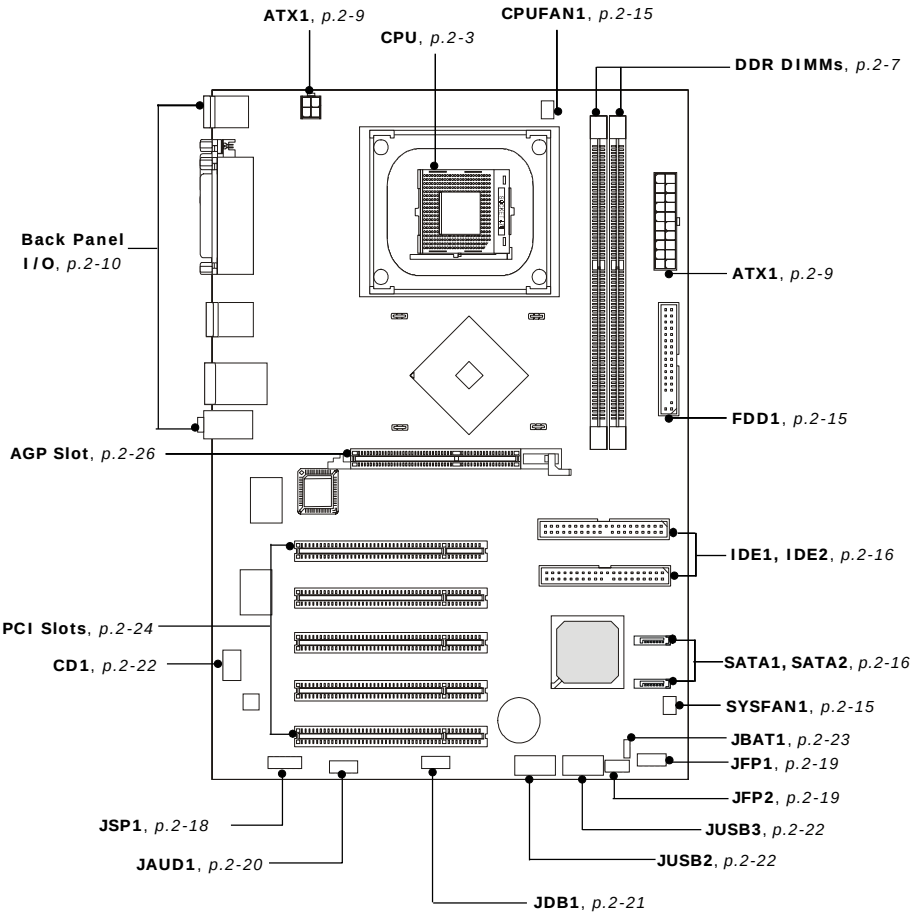


Hardware Setup

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

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

Quick Components Guide



Central Processing Unit: CPU

The mainboard supports Intel® Pentium® 4 processors 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 have 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	=	200MHz
	Core/Bus ratio	=	12
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	200MHz x 12
		=	2.4GHz

Memory Speed/CPU FSB Support Matrix

FSB \ Memory	DDR 266	DDR 333	DDR 400
400 MHz	OK	N/A	N/A
533 MHz	OK	OK	N/A
800 MHz	N/A	OK	OK

MSI Reminds You...

Overheating

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

Overclocking

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

CPU Installation Procedures for Socket 478

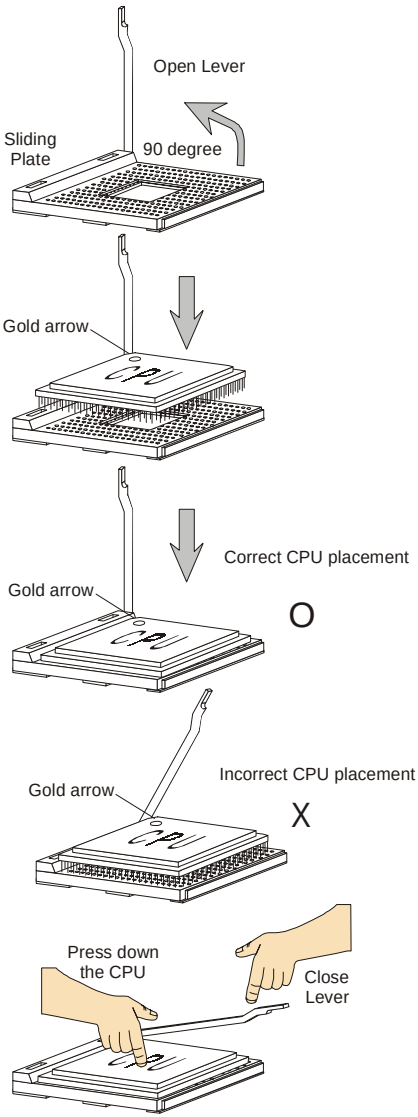
1. Please turn off the power and unplug the power cord before installing the CPU.

2. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.

3. Look for the gold arrow. The gold arrow should point towards the lever pivot. The CPU can only fit in the correct orientation.

4. If the CPU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your mainboard.

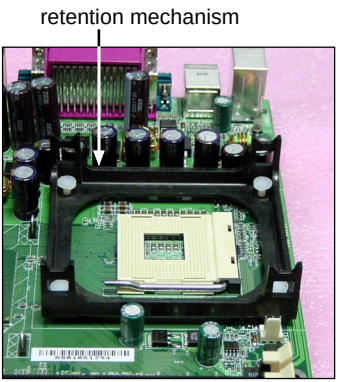
5. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



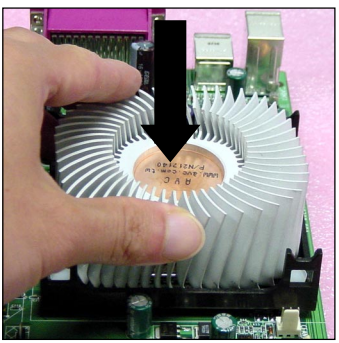
Installing the CPU Fan

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

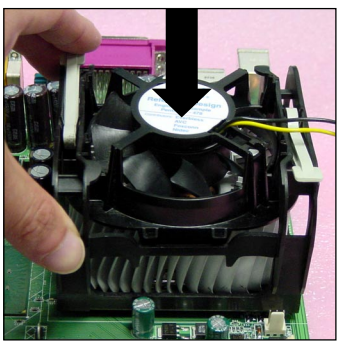
1. Locate the CPU and its retention mechanism on the motherboard.



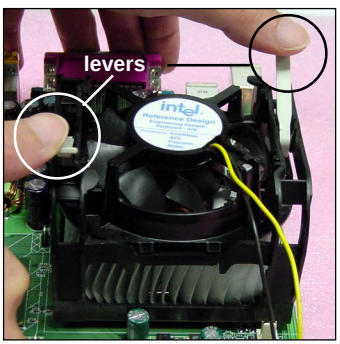
2. Position the heatsink onto the retention mechanism.



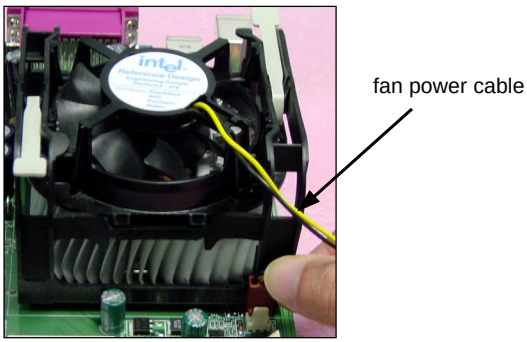
3. Mount the fan on top of the heatsink. Press down the fan until its four clips get wedged in the holes of the retention mechanism.



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



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



NOTES

Memory

The mainboard provides 2 slots for 184-pin, 2.5V DDR DIMM modules and supports the memory size up to 2 GB without ECC,. You can install DDR266/ DDR333/DDR400 DDR SDRAM modules on the DDR DIMM slots. To operate properly, at least one DIMM module must be installed.

DIMM1-2

Introduction to DDR SDRAM

DDR (Double Data Rate) SDRAM is similar to conventional SDRAM, but doubles the rate by transferring data twice per cycle. It uses 2.5 volts as opposed to 3.3 volts used in SDR SDRAM, and requires 184-pin DIMM modules rather than 168-pin DIMM modules used by SDR SDRAM. Three types of DDR are available at the time of writing: DDR266, DDR333 & DDR400. DDR266 DDR SDRAM running at 133MHz will produce about 1.6GB/s memory bandwidth. DDR333 running at 166MHz will produce 2.1GB/s memory bandwidth. DDR400 is also available with bandwidith up to 3.2GB/s for single-channel mode or with 6.4GB/s for dual-channel mode. High memory bandwidth makes DDR an ideal solution for high performance PC, workstations and servers.

DDR 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-side modules to meet your own needs.

Memory modules can be installed in any combination as follows:

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

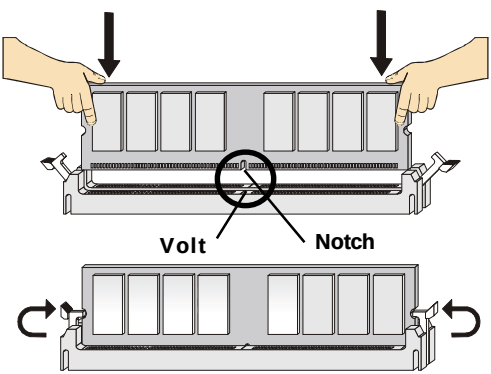
S: Single Side **D: Double Side**

Installing DDR Modules

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

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

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

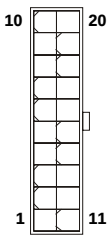


Power Supply

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

ATX 20-Pin Power Connector: ATX1

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.



ATX1

ATX1 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

ATX 12V Power Connector: JPW1

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

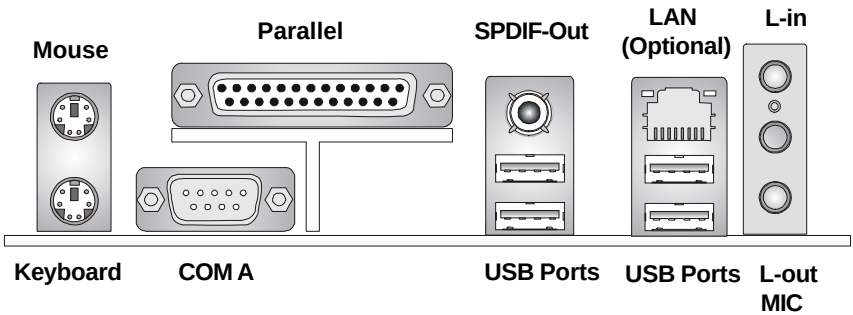
JPW1

JPW1 Pin Definition

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

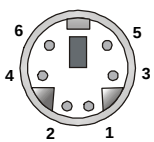
Back Panel

The back panel provides the following connectors:



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:



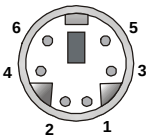
PS/2 Mouse (6-pin Female)

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

Keyboard Connector

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



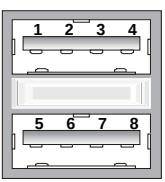
PS/2 Keyboard (6-pin Female)

Pin Definition

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

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.



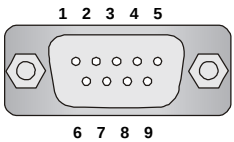
USB Ports

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

Serial Port Connector: COM A

The mainboard offers one 9-pin male DIN connector as serial port COM A. The ports are 16550A high speed communication ports that send/receive 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connectors.



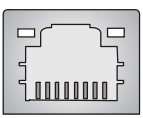
9-Pin Male DIN Connector

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

LAN (RJ-45) Jacks: 10/100 LAN

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



RJ-45 LAN Jack

10/100 LAN Pin Definition

PIN	SIGNAL	DESCRIPTION
1	D0P	Differential Pair 0+
2	D0N	Differential Pair 0-
3	D1P	Differential Pair 1+
4	NC	Not used
5	NC	Not used
6	D1N	Differential Pair 1-
7	NC	Not used
8	NC	Not used

SPDIF-out Port Connector

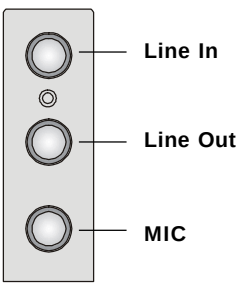
SPDIF-out is a jack for coaxial fiber connection for digital audio transmission.

SPDIF-out port

Audio Port Connectors

Line Out is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones.

1/8" Stereo Audio Connectors

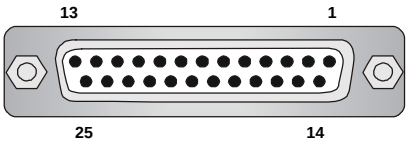


MSI Reminds You...

*For advanced audio application, ALC655 is provided to offer support for **6-channel audio operation** and can turn rear audio connectors from 2-channel to 4-/6-channel audio. For more information on **6-channel audio operation**, please refer to Appendix. Using 2-, 4- or 6-Channel Audio Function.*

Parallel Port Connector: LPT1

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



Pin Definition

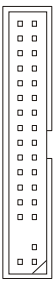
PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select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

Connectors

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

Floppy Disk Drive Connector: FDD1

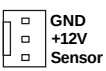
The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.



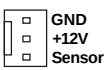
FDD1

Fan Power Connectors: CPUFAN1/SYSFAN1

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



CPUFAN1



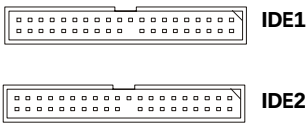
SYSFAN1

MSI Reminds You...

Always consult the vendors for proper CPU cooling fan.

ATA100 Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 33/66/100 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA 33/66/100 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy 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)

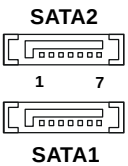
IDE2 can also connect a Master and a Slave drive.

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.

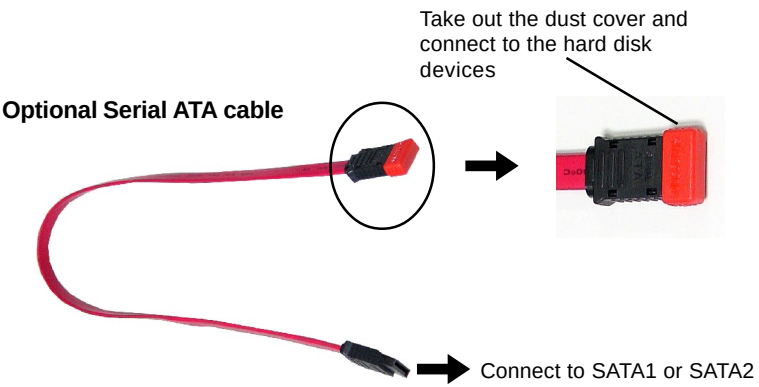
Serial ATA HDD Connectors: SATA1, SATA2

The mainboard provides dual high-speed Serial ATA interface ports. The ports support 1st generation Serial ATA data rates of 150MB/s and are fully compliant with Serial ATA 1.0 specifications. Each Serial ATA connector can connect to 1 hard disk drive.



Pin Definition

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



MSI Reminds You...

Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, the loss of data may occur during transmission.

S-Bracket (SPDIF) Connector: JSP1 (Optional)

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

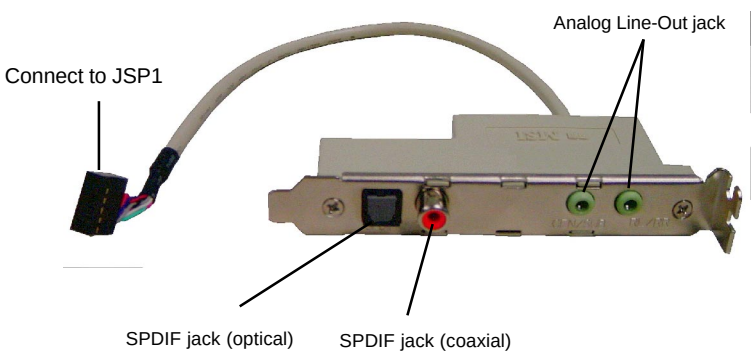
To attach the fiber-optic cable to optical SPDIF jack, you need to remove the plug from the jack first. The two SPDIF jacks support *SPDIF output* only. For more information on the S-Bracket, refer to *Appendix: Using 2-, 4- or 6-Channel Audio Function*.

JSP1

JSP1 Pin Definition

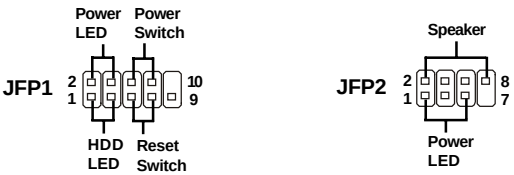
PIN	SIGNAL	DESCRIPTION	PIN	SIGNAL	DESCRIPTION
1	VCC5	VCC 5V	2	VDD3	VDD 3.3V
3	SPDFO	S/PDIF output	4	(No Pin)	Key
5	GND	Ground	6	SPDFI	S/PDIF input
7	LFE-OUT	Audio bass output	8	SOUT-R	Audio right surrounding output
9	CET-OUT	Audio center output	10	SOUT-L	Audio left surrounding output
11	GND	Ground	12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

Optional S-Bracket



Front Panel Connectors: JFP1 & JFP2

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



JFP1 Pin Definition

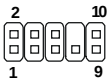
PIN	SIGNAL	DESCRIPTION
1	HD_LED_P	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED_N	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW_N	Reset Switch low reference pull-down to GND
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_P	Reset Switch high reference pull-up
8	PWR_SW_N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

JFP2 Pin Definition

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

Front Panel Audio Connector: JAUD1

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



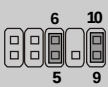
JAUD1

JAUD1 Pin Definition

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

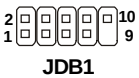
MSI Reminds You...

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



D-Bracket™ 2 Connector: JDB1 (Optional)

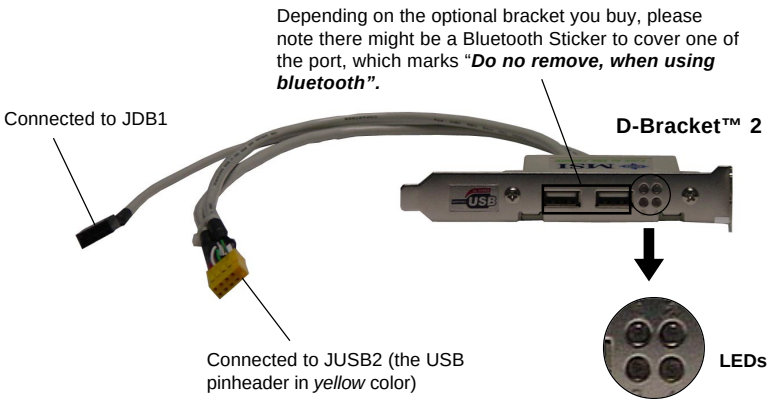
The mainboard comes with a JDB1 connector for you to connect to D-Bracket™ 2. D-Bracket™ 2 is a USB Bracket that supports both USB1.1 & 2.0 spec. It integrates four LEDs and allows users to identify system problem through 16 various combinations of LED signals. For definitions of 16 signal combinations,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



JDB1

JDB1 Pin Definition

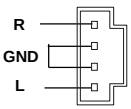
Pin	Signal
1	DBG1 (high for green color)
2	DBR1 (high for red color)
3	DBG2 (high for green color)
4	DBR2 (high for red color)
5	DBG3 (high for green color)
6	DBR3 (high for red color)
7	DBG4 (high for green color)
8	DBR4 (high for red color)
9	Key
10	NC



CD-In Connector: CD1

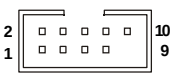
The connector is for CD-ROM audio connector.

CD1



Front USB Connectors: JUSB2 & JUSB3

The mainboard provides two USB 2.0 pin headers *JUSB2* & *JUSB3* that are compliant with Intel® I/O Connectivity Design Guide. USB 2.0 technology increases data transfer rate up to a maximum throughput of 480Mbps, which is 40 times faster than USB 1.1, and is ideal for connecting high-speed USB interface peripherals such as **USB HDD**, **digital cameras**, **MP3 players**, **printers**, **modems and the like**.



JUSB2 / JUSB3

JUSB2 & JUSB3 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key (no pin)	10	USBOC

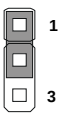
Jumpers

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

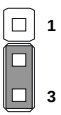
Clear CMOS Jumper: JBAT1

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

JBAT1



Keep Data



Clear Data

MSI Reminds You...

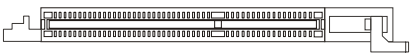
You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Slots

The motherboard provides one AGP slot and five 32-bit PCI bus slots.

AGP (Accelerated Graphics Port) Slot

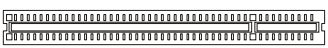
The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory. The slot supports 8x/4x AGP card.



AGP Slot

PCI (Peripheral Component Interconnect) Slots

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



PCI Slots

PCI Interrupt Request Routing

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

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT B#	INT C#	INT D#	INT A#
PCI Slot 2	INT C#	INT D#	INT A#	INT B#
PCI Slot 3	INT D#	INT A#	INT B#	INT C#
PCI Slot 4	INT B#	INT C#	INT D#	INT A#
PCI Slot 5	INT A#	INT B#	INT C#	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, then press <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 in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F7>	Load BIOS Setup Defaults
<F9>	Load High Performance Defaults
<F10>	Save all the CMOS changes and exit

Getting Help

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

Main Menu

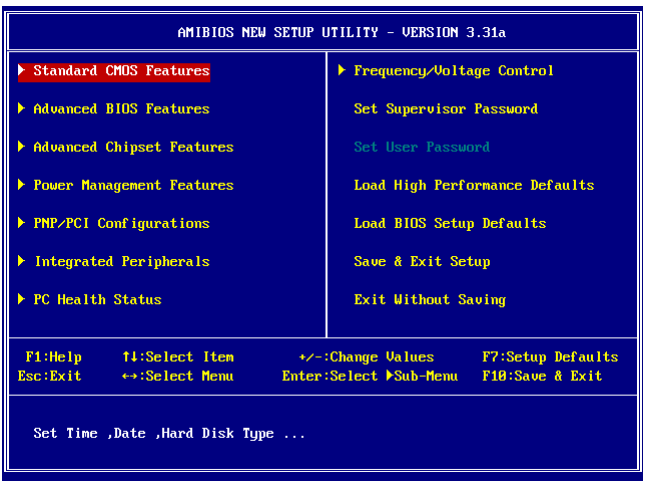
The main menu displays the setup categories the BIOS supplies. You can use the arrow keys (↑↓) to select the item. The on-line description for the selected setup category is displayed at the bottom of the screen.

Default Settings

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

The Main Menu

Once you enter AMIBIOS NEW SETUP UTILITY, the Main Menu will appear on the screen. The Main Menu displays twelve configurable functions and two exit choices. Use arrow keys to move among the items and press <Enter> to enter the sub-menu.



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

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

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

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

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

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

PC Health Status
This entry shows your PC health status.

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

Set Supervisor Password
Use this menu to set Supervisor Password.

Set User Password
Use this menu to set User Password.

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

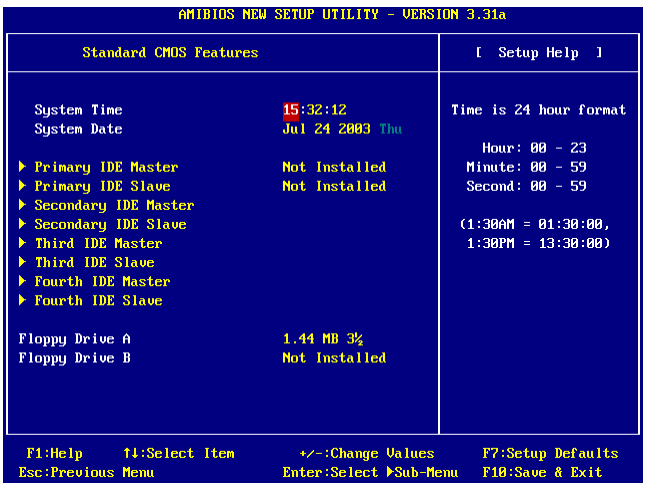
Load BIOS Setup Defaults
Use this menu to load factory default settings into the BIOS for stable system performance operations.

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

Exit Without Saving
Abandon all changes and exit setup.

Standard CMOS Features

The items inside STANDARD CMOS SETUP menu are divided into 9 categories. Each category includes none, one or more setup items. Use the arrow keys to highlight the item you want to modify and use the <PgUp> or <PgDn> keys to switch to the value you prefer.



System Time

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

System Date

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

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

Primary/Secondary/Third/Fourth IDE Master/Slave

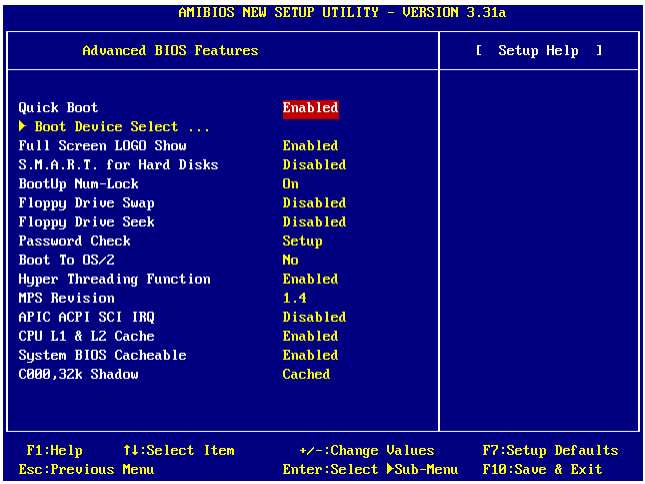
Press PgUp/<+> or PgDn/<-> to select the hard disk drive type. The specification of hard disk drive will show up on the right hand according to your selection.

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*.

Advanced BIOS Features

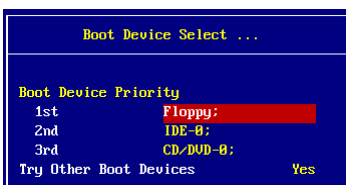


Quick Boot

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

Boot Device Select

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



1st/2nd/3rd Boot Device

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

MSI Reminds You...

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

Try Other Boot Device
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.

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

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

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
Toggle between *On* or *Off* to control the state of the NumLock key when the system boots. When toggled *On*, the numeric keypad generates numbers instead of controlling cursor operations. Setting options: *On*, *Off*.

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

Floppy Drive Seek
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
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 Intel Hyper Threading CPU function. Setting to Enabled will increase the system performance. Settings: *Enabled*, *Disabled*. Please disable this item if your operating system doesn't support HT Function, or the unreliability and instability may occur.

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;*
* ***OS:*** *An operating system that supports HT Technology.*

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

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*.

APIC ACPI SCI IRQ
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* and *Disabled*.

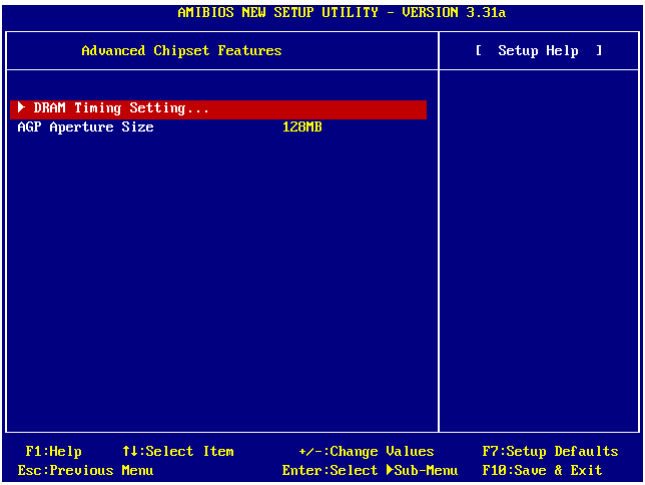
CPU L1 & L2 Cache
Cache memory is additional memory that is much faster than conventional DRAM (system memory). When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. The setting controls the internal cache (also known as L1 or level 1 cache). Setting to *WriteBack* will speed up the system performance.

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

C000, 32k Shadow
This item specifies how the contents of the adapter ROM named in the item are handled. Settings are described below:

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

Advanced Chipset Features

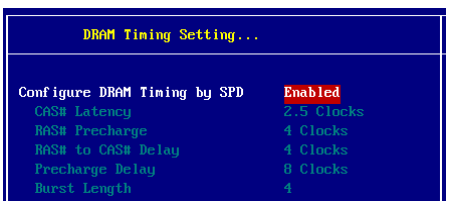


MSI Reminds You...

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

DRAM Timing Setting...

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



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*, *3* (clocks). *2* (clocks)

increases the system performance the most while *3* (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*.

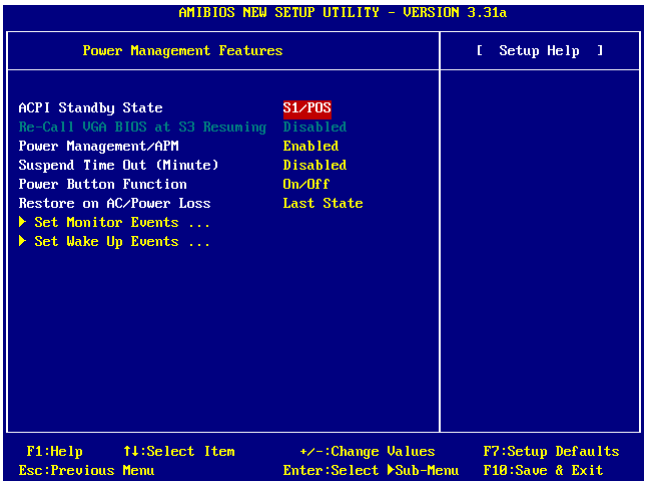
RAS# to CAS# Delay
When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance. Setting options: *3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

Precharge Delay
The field specifies the idle cycles before precharging an idle bank. Settings: *7, 6, 5* (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. Settings: *4 QW* and *8 QW*.

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

Power Management Features



MSI Reminds You...

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

ACPI Standby State

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

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

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

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

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

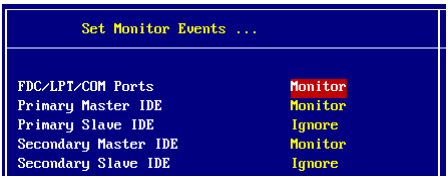
On/Off	The power button functions as a normal power-on/-off button.
Suspend	When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

Restore on AC/Power Loss
This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

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

Set Monitor Events

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



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

These items specify if the BIOS will monitor the activity of the specified hardware peripherals or components. If set to *Monitor*, any activity detected on the specified hardware peripherals or components 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.

USB Device Wakeup From S3

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

Keyboard PowerOn Function

This controls how and whether the PS/2 keyboard is able to power on the system. If you choose *Specific Key*, the power button on the case will not function anymore and you must type the password to power on the system. Settings: *Disabled*, *Any Key*, *Specific Key*.

Specific Key for PowerOn

Specify the password to enable for the “Keyboard PowerOn Function“ while setting to *Specific Key.*

Mouse PowerOn Function
This controls how and whether the PS/2 mouse is able to power on the system. Settings: *Disabled*, *Any Action*, *Left-button* and *Right-button*.

Resume On PME#
This field specifies whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected. Settings: *Enabled*, *Disabled*.

Resume On RTC Alarm
This is used to enable or disable the feature of booting up the system on a scheduled time/date from the soft off (S5) state. Settings: *Enabled*, *Disabled*.

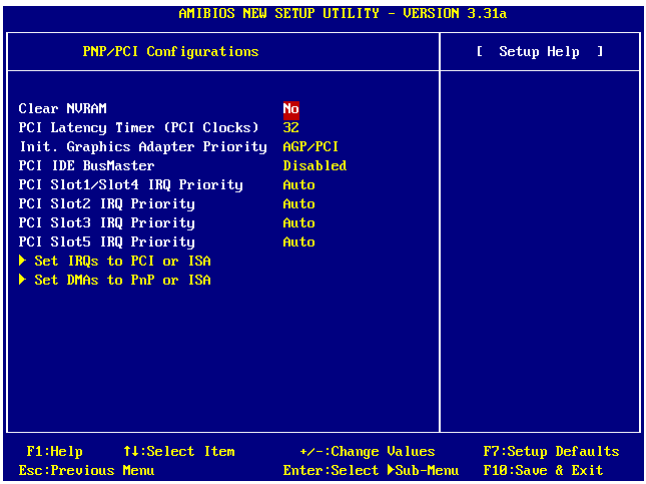
RTC Alarm Date/Hour/Minute/Second
If *Resume On RTC Alarm* is set to *Enabled*, the system will automatically resume (boot up) on a specific date/hour/minute/second specified in these fields. Available settings for each item are:

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

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

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.



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 Adapter Priority

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

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

PCI IDE BusMaster

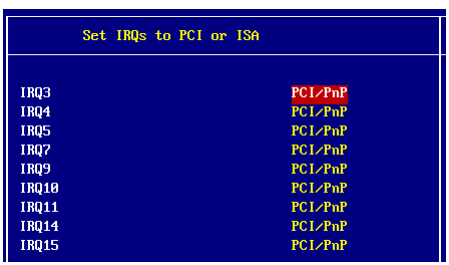
Set this option to *Enabled* to specify that the IDE controller on the PCI local bus has bus mastering capability. Setting options: *Disabled*, *Enabled*.

PCI Slot1/Slot4 IRQ Priority, PCI Slot2 IRQ Priority, PCI Slot3 IRQ Priority, PCI Slot5 IRQ Priority

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

Set IRQs to PCI or ISA

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



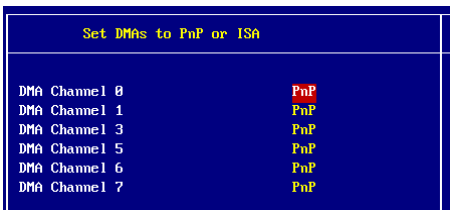
IRQ 3/4/5/7/9/10/11/14/15

These items specify the bus where the specified IRQ line is used. The settings determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the IRQ pool, the end user can use these settings to reserve the IRQ by assigning an *ISA/EISA* setting to it.

Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as *PCI/PnP*. If all IRQs are set to ISA/EISA, and IRQ 14/15 are allocated to the onboard PCI IDE, IRQ 9 will still be available for PCI and PnP devices. Available settings: *ISA/EISA* and *PCI/PnP*.

Set DMAs to PnP or ISA

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

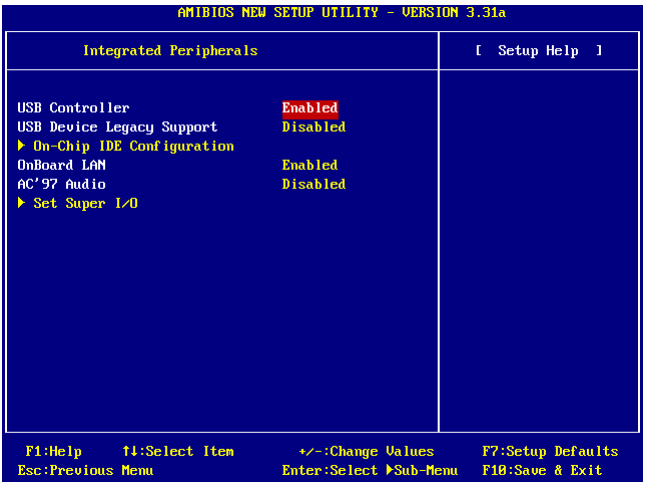


DMA Channel 0/1/3/5/6/7

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

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

Integrated Peripherals



Please note that the options showed on your BIOS might be different depending on the motherboard you buy.

USB Controller

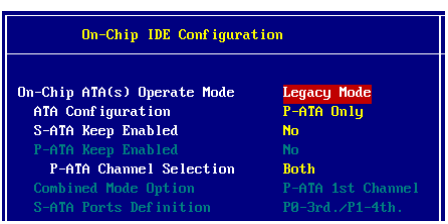
This setting is used to enable/disable the onboard USB controllers.

USB Device Legacy Support

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

On-Chip IDE Configuration

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



On-Chip ATA(s) Operate Mode

This setting allows you to determine how the RAID controller on the south bridge is going to switch to SATA controller. Legacy Mode means you may use the traditional 14 and 15 IRQs, while Native Mode means you may use all the available IRQs. Setting options: *Legacy Mode, Native Mode*.

MSI Reminds You...

There are two modes to select: Legacy mode and Native mode.

Legacy Mode:

* *In this mode, system BIOS just assign the traditional 14 and 15 IRQs to use for HDD.*
* *Older OSs that do not support switch to Native Mode (DOS, Win2K, Win98/ME...) should set SATA and PATA to Legacy Mode.*
* *Maximum 4 ATA devices to connect.*
* *Combine mode and Non-Combine mode.*
  - *Non-Combined Mode: P-ATA devices only . Maximum of 4 devices.*
  - *Non-Combined Mode: S-ATA devices only. Maximum of 2 devices.*
  - *Combined Mode: S-ATA devices P-ATA devices Maximum of 2 devices each, total 4 devices at maximum.*

Native Mode:

* *In this mode, system BIOS will search all available IRQs to use for HDD.*
* *New OS that supports switching to Native Mode (WinXP, Windows .NET Server) can set SATA and PATA to Native Mode.*
* *Maximum 6 ATA devices to connect (4 for P-ATA & 2 for S-ATA).*

ATA Configuration

The field lets you configure the available ATA controller. Setting options: *Disabled, P-ATA Only, S-ATA Only, P-ATA+S-ATA.*

S-ATA Keep Enabled
This item is available for you to enable/disable the onboard S-ATA. Setting options: *Yes, No.*

P-ATA Keep Enabled
This item is available for you to enable/disable the onboard P-ATA. Setting options: *Yes, No.*

P-ATA Channel Selection
This item is available for you to select the parallel ATA channel. Setting options: *Primary, Secondary, Both.*

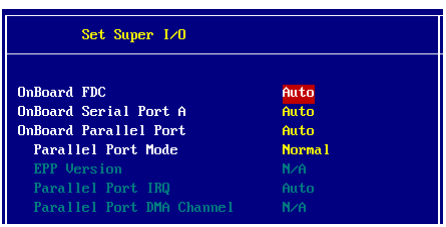
Combined Mode Option
This item is available for you to select the combined mode of the ATA controllers. Setting options*: P-ATA 1st Channel, S-ATA 1st Channel.*

S-ATA Ports Definition
This allows you to set the boot sequence of serial ATA ports.

OnBoard LAN
This setting controls the onboard LAN controller. Setting options: *Disabled, Enabled*.

AC'97 Audio
This item is used to enable or disable the onboard AC'97 (Audio Codec'97) feature. Selecting *Auto* allows the mainboard to detect whether an audio device is used. If an audio device is detected, the onboard AC'97 controller will be enabled; if not, the controller is disabled. Disable the function if you want to use other controller cards to connect an audio device. Settings: *Disabled* and *Auto***.**

Set Super I/O
Press <Enter> to enter the sub-menu and the following screen appears:



OnBoard FDC
Select *Enabled* if your system has a floppy disk controller (FDD) installed on the system board and you wish to use it.

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
This item specifies the base I/O port addresses of the onboard Serial Port 1 (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* and *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* and *Disabled*.

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

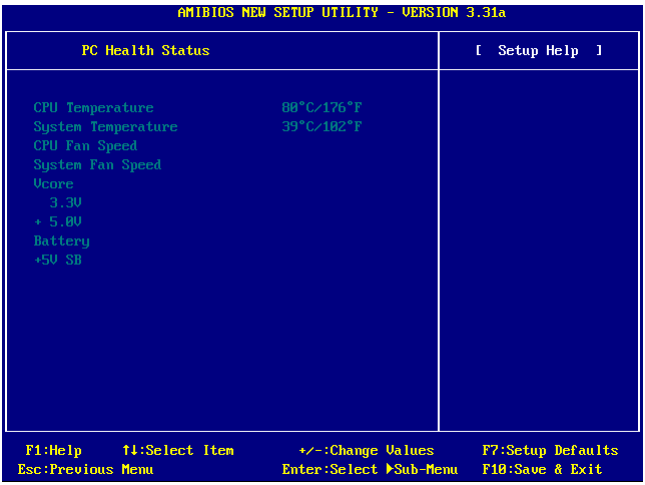
EPP Version
The item selects the EPP version used by the parallel port if the port is set to *EPP* mode. Settings: *1.7* and *1.9*.

Parallel Port IRQ
When *Onboard 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.

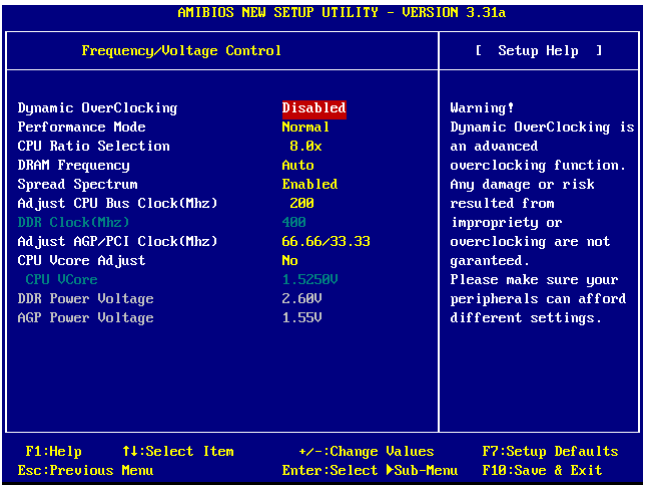


CPU/System Temperature, CPU/System Fan Speed, Vcore, 3.3V, +5.0V, Battery, +5V SB

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.



Dynamic OverClocking

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

Disabled	Disable Dynamic Overclocking.
Private	1st level of overclocking.
Sergeant	2nd level of overclocking.
Captain	3rd level of overclocking, also the default value of "Load High Performance Defaults".
Colonel	4th level of overclocking.
General	5th level of overclocking.
Commander	6th level of overclocking.

MSI Reminds You...

Even though the Dynamic Overclocking Technology is more stable than manual overclocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overclocking regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to disable the Dynamic Overclocking or to lower the level of overclocking options. By the way, if you need to conduct overclocking manually, you also need to disable the Dynamic OverClocking first.

Performance Mode

This item allows you to control the MAT (memory acceleration technology) function of CPU. MAT is MSI™'s exclusive technology, specializing in optimizing the data transfer rate among CPU, north bridge chip and memory, and also in procuring better memory performance and bandwidth up to 10%. Selecting *Fast* will enable MAT. Please be noted that not every memory is compatible with MAT. If the system fail to reboot for four times, the BIOS will be restored to the Default value (*Normal*). Setting options: *Normal*, *Fast.*

MSI Reminds You...

1. *Even though MAT is easy to use, it doesn't mean there's no risk at all. We recommend you to check if your memory is able to bear MAT setting or not before deciding to always use it. If your system will be unstable or reboot incidentally after switching to* ***Fast****, please switch back to* ***Normal****. Moreover, if you want to conduct FSB overclocking, you should set MAT as* ***Normal****.*
2. *Meanwhile, for security reason, there are two functions to protect BIOS and protect user's system from crashing:*
   (a) There is a safe hotkey "Ins" in BIOS. If the overclocking or/and MAT fails to run, you can press "Ins" key while rebooting system to restore to the BIOS Defaults.
   *(b) If your system reboot for four times continually, the BIOS will be restored to the Defaults (****Normal****), too*

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.

DRAM Frequency
Use this field to configure the clock frequency of the installed DRAM. Settings are:

PSB 400: *100-355MHz.*
PSB 533: *133-500MHz*
PSB 800: *200-500MHz*

Spread Spectrum
When the motherboard's clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at *No* for optimal system stability and performance. But if you are plagued by EMI, setting to *Enabled* for EMI reduction. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clockspeed which may just cause your overclocked processor to lock up.

Adjust CPU Bus Clock (Mhz)
This item allows you to select the CPU Bus clock frequency (in MHz) and overclock the processor by adjusting the FSB clock to a higher frequency. Also the setting you choose will change color for warning if the value is of over the specifications.

DDR Clock (Mhz)
This read-only item allows you to view the current DDR clock.

Adjust AGP/PCI Clock (Mhz)
This item allows you to select the AGP/PCI clock frequency (in MHz) by adjusting the AGP/PCI clock to a higher frequency.

CPU Vcore Adjust
The setting allows you to adjust the CPU Vcore voltage. Available options: *Yes, No.*

CPU Vcore

The setting is adjustable if you set the "CPU Vcore Adjust" to "*Yes*".

MSI Reminds You...

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

DDR Power Voltage

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

AGP Power Voltage

AGP voltage is adjustable in the field, allowing you to increase the performance of your AGP display card when overclocking, but the stability may be affected.

MSI Reminds You...

The settings shown in different color in ***CPU Vcore (V), DDR Power Voltage (V)*** and ***AGP Power Voltage (V)*** *helps to verify if your setting is proper for your system.*

White: Safe setting.

Yellow: High performance setting.

Red: Not recommended setting and the system may be unstable.

Set Supervisor/User Password

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

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

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

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

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

MSI Reminds You...

About Supervisor Password & User Password:

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

Load High Performance/BIOS Setup Defaults

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

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

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:

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

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

The mainboard is equipped with Realtek ALC655 chip, which provides support for 6-channel audio output, including 2 Front, 2 Rear, 1 Center and 1 Subwoofer channel. ALC655 allows the board to attach 4 or 6 speakers for better surround sound effect. The section will tell you how to install and use 4-/6-channel audio function on the board.

Installing the Audio Driver

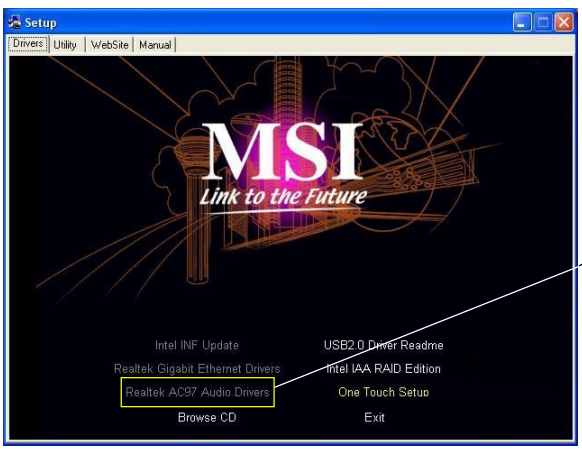
You need to install the driver for Realtek ALC655 chip to function properly before you can get access to 4-/6-channel audio operations. Follow the procedures described below to install the drivers for different operating systems.

Installation for Windows 98SE/ME/2000/XP

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

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

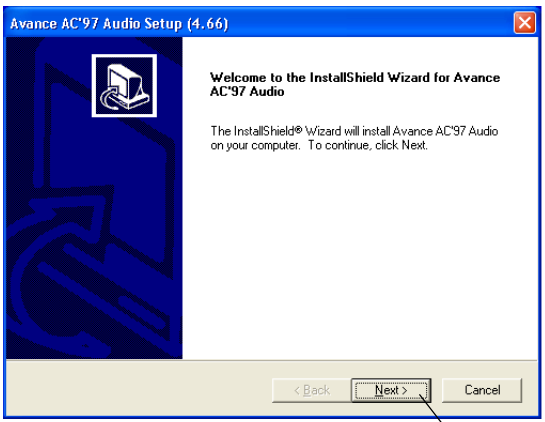
1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click **Realtek AC97 Audio Drivers**.



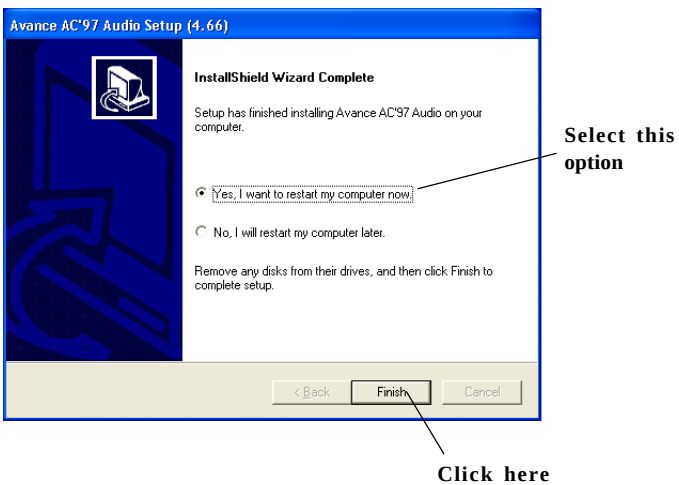
MSI Reminds You...

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

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



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

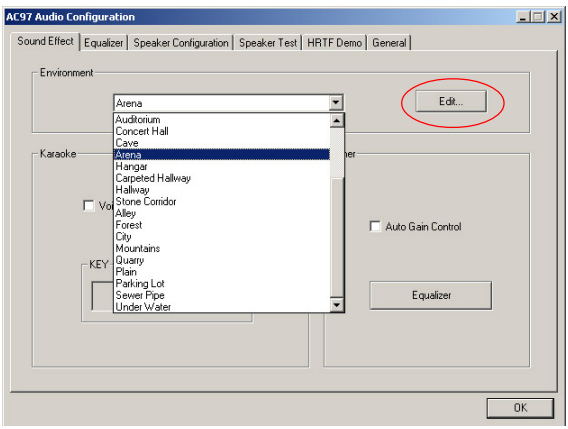


Software Configuration

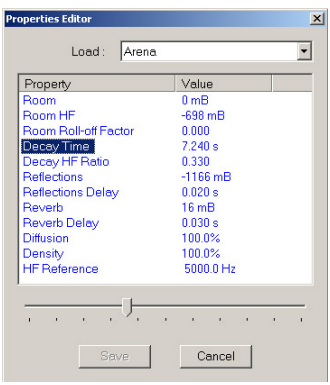
After installing the audio driver, you are able to use the 4-/6-channel audio feature now. Click the audio icon from the window tray at the lower-right corner of the screen to activate the **AC97 Audio Configuration**.

Sound Effect

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

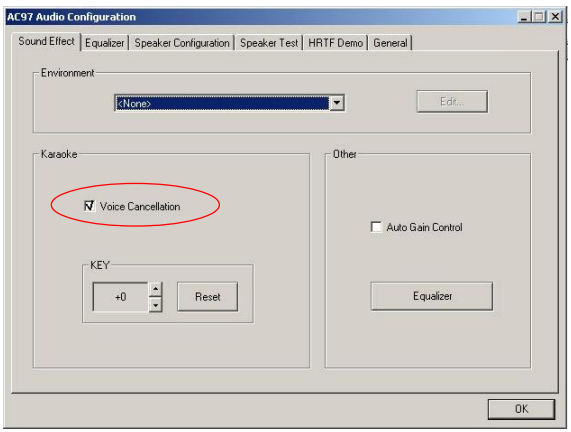


You may also edit the properties for an environment as you wish by clicking the **Edit** button, then just scroll the bar in the bottom for each property to adjust.



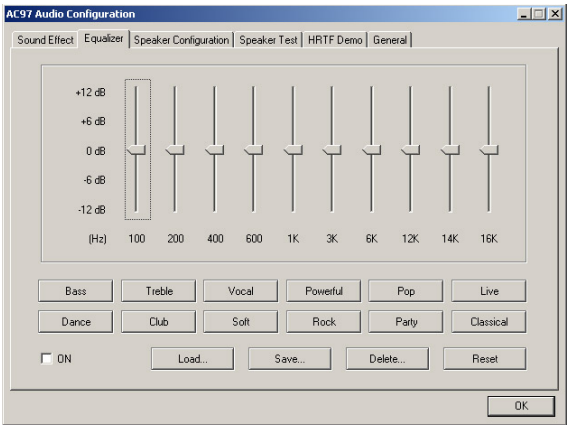
Here it provides the Karaoke function which will automatically remove human voice (lyrics) and leave melody for you to sing the song. Note that this function applies only for 2-channel audio operation.

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

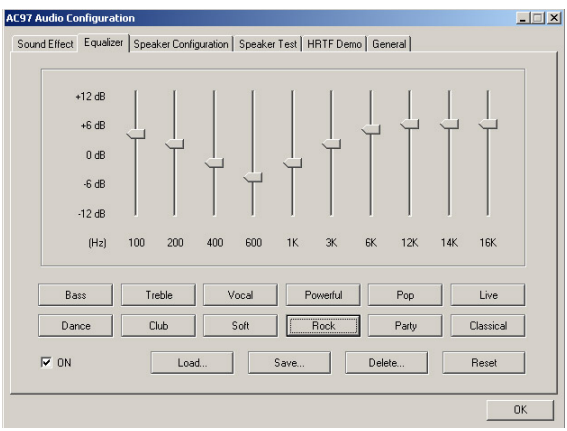


Equalizer

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



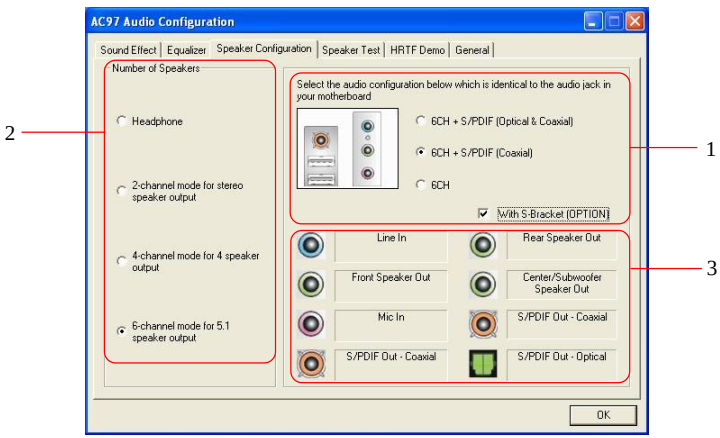
You may choose the provided sound effects, and the equalizer will adjust automatically. If you like, you may also load an equalizer setting or make an new equalizer setting to save as an new one by using the buttons **Load** and **Save**. Or you may click **Reset** to use the default value.



Speaker Configuration

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

1. Select the audio configuration below which is identical to the audio jack in your mainboard. For 848P Neo, you will have to choose **6CH+ S/PDIF (Coaxial).** Be sure to check **With S-Bracket (OPTION)** if you have the optional S-Bracket.



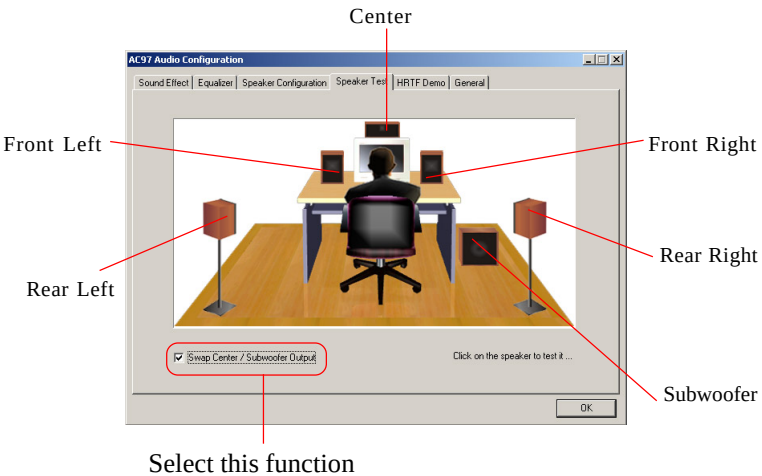
2. Select a desired multi-channel operation from ***Number of Speaker***.
   a. Headphone for the common headphone
   b. 2-Channel Mode for Stereo-Speaker Output
   c. 4-Channel Mode for 4-Speaker Output
   d. 6-Channel Mode for 5.1-Speaker Output

3. Here it shows the multi-channel setting for the audio jack. Please connect your speakers to the correct phone jack in accordance with the setting displayed here.

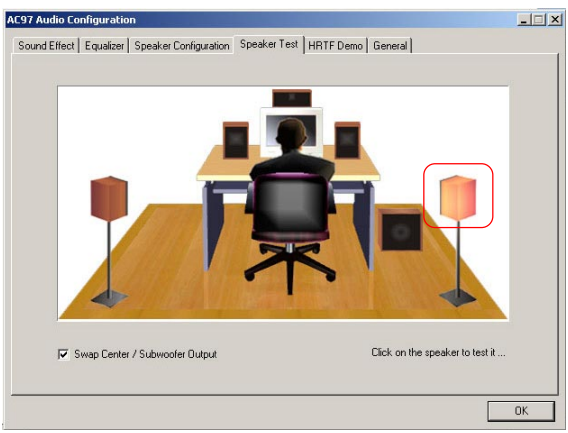
4. Then click **OK** to apply the configuration.

Speaker Test

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



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

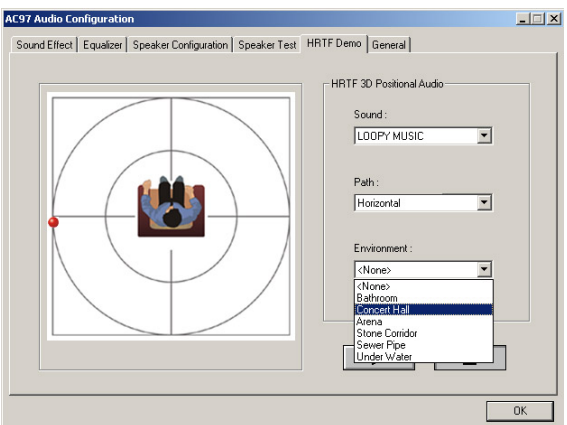


MSI Reminds You...

1. *6 speakers appear on the "Speaker Test" tab only when you select "**6-Channel Mode**" in the "Number of Speakers" column in "Speaker Configuration" tab. If you select "4-Channel Mode", only 4 speakers appear on the window.*
2. *While you are testing the speakers in 6-Channel Mode, if the sound coming from the center speaker and subwoofer is swapped, you should select **Swap Center/Subwoofer Output** to readjust these two channels.*

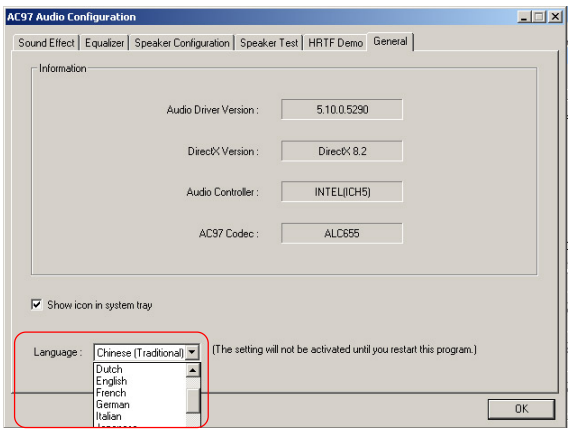
HRTF Demo

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



General

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



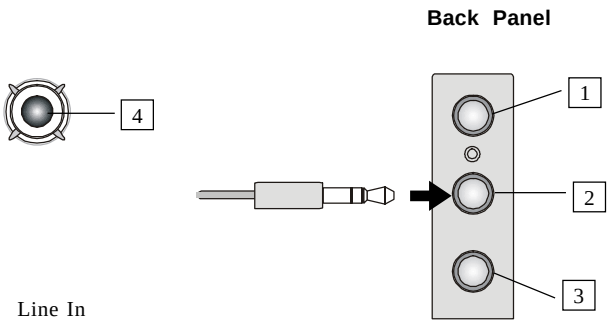
Using 2-, 4- & 6- Channel Audio Function

Connecting the Speakers without the Optional S-Bracket

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.

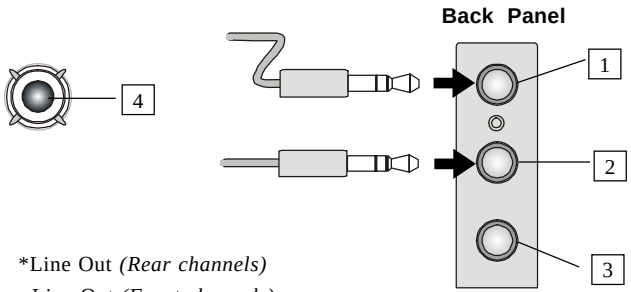


1 Line In
2 Line Out *(Front channels)*
3 MIC
4 SPDIF Coaxial jack

■ 4-Channel Mode for 4-Speaker Output

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

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

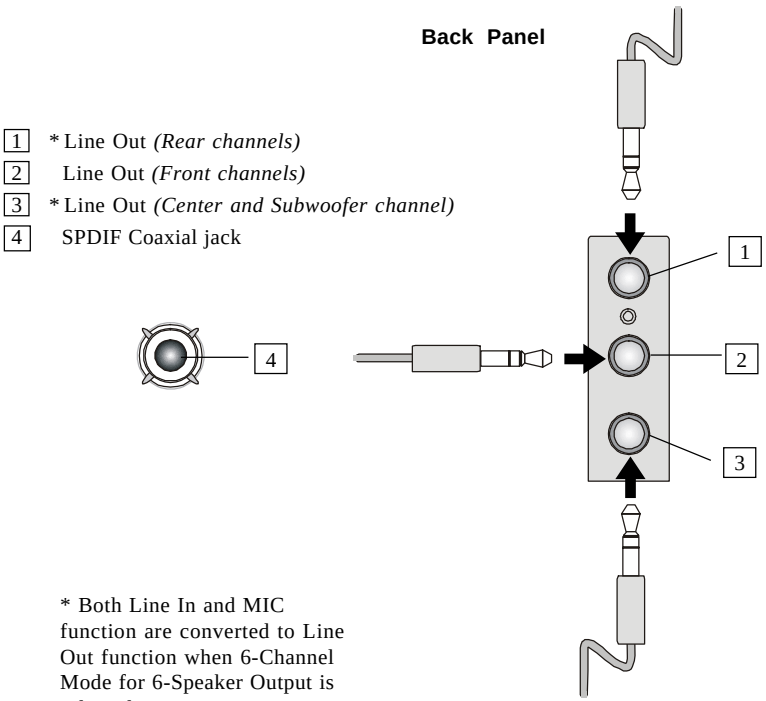


1 *Line Out *(Rear channels)*
2 Line Out *(Front channels)*
3 MIC
4 SPDIF Coaxial jack

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

■ 6-Channel Mode for 6-Speaker Output

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



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

MSI Reminds You...

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

Connecting the Speakers with the Optional S-Bracket

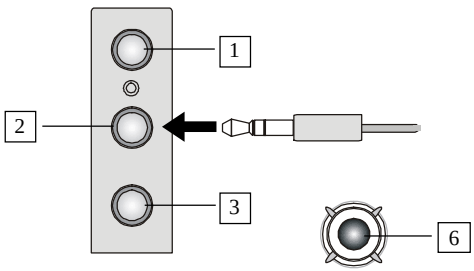
S-Bracket is an optional accessory. It gives access to analog and digital audio output by integrating both SPDIF (Sony & Philips Digital Interface) and analog LINE OUT connectors. To use the S-Bracket, you should select correct setting in the software utility.

2-Channel Analog Audio Output

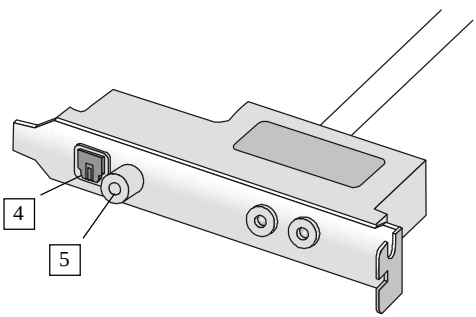
We recommend that you should still attach the speakers to BACK PANEL's Line Out connector during 2-channel audio mode even though S-Bracket's Line Out connectors function properly.

Back Panel

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



S-Bracket



MSI Reminds You...

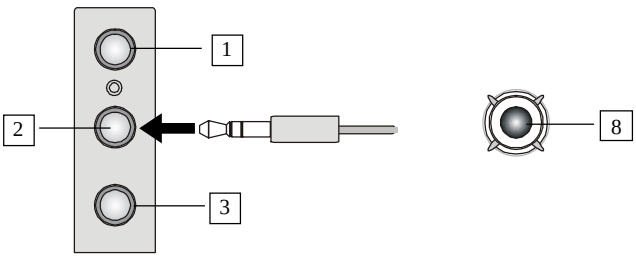
When any Multi-Channel Audio Mode is selected, you may also connect your speakers to the Optical or Coaxial SPDIF phone jack on the S-Bracket to exprience digital surround sound effect.

4-Channel Analog Audio Output

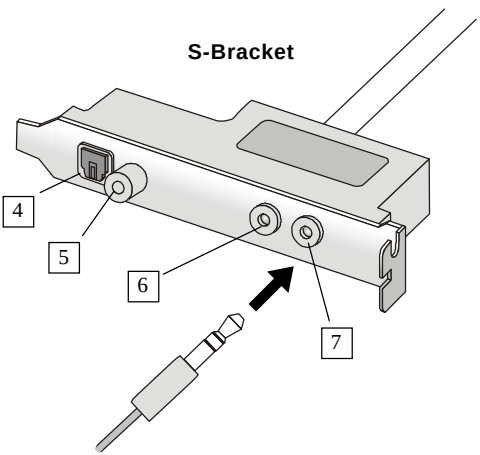
Description:
Connect two speakers to back panel's Line Out connector and two speakers to one Line Out connector of S-Bracket.

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

Back Panel



S-Bracket

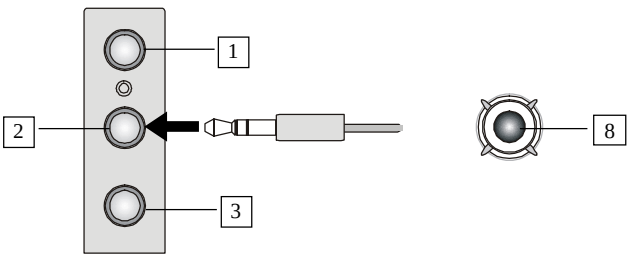


6-Channel Analog Audio Output

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

Description:
Connect two speakers to back panel's Line Out connector and four speakers to both Line Out connectors of S-Bracket.

Back Panel



S-Bracket