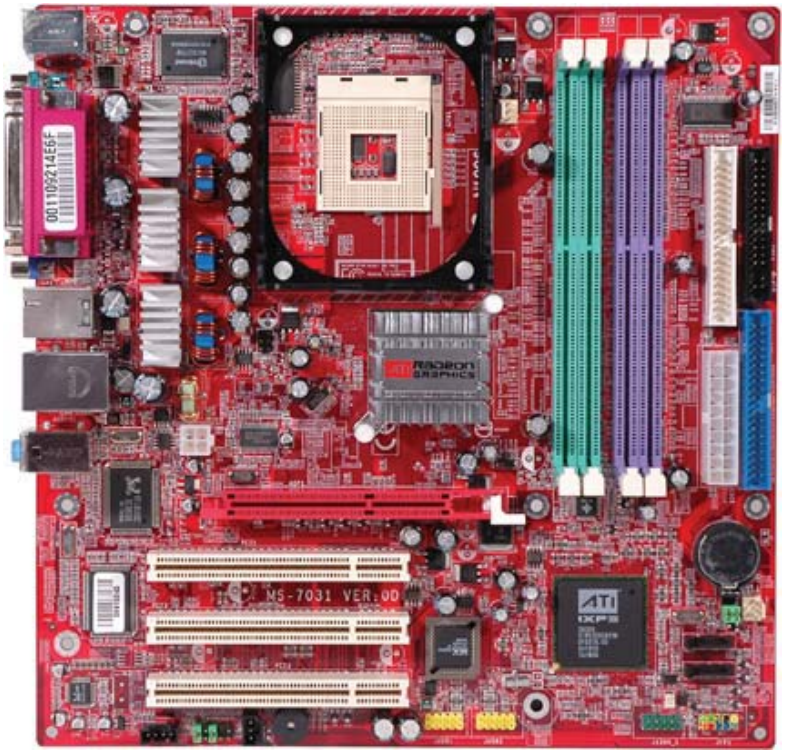
RS350M

MS-7031 (v1.X) M-ATX Mainboard



G52-M7031X1

Manual Rev: 1.0
Release Date: September 2004

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.

FC **Micro-Star International**
MS-7031

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

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Revision History

Revision	Revision History	Date
V1.0	First release of PCB 1.0 with ATi RAdeon 9100 IGP & ATi IXP 300	September 2004

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

➤ Visit the MSI homepage & FAQ site for technical guide, BIOS updates, driver updates, and other information: **http://www.msi.com.tw** & **http://www.msi.com.tw/program/service/faq/faq/esc_faq_list.php**

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

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. **Do not cover the openings.**
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    - ➤ The power cord or plug is damaged.
    - ➤ Liquid has penetrated into the equipment.
    - ➤ The equipment has been exposed to moisture.
    - ➤ The equipment has not work well or you can not get it work according to User's Manual.
    - ➤ The equipment has dropped and damaged.
    - ➤ The equipment has obvious sign of breakage.
12. **Do not leave this equipment in an environment unconditioned, storage temperature above 60^0 C (140^0F), 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 purchasing RS350M Series (MS-7031) v1.X Micro ATX mainboard. The RS350M Series is based on **ATI® Radeon 9100 IGP** & **ATI® IXP 300** chipsets and provides 8 USB 2.0 ports for high-speed data transmission. With all these special designs, the RS350M Series delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU

➤ Socket 478 for P4 processors (Northwood/Prescott) at 400/533/800 MHz
➤ Supports up to 3.4GHz.
➤ Hyper-Threading CPU.
(For the latest information about CPU, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_cpu_support.php)

Chipset

➤ ATI Radeon 9100 IGP
- Supports AGP 8x/4x at 0.8V (AGP 3.0) or 4x at 1.5V
- Supports TV-out (optional)
- Supports ATI Surround View
- ATI RADEON 9200 graphic controller Integrated
- Supports 266/333/400MHz memory FSB

➤ ATI IXP 300
- AC'97 2.2 interface
- 8 USB 2.0/1.1 ports
- 2 channel Ultra ATA33/66/100/133 Bus Master IDE controller
- Supports RAID 0, 1 & 2 SATA ports

Main Memory

➤ Supports four 184-pin unbuffered DDR 266/333/400 DIMMs.
➤ Supports up to 4GB memory size without ECC.
(For the updated supporting memory modules, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_trp_list.php.)

Slots

➤ One AGP (Accelerated Graphics Port) slot that supports AGP 3.0 8x/4x.
➤ Three PCI 2.2 32-bit Master PCI Bus slots（support 3.3V/5V PCI bus interface).

On-Board IDE

➤ One Ultra DMA 33/66/100/133 IDE controllers integrated in ATI IXP 300.
- Supports PIO, Bus Master operation modes.
- Can connect up to four Ultra ATA drives.
- Support Bus Master, Ultra DMA 33/66/100/133 operation modes

➤ Serial ATA 150 controller integrated in ATI IXP 300.
- Up to 150MB/sec transfer speed.
- Can connect up to two Serial ATA devices.
- Supports SATA Raid 0 and Raid 1 function.

On-Board Peripherals

➤ On-Board Peripherals include:
- 1 floppy port supports 1 FDD with 360K, 720K, 1.2M, 1.44M and 2.88 Mbytes.
- 1 serial port (COM1) and 1 VGA port
- 1 parallel port supports SPP/EPP/ECP mode
- 8 USB 2.0/1.1 ports (Rear * 4 / Front * 4)

- 1 Line-In/Line-Out/Mic-In port
- 1 RJ-45 LAN connector
- 1 IEEE 1394 port (Optional)
- 1 CD-IN pin header

IEEE1394 (Optional)

- VIA VT6307 PCI Controller with integrated PHY (optional)
- Supports 2 1394 ports (Rear x1 / Front x 1)

Audio

- AC97 link controller integrated in ATI IXP 300.
- 6 channels S/W audio codec Realtek ALC655 codec
  - Compliance with AC97 2.2 Spec
  - Meets PC2001 audio performance requirement
- Supports SPDIF-Out pin header (Optional)

LAN (Optional)

- Realtek RTL8100C/8110SB
  - Support 10Mb/s, 100Mb/s and 1000Mb/s (1000Mb/s only for 8110SB auto-negotiation operation.
  - Compliance with PCI 2.2 standard.
- Supports Wake-On-LAN and remote wake-up.
- Supports ACPI power management.

BIOS

- 4MB Award BIOS with PNP BIOS, ACPI, SMBIOS 2.3, Green and Boot Block.
- Provides DMI 2.0, WFM 2.0, WOL, WOR, chassis intrusion, and SMBus for system management.

Dimension

- Micro-ATX Form Factor: 24.4 cm (L) x 24.4 cm (W).

Mounting

- 8 mounting holes.

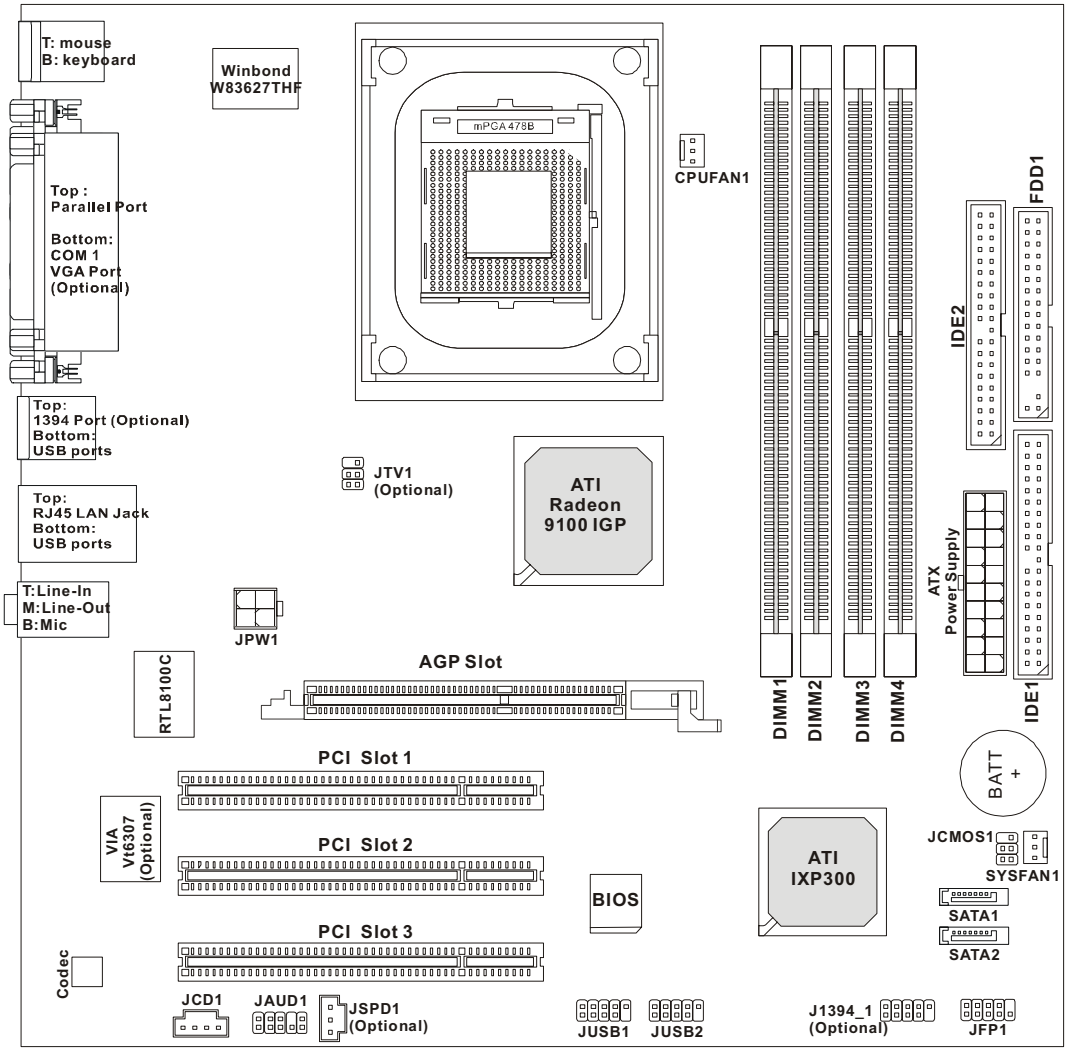
Others

- Live BIOS/Live Driver Update
- PC2001 Compliant
- Suspends to RAM/Disk

MSI Reminds You...

The Windows 98 & Windows ME operating systems are not supported by this mainboard.

Mainboard Layout



RS350M Series (MS-7031) v1.X
Micro ATX Mainboard

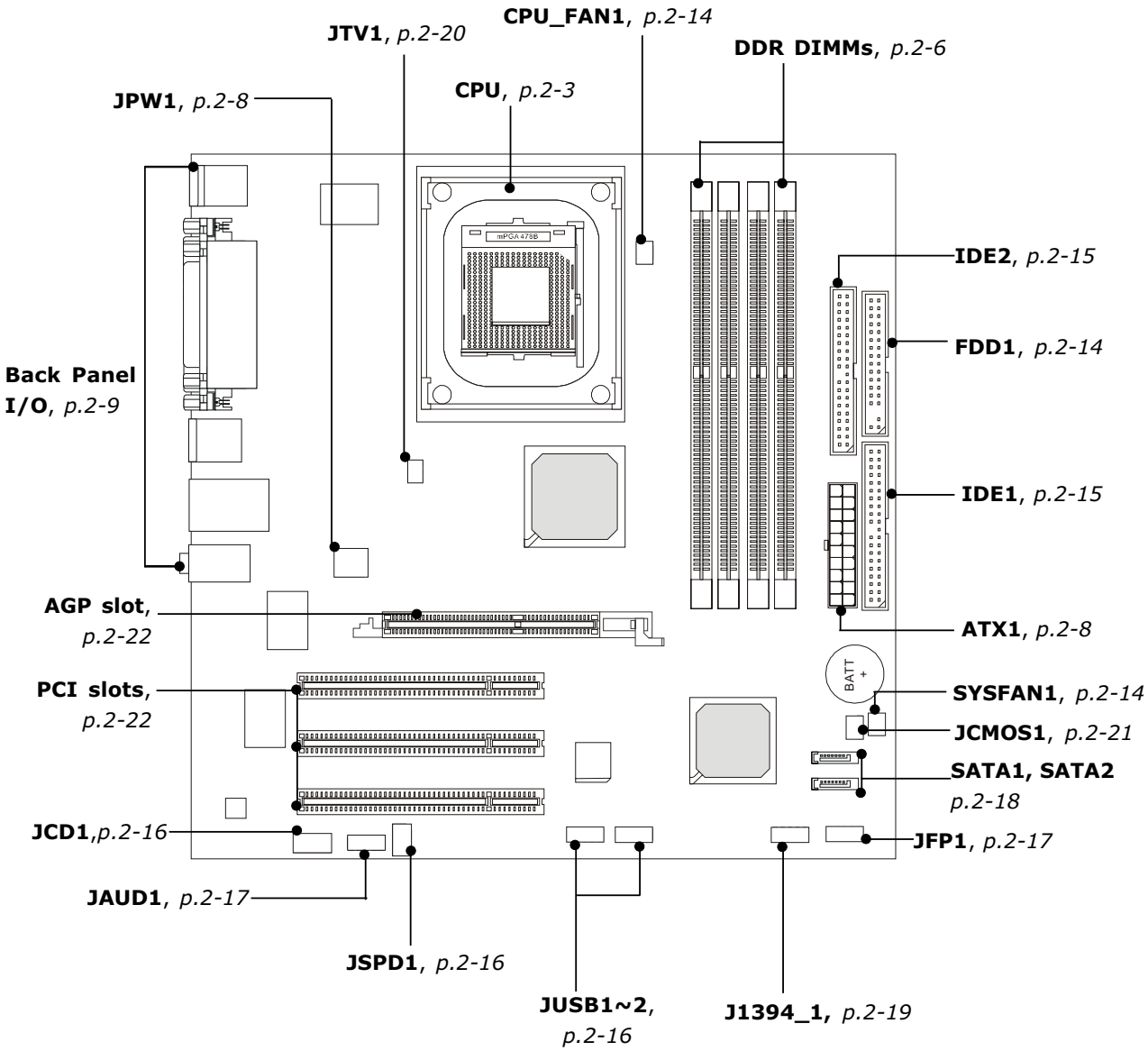
2

Hardware Setup

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

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

Quick Components Guide



Central Processing Unit: CPU

The mainboard supports Intel® Pentium® 4/Celeron Northwood/Prescott processor in the 478 pin package. The mainboard uses a CPU socket called PGA478 for easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not find the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

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

Example of CPU Core Speed Derivation Procedure

If	CPU Clock	=	133MHz
	Core/Bus ratio	=	23
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	133MHz x 23
		=	3.06 GHz

MSI Reminds You...

Overheating

Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating. If the system shuts down automatically, please unplug the power cord and check the cooling fan.

Replacing the CPU

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

Memory Speed/CPU FSB Support Matrix

Memory / FSB	DDR 266	DDR 333	DDR 400
400 MHz	OK	OK	OK
533 MHz	OK	OK	OK
800 MHz	OK	OK	OK

MSI Reminds You...

For the tested & compatible memory modules, please go to MSI global website (http://www.msi.com.tw) for the updated details.

CPU Installation Procedures for Socket 478

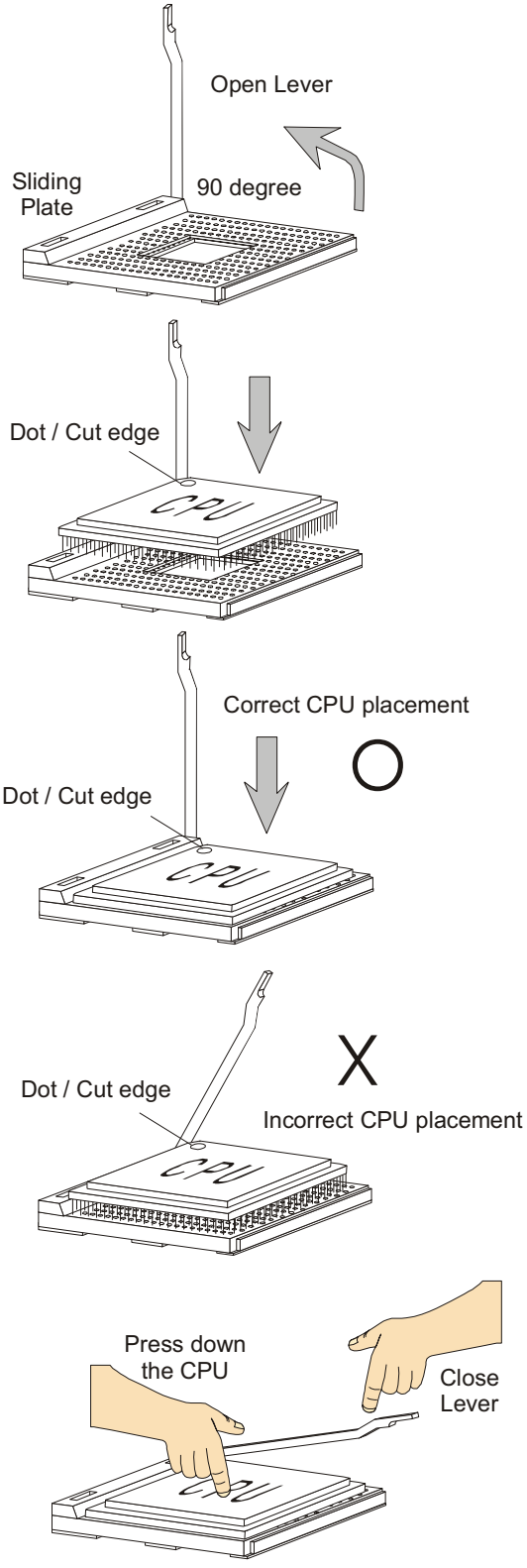
1. Please turn off the power and unplug the power cord before installing the CPU.

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 cut edge. The cut edge 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.

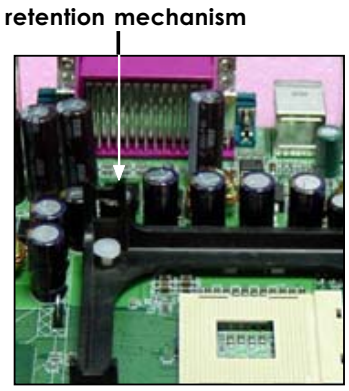
5. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



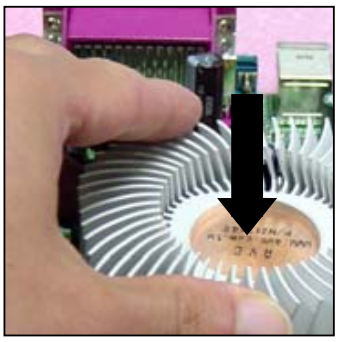
Installing the CPU Fan

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.



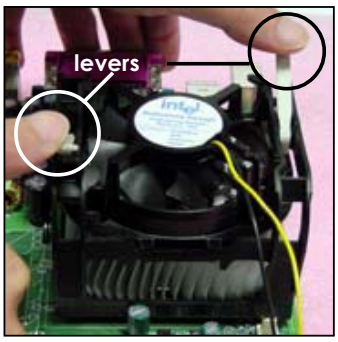
2. Position the heatsink onto the retention mechanism.



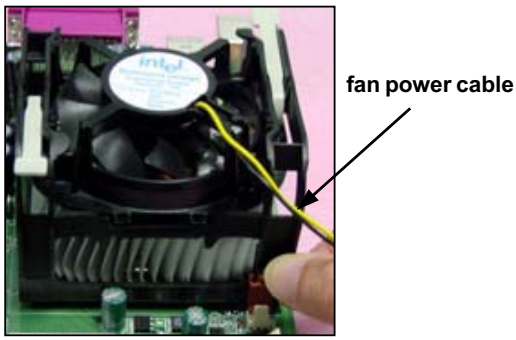
3. Mount the fan on top of the heatsink. Press down the fan until its four clips get wedged in the holes of the retention mechanism.



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.



MSI Reminds You...

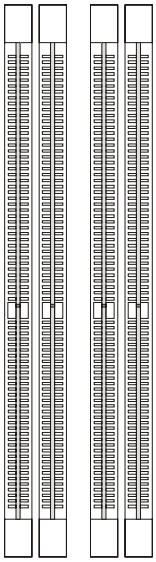
If your Intel Pentium 4 processor supports 3.0GHz (and up), please be sure to use a multi-direction fan to make the heatsink exhausts air towards the voltage regulators on the board easier. Multi-direction fan has better performance in CPU overheating.

Memory

The mainboard provides 4 slots for 184-pin, 2.5V DDR DIMM with 8 memory banks. You can install DDR266 / DDR333 / DDR400 SDRAM modules on the DDR DIMM slots (DIMM 1~4). To operate properly, at least one DIMM module must be installed.

DDR DIMM Slots

(DIMM 1~4, from left to right)
Channel A: DIMM1 & DIMM2 (green)
Channel B: DIMM3 & DIMM4 (purple)



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. Please note that the DDR SDRAM does not support ECC (error correcting code) and registered DIMM.

DDR Population Rules

Install at least one DIMM module on the slots. Each DIMM slot supports up to a maximum size of 1GB. Users can install either single- or double-sided modules to meet their own needs. Please note that ***each DIMM can work respectively for single-channel DDR, but there are some rules while using dual-channel DDR*** (Please refer to the suggested DDR population table on p.2-7)***.*** Users may install memory modules of different type and density on different-channel DDR DIMMs. However, the ***same type and density memory modules*** are necessary while using dual-channel DDR, or instability may happen.

MSI Reminds You...
For the tested & compatible memory modules, please go to MSI global website (http://www.msi.com.tw) for the updated details.

Please refer to the following table for detailed dual-channel DDR. Other combination not listed below will function as single-channel DDR.

DIMM1 (Ch A)	DIMM2 (Ch A)	DIMM3 (Ch B)	DIMM4 (Ch B)	System Density
128MB~1GB		128MB~1GB		256MB~2GB
	128MB~1GB		128MB~1GB	256MB~2GB
128MB~1GB	128MB~1GB	128MB~1GB	128MB~1GB	512MB~4GB

MSI Reminds You...

1. Dual-channel DDR works ONLY in the 3 combinations listed in the table above.

2. Due to the South Bridge resource deployment, the system density will only be detected up to 3+ GB (not to full 4GB) when each DIMM is installed with an 1GB memory module.

Installing DDR Modules

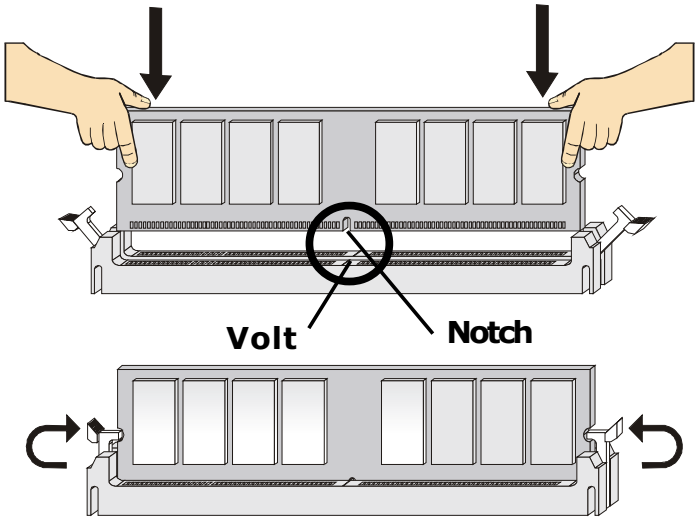
1. The DDR DIMM has only one notch on the center of module. The module will only fit in the right orientation.

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

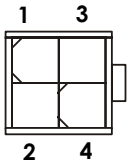
The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 20-Pin Power Connector: ATX1

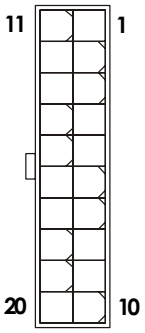
This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

ATX 12V Power Connector: JPW1

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



JPW1



ATX1

JPW1 Pin Definition

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

ATX1 Pin Definition

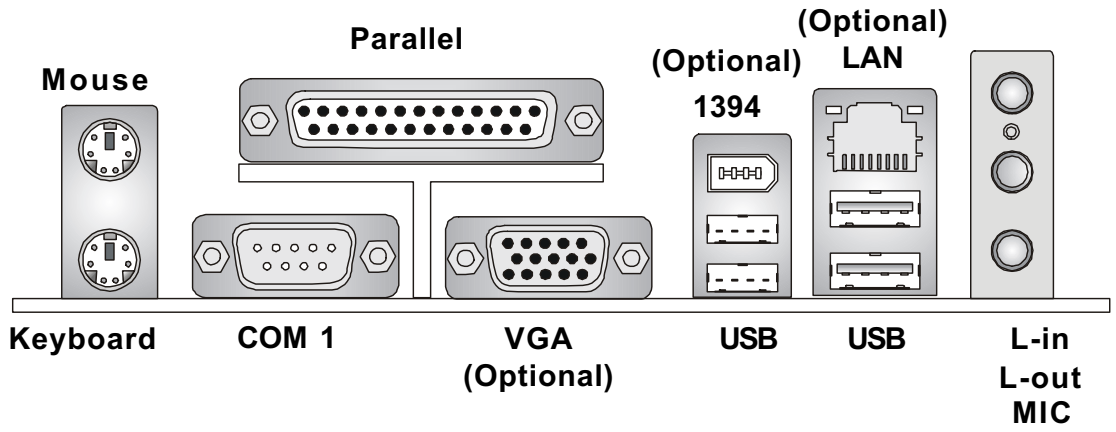
PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

MSI Reminds You...

Power supply of 300 watts (and above) is highly recommended for system stability.

Back Panel

The back panel provides the following connectors:

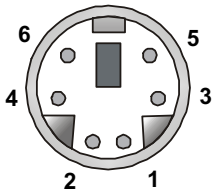


Mouse Connector

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.

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.



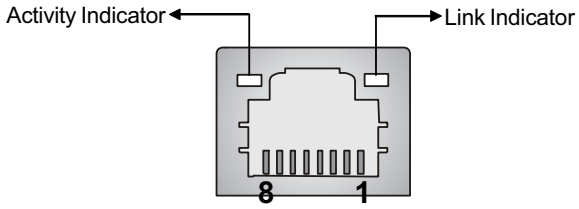
PS/2 Mouse (6-pin Female)
PS/2 Keyboard (6-pin Female)

Pin Definition

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

RJ-45 LAN Jack: 10/100 LAN (8100C) /Giga-bit LAN (8110SB) (Optional)

The mainboard provides two standard RJ-45 jacks for connection to Local Area Network (LAN). Giga-bit LAN enables data to be transferred at 1000, 100 or 10Mbps. You can connect a network cable to either LAN jack.



RJ-45 LAN Jack

LED	Color	LED State	Condition
Left	Orange	Off	LAN link is not established.
		On (steady state)	LAN link is established.
		On (brighter & pulsing)	The computer is communicating with another computer on the LAN.
Right	Green	Off	10 Mbit/sec data rate is selected.
		On	100 Mbit/sec data rate is selected.
	Orange	On	1000 Mbit/sec data rate is selected.

The pin assignments vary depending on the transfer rates: 10/100Mbps or 1000Mbps. Note that Pin 1/2, 3/6, 4/5, 7/8 must work in pairs. Please refer to the following for details:

10/100 LAN Pin Definition

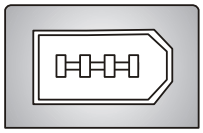
PIN	SIGNAL	DESCRIPTION
1	TDP	Transmit Differential Pair
2	TDN	Transmit Differential Pair
3	RDP	Receive Differential Pair
4	NC	Not Used
5	NC	Not Used
6	RDN	Receive Differential Pair
7	NC	Not Used
8	NC	Not Used

Giga-bit LAN Pin Definition

PIN	SIGNAL	DESCRIPTION
1	D0P	Differential Pair 0+
2	D0N	Differential Pair 0-
3	D1P	Differential Pair 1+
4	D2P	Differential Pair 2+
5	D2N	Differential Pair 2-
6	D1N	Differential Pair 1-
7	D3P	Differential Pair 3+
8	D3N	Differential Pair 3-

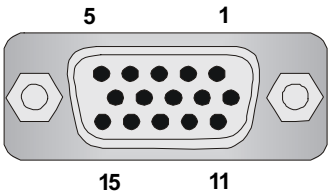
IEEE1394 Port (Optional)

The mainboard provides one standard IEEE1394 port. The standard IEEE1394 port connects to IEEE1394 devices without external power. The IEEE1394 high-speed serial bus complements USB by providing enhanced PC connectivity for a wide range of devices, including consumer electronics audio/video (A/V) appliances, storage peripherals, other PCs, and portable devices.



VGA Connector (Optional)

The mainboard provides a DB 15-pin female connector to connect a VGA monitor.

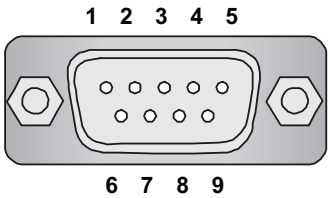


VGA Connector
(DB 15-pin)

Pin	Signal Description	Pin	Signal Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	+5V	10	GND
11	N/C	12	SDA
13	Horizontal Sync	14	Vertical Sync
15	SCL		

Serial Port Connector: COM1

The mainboard offers one 9-pin male DIN connector COM1 . It is a 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial mouse or other serial device directly to it.



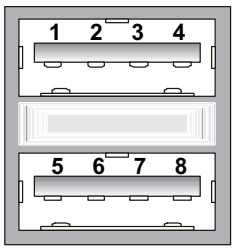
9-Pin Male DIN Connector
COM1

Pin Definition

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

USB Connectors

The mainboard provides 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

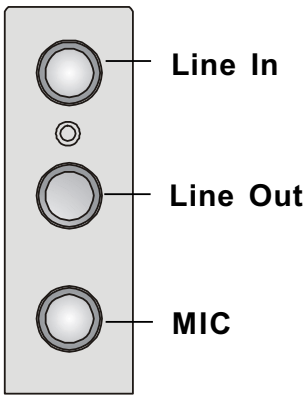
USB Port Description

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

Audio Port Connectors

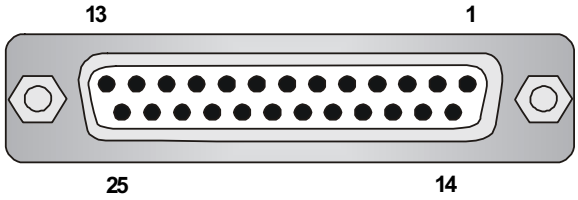
Line Out is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **MIC-In** is a connector for microphones.

1/8" Stereo Audio Connectors



Parallel Port Connector: LPT1

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



Pin Definition

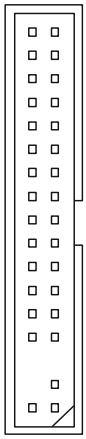
PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select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

Connectors

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

Floppy Disk Drive Connector: FDD1

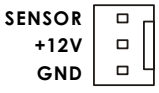
The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.



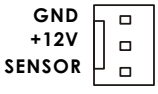
FDD1

Fan Power Connectors: CPUFAN1/SYSFAN1

The CPUFAN1 (processor fan), 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.



SYSFAN1



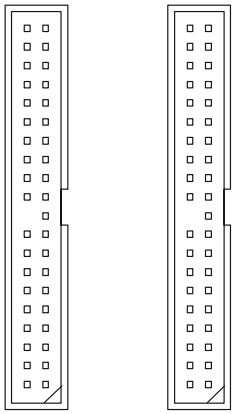
CPUFAN1

MSI Reminds You...

1. *Always consult the vendors for proper CPU cooling fan.*
2. *Please refer to the recommended CPU fans at Intel® official website.*
3. *If you want to overclock the CPU, it is strongly recommended to use a multi-direction fan for better heatsink.*

Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 33/66/100/133 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA 33/66/100/133 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices.



IDE2 **IDE1**
(white) **(blue)**

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.

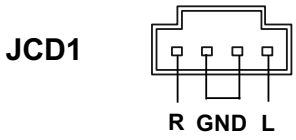
MSI Reminds You...
If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.

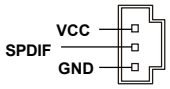
CD-In Connector: JCD1

The connector is for CD-ROM audio connector.

SPDIF-Out Connector: JSPD1 (Optional)

This connector is used to connect SPDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.



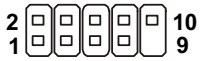


JSPD1



Front USB Connectors: JUSB1 / JUSB2

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



JUSB1 / JUSB2
(USB 2.0/standard spec)

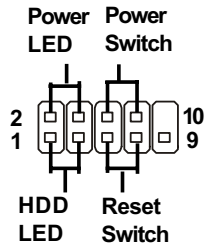
JUSB1/2 Pin Definition

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

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

Front Panel Connector: JFP1

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



JFP1

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.

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.



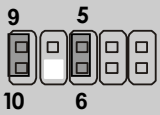
JAUD1

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...

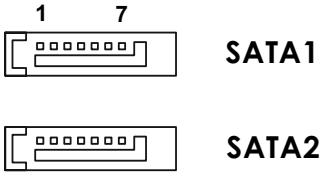
If you don't want to connect to the front audio header, pins 5 & 6, 9 & 10 have to be jumpered in order to have signal output directed to the rear audio ports. Otherwise, the Line-Out connector on the back panel will not function.



Serial ATA Connectors controlled by ATI IXP 300: SATA1, SATA2

The Southbridge of this mainboard is ATI IXP 300 which supports two serial connectors SATA1 & SATA2.

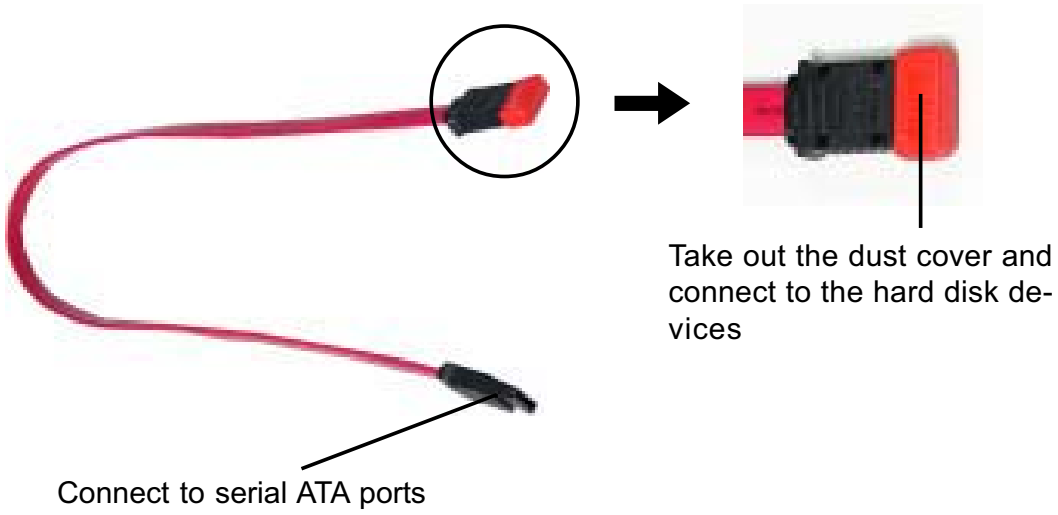
SATA1 & SATA2 are dual high-speed Serial ATA interface ports. Each supports 1st generation serial ATA data rates of 150 MB/s. Both connectors are fully compliant with Serial ATA 1.0 specifications. Each Serial ATA connector can connect to 1 hard disk device.



SATA1 & SATA2 Pin Definition

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

Serial ATA cable

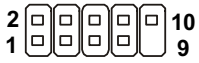


MSI Reminds You...

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

IEEE 1394 Connector: J1394_1 (Optional)

The mainboard provides one 1394 pin header that allows you to connect optional IEEE 1394 bracket.



J1394_1

Pin Definition

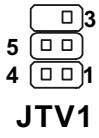
PIN	SIGNAL	PIN	SIGNAL
1	TPA+	2	TPA-
3	Ground	4	Ground
5	TPB+	6	TPB-
7	Cable power	8	Cable power
9	Key (no pin)	10	Ground

How to attach the IEEE 1394 Port:



TV-Out Connector: JTV1 (Optional)

The mainboard optionally provides a TV-Out connector for you to attach a TV-Out bracket. The TV-Out bracket offers two types of TV-Out connectors: S-Video and RCA Composite connector. Select the appropriate one to connect to the television and the television will be able to display the PC's information.

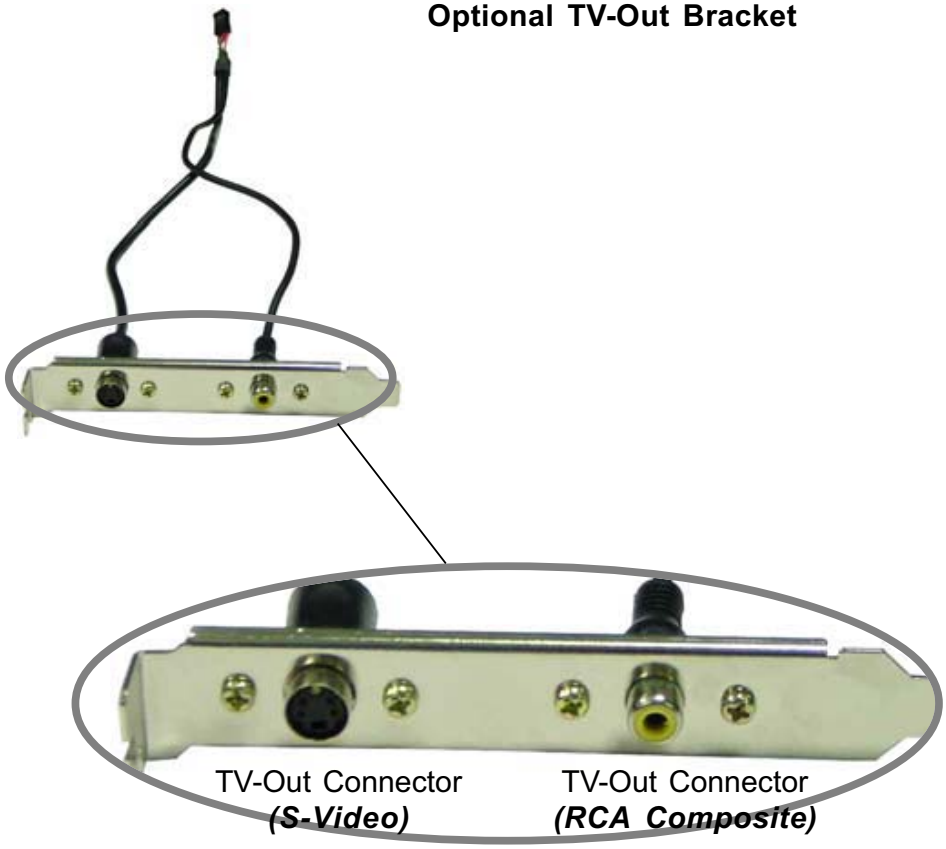


JTV1

JTV1 Pin Definition

Pin	Description	Pin	Description
1	GND	4	CVBS
2	Yout	5	GND
3	Cout		

Optional TV-Out Bracket



Jumpers

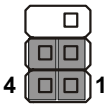
The motherboard provides the following jumpers for you to set the computer's function. This section will explain how to change your motherboard's function through the use of jumpers.

Clear CMOS Jumper: JCMOS1

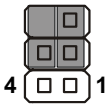
There is a CMOS RAM on board that has a power supply from external battery to keep the system configuration data. With the CMOS RAM, the system can automatically boot OS every time it is turned on. The battery has long life time for at least 5 years. If you want to clear the system configuration, use the JCMOS1 (Clear CMOS Jumper) to clear data. Follow the instructions below to clear the data:



JCMOS1



Keep Data



Clear Data

MSI Reminds You...

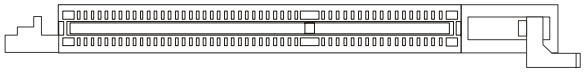
You can clear CMOS by shorting 2-3 & 5-6 pin while the system is off (always turn off the ATX power supply or unplug the power cord). Then return to 1-2 & 4-5 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Slots

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

AGP (Accelerated Graphics Port) Slot

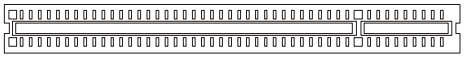
The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory. The mainboard supports one AGP 8x slot.



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, abbreviation 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 G#	INT H#	INT E#	INT F#
PCI Slot 2	INT F#	INT G#	INT H#	INT E#
PCI Slot 3	INT E#	INT F#	INT G#	INT H#



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 system boot up, and requests you to run SETUP.
- You want to change the default settings for customized features.

MSI Reminds You...

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

2. While booting up, the BIOS version is shown in the 1st line appearing after the memory counting. It is usually in the format: example: W7031ams V1.0 071904

where:

1st digit refers to BIOS maker as A=AMI(R); W=AWARD(R)
2nd - 5th digit refers to the model number
6th digit refers to the chipset vendor
7th - 8th digit refers to the customer, MS=all standard customers.
V1.0 refers to the BIOS version.
071904 refers to the date this BIOS is released.

Entering Setup

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

```
Press DEL to enter SETUP
```

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

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General help, only for Status Page Setup Menu and Option Page Setup Menu

Getting Help

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

Main Menu

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

Sub-Menu



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

General Help <F1>

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

The Main Menu

Once you enter Phoenix-Award® BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from the on-screen setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.



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

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

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

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

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

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

PC Health Status
This entry shows your PC health status.

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

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

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

BIOS Setting Password
Use this menu to set the password for BIOS.

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

Exit Without Saving
Abandon all changes and exit setup.

Standard CMOS Features

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



Date

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

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

Time

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

IDE Primary/Secondary Master/Slave

Press PgUp/<+> or PgDn/<-> to select [Manual], [None] or [Auto] type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use [Manual] to define your own drive type manually.

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

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

Drive A:
This item allows you to set the type of floppy drives installed. Available options: [None], [360K, 5.25 in.], [1.2M, 5.25 in.], [720K, 3.5 in.], [1.44M, 3.5 in.], [2.88M, 3.5 in.].

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

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

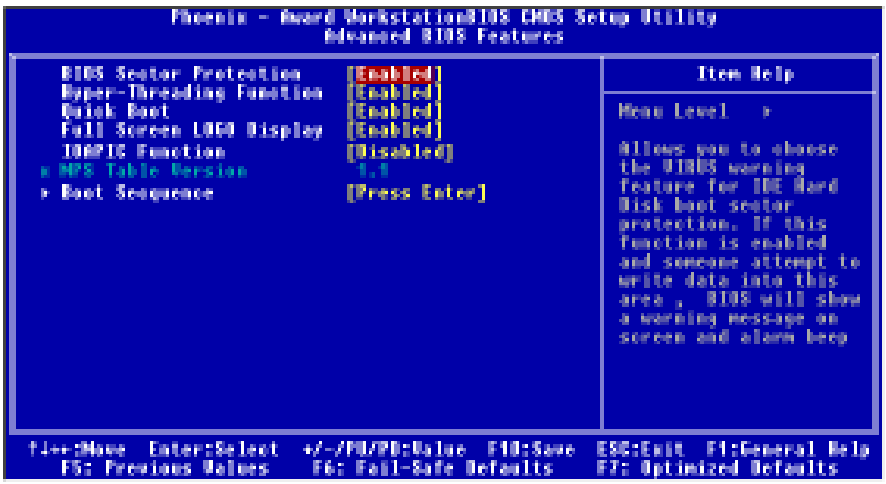
[All Errors]	The system stops when any error is detected.
[No Errors]	The system doesn't stop for any detected error.
[All, But Keyboard]	The system doesn't stop for a keyboard error.
[All, But Diskette]	The system doesn't stop for a disk error.
[All, But Disk/Key]	The system doesn't stop for either a disk or a keyboard error.

System Information
Press <Enter> for the sub-menu of each item:



CPU Type/BIOS Version/Video Memory/System Memory/Total Memory
The items show the CPU type, BIOS version and memory status of your system (read only).

Advanced BIOS Features



BIOS Sector Protection

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

Hyper-Threading Technology

The processor uses Hyper-Threading technology to increase transaction rates and reduces end-user response times. The technology treats the two cores inside the processor as two logical processors that can execute instructions simultaneously. In this way, the system performance is highly improved. If you disable the function, the processor will use only one core to execute the instructions. Settings: [Disabled] and [Enabled].

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:*** *A 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

Quick Boot

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

Full Screen LOGO Show

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

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

IOAPIC Function

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

MPS Table Version

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].

Boot Sequence

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



Hard Disk Boot Priority

Use the arrow keys to select the desired device, then press <+> or <-> to move it up or down to assign the hard disk boot priority. Then press <ESC> to exit this menu.

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.

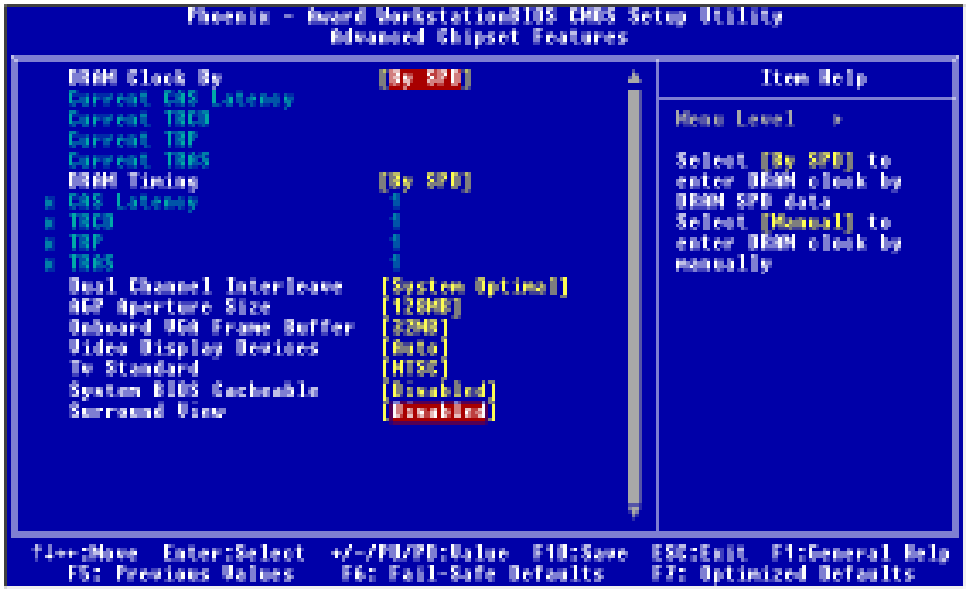
MSI Reminds You...

*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" will be ignored.*

Boot from Other Device

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

Advanced Chipset Features



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

DRAM Clock By
Selects whether DRAM clock is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to [By SPD] enables the following fields automatically to be determined by BIOS based on the configurations on the SPD. User can specifiy the desired DRAM clock among the setting options: [By SPD], [1:1], [DDR-200], [DDR-266], [DDR-333], [DDR-400].

Current CAS Latency / Current TRCD / Current TRP / Current TRAS
These items show the current CAS latency TRCD, TRP & TRAS. Read only.

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

CAS Latency
This field controls the CAS latency, which determines the timing delay before RAM starts a read command after receiving it. Setting options are: [1], [1.5], [2], [2.5], [3], [3.5], [4]. Setting to [1] increases system performance while [4] provides more stable system performance.

TRCD
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. Settings: [1], [2], [3], [4].

TRP
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, refreshing may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Setting options: [1], [2], [3], [4].

TRAS
This setting determines the time RAS takes to read from and write to a memory cell. Setting options: [1], [2], [3], [4], [5], [6], [7], [8].

Dual Channel Interleave
Specify the major resources supported by the memory. Selecting [System Optimal] will enhance the system performance, while selecting [Graphics Optimal] will let the graphics have better performance. Setting options: [System Optimal], [Graphics Optimal].

AGP Aperture Size
This setting controls just how much system RAM can be allocated to AGP for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The option allows the selection of an aperture size of [32MB], [64MB], [128MB], [256MB], [512MB], [1GB], [2GB], [None].

Onboard VGA Frame Buffer
Frame Buffer is the video memory that stores data for video display (frame). This field is used to determine the memory size for Frame Buffer. Larger frame buffer size increases video performance. Settings: [8MB], [16MB], [32MB], [64MB], [128MB].

Video Display Devices
Use the field to select the type of device you want to use as the display(s) of the system. Setting options:

[Auto]	Let the system decide automatically.
[CRT Only]	Use CRT monitor only.
[CLD Only]	Use CD/LCD device only.
[DFP Only]	Use DFP-Digital Flat Panel only.
[TV Only]	Use TV only.
[CRT Force, Other Auto]	CRT is the primary video display device.
[TV Force, Other Auto]	TV is the primary video display device.

TV Standard

Select the TV standard which is used as the video signal format of your TV if you have connected a TV to the system. Three TV standards are available for the field:

[NTSC]	NTSC format which is used in United States.
[PAL]	PAL format. This is a dominant standard in Europe.
[PAL-M]	PAL format used in Brazil.
[PAL-60]	PAL format. PAL 60 makes it possible to output a PAL signal with 60 Hz instead of 50 Hz. This is made for playback of NTSC movies on PAL TVs, where you might get a stumbling playback otherwise.
[NTSC-JAP]	NTSC format which is used in Japan.
[PAL-CN]	PAL format used in Argentina.
[PAL-N]	PAL format used in Paraguay & Urugray.
[SCART_RGB]	SCART format. SCART is the established European standard for connecting home video equipment like TVs, VCRs, DVD player, etc.

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].

Surround View

This item allows a user to use an additional AGP card (installed on AGP slot) in conjunction with the onboard graphics (built-in the Northbridge), which would give you the ability to use more than one output device at once.

[Enabled]	You can use the onboard graphics and the external AGP card simultaneously.
[Disabeld]	You can only use either onboard graphics or the external AGP card. The onboard graphics is with higher priority.

Integrated Peripherals



USB Controller
Select [Enabled] if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. Setting options: [Disabled], [Enabled].

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

USB Keyboard/Mouse Support
Select [Enabled] if you need to use a USB-interfaced keyboard/mouse in the operating system. Setting options: [Disabled], [Enabled].

AC97 Audio
[Auto] allows the mainboard to detect whether an audio device is used. If an audio device is detected, the onboard AC'97 (Audio Codec'97) controller will be enabled; if not, it is disabled. Disable the controller if you want to use other controller cards to connect an audio device. The settings are: [Auto], [Disabled].

Onboard LAN Controller
This setting controls the onboard LAN controller. Setting options: [Enabled], [Disabled].

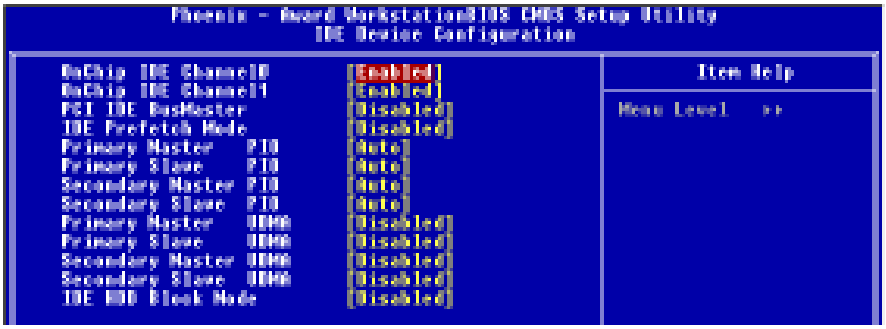
OnBoard 1394 Controller
This item allows you to enable/disable the onboard IEEE1394 controller. The settings are: [Enabled], [Disabled].

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

[OnChip VGA/AGP]	The system initializes the onboard VGA device.
[PCI Slot]	The system initializes the installed PCI VGA card first. If a PCI VGA card is not available, it will initialize the onboard VGA device.

IDE Device Configuration

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



On-Chip IDE Channel0/1

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Choose [Enabled] to activate each channel separately. Setting options: [Enabled], [Disabled].

PCI IDE BusMaster

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

IDE Prefetch Mode

The onboard IDE drive interfaces support IDE prefetching, for faster drive accesses. When you install a primary and/or secondary add-in IDE interface, set this option to [Disabled] if the interface does not support prefetching. Setting options: [Disabled], [Enabled].

Primary/Secondary Master/Slave PIO

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

Primary/Secondary Master/Slave UDMA

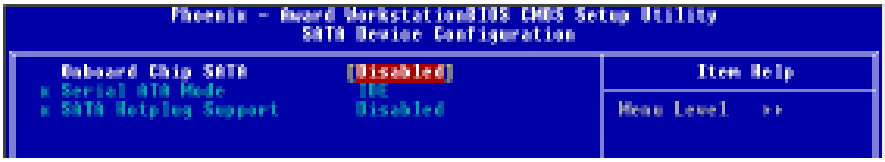
Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, Ultra DMA/66 and Ultra DMA/100, select [Auto]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

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select [Enabled] for automatic detection of the optimal number of block read/writes per sector the drive can support. Setting options: [Enabled], [Disabled].

SATA Device Configuration

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



Onboard Serial ATA

This item is used to enable/disable the onboard Serial ATA controller. Setting options: [Enabled], [Disabled].

Serial ATA Mode

This item is used to set the SATA configuration. Select [IDE] if you want to have SATA as IDE function, and select [RAID] to use SATA as RAID function. Setting options: [IDE], [RAID].

SATA Hotplug Support

This item is used to enable/disable the hotplug support. Setting options: [Enabled], [Disabled].

I/O Device Configuration

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



FDC Controller

Select [Enabled] if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install add-on FDC or the system has no floppy drive, select [Disabled] in this field. Setting options: [Enabled], [Disabled].

COM Port

Select an address and corresponding interrupt for the first serial port. Setting options: [3F8/IRQ4], [2E8/IRQ3], [3E8/IRQ4], [2F8/IRQ3], [Disabled], [Auto].

Parallel Port

There is a built-in parallel port on the on-board Super I/O chipset that provides Standard, ECP, and EPP features. It has the following options:

[Disabled]
[3BC/IRQ7] Line Printer port 0
[278/IRQ5] Line Printer port 2
[378/IRQ7] Line Printer port 1

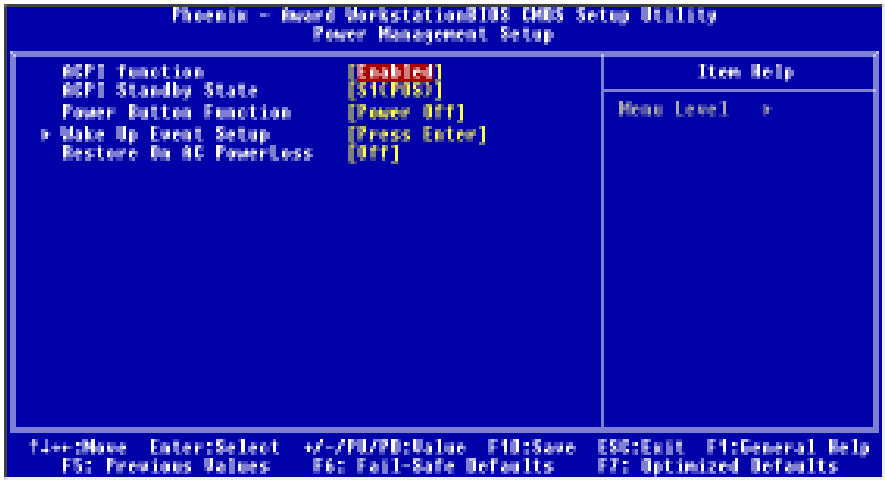
Parallel Port Mode
SPP : Standard Parallel Port
EPP : Enhanced Parallel Port
ECP : Extended Capability Port
ECP + EPP: Extended Capability Port + Enhanced Parallel Port
Normal

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

EPP Mode Select
The onboard parallel port is EPP Spec. compliant, so after the user chooses the onboard parallel port with the EPP function, the following message will be displayed on the screen: “EPP Mode Select.” At this time either [EPP 1.7] spec or [EPP 1.9] spec can be chosen.

ECP Mode Use DMA
The ECP mode has to use the DMA channel, so choose the onboard parallel port with the ECP feature. After selecting it, the following message will appear: “ECP Mode Use DMA.” At this time, the user can choose between DMA channel [3] or [1].

Power Management Setup



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

ACPI Function

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

ACPI Standby State

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

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

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

Power Button Function

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

[Power Off] The power button functions as normal power off button.

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

Wake Up Event Setup

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



Resume by PCI (PME #)

This controls how and whether the system can be powered on by the devices installed on PCI slots. Setting options: [Disabled], [Enabled].

POWER ON Function

This controls how the PS/2 mouse or keyboard can power on the system. Settings: [Password], [Hot KEY], [Mouse Left], [Mouse Right], [any KEY], [BUTTON ONLY], [Keyboard 98].

KB Power ON Password

Power ON Function is set to [Password], then you can set a password in the field for the PS/2 keyboard to power on the system.

Hot Key Power ON

If ***POWER ON Function*** is set to [Hot KEY], you can assign a hot key combination in the field for the PS/2 keyboard to power on the system. Settings: [Ctrl-F1] through [Ctrl-F12].

Resume by RTC Alarm

This function is for setting time for your computer to boot up. The settings are: [Enabled], [Disabled].

Date (of Month)

The field specifies the date for ***Resume by Alarm***. Settings: 0~31.

Resume Time (hh:mm:ss)

The field specifies the time for ***Resume by Alarm***. Format is <hour><minute><second>.

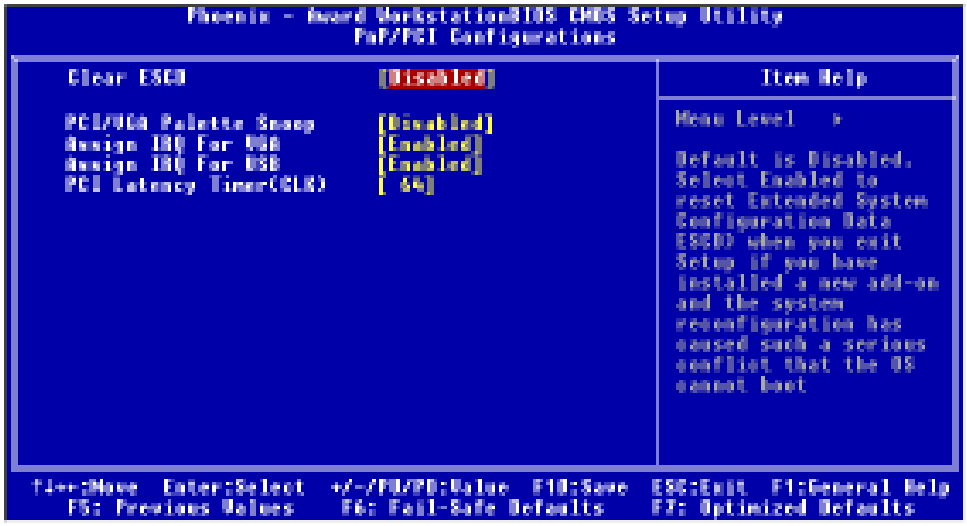
Restore on AC/Power Loss

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

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

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 ESCD

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 [Enabled], the system will reset ESCD NVRAM right after the system is booted up and then set the setting of the item back to [Disabled] automatically. Setting options: [Enabled], [Disabled].

PCI/VGA Palette Snoop

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

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

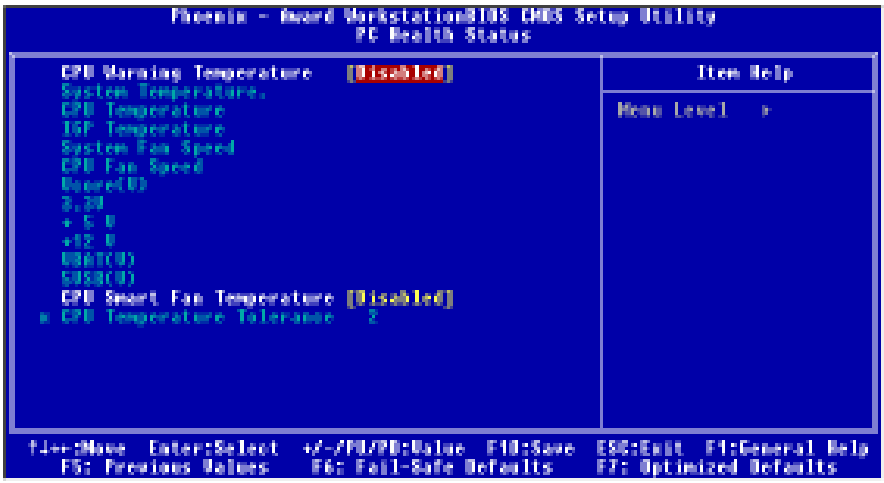
The setting must be set to [Enabled] if any ISA bus adapter in the system requires VGA palette snooping.

Assign IRQ For VGA/USB
Set to [Enabled] allows BIOS to assign an IRQ to VGA card/USB device. Choose [Disabled] if you want to release the IRQ. Setting options: [Enabled], [Disabled].

PCI Latency Timer (CLK)
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. Give a DEC value by entering a value between [0] to [255].

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 Warning Temperature

This item is used to specify a thermal limit for CPU. If CPU temperature reaches the specified limit, the system will issue a warning which allows you to prevent the CPU overheat problem. Setting options: [Enabled], [Disabled].

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

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

CPU Smart Fan Temperature

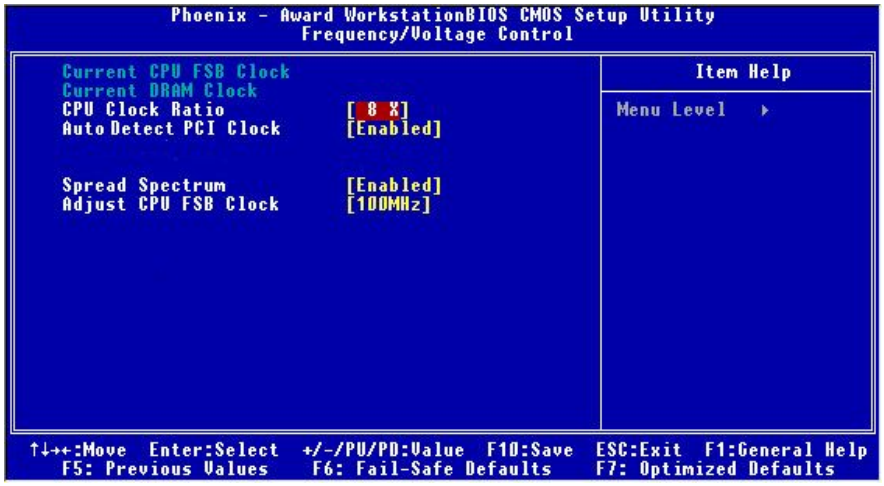
There is a pair of Temperature/FAN Speed control: CPU Temperature with CPU Fan. W83627THF provides the Smart Fan system which can control the fan speed automatically depending on the current temperature to keep it with in a specific range. Setting options: [Enabled], [Disabled].

CPU Temperature Tolerance

You can select a fan tolerance value here for the specific range for the ***CPU Smart Fan Temperature*** item. If the current temperatures of the 2 fans reach the maximum threshold (the temperatures set in the ***CPU Smart Fan Temperature*** plus the tolerance values you set here), the fans will speed up for cooling down. On the contrary if the current temperatures reach the minimum threshold (the set temperatures minus the tolerance values), the fans will slow down to keep the temperatures stable.

Frequency/Voltage Control

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



Current CPU FSB Clock/DRAM Clock
These two items show the current clocks of CPU/DRAM. Read-only.

CPU Clock Ratio
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.

Auto Detect PCI Clock
This feature enables the BIOS to auto detect PCI device and set PCI slot clock. Setting options are: [Enabled], [Disabled].

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

Adjust CPU FSB Clock
This item specifies the clock frequency of CPU host bus (FSB), AGP (3V66) and PCI bus. It provides a method for end users to overclock the processor. Setting options: Give a DEC value by entering a number between maximum [232] MHz to minimum [100] MHz.

Load Fail-Safe/Optimized Defaults

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

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



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

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



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

BIOS Setting Password

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



Type the password, up to eight 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.



Introduction to ALC655 Audio Codec

The motherboard 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.

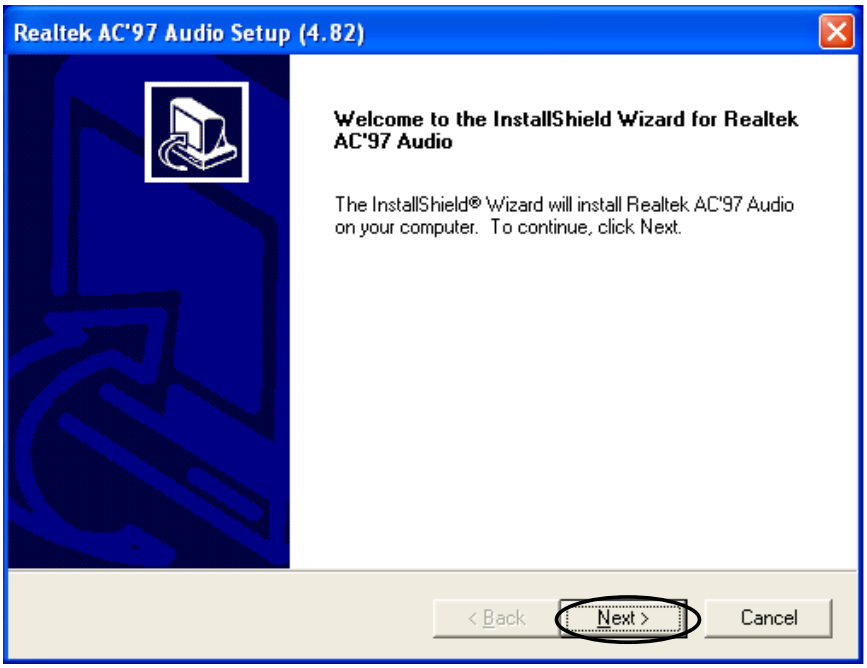
Installation for Windows 2000/XP

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.

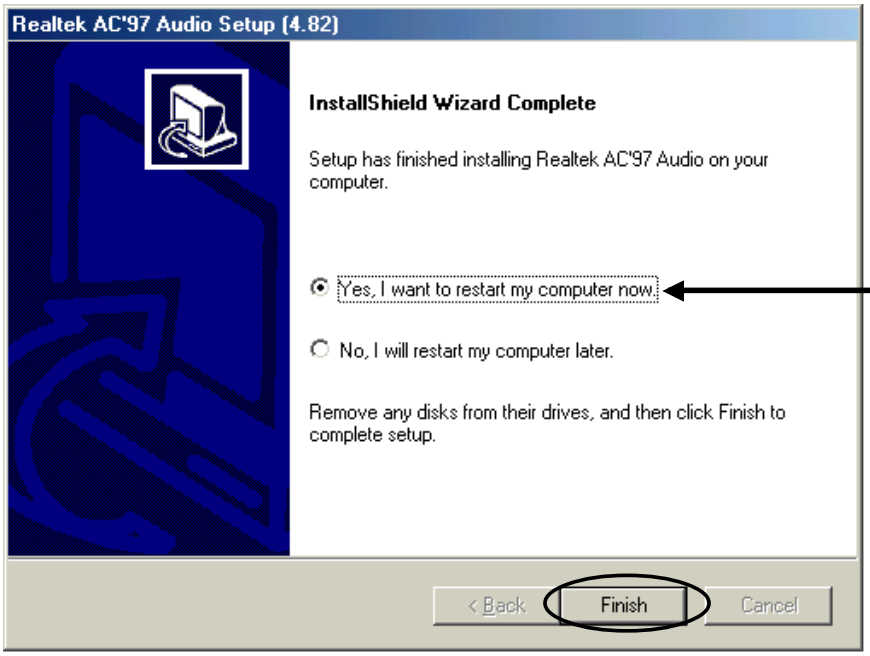
1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear. (***Please note the screen below might be different depending on the different mainboard you purchased.)***
2. Click **Realtek AC97 Audio Drivers**.

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 start installing files into the system.



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



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

After installing the audio driver, you are able to use the 2-/4-/6-channel audio feature now. To enable 2-, 4- or 6-channel audio operation, first connect 2, 4 or 6 speakers to the appropriate audio connectors, and then select 2-, 4- or 6-channel audio setting in the software utility.

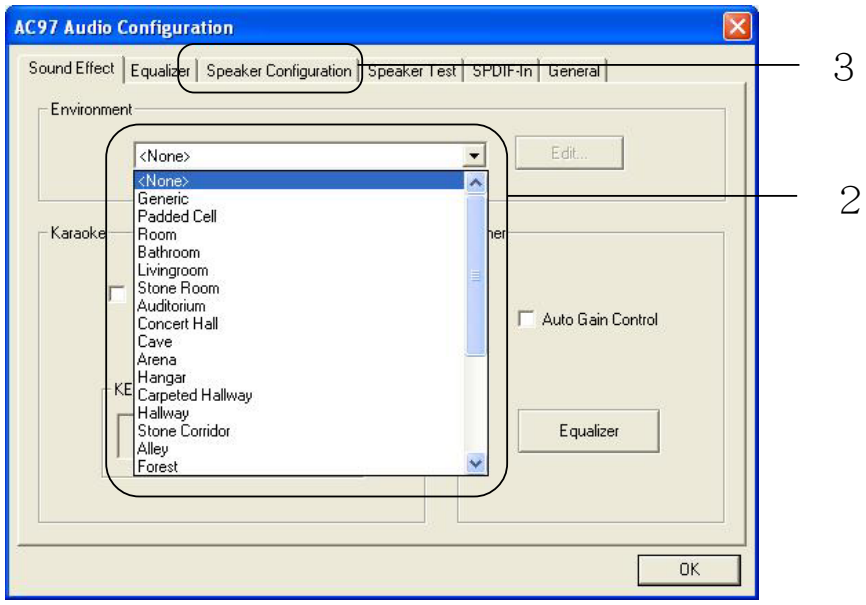
Using the Back Panel

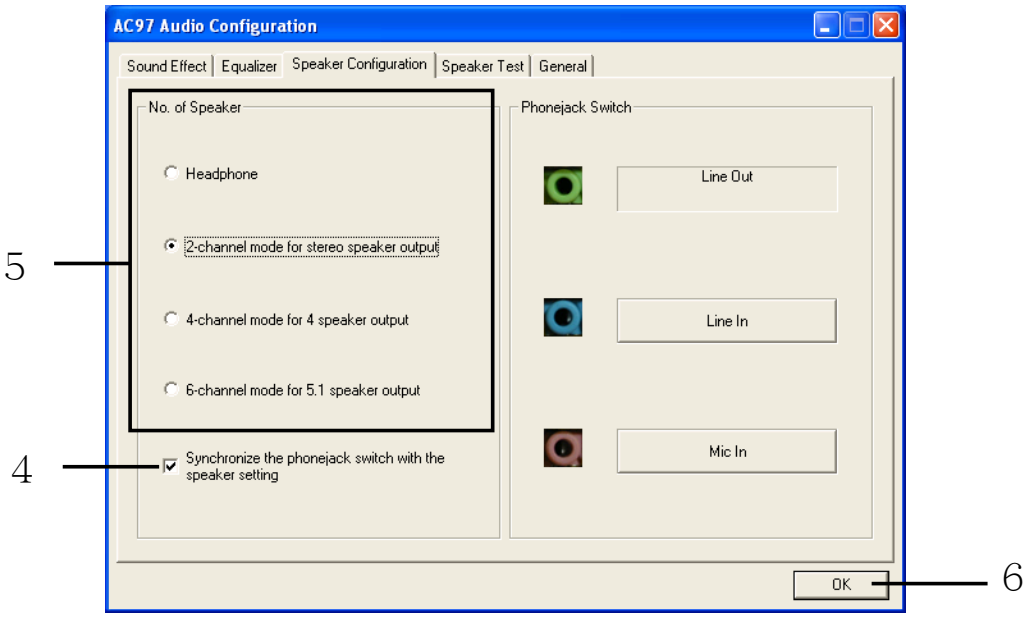
In addition to a default 2-channel analog audio output function, the audio connectors on the Back Panel also provide 4- or 6-channel analog audio output function if a proper setting is made in the software utility.

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

Configuration in the Software Utility

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


AC97 Audio Configuration
Sound Effect
Equalizer
Speaker Configuration
Speaker Test
SPDIF-In
General
Environment
<None>
Edit...
Karaoke
Generic
Padded Cell
Room
Bathroom
Livingroom
Stone Room
Auditorium
Concert Hall
Cave
Arena
Hangar
Carpeted Hallway
Hallway
Stone Corridor
Alley
Forest
Auto Gain Control
Equalizer
OK
3
2


AC97 Audio Configuration
Sound Effect
Equalizer
Speaker Configuration
Speaker Test
General
No. of Speaker
Headphone
2-channel mode for stereo speaker output
4-channel mode for 4 speaker output
6-channel mode for 5.1 speaker output
Synchronize the phonejack switch with the speaker setting
Phonejack Switch
Line Out
Line In
Mic In
OK
5
4
6

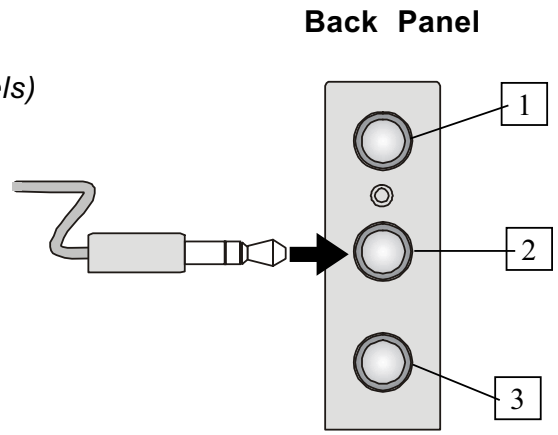
Connecting the Speakers

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

2-Channel Mode for Stereo-Speaker Output

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

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

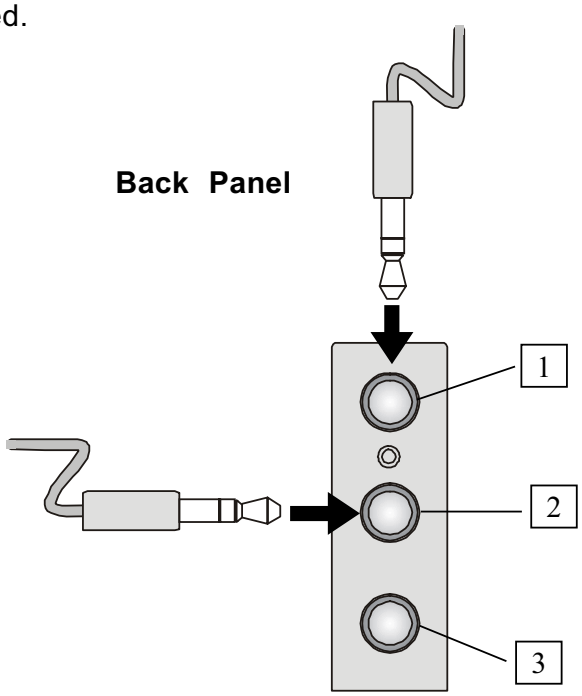


4-Channel Mode for 4-Speaker Output

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

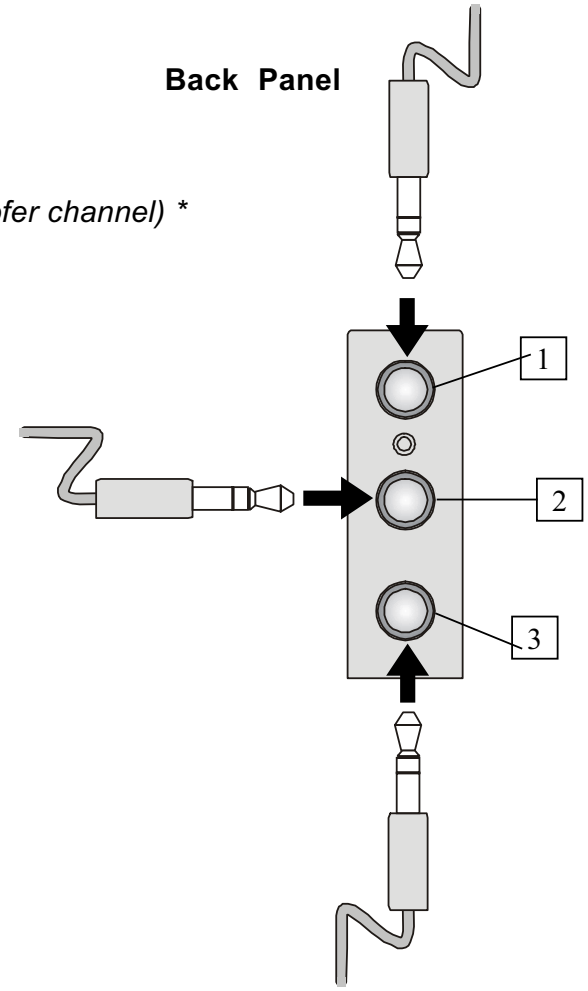
1	Line Out *(Rear channels)* *
2	Line Out *(Front channels)*
3	MIC

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



6-Channel Mode for 6-Speaker Output

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



1 Line Out *(Rear channels)* *

2 Line Out *(Front channels)*

3 Line Out *(Center and Subwoofer channel)* *

* 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...

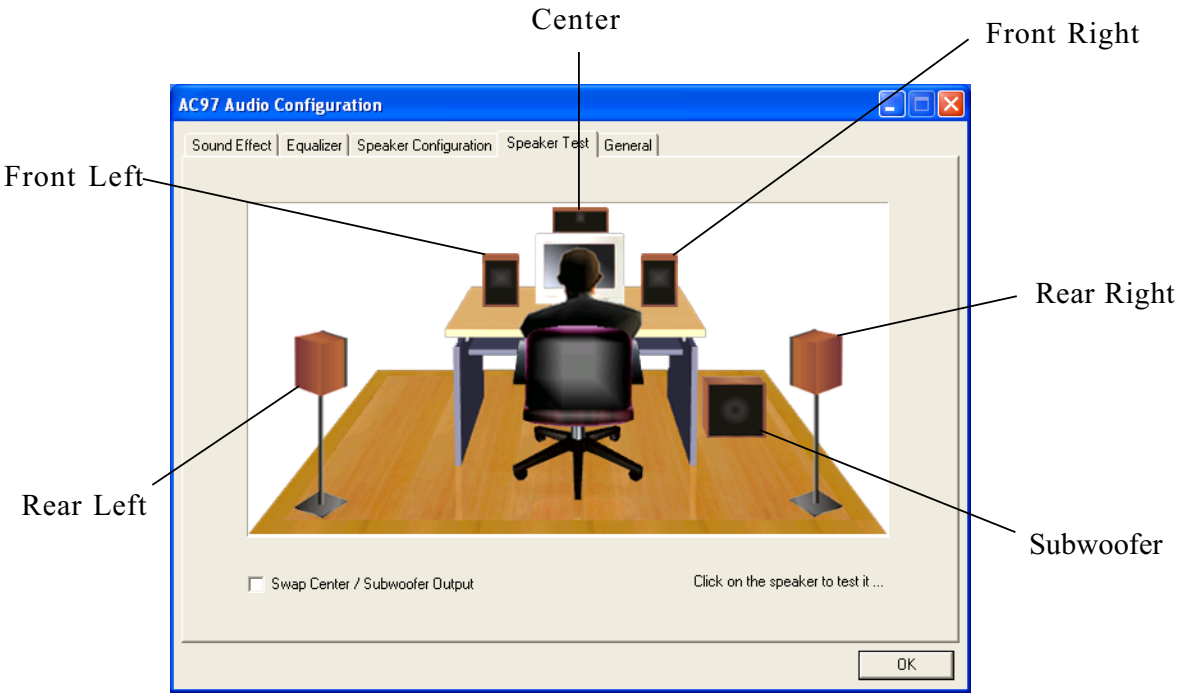
If the Center and Subwoofer speaker exchange their audio channels when you play video or music on the computer, a converter may be required to exchange center and subwoofer audio signals. You can purchase the converter from a speaker store.

Testing the Connected Speakers

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

Testing Each Speaker

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



MSI Reminds You...

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

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

