MSI 850E Max

MICRO-STAR INTERNATIONAL

MS-6545 (v2.X) ATX Mainboard

Version 2.0
G52-MA6545X1

$C\mathcal{E}$ **N1996**
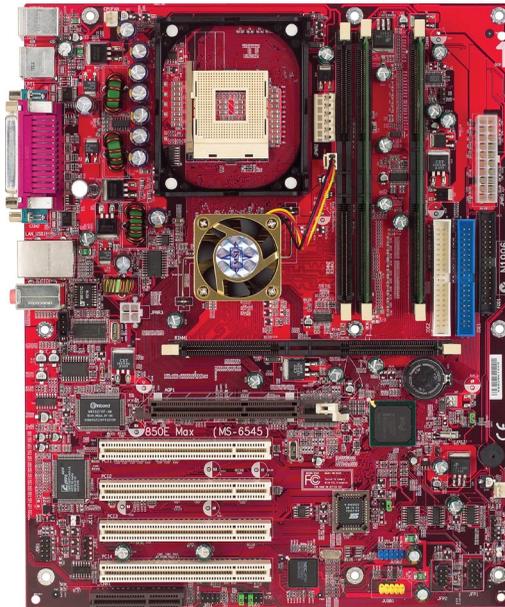
FCC-B Radio Frequency Interference Statement

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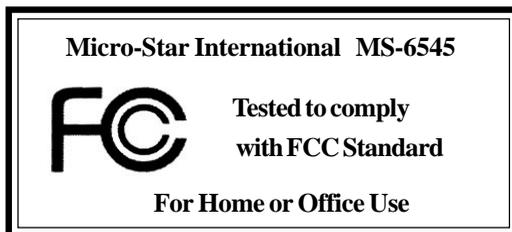
Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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-6545     │
│                                           │
│   FC      Tested to comply                │
│            with FCC Standard              │
│                                           │
│         For Home or Office Use            │
└─────────────────────────────────────────┘
```

Edition

July 2002

Copyright Notice

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

Trademarks

All trademarks are the properties of their respective owners.

Intel® and Pentium® are registered trademarks of Intel Corporation.
PS/2 and OS®/2 are registered trademarks of International Business Machines Corporation.
Windows® 95/98/2000/NT/XP are registered trademarks of Microsoft Corporation.
Netware® is a registered trademark of Novell, Inc.
Award® is a registered trademark of Phoenix Technologies Ltd.
AMI® is a registered trademark of American Megatrends Inc.

Revision History

Revision	Revision History	Date
V2.0	First release for PCB 2.X	July 2002

Safety Instructions

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

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

CONTENTS

Getting Started *1*

The 850 E Max (MS-6545 v2.X) ATX mainboard is a high-performance computer mainboard based on Intel® 850E chipset. It is optimized to support Intel® Pentium® 4 processors for high-end business/personal desktop markets, and it is a highly-flexible chipset which is designed to extend the basic graphics/ multimedia PC platform up to the mainstream performance desktop platform.

Mainboard Specification

CPU
- Supports Intel® Pentium® 4 (Willameete/Northwood) processor in the 478 pin package.
- Supports from 1.6GHz to 2.53GHz and up.

Chipset
- Intel® 850E
    - Supports Direct RDRAM up to 2GB maximum memory.
    - Supports System bus at 100/133 HMz (400/533 MHz System bus).
    - 1.5V AGP interface with 4x data transfer and 4x fast write capability.
- Intel® ICH2
    - Upstream hub interface for access to the Intel MCH.
    - 2-channel Ultra ATA 100 Bus Master IDE controller.
    - USB controller 1.1 (expanded capabilities for 4 ports).
    - I/O APIC.
    - SMBus controller.
    - FWH interfaceAuto enables onboard SCSI termintor
    - LPC interface, AC'97 2.1 interface, PCI 2.2 interface.
    - Integrated system management controller.
    - Low pin count interface for SIO.

Main Memory
- Supports four 184-pin gold-lead RIMM sockets.
- Supports a maximum memory size of 2GB.

Slots
- One AGP (Accelerated Graphics Port) 4x slot.
- Four 32-bit/33 MHz PCI bus slots.
- Support 3.3v/5v PCI bus interface.
- One CNR (Communication Network Riser) slot.

On-Board IDE
- An IDE controller on the Intel® ICH2 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA 100 operation modes.
- Can connect up to four IDE devices.

On-Board Peripherals
- Intergrated Super I/O Controller
    - 1 floppy port supports 2 FDDs with 360K, 720K, 1.2M, 1.44M and

2.88Mbytes.
- 2 serial ports (COM A + COM B).
- 1 parallel port supports SPP/EPP/ECP mode.
- 1 IrDA connector for SIR.
- 1 Line-in/Line-out/Mic-in port.
- 1 RJ45 connector.

USB Interface
❏ 4 USB 1.1 ports (Rear * 4, one for BlueTooth Networking function) and 4 NEC USB 2.0 ports (Front * 4) (Optional)

Audio
❏ C-Media CMI8738/PCI-6ch-LX supports 2/4/6 ch speaker
  - 6CH DAC for AC3® 5.1CH purpose.
  - HRTF-based 3D positional audio, supporting DirectSound™ 3D and A3D™ interface.
  - Supports 4.1/5.1 speakers, C3DX positional audio in 4/6 CH speaker mode.
  - Legacy audio SBPRO™ compatible.
  - DLS-based wavetable music synthesizer.

Intel® LAN (Optional)
❏ Intel® 82562ET chip
    - Integrated Fast Ethernet MAC and PHY in one chip.
    - Supports 10 Mb/s and 100 Mb/s.
    - Compliance 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.
❏ IDE drive auto configure, Advanced Power Management (APM) 1.2, ACPI 1.0a, DMI 2.0, ECC/Parity support, LS 120 support, PnP 1.0a, SMBIOS 2.3, WFM 2.0, Auto enables onboard SCSI termintor.
❏ Supports boot from Lan and boot from USB device.

Dimension
❏ ATX Form Factor: 305 mm (L) x 244 mm (W) x 4 layers PCB.

Mounting
❏ 12 mounting holes.

Mainboard Layout
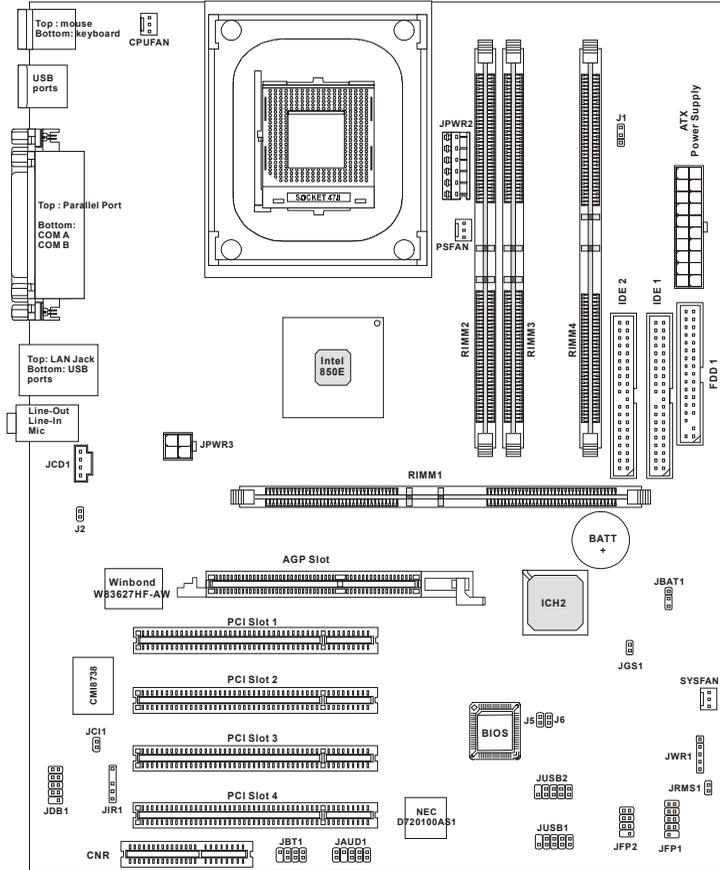
850 E Max (MS-6545 v2.X) ATX Mainboard

Quick Components Guide

Component	Function	Reference
JPWR1/2/3	ATX power connectors	See p. 2-7
JKBMS1	Mouse/keyboard connectors	See p. 2-9
USB 1.1 Connectors	Connecting to USB devices	See p. 2-10
COM A & COM B	Serial port connector	See p. 2-11
LPT1	Parallel port connector	See p. 2-12
FDD1	Floppy disk drive connector	See p. 2-13
IDE1& IDE2	Hard disk connectors	See p. 2-14
JFP1 & JFP2	Front panel connectors	See p. 2-15
CPU/SYS/PS FAN	Fan power connectors	See p. 2-16
JAUD1	Front panel audio connector	See p. 2-17
JBAT1	Bluetooth connector	See p. 2-18
JCD1	CD connector	See p. 2-19
JWR1	Wake On Ring Connector	See p. 2-19
JIR1	IrDA infrared module connector	See p. 2-20
JCI1	Chassis intrusion switch connector	See p. 2-20
JRMS1	Remote power on/off switch	See p. 2-21
JGS1	Power saving switch connector	See p. 2-21
JUSB1 & JUSB2	Front USB 2.0 Connectors	See p. 2-22
JDB1	D-Bracket connector	See p. 2-24
JBAT1	Clear CMOS jumper	See p. 2-25
J6	Clear BIOS password jumper	See p. 2-26
J5	BIOS flash jumper	See p. 2-26
J2	LAN Enable/Disable Jumper	See p. 2-27
J1	RDRAM Over Voltage Jumper	See p. 2-28
AGP Slot	Connecting to AGP cards	See p. 2-30
PCI Slots	Connecting to expansion cards	See p. 2-30
CNR Slot	Connecting to expansion cards	See p. 2-30

Key Features

- ATX Form Factor
- CPU: Intel® Pentium® 4 processor in the 478 pin package
- USB PC to PC networking function (Optional)
- Fuzzy Logic 4
- Live BIOS / Live Driver
- PC Alert™ III system hardware monitor
- D-LED/ D-Bracket (Optional)
- LAN/Modem Ring Wake Up Function
- Suspend to RAM/Disk
- PC2001 Compliant
- STD/STR (S3/S4)
- Chassis intrusion

MSI Special Features

T.O.P Tech™

The T.O.P Tech™ is an extended sensing device that can 100% accurately detect the CPU's temperature. You can find out the temperature on BIOS setup menu. The PC Alert™ also provides the information.

CPU temperature on Setup menu
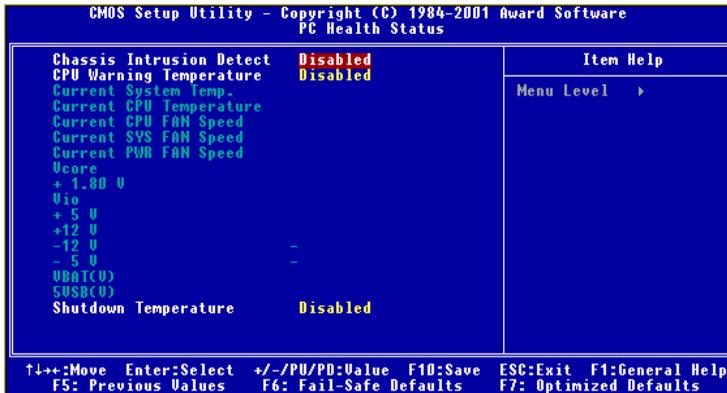
Fuzzy Logic™ 4

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

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

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

PC Alert™ III

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

    * monitor CPU & system temperatures
    * monitor fan speed(s)
    * monitor system voltage
    * monitor chassis intrusion

If one of the items above is abnormal, the program main screen will be immediately shown on the screen, with the abnormal item highlighted in red. This will continue to be shown until users disable the warning.
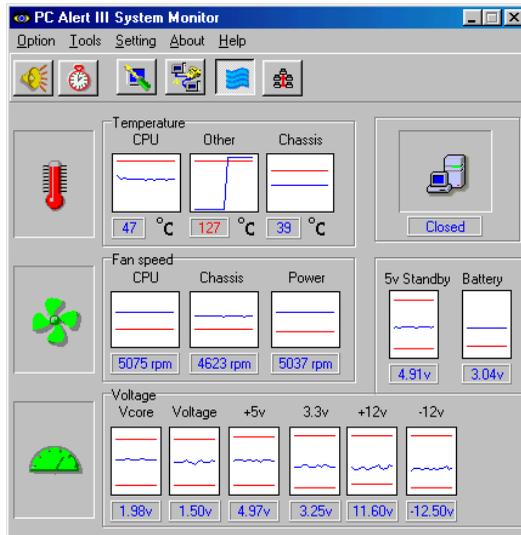
Note: Items shown on PC Alert III vary depending on your system's status.

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 Series 2" application. After installation, the "MSI Live Update Series 2" icon (as shown on the right) will appear on the screen.

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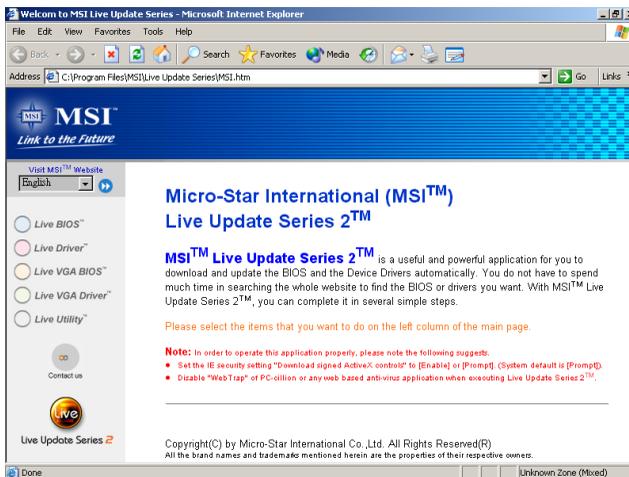
Five buttons are placed on the leftmost pane of the screen. Click the desired button to start the update process.

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

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

Live Monitor™

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

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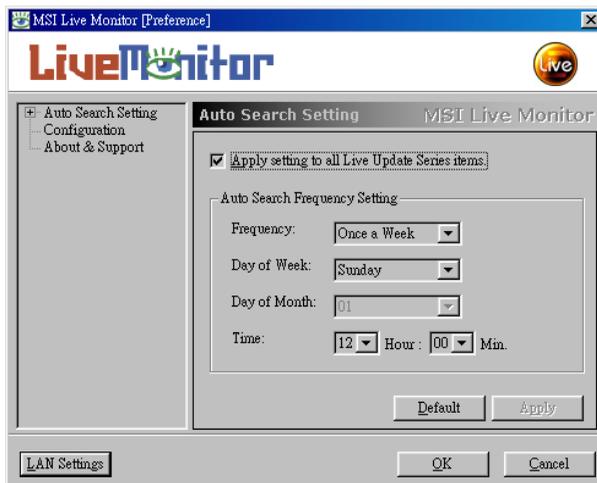
You can right-click the MSI Live Monitor icon to perform the functions listed below:

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

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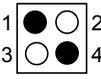
D-Bracket™ 2	Description
1 ● ○ 2 3 ○ ● 4	Processor Initialization - This will show information regarding the processor (like brand name, system bus, etc…)
○ ○ ○ ●	Testing RTC (Real Time Clock)
● ● ● ○	Initializing Video Interface - This will start detecting CPU clock, checking type of video onboard.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

Hardware Setup

2

This chapter provides you with the information about hardware setup procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.

Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

This chapter contains the following topics:

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.

Open Lever

Sliding Plate   90 degree

Dot / Cut edge

Correct CPU placement

O

Dot / Cut edge

X

Dot / Cut edge

Incorrect CPU placement

Press down the CPU

Close Lever
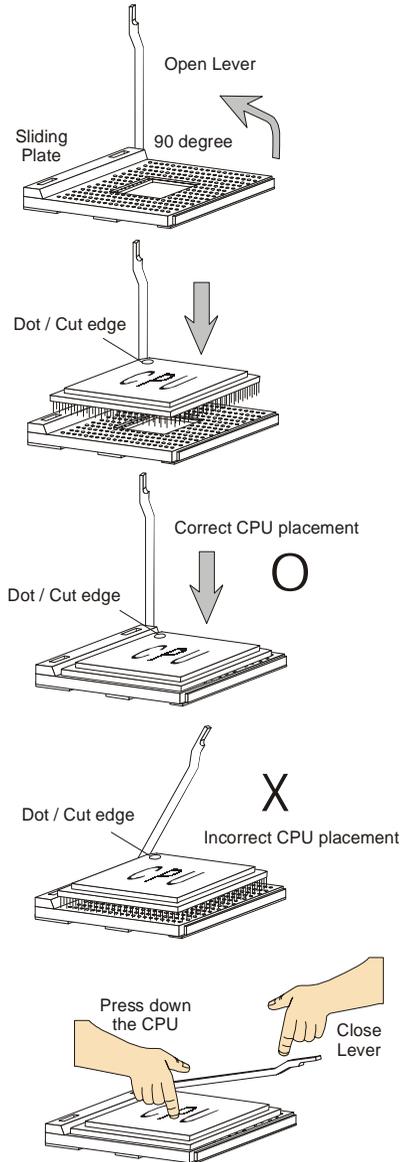
Installing the CPU Fan

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

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

retention mechanism

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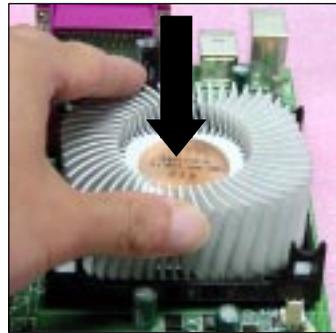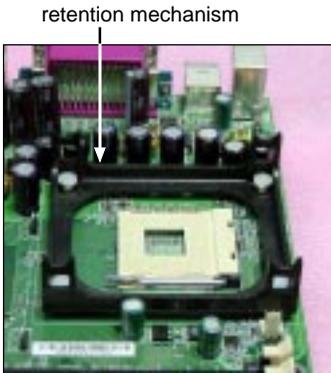
3. Mount the fan on top of the heatsink. Press down the fan until its four clips get wedged in the holes of the retention mechanism.

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

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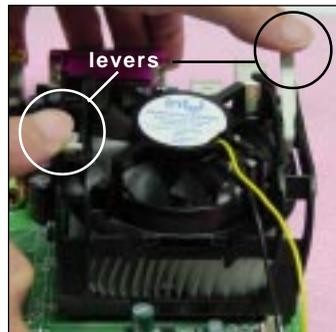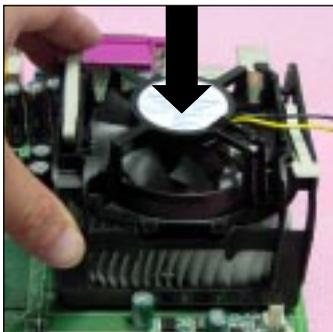
5. Connect the fan power cable from the mounted fan to the 3-pin fan power connector on the board.

fan power cable
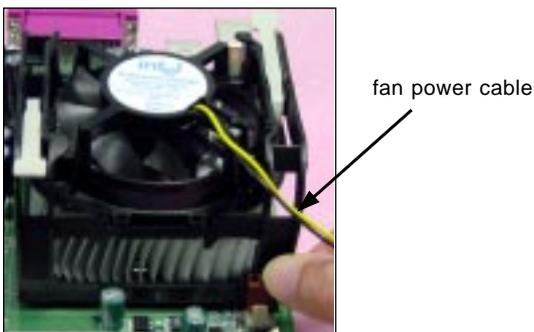
CPU Core Speed Derivation Procedure

If	CPU Clock	=	100MHz
	Core/Bus ratio	=	17
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	100MHz x 17
		=	1.7GHz

STOP
WARNING!

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

Memory Installation

The mainboard provides 4 gold-lead sockets for 184-pin RIMM modules. To operate properly, at least two RIMM modules must be installed. The mainboard supports the memory size up to 2 GB.

**RIMM Slots
(RIMM 1~4)**
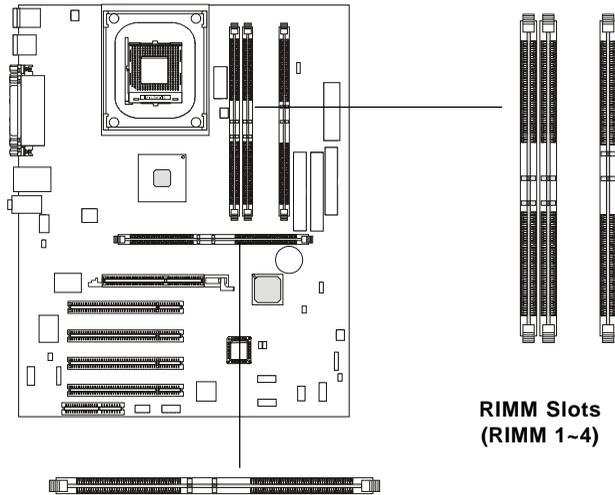
Memory Population Rules

- Support RIMM only.
- To operate properly, make sure that the RIMM banks are using the same type and equal size density memory.
- Support PC600/PC800 RIMM.
- Support up to 16 Direct Rambus Device.
- Support ECC Single bit Correction and Multiple bit error detection (Setting in BIOS).
- Install two RIMM modules either on "RIMM 1and RIMM 2" or on "RIMM3 and RIMM4" slots.

About RIMM Module

RIMM module is a module integrated with RDRAM chips. It is similar to a DIMM package but uses different pin settings. Rambus trademarked the term RIMM as an entire word for a module using Rambus technology.

Installing RIMM Modules

You can install two or four RIMM modules in the following combination:

DIMM Socket	Memory Module	Total Memory
Socket 1 (Bank 0 & Bank 1)	32MB, 64MB, 128MB, 256MB, 512MB	32MB ~ 512MB
Socket 2 (Bank 2 & Bank 3)	32MB, 64MB, 128MB, 256MB, 512MB	32MB ~ 512MB
Socket 3 (Bank 4 & Bank 5)	32MB, 64MB, 128MB, 256MB, 512MB	32MB ~ 512MB
Socket 4 (Bank 6 & Bank 7)	32MB, 64MB, 128MB, 256MB, 512MB	32MB ~ 512MB
Total System Memory		64MB ~ 2GB

Note: If only two RIMM slots are populated, you must install C-RIMM (Continuity RIMM) modules on the other

C-RIMM Module

unused RIMM slots. A C-RIMM module is a dummy module for continuing the signal connection.

1. The RIMM slot has 2 Notch Keys, so the RIMM memory module can only fit in one orientation.

RIMM Module

2. Insert the RIMM memory module vertically into the RIMM slot. Then push it in.
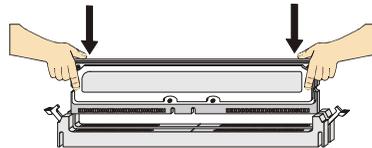
3. The plastic clips at sides of the RIMM slot will automatically close.

4. If you won't insert any RIMM modules on the other two RIMM slots, you must install C-RIMM modules on the empty slots.

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: JPWR1

This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plugs 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. The power connector supports **instant power on** function which means that system will boot up immediately when the power supply connector is inserted on the board.
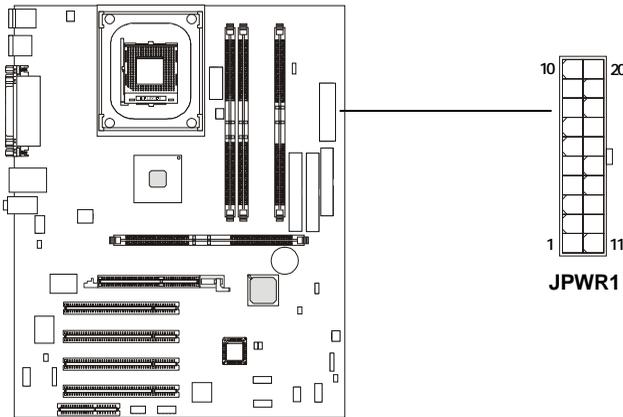
JPWR1

JPWR1 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: JPWR3

Attaching the ATX power supply to the connector help offer sufficient voltage to Pentium 4 CPU. This power connector also supports **instant power on** function.

JPWR3

PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V
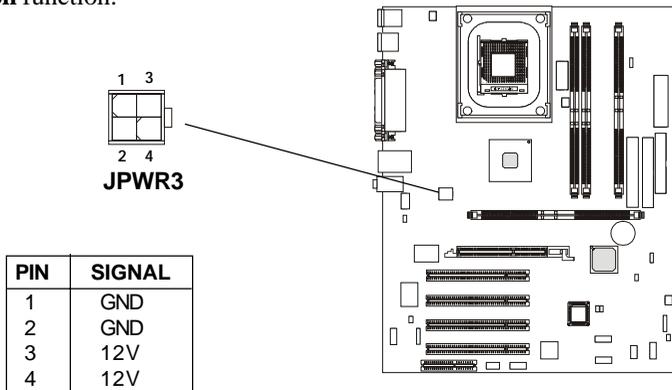
ATX 5V/3V Power Connector: JPWR2

The mainboard provides an extra 5V/3V power connector for you to connect to the ATX power supply.

JPWR2

PIN	SIGNAL	PIN	SIGNAL
1	GND	4	3.3V
2	GND	5	3.3V
3	GND	6	5V
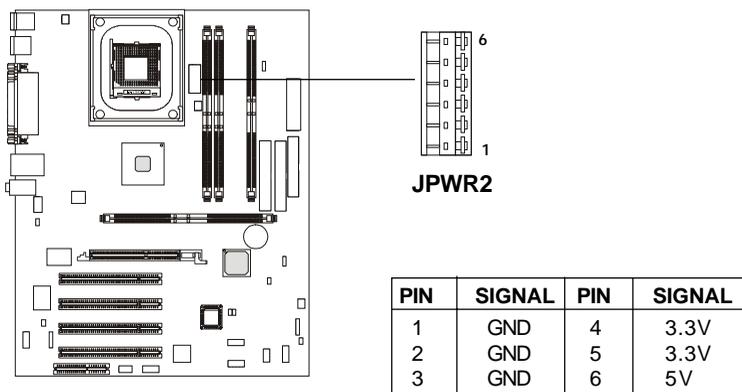
Back Panel

The Back Panel provides the following connectors:
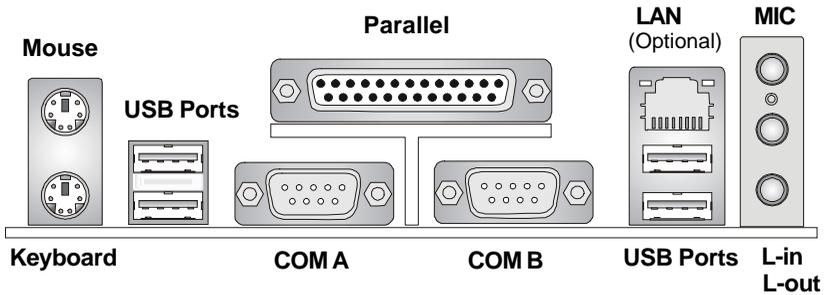
Mouse Connector: JKBMS1

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:

Pin Definition

PS/2 Mouse (6-pin Female)

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: JKBMS1

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

Pin Definition

PS/2 Keyboard (6-pin Female)

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 1.1 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 ths connector.
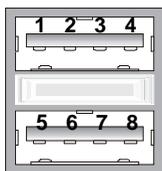
USB Ports

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 & COM B

The mainboard offers two 9-pin male DIN connectors for serial port COM A and COM B. 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 them.

Pin Definition

1 2 3 4 5

6 7 8 9
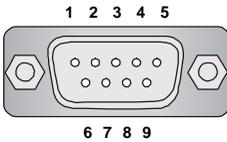
9-Pin Male DIN Connectors

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

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

MIC

Line In

Line Out
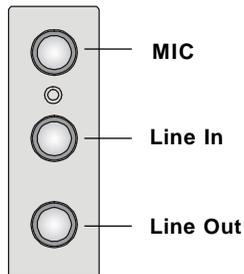
Note: Details on the application of 6-channel audio can be acquired by installing the CMI8738 Audio Driver on the CD-ROM (enclosed in the product package).

Parallel Port Connector: LPT1

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

13   **1**

25   **14**
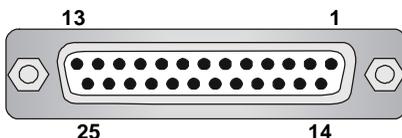
Pin Definition

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, IR module and CPU/System FAN.

Floppy Disk Drive Connector: FDD1

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

FDD1
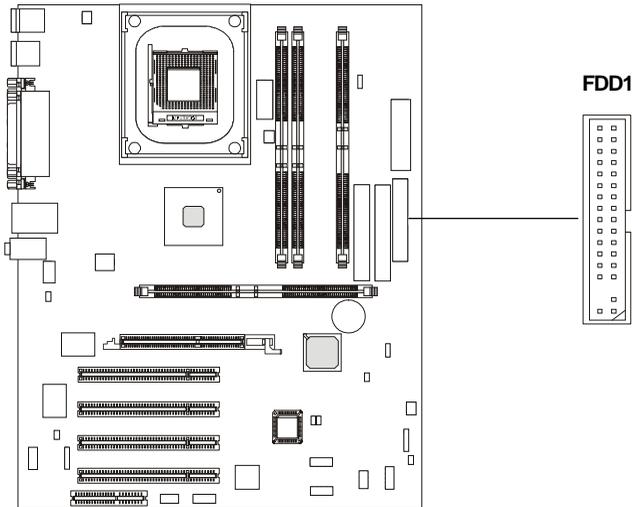
Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra 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 (reserved for future BIOS) and other devices. These connectors support the provided IDE hard disk cable.
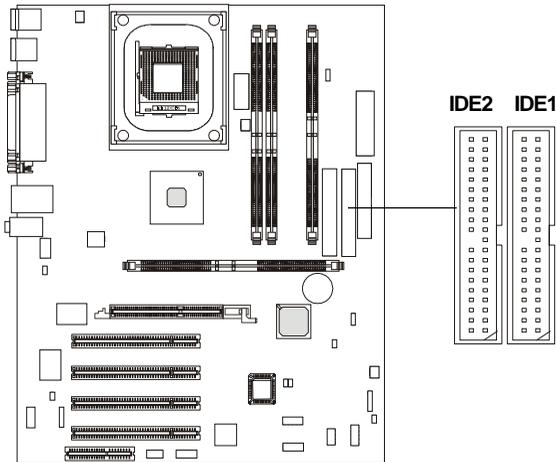
IDE1 (Primary IDE Connector)

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

IDE2 (Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

TIP:

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

Front Panel Connector: JFP1 and JFP2 (Optional Intel spec)

This connector is for electrical connection to the front panel switches and LEDs.
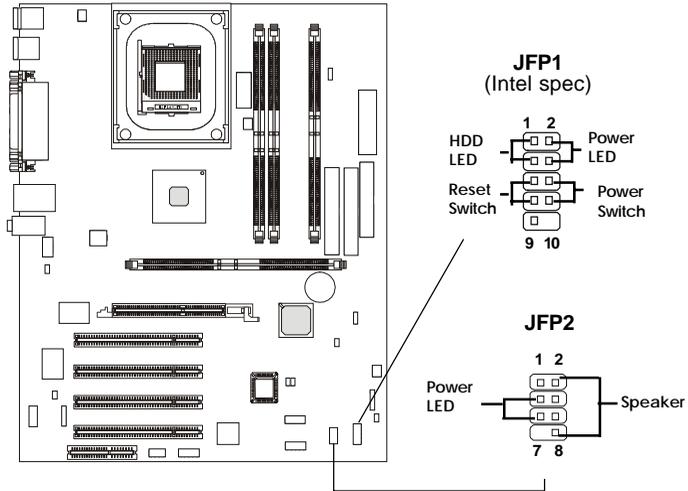
JFP1 Pin Definition

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_1	Reset Switch 1
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_2	Reset Switch 2
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+

Fan Power Connectors: CPUFAN/SYSFAN/PSFAN

The CPUFAN (processor fan), SYSFAN (system fan) and PSFAN (power supply 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.
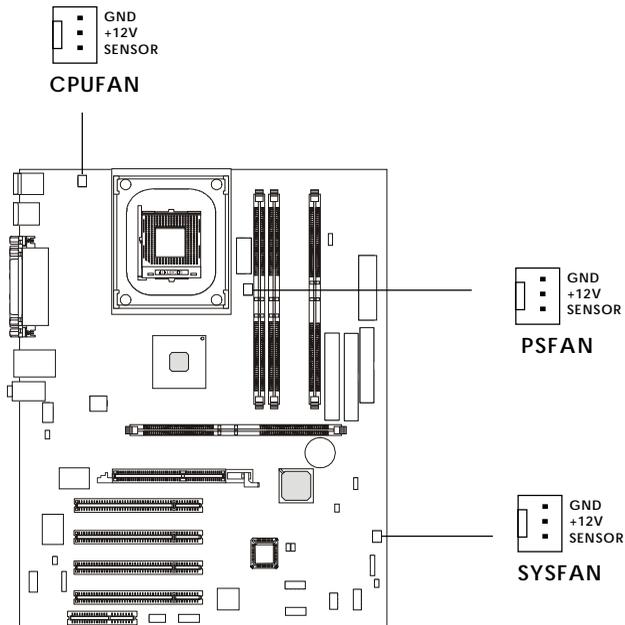
Note:

1. *Always consult the vendor for proper CPU cooling fan.*
2. *CPU Fan supports the fan control. You can install the PC Alert utility that will automatically control the CPU Fan speed according to the actual CPU temeperature.*

Front Panel Audio Connector: JAUD1 (Optional Intel spec)

This connector allows you to connect to the front panel audio.

JAUD1
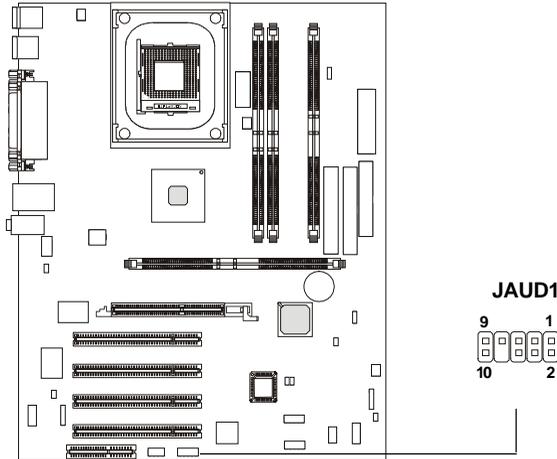
Pin Definition

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

Note:

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.

2-17
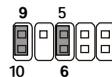
Bluetooth Connector: JBT1 (Optional)

This connector is used to connect a bluetooth module for wireless connection.

JBT1
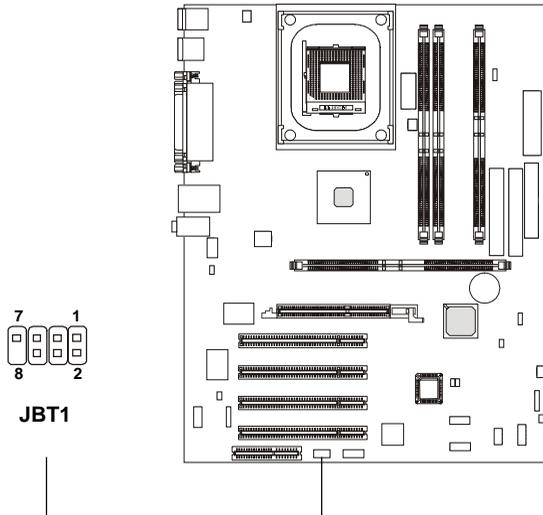
Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	5VDUAL	2	3VDUAL
3	D+ (USB signal)	4	GND
5	D- (USB signal)	6	GND
7	GND	8	NC

Note: Because the bluetooth connector shares the USB1.1 connector, the upper USB1 USB 1.1 port will not function when you attach a bluetooth module to this connector.

CD-In Connector: JCD1

JCD1 connector is for CD-ROM audio connector.

R
GND
L

JCD1
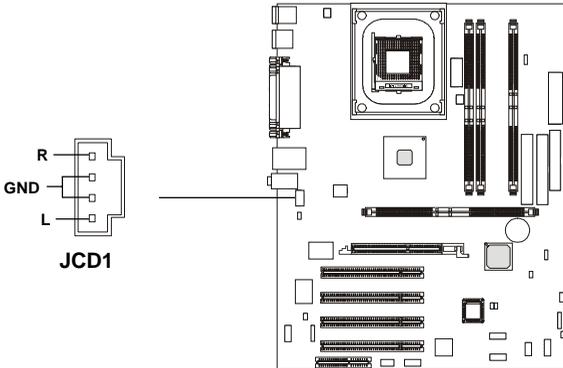
Wake On Ring Connector: JWR1

This connector allows you to connect to a modem card with Wake On Ring function. The connector will power up the system when a signal is received through the modem card.

1 — NC
GND
MDM_WAKEUP
NC
5VSB

JWR1
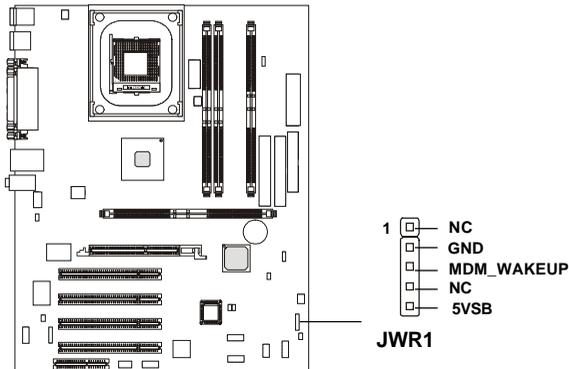
Note: Modem wake-up signal is active "low".

2-19

IrDA Infrared Module Connector: JIR1

This connector allows you to connect to an IrDA Infrared module. You must configure the setting through the BIOS setup to use the IR function.

JIR1

Pin	Signal
1	VCC
2	NC
3	IRRX
4	GND
5	IRTX
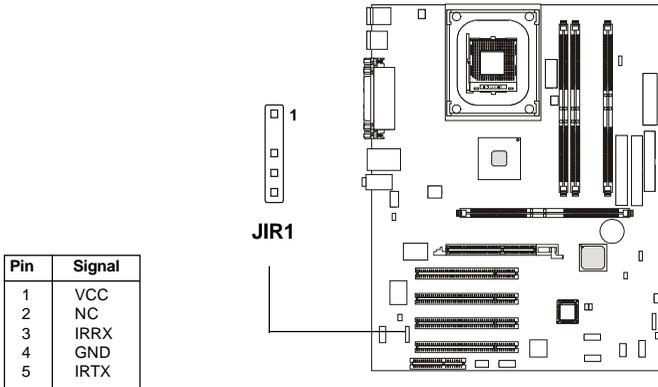
Chassis Intrusion Switch Connector: JCI1

The connector is connected to a 2-pin chassis switch. If the chassis is opened, the switch will be short. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.

JCI1
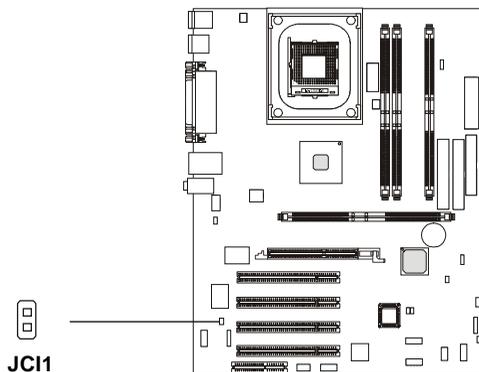
Remote Power On/Off Switch Connector: JRMS1

Connect to a 2-pin push button switch. When OFF, pressing the button can turn the system on. When ON, pressing the button once will make the system enter the sleep/suspend state. If the button is pressed for more than four seconds, the system will be turned off. To change the setup, go to the BIOS Power Management Setup.

JRMS1
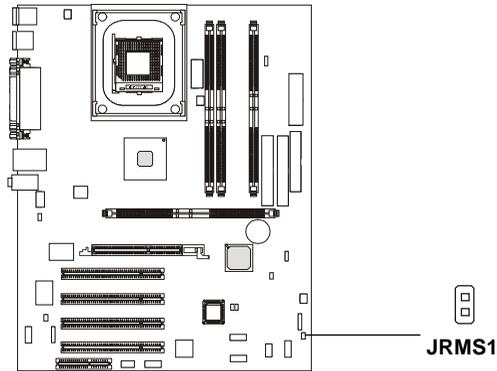
Power Saving Switch Connector: JGS1

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

JGS1

2-21
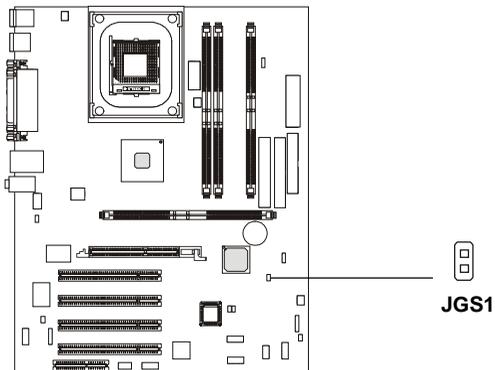
Front USB 2.0 Connectors: JUSB1 & JUSB2 (Optional)

The mainboard provides two USB 2.0 pin headers USB1 & USB2 (optional USB 2.0 Bracket available). 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**. Both USB1 & USB3 are compliant with Intel® Front Panel I/O Connectivity Design Guide.
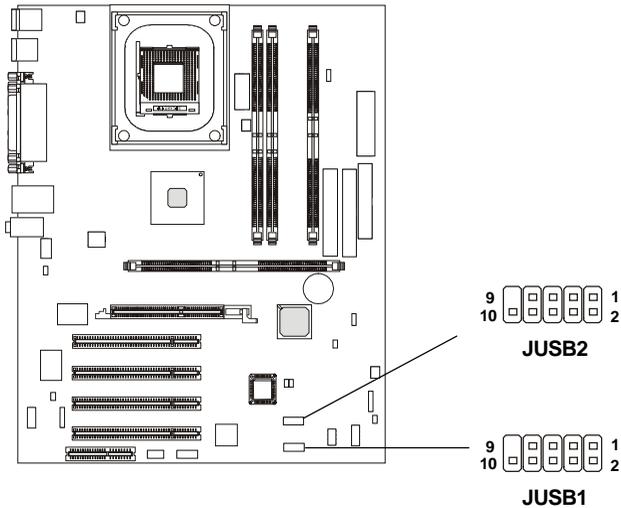
JUSB2

JUSB1

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	USBPWR	2	USBPWR
3	USBP2-	4	USBP3-
5	USBP2+	6	USBP3+
7	GND	8	GND
9	NC	10	USBOC

To Attach the Optional USB 2.0 Ports:
1. Take out the USB 2.0 bracket
2. Locate the JUSB1 and JUSB2 pin headers on the motherboard.
3. Connect the USB cables from USB 2.0 bracket to the JUSB1 and JUSB2 pin headers separately. The blue connector of the USB bracket should be attached to the blue pin header on the board, and the yellow connector to the yellow pin header on the board.

Connected to JUSB1 & JUSB2 separately
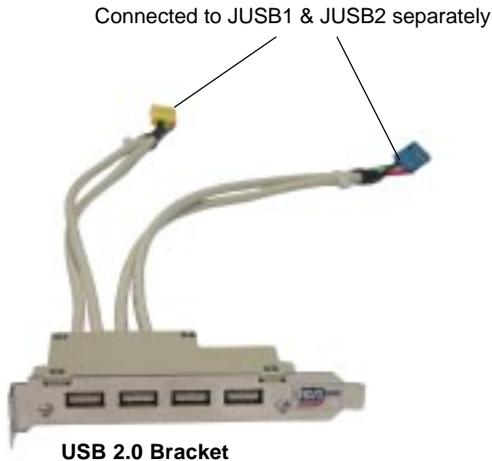
USB 2.0 Bracket

4. Place the USB 2.0 bracket into the appropriate slot of the system case.

> *Note: The USB 2.0 controller is backwards compatible with USB 1.1 spec. To use the USB 2.0 ports, you still need to install USB 2.0 driver, which is supplied by Microsoft for Windows® 2000 and XP. If you have any problems regarding USB 2.0 driver, please visit Microsoft website for more information.*

D-Bracket™ 2 Connector: JDB1

The D-Bracket™ 2 is a USB Bracket that supports both USB 1.1 & 2.0 spec. It integrates four LEDs and allows users to identify system problems through 16 various combinations of LED signals. For definitions of 16 signal combinations, please refer to *D-Bracket™ 2* in *Chapter 1*.
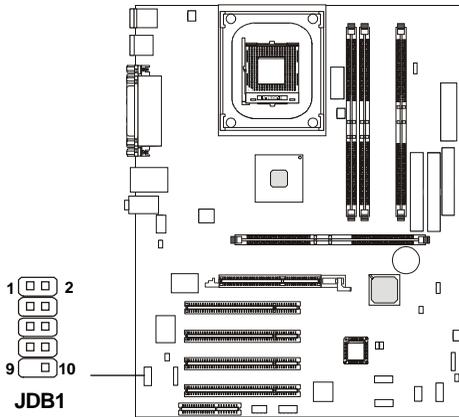
JDB1 Pin Definition

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

Connected to JDB1

Connected to USB1

D-Bracket™ 2

2-24
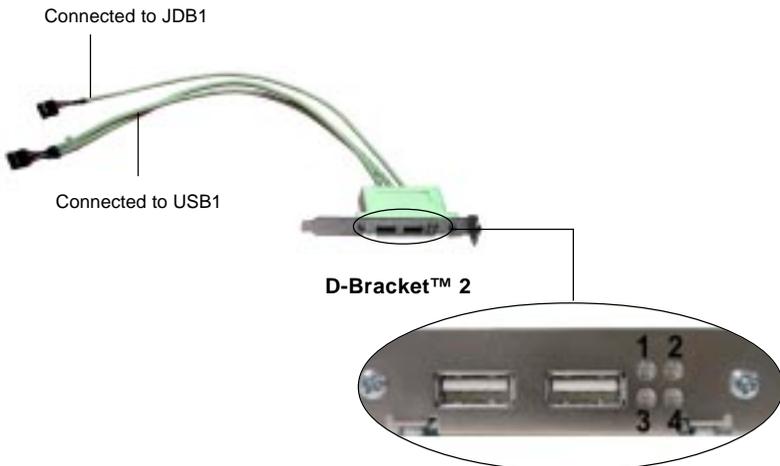
Jumpers

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

Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. That battery has long life time for at least 5 years. If you want to clear the system configuration, use the JBAT1 (Clear CMOS Jumper) to clear data. Follow the instructions below to clear the data:

Keep Data   **Clear Data**   **JBAT1**
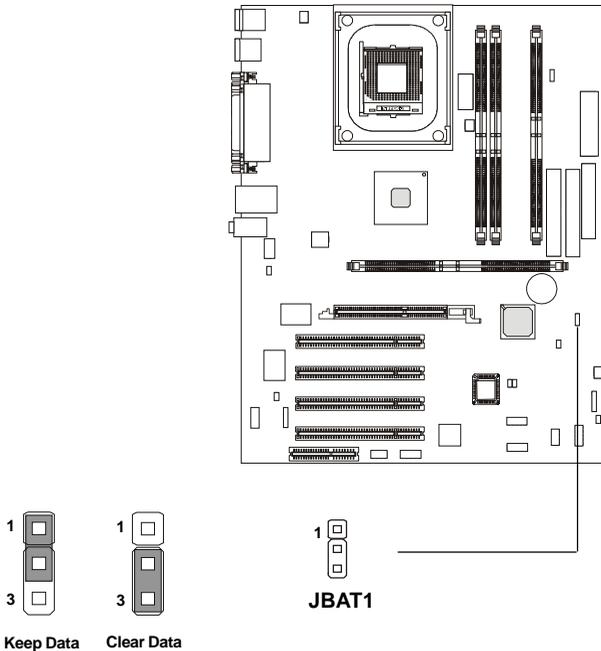
> **STOP**
> **WARNING!**
> *You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.*

Clear BIOS Password Jumper: J6

The jumper is used to clear the BIOS password. To clear the password, open the jumper and restart your computer.

Normal   **Clear**

J6
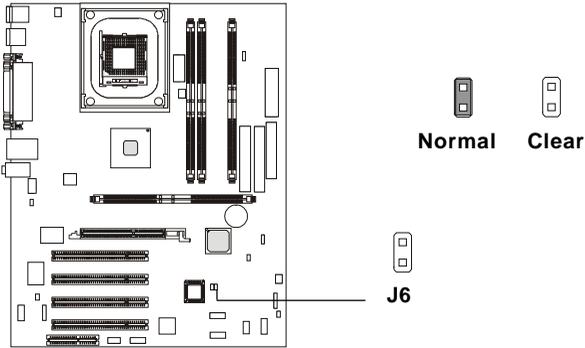
BIOS Flash Jumper: J5

This jumper is used to lock or unlock the boot block area on BIOS. When unlocked, the BIOS boot block area can be updated. When locked, the BIOS boot block area cannot be updated.

BIOS Flash   **BIOS Flash**
Locked   **Unlocked**

J5
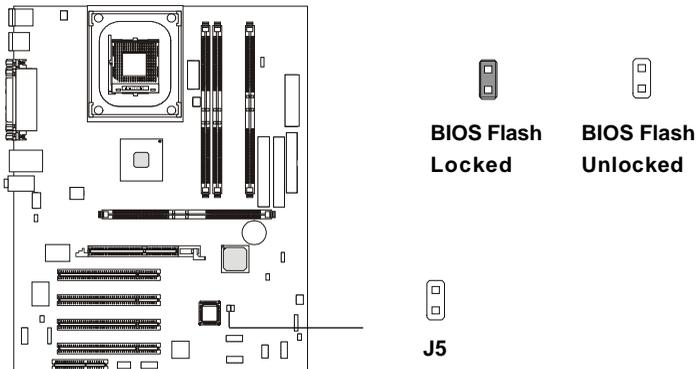
LAN Enable/Disable Jumper: J2

The jumper is used to disable the onboard LAN function, and the status should be set in the BIOS Setup program.
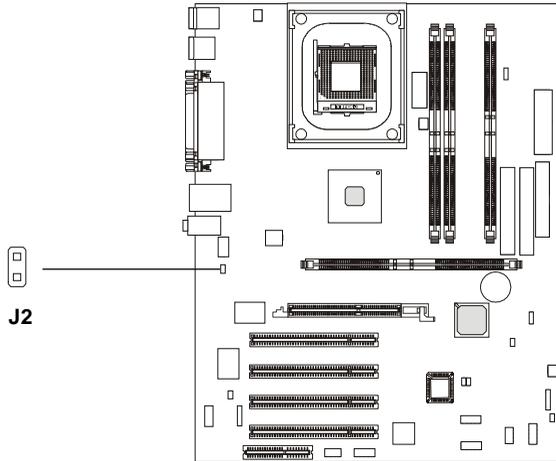
J2

RDRAM Over Voltage Jumper: J1

The jumper is used to set the RDRAM voltage for overcolcking purpose.
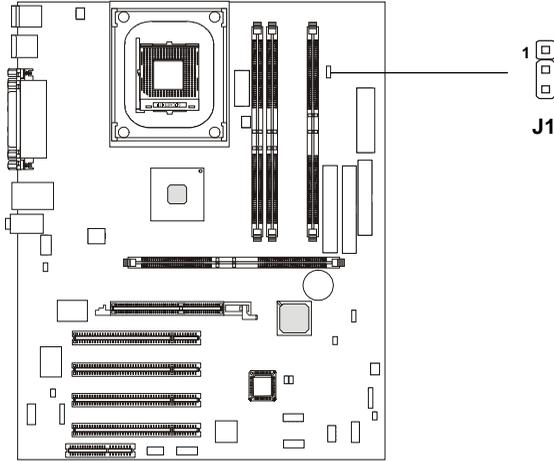
Normal
(2.6V)

Over Voltage
(2.58V)

Over Voltage
(2.68V)

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

Slots

The motherboard provides four 32-bit Master PCI Bus Slots, one AGP and one CNR slot.
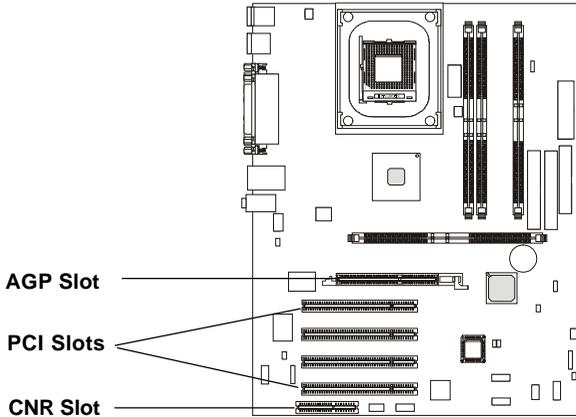
AGP (Accelerated Graphics Port) Slot

The AGP slot allows you to insert the AGP graphics card only. 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 only supports **1.5V 4x** AGP card.

PCI Slots

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

CNR (Communication Network Riser) Slot

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

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 as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT C#	INT F#	INT G#	INT A#
PCI Slot 2	INT F#	INT G#	INT A#	INT C#
PCI Slot 3	INT G#	INT A#	INT C#	INT F#
PCI Slot 4	INT A#	INT C#	INT F#	INT G#

AWARD® BIOS Setup 3

The mainboard uses AWARD® BIOS Setup program that provides a Setup utility for users to modify the basic system configuration. The information is stored in a battery-backed CMOS RAM so it retains the Setup information when the power is turned off.

This chapter provides you with the overview of the BIOS Setup program. It contains the following topics:

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.

<div align="center">

`Press DEL to enter SETUP`

</div>

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

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General help, only for Status Page Setup Menu and Option Page Setup Menu
<F5>	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
<F6>	Load the default CMOS value from Fail-Safe default table, only for Option Page Setup Menu
<F7>	Load Optimized defaults
<F10>	Save all the CMOS changes and exit

Getting Help

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

Main Menu

The main menu lists the setup functions you can make changes to. You can use the control keys (↑↓) to select the item. The on-line description of the high-lighted 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 high-light 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 Award® BIOS CMOS Setup Utility, the Main Menu (Figure 1) will appear on the screen. The Main Menu allows you to select from twelve setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

```
CMOS Setup Utility - Copyright (C) 1984-2001 Award Software

  ▶ Standard CMOS Features          ▶ Frequency/Voltage Control
  ▶ Advanced BIOS Features            High System Performance
  ▶ Advanced Chipset Features         Load Optimized Defaults
  ▶ Integrated Peripherals            Set Supervisor Password
  ▶ Power Management Setup            Set User Password
  ▶ PnP/PCI Configurations            Save & Exit Setup
  ▶ PC Health Status                  Exit Without Saving

Esc : Quit      F9 : Menu in BIOS      ↑ ↓ → ←   : Select Item
F10 : Save & Exit Setup

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

Standard CMOS Features
Use this Menu for basic system configurations.

Advanced BIOS Features
Use this menu to set the Advanced Features available on your system.

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.

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

Load Optimized Defaults
Use this menu to load factory default settings into the BIOS for optimal and stable system operations.

Set Supervisor/User Password
Use this menu to set User and Supervisor Passwords.

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

Exit Without Saving
Abandon all CMOS value changes and exit setup.

Standard CMOS Features

The items in Standard CMOS Features Menu are divided into 10 categories. Each category includes no, one or more than one 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.

```
     CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                         Standard CMOS Features

   Date (mm:dd:yy)          Tue, Jun 18 2002          Item Help
   Time (hh:mm:ss)          10 : 51 : 55
                                               Menu Level    ▶
 ▶ IDE Primary Master
 ▶ IDE Primary Slave                           Change the day, month,
 ▶ IDE Secondary Master                        year and century
 ▶ IDE Secondary Slave        None

   Drive A                   1.44M, 3.5 in.
   Drive B                   None

   Video                     EGA/VGA
   Halt On                   All , But Keyboard

   Base Memory                  640K
   Extended Memory            65472K
   Total Memory                1024K

 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
     F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults
```

Date

The date 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, depends on the year of the BIOS

Time

> The time format is <hour> <minute> <second>.

IDE Primary/Secondary Master/Slave

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

If you select Manual, related information is asked to be entered to the follow-

ing items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

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

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

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

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

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.

Advanced BIOS Features

```
        Phoenix - Award WorkstationBIOS CMOS Setup Utility
                    Advanced BIOS Features
 ┌─────────────────────────────────────────┬──────────────────────┐
 │ Virus Warning              Disabled    ▲ │     Item Help        │
 │ BIOS Flash Write Control   Disabled      ├──────────────────────┤
 │ CPU L1 & L2 Cache          Enabled       │ Menu Level   ▶       │
 │ Quick Power On Self Test   Enabled       │                      │
 │ First Boot Device          Floppy        │ Allows you to choose │
 │ Second Boot Device         HDD-0         │ the VIRUS warning    │
 │ Third Boot Device          LS120         │ feature for IDE Hard │
 │ Boot Other Device          Enabled       │ Disk boot sector     │
 │ Swap Floppy Drive          Disabled      │ protection. If this  │
 │ Boot Up Floppy Seek        Disabled      │ function is enabled   │
 │ Boot Up NumLock Status     On            │ and someone attempt to│
 │ Gate A20 Option            Fast          │ write data into this  │
 │ Typematic Rate Setting     Disabled      │ area , BIOS will show │
 │x Typematic Rate (Chars/Sec) 6            │ a warning message on  │
 │x Typematic Delay (Msec)    250           │ screen and alarm beep │
 │ Security Option            Setup         │                      │
 │ APIC Mode                  Disabled      │                      │
 │x MPS Version Control For OS 1.4        ▓ │                      │
 │ OS Select For DRAM > 64MB  Non-OS2     ▼ │                      │
 │ HDD S.M.A.R.T. Capability  Disabled      │                      │
 │ Report No FDD For WIN 95   No          ▼ │                      │
 ├─────────────────────────────────────────┴──────────────────────┤
 │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help │
 │     F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults  │
 └─────────────────────────────────────────────────────────────────┘
```

Virus Warning

The setting 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 the screen and beep. Setting options: *Disabled*, *Enabled*.

BIOS Flash Write Control

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

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. This setting enables/disables the internal cache (also known as L1 or level 1 cache) and external cache (also known as L2 or level 2 cache). Setting options: *Disabled, Enabled*.

Quick Power On Self Test

The option speeds up Power On Self Test (POST) after you power on the

computer. When setting the item to *Enabled*, BIOS will shorten or skip some check items during POST. Setting options: *Enabled, Disabled*.

First/Second/Third Boot Device
The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. The settings are:

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

Boot 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 First/Second/Third boot device.

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

Boot Up Floppy Seek
Setting to *Enabled* will make BIOS seek floppy drive A: before booting the system. Settings: *Disabled* and *Enabled*.

Boot Up NumLock Status
This setting is to set the Num Lock status when the system is powered on. Setting to *On* will turn on the Num Lock key when the system is powered on. Setting to *Off* will allow users to use the arrow keys on the numeric keypad. Setting options: *On*, *Off*.

Gate A20 Option

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

Typematic Rate Setting

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

Typematic Rate (Chars/Sec)

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

Typematic Delay (Msec)

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

Security Option

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

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

APIC Mode

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

MPS Version Control For OS
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* and *1.1*.

OS Select For DRAM > 64MB
This allows you to run the OS/2® operating system with DRAM greater than 64MB. Setting options: *Non-OS2, OS2*.

HDD S.M.A.R.T. Capability
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* and *Disabled*.

Report No FDD For WIN 95
For compatibility with Windows 95 logo certification, select *Yes* to release IRQ6 when the system contains no floppy drive. When this setting is set to *Yes*, users have to select *Disabled* for the *Onboard FDC Controller* in the Integrated Peripherals menu. Setting options: *Yes, No*.

Chapter 3

Advanced Chipset Features

The Advanced Chipset Features Setup option is used to change the values of the chipset registers. These registers control most of the system options in the computer.

Choose the "ADVANCED CHIPSET FEATURES" from the Main Menu and the following screen will appear.

```
          CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                          Advanced Chipset Features

      RDRAM Bus Frequency         Auto                  Item Help
      DRAM Data Integrity Mode    Non-ECC
      System BIOS Cacheable       Disabled      Menu Level    ▶
      Video  BIOS Cacheable       Disabled
      Video RAM Cacheable         Disabled
      Delayed Transaction         Enabled
      AGP Aperture Size (MB)      64
      Delay Prior to Thermal      16 Min




      ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
          F5: Previous Values     F6: Fail-Safe Defaults    F7: Optimized Defaults
```

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

RDRAM Bus Frequency
This setting allows you to set the bus frequency for installed RDRAM. Setting options: *Auto, 533MHz, 400 MHz, 300 MHz*.

DRAM Data Integrity Mode
Select *ECC* (Error-Checking & Correcting Code) or *Non-ECC* according to the type of DRAM installed.

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*.

Video BIOS Cacheable
Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this

memory area, a system error may result. Setting options: *Enabled*, *Disabled*.

Video RAM Cacheable
Selecting *Enabled* allows caching of the video memory (RAM) at A0000h to AFFFFh, resulting in better video performance. However, if any program writes to this memory area, a memory access error may result. Setting options: *Disabled*, *Enabled*.

Delayed Transaction
The chipset has an embedded 32-bit posted write buffer to support delayed transactions cycles so that transactions to and from the ISA bus are buffered and PCI bus can perform other transactions while the ISA transaction is underway. Select *Enabled* to support compliance with PCI specification version 2.1. Setting options: *Enabled, Disabled*.

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 *256MB*.

Delay Prior to Thermal
When the CPU temperature reaches a factory preset level, a thermal monitoring mechanism will be enabled following the appropriate timing delay specified in this field. With the thermal monitoring enabled, clock modulation controlled by the processor's internal thermal sensor is also activated to keep the processor within allowable temperature limit. Setting options: *4 Mins, 8 Mins, 16 Mins, 32 Mins*.

Chapter 3

Integrated Peripherals

```
         Phoenix - Award WorkstationBIOS CMOS Setup Utility
                     Integrated Peripherals

  On-Chip Primary   PCI IDE   Enabled            Item Help
  On-Chip Secondary PCI IDE   Enabled
  IDE Primary Master PIO      Auto         Menu Level   ▶
  IDE Primary Slave  PIO      Auto
  IDE Secondary Master PIO    Auto
  IDE Secondary Slave  PIO    Auto
  IDE Primary Master UDMA     Auto
  IDE Primary Slave  UDMA     Auto
  IDE Secondary Master UDMA   Auto
  IDE Secondary Slave  UDMA   Auto
  USB Controller              Enabled
  USB2 Controller             Enabled
  USB Keyboard Support        Disabled
  USB Mouse Support           Disabled
  USB 2.0 Controller          Enabled
  Init Display First          AGP
  AC97 Audio                  Auto
  AC97 Modem                  Auto
  OnBoard Sound(CMedia8738)   Auto
  IDE HDD Block Mode          Enabled            Item Help
  POWER ON Function           BUTTON ONLY
  KB Power ON Password        Enter        Menu Level   ▶
  Hot Key Power ON            Ctrl-F1
  Onboard FDC Controller      Enabled
  Onboard Serial Port 1       3F8/IRQ4
  Onboard Serial Port 2       2F8/IRQ3
  UART Mode Select            Normal
  RxD , TxD Active            Hi,Lo
  IR Transmission Delay       Enabled
  UR2 Duplex Mode             Half
  Use IR Pins                 IR-Rx2Tx2
  Onboard Parallel Port       378/IRQ7
  Parallel Port Mode          SPP
  EPP Mode Select             EPP1.7
  ECP Mode Use DMA            3
  PWRON After PWR-Fail        Off
  Game Port Address           201
  Midi Port Address           330
  Midi Port IRQ               10
  Power Status Led            Single

↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
   F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults
```

On-Chip Primary/Secondary PCI IDE
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Choose *Enabled* to activate each channel separately.

IDE Primary/Secondary Master/Slave PIO
The four items allow you to set a PIO (Programmed Input/Output) mode for each of the four IDE devices that the onboard IDE interface supports. *Modes 0~4* provide increased performance. In *Auto* mode, BIOS automatically determines the best mode for each IDE device.

IDE Primary/Secondary Master/Slave UDMA
Ultra DMA implementation is possible only if your IDE device supports it and your operating environment contains a DMA driver. If both your hard drive and software support Ultra DMA 33/66/100, select *Auto* to enable BIOS support.

3-14

USB/USB2 Controller
Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. Setting options: *Enabled, Disabled*.

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

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

USB 2.0 Controller
Select *Enabled* if your system contains a Universal Serial Bus (USB) 2.0 controller and you have USB 2.0 peripherals. Setting options: *Enabled, Disabled*.

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

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

AC'97 Modem
Auto allows the mainboard to detect whether a modem is used. If a modem is used, the onboard MC'97 (Modem Codec'97) controller will be enabled; if not, it is disabled. Disable the controller if you want to use other controller cards to connect to a modem. Settings: *Auto*, *Disabled*.

Onboard Sound (CMedia8738)
This setting enables/disables the onboard sound chip CMedia8738. The onboard audio controller will be enabled if the device is detected. If you want to use other controller cards to connect an audio device, diable the controller. Settings: *Auto*, *Disabled*.

IDE HDD Block Mode
This allows your hard disk controller to use the fast block mode to transfer data to and from the hard disk drive. Block mode is also called block transfer, multiple commands or multiple sector read/write. *Enabled* enables IDE controller to use block mode; *Disabled* allows the controller to use standard mode.

POWER ON Function
This controls which part on the PS/2 mouse or keyboard can power on the system. Settings: *Password*, *Hot KEY*, *Mouse Left*, *Mouse Right*, *Any Key, BUTTON ONLY* and *Keyboard 98*.

KB Power ON Password
If *POWER ON Function i*s 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*.

Onboard FDC Controller
The item is used to enable or disable the onboard Floppy controller. Select *Enabled* when you have installed a floppy disk drive and want to use it.

Onboard Serial Port 1/2
The items specify the base I/O port address and IRQ for the onboard Serial Port A/Serial Port B. Selecting *Auto* allows BIOS to automatically determine the correct base I/O port address. Settings: *Disabled*, *3F8/IRQ4*, *2F8/IRQ3*, *3E8/IRQ4*, *2E8/IRQ3* and *Auto*.

UART Mode Select
The field allows you to specify the operation mode for serial port "COM B". Settings are:

> *Normal:* RS-232C Serial Port
> *IrDA:* IrDA-compliant Serial Infrared Port
> *ASKIR:* Amplitude Shift Keyed Infrared Port

RxD, TxD Active
This setting controls the receiving and transmitting speed of the IR peripheral

in use. Setting options: *Hi/Hi, Hi/Lo, Lo/Hi, Lo/Lo*.

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

UR2 Duplex Mode
This setting controls the operating mode of IR transmission/reception. Setting options: *Full, Half*. Under Full Duplex mode, synchronous, bi-directional transmission/reception is allowed. Under Half Duplex mode, only asynchronous, bi-directional transmission/reception is allowed.

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

Onboard Parallel Port
This specifies the I/O port address and IRQ of the onboard parallel port. Settings: *378/IRQ7*, *278/IRQ5*, *3BC/IRQ7* and *Disabled*.

Parallel Port Mode
> SPP : Standard Parallel Port
> EPP : Enhanced Parallel Port
> ECP : Extended Capability Port
> ECP + EPP: Extended Capability Port + Enhanced Parallel Port
>
> *SPP/EPP/ECP/ECP+EPP/Normal*
> To operate the onboard parallel port as Standard Parallel Port only, choose "SPP." To operate the onboard parallel port in the EPP mode simultaneously, choose "EPP." By choosing "ECP", the onboard parallel port will operate in ECP mode only. Choosing "ECP + EPP" will allow the onboard parallel port to support both the ECP and EPP modes simultaneously.

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

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

PWRON After PWR-Fail
This setting specifies whether your system will reboot after a power failure or interrupts occurs. Available settins are:

Off	Leaves the computer in the power off state.
On	Reboots the computer.
Former-Sts	Restores the system to the status before power failure or interrupt occurs.

Game Port Address
This setting disables or assigns an address for the onboard game/midi port. Settings: *Disabled, 201, 209.*

Midi Port Address
This setting specifies the base I/O port address for the onboard midi port. Settings: *Disabled, 330, 300, 290.*

Midi Port IRQ
This setting specifies which IRQ the midi port will use. Settings: *5, 10.*

Power Status Led
This item sets how the system uses Power LED on the case to indicate the suspend/sleep state. Settings are:

Single	The Power LED blinks to indicate the suspend/sleep state.
Dual	The Power LED changes its color to indicate the suspend/sleep state.

Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.
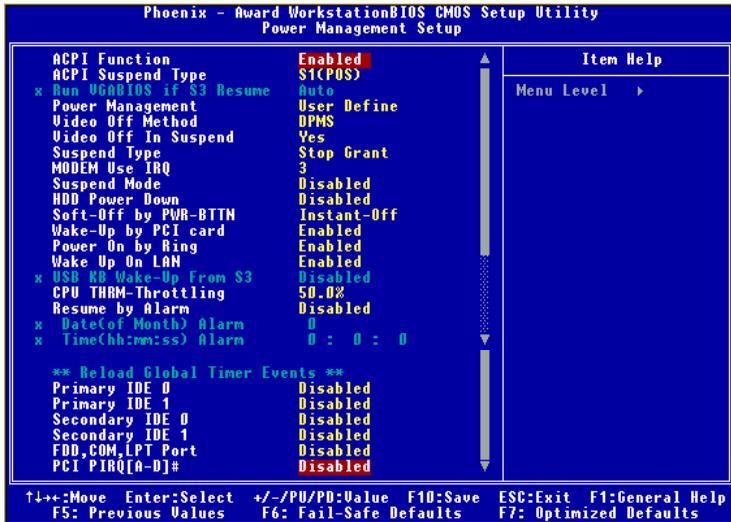
ACPI Function

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, select *Enabled*. Settings: *Enabled* and *Disabled.*

ACPI Suspend Type

This item specifies the power saving modes for ACPI function. Options are:

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

S3 (STR)   The S3 sleep mode is a power-down state in which power is supplied only to essential components such as main memory and wake-capable devices and all system con-

text is saved to main memory. The information stored in memory will be used to restore the PC to the previous state when an "wake up" event occurs.

Run VGABIOS if S3 Resume

This item allows the system to initialize the VGA BIOS from S3 (Suspend to RAM) sleep state. Setting options: *Auto, Yes, No*.

Power Management

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

User Define	Allows end users to configure each mode separately.
Min Saving	Minimum Power Management. Suspend Mode = 1 Hour, and HDD Power Down = 15 Min.
Max Saving	Maximum Power Management. Suspend Mode = 1 Min, and HDD Power Down = 1 Min.

Video Off Method

This determines the manner in which the monitor is blanked.

Blank Screen	This option only writes blanks to the video buffer.
V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off In Suspend

This setting determines whether the monitor will be turned off during suspend mode. Setting options: *Yes, No*.

Suspend Type

This setting allows you to select the type of Suspend mode. Setting options: *Stop Grant* (saves the state of the entire system to disk and then powers off the system), *PwrOn Suspend* (the CPU and core system remain powered on in a very low-power mode).

Modem Use IRQ

Name the interrupt request (IRQ) line assigned to the modem (if any) on your

system. Activity of the selected IRQ always awakens the system. Settings are *3*, *4*, *5*, *7*, *9*, *10*, *11* and *NA*.

Suspend Mode
After the selected period of system inactivity, all devices except the CPU shut off. Settings are *Disabled*, *1 Min*, *2 Min*, *4 Min*, *8 Min*, *12 Min*, *20 Min*, *30 Min*, *40 Min* and *1 Hour*.

HDD Power Down
If HDD activity is not detected for the length of time specified in this field, the hard disk drive will be powered down while all other devices remain active. Settings are *Disabled* and *1 through 15 Min*.

Soft-Off by PWR-BTTN
This feature allows users to configure the power button function. Settings are:

Instant-Off	The power button functions as a normal power-on/-off button.
Delay 4 Sec.	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 by PCI Card, Power On by Ring, Wake Up On LAN, USB KB Wake-Up From S3
These fields specify whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected.

Note: To use the function of "Power On by Ring", you need to install a modem/LAN card supporting power on function.

CPU THRM-Throttling
The item allows you to specify the CPU speed (at percentage) to which it will slow down when the CPU reaches the predetermined overheat temperature. Settings range from 12.5% to 87.5% at 12.5% increment.

Resume by Alarm
The field is used to enable or disable the feature of booting up the system on a scheduled time/date.

Date (of Month) Alarm
The field specifies the date for Resume by Alarm. Settings: 0~31.

Time (hh:mm:ss) Alarm
The field specifies the time for *Resume by Alarm. F*ormat is <hour><minute><second>.

Reload Global Timer Events: Primary IDE 0/1, Secondary IDE 0/1, FDD/COM/LPT Port, PCI PIRQ [A-D]#
Global Timer Events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device that is configured as *Enabled*, even when the system is in a power down mode.

PNP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **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 own 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.

```
         CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                           PnP/PCI Configurations
 ┌────────────────────────────────────────────────┬───────────────────────┐
 │  Reset Configuration Data    Disabled           │      Item Help        │
 │                                                  ├───────────────────────┤
 │  Resources Controlled By     Auto(ESCD)          │  Menu Level    ►      │
 │ x IRQ Resources              Press Enter         │                       │
 │                                                  │  Default is Disabled. │
 │  PCI/VGA Palette Snoop        Disabled           │  Select Enabled to    │
 │                                                  │  reset Extended System│
 │                                                  │  Configuration Data   │
 │                                                  │  ESCD) when you exit  │
 │                                                  │  Setup if you have    │
 │                                                  │  installed a new add-on│
 │                                                  │  and the system       │
 │                                                  │  reconfiguration has  │
 │                                                  │  caused such a serious│
 │                                                  │  conflict that the OS │
 │                                                  │  cannot boot          │
 │                                                  │                       │
 ├──────────────────────────────────────────────────────────────────────────┤
 │ ↑↓←→:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help│
 │     F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults  │
 └──────────────────────────────────────────────────────────────────────────┘
```

Reset Configuration Data

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

Resource Controlled By

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

IRQ Resources

The items are adjustable only when *Resources Controlled By* is set to *Manual*.

Press <Enter> and you will enter the sub-menu of the items. IRQ Resources list IRQ 3/4/5/7/9/10/11/12/14/15 for users to set each IRQ a type depending on the type of device using the IRQ. Settings are:

    PCI Device   For Plug & Play compatible devices designed for PCI bus architecture.

    Reserved   The IRQ will be reserved for further request.

PCI/VGA Palette Snoop

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

VGA Palette Snoop Bit Setting	Action
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.

PC Health Status

This section shows the status of your CPU, fan, warning for overall system status.

```
        CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                              PC Health Status

   Chassis Intrusion Detect    Disabled              Item Help
   CPU Warning Temperature      Disabled
   Current System Temp.                            Menu Level    ▶
   Current CPU Temperature
   Current CPU FAN Speed
   Current SYS FAN Speed
   Current PWR FAN Speed
   Vcore
   + 1.80 V
   Vio
   + 5 V
   +12 V
   -12 V                    -
   - 5 V                    -
   VBAT(V)
   5VSB(V)
   Shutdown Temperature         Disabled


   ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
       F5: Previous Values   F6: Fail-Safe Defaults   F7: Optimized Defaults
```

Chassis Intrusion Detect
Set this option to enable, reset, or disable the chassis intrusion detector. During *Enabled*, any intrusion on the system chassis will be recorded. The next time you turn on the system, it will show a warning message. To be able to clear those warnings, choose *Reset*. After clearing the message it will go back to *Enabled*.

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

Current System/CPU Temperature, Current CPU/SYS/PWR FAN Speed, Vcore, +1.80 V, Vio, +5 V, +12 V, -12 V, -5 V, VBAT(V), 5VSB(V)
These items display the current status of all of the monitored hardware devices/components such as CPU voltages, temperatures and all fans' speeds.

Shutdown Temperature
The setting allows ACPI-aware OS to automatically shutdown if the system temperature reaches a thermal level preset in the field. This can prevent the system components from being damaged due to overheat.

Frequency/Voltage Control

```
        CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                          Frequency/Voltage Control
   CPU Clock Ratio              8 X                    Item Help
   CPU Vcore Select             Default
   Auto Detect PCI Clk          Disabled          Menu Level   ▶
   Spread Spectrum              Enable
   CPU Clock                    100




   ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
       F5: Previous Values      F6: Fail-Safe Defaults  F7: Optimized Defaults
```
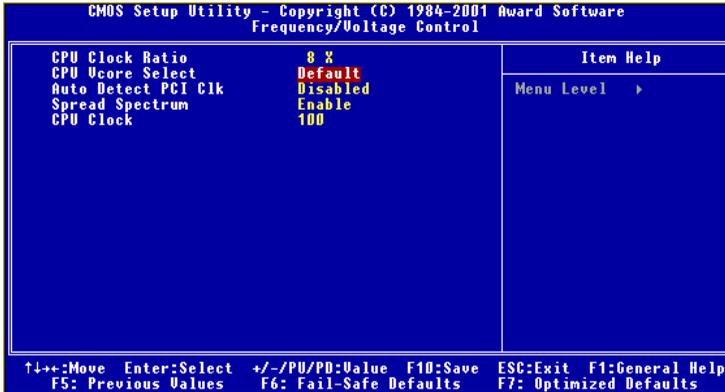
CPU Clock Ratio
This setting controls the multiplier that is used to determine the internal clock speed of the processor relative to the external or motherboard clock speed.

CPU Vcore Select
This setting allows you to set the CPU core voltage. Setting options: *Default, +25mV, +50mV, +75mV, +100mV, +125mV, +150mV*.

Auto Detect PCI Clk
To reduce the occurrence of electromagnetic interference (EMI), the BIOS detects the presence or absence of components in PCI slots and turns off system clock generator pulses to empty slots. The settings 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, 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 of

25MHz (with a 1GHz CPU) which may just cause your overclocked processor to lock up.
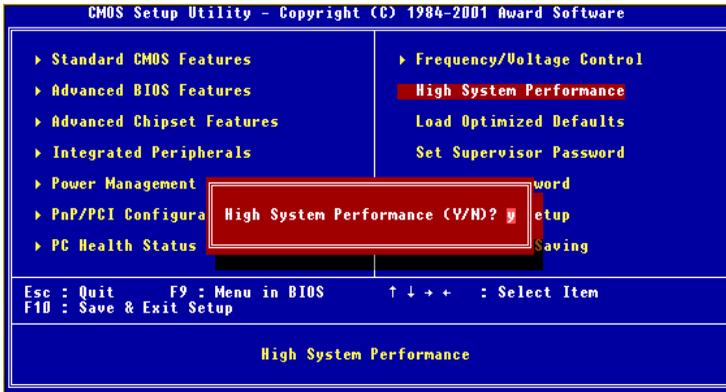
CPU Clock
This setting specifies the clock frequency of CPU host bus (FSB) and provides a method for end-users to overclock the processor accordingly.

High System Performance

This option on the main menu allows users to restore all the BIOS settings to the default High Performance values. The High Performance Defaults are the default values set by the mainboard manufacturer specifically for maximal system performance but will probably cause a stability issue.

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

```
         CMOS Setup Utility - Copyright (C) 1984-2001 Award Software

   ▸ Standard CMOS Features              ▸ Frequency/Voltage Control
   ▸ Advanced BIOS Features                High System Performance
   ▸ Advanced Chipset Features             Load Optimized Defaults
   ▸ Integrated Peripherals                Set Supervisor Password
   ▸ Power Management              ┌──────────────────────────┐ word
   ▸ PnP/PCI Configura            │ High System Performance (Y/N)? y │ etup
   ▸ PC Health Status             └──────────────────────────┘ Saving

   Esc : Quit        F9 : Menu in BIOS      ↑ ↓ → ←   : Select Item
   F10 : Save & Exit Setup

                          High System Performance
```

Pressing 'Y' loads the default BIOS values that enable the best system performance (better than the Optimized Defaults) but may result in the instability of the system.

STOP **WARNING!**	**This setting is for experienced or overclocking users only**. 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 in Chapter 2.

Load Optimized Defaults

This option on the main menu allows users to restore all the BIOS settings to the default Optimized values. The Optimized Defaults are the default values also set by the mainboard manufacturer for both optimized and stable performance of the mainboard.

When you select Load Optimized Defaults, a message as below appears:
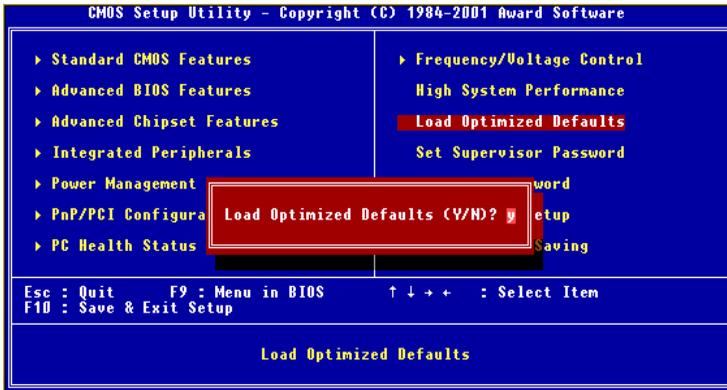
Pressing 'Y' loads the default values that are factory settings for optimal and stable system performance.

Set Supervisor/User Password

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

```
      CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
  ┌──────────────────────────────────────────────────────────────────┐
  │  ▶ Standard CMOS Features        ▶ Frequency/Voltage Control       │
  │                                                                    │
  │  ▶ Advanced BIOS Features          High System Performance         │
  │                                                                    │
  │  ▶ Advanced Chipset Features       Load Optimized Defaults         │
  │                                                                    │
  │  ▶ Integrated Peripherals          Set Supervisor Password         │
  │                                                                    │
  │  ▶ Power Management Setup          Set User Password               │
  │                                                                    │
  │  ▶ PnP/PCI Configurati┌──────────────────────────┐ t Setup         │
  │                       │  Enter Password:         │                 │
  │  ▶ PC Health Status   └──────────────────────────┘ ut Saving       │
  │                                                                    │
  ├──────────────────────────────────────────────────────────────────┤
  │  Esc : Quit      F9 : Menu in BIOS      ↑ ↓ → ←  : Select Item      │
  │  F10 : Save & Exit Setup                                           │
  ├──────────────────────────────────────────────────────────────────┤
  │             Change/Set/Disable Password                            │
  └──────────────────────────────────────────────────────────────────┘
```

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously set password from CMOS memory. You will be prompted to confirm the password. Re-type 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 BIOS to request a password each time the system is booted. This would prevent unauthorized use of your computer. The setting to determine when the password prompt is required is the Security Option of the Advanced BIOS Features menu. If the Security Option is set to *System*, the password is required both at boot and at

entry to Setup. If set to *Setup*, password prompt only occurs when trying to enter Setup.

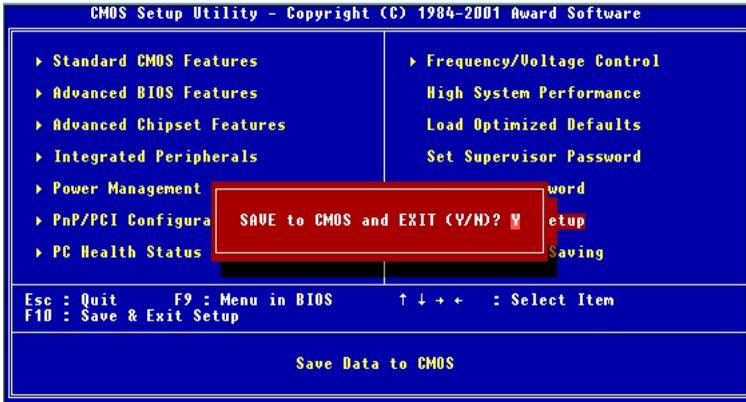*About Supervisor Password & User Password:*

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

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

Save & Exit Setup

When you want to quit the Setup menu, you can select this option to save the changes and quit. A message as below will appear on the screen:

```
      CMOS Setup Utility - Copyright (C) 1984-2001 Award Software

    ▶ Standard CMOS Features              ▶ Frequency/Voltage Control

    ▶ Advanced BIOS Features              High System Performance

    ▶ Advanced Chipset Features           Load Optimized Defaults

    ▶ Integrated Peripherals              Set Supervisor Password

    ▶ Power Management          ┌─────────────────────────┐ word
    ▶ PnP/PCI Configura         │ SAVE to CMOS and EXIT (Y/N)? Y │ etup
    ▶ PC Health Status          └─────────────────────────┘ aving

    Esc : Quit       F9 : Menu in BIOS       ↑ ↓ → ←   : Select Item
    F10 : Save & Exit Setup

                         Save Data to CMOS
```

Typing "Y" will allow you to quit the Setup Utility and save the user setup changes to RTC CMOS.

Typing "N" will return to the Setup Utility.

Exit Without Saving

When you want to quit the Setup menu, you can select this option to abandon the changes. A message as below will appear on the screen:
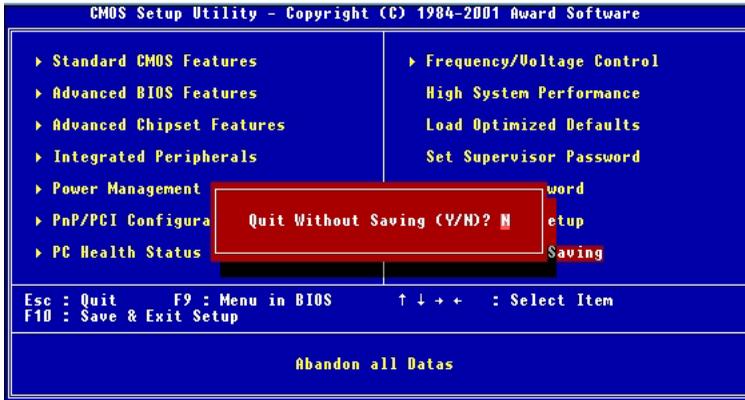
Typing "Y" will allow you to quit the Setup Utility without saving any changes to RTC CMOS.

Typing "N" will return to the Setup Utility.

Using 4-/6-channel Audio Function *A*

The mainboard comes with C-Media 6-channel audio function, which allows you to attach 4 or 6 speakers for better space sound effect. The section will tell you how to activate 4-/6-channel audio function.

This section includes the following topics:

Installing C-Media Drivers

The mainboard is able to transform the audio connectors on the back panel from 2-channel to 4-/6-channel. To use the function, you need to install the C-Media drivers.

To install C-Media drivers:

1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear.

2. Click on **C-Media Sound Drivers**.

3. Follow the on-screen instructions to complete installation.

4. Restart the system.

> *Note: For Windows NT4.0, you need to install the C-Media Sound Drivers **manually**.*

Hardware Configuration

After installing the C-Media drivers, you can attach the speakers for 4-/6-channel audio output. Always connect the speakers to the LINE OUT connectors. Different connector configurations for 2-/4-/6-channel operations are listed below:
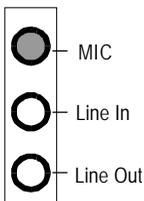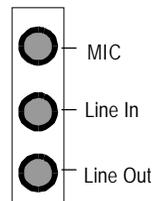
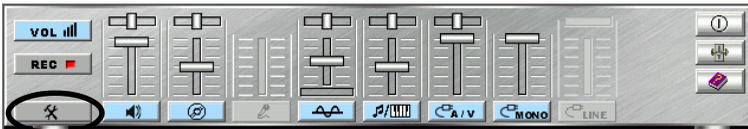| **2-Channel**	**4-Channel**	**6-Channel**
MIC — Line In — Line Out	MIC — Line In — Line Out	MIC — Line In — Line Out
In 2-channel configuration, Line Out, Line In and MIC functions all exist.	When set to 4-channel configuration, LINE IN function DOES NOT WORK any more.	When set to 6-channel configuration, LINE IN and MIC functions DO NOT WORK anymore.
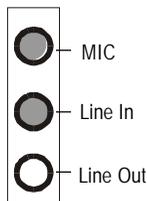
Software Configuration

To have 4-/6-channel audio work, you must set appropriate configuration in the C-Media software application.
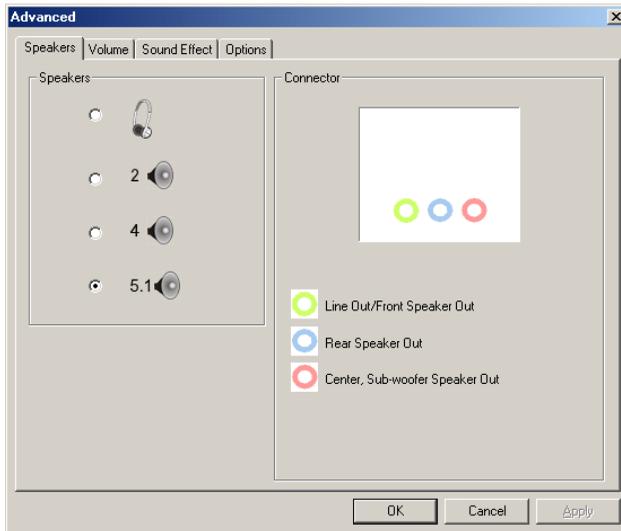
To set the multi-channel configuration:

1. Click the C-Media Mixer icon from the window tray on the bottom.

2. The following screen appears. Click the indicated button.

Click here

3. The "Advanced" window appears.

4. Select 5.1 for 6-channel or 4 for 4-channel audio output.

5. Click OK.

Glossary

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

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

ATX
A modern shape and layout of mainboard that supersedes the widely-used Baby AT form factor. It improves many placement of components and makes a more efficient design.

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

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

Cache
A special memory subsystem that is used to speed up the data transfer. It stores the contents of frequently accessed RAM locations and the addresses where these data items are stored.

Chipset
A collection of integrated chips designed to perform one or more related functions. For

example, a modem chipset contains all the primary circuits for transmitting and receiving data; a PC chipset provides the electronic interfaces between all subsystems.

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

COM
In MS-DOS system, the name of a serial communications port. DOS supports four serial ports. For example, if a modem is connected to one serial port and a serial mouse to another, they are identified as COM1 and COM2.

DIMM (*dual in-line memory module*)
A small circuit board that holds memory chips. A ***SIMM (single in-line memory module)*** has a 32-bit path to the memory chips whereas a DIMM has 64-bit path.

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

Dynamic RAM (DRAM) Memory Technologies					
Type	First Used	Clock Rate	Bus* Width	Peak Bandwidth	Volts
FPM (60,70ns)	1990	25MHz	64 bits	200 MBps	5v
EDO (50,60,70ns)	1994	40MHz	64 bits	320 MBps	5v
SDRAM (66MHz)	1996	66MHz	64 bits	528 MBps	3.3v
SDRAM (100MHz)	1998	100MHz	64 bits	800 MBps	3.3v
SDRAM (133MHz)	1999	133MHz	64 bits	1.1 GBps	3.3v
RDRAM (Direct Rambus)	1999	400MHz	16 bits	1.6 GBps	2.5v
DDR SDRAM (100MHz)	2000	100MHz	64 bits	1.6 GBps	3.3v
DDR SDRAM (133MHz)	2000	133MHz	64 bits	2.1 GBps	3.3v
* Memory channel width (64 bits started with 75MHz Pentium)					

Source: Computer Desktop Encyclopedia

ECC Memory (*error correcting code memory*)
A type of memory that contains special circuitry for testing the accuracy of data and correcting the errors on the fly.

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

IEEE 1394
A new, high speed external bus standard, also known as *FireWire* or *iLink*, which supports data transfer rates of up to 400 Mbps for connecting up to 63 external devices.

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

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

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

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

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

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

POST (*Power On Self Test*)
During booting up your system, the BIOS executes a series of diagnostic tests, include checking the RAM, the keyboard, the disk drives, etc., to see if they are properly connected and operating.

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

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

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