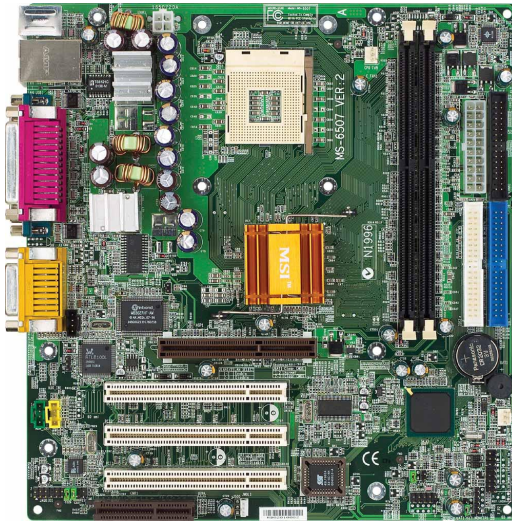


MSI

MICRO-STAR INTERNATIONAL

MS-6507 (v2.X) Micro ATX Mainboard



Version 2.0
G52-MA00548

Manual Rev: 2.0
Release Date: Feb. 2002



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.

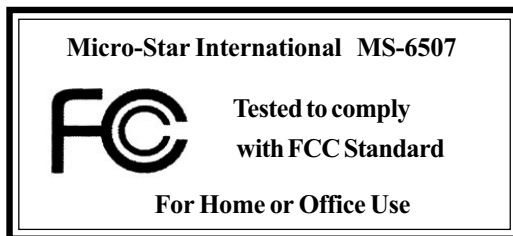
Notice 1

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.



Edition

Feb. 2002

Copyright Notice

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AMI[®] is a registered trademark of American Megatrends Inc.

Revision History

| Revision | Revision History | Date |
|-----------------|---------------------------|-------------|
| V2.0 | First Release for PCB 2.X | Feb. 2002 |

Safety Instructions

1. Read the safety instructions carefully.
2. Save this User's Guide for possible use later.
3. Keep this equipment away from humidity.
4. Lay this equipment on a stable and flat surface before setting it up.
5. The openings on the enclosure are used for air convection and to prevent the equipment from overheating. Note: Do not cover the openings.
6. Make sure that the power voltage is within its safety range and has been adjusted properly to the value of 110/220V before connecting the equipment to the power inlet.
7. Place the power cord in a way that people are unlikely to step on it. Do not place anything on 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 the equipment or cause an 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 Guide
 - the equipment was dropped and damaged
 - the equipment has obvious signs of breakage
12. Do not leave the equipment in an unconditioned environment with a storage temperature of 60°C (140°F) or above, which may damage the equipment.



CAUTION: To prevent explosion caused by improper battery replacement, use the same or equivalent type of battery recommended by the manufacturer only.

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Getting Started

1

Thank you for purchasing the MS-6507 v2.X Micro ATX mainboard. The MS-6507 is based on Intel® Brookdale and ICH2 chipsets for optimal system efficiency. Designed to fit the advanced Intel® Pentium® 4 processors in the 478 pin package, the MS-6507 delivers a high performance and professional desktop platform solution.

TOPICS

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Mainboard Specification

CPU

- Supports Intel® Pentium® 4 processor in 478 pin package
- Supports 1.2GHz, 1.3GHz and up to 2.X GHz

Chipset

- Intel® Brookdale chipset
 - AGP 4x/2x universal slot
 - Support 100MHz FSB
 - Support 400MHz Intel NetBurst micro-architecture bus
 - Support PC200/PC266 DDR technology
- Intel® ICH2 chipset (360 EBG A)
 - AC'97 Controller Integrated
 - 2 full IDE channels, up to ATA 100
 - Low pin count interface for Winbond SIO

Main Memory

- Support two 184-pin DDR DIMMs
- Support a maximum memory size of 2GB
- Support 2.5v DDR SDRAM

Slots

- One AGP (Accelerated Graphics Port) 4x slot (1.5V only)
- Three PCI 2.2 32-bit Master PCI bus slots (support 3.3V/5V PCI bus interface)
- One CNR (Communication Network Riser) slot

On-Board IDE

- An IDE controller on the ICH2 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA66/100 operation modes
- Can connect up to four IDE devices

On-Board Peripherals

- On-Board Peripherals include:
 - 1 floppy port supports 2 FDDs with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
 - 2 serial ports (COM A + COM B)

- 1 parallel port supports SPP/EPP/ECP mode
- 4 USB ports (Rear * 2/ Front * 2)
- 1 RJ-45 LAN jack
- 1 audio/game port

Audio

- AC'97 2.1 compliant
- ICH2 chip integrated

LAN

- Realtek 8100L LAN chip on board (optional)

BIOS

- The mainboard BIOS provides “Plug & Play” BIOS which detects the peripheral devices and expansion cards of the board automatically.
- The mainboard provides a Desktop Management Interface (DMI) function which records your mainboard specifications.

Dimension

- Micro ATX Form Factor: 24.4cm x 23.1cm

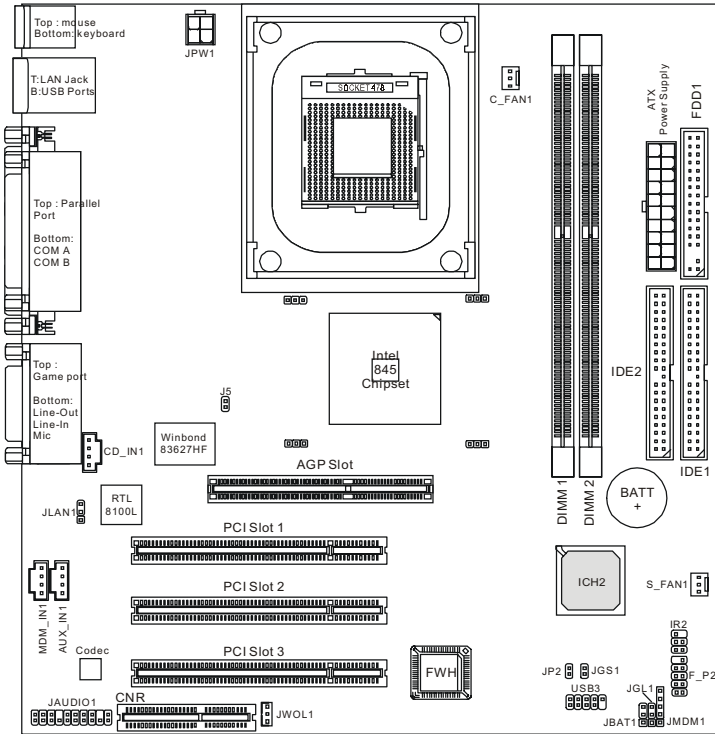
Mounting

- 6 mounting holes

Others

- PC 2001 compliant
- Support TCAV (Build-in BIOS Anti-Virus)
- PC Alert System Hardware Monitor (optional)
- Support WOL/WOR

Mainboard Layout



MS-6507 v2.X Micro ATX Mainboard

Quick Components Guide

| Component | Function | Reference |
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| Socket 478 | Installing CPU | See p. 2-2 |
| DDR1~2 | Installing DDR modules | See p. 2-5 |
| CONN1/JPW1 | ATX Power Connector | See p. 2-7 |
| USB Connectors | Connecting to USB devices | See p. 2-9 |
| COM A & COM B | Serial port connector | See p. 2-10 |
| LPT1 | Parallel port connector | See p. 2-11 |
| RJ-45 LAN Jack | Connecting to LAN devices | See p. 2-12 |
| FDD1 | Floppy disk drive connector | See p. 2-13 |
| J5 | Chassis intrusion switch | See p. 2-13 |
| IDE1~ IDE2 | Hard disk connectors | See p. 2-14 |
| CD_IN1 | CD-in connector | See p. 2-15 |
| AUX_IN1 | Aux line-in connector | See p. 2-15 |
| MDM_IN1 | Modem-in connector | See p. 2-15 |
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| JMDM1 | Wake on ring connector | See p. 2-17 |
| JWOL1 | Wake on LAN connector | See p. 2-17 |
| JGS1 | Power saving switch connector | See p. 2-18 |
| IR2 | IrDA infrared module connector | See p. 2-18 |
| JGL1 | Power saving LED connector | See p. 2-19 |
| JAUDIO1 | Front panel audio connector | See p. 2-19 |
| F_P2 | Front panel connector | See p. 2-21 |
| USB3 | Front USB connector | See p. 2-22 |
| JBAT1 | Clear CMOS jumper | See p. 2-23 |
| JLAN1 | Onboard LAN jumper | See p. 2-24 |
| JP2 | Onboard audio codec jumper | See p. 2-24 |
| AGP Slot | Connecting to AGP cards | See p. 2-25 |
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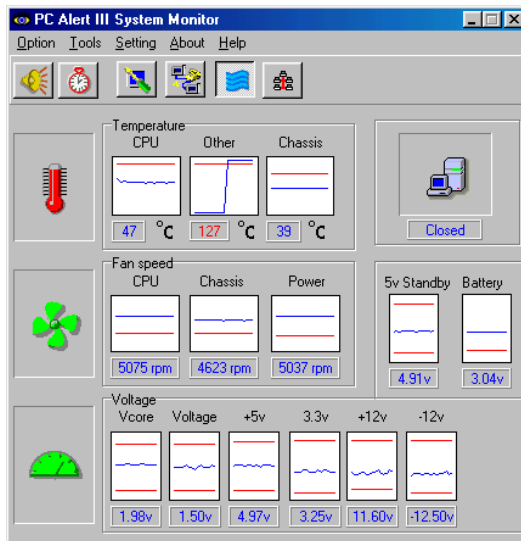
MSI Special Features

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 user disables the warning.



Note: Items shown on PC Alert III vary depending on your system's status.

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.

TOPICS

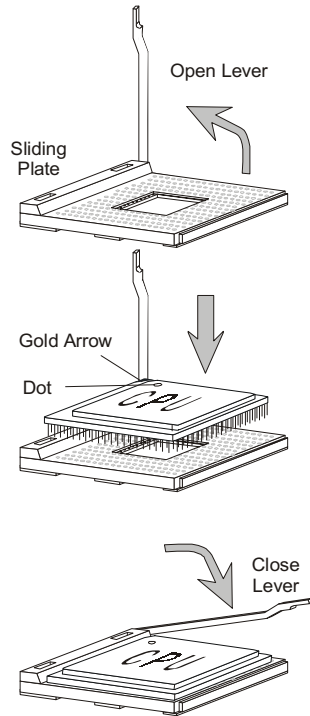
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Central Processing Unit: CPU

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

CPU Installation Procedures

1. Pull the lever sideways away from the socket. Then, raise the lever up to a 90-degree angle.
2. Look for the gold arrow. The gold arrow should point towards the lever pivot. The CPU will only fit in the correct orientation.
3. Hold the CPU down firmly, and then close the lever to complete the installation.



WARNING!

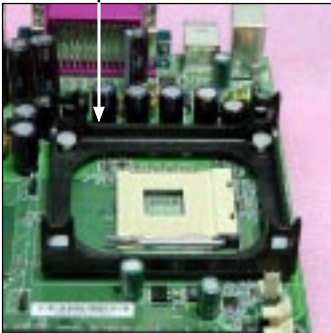
Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.

Installing the CPU Fan

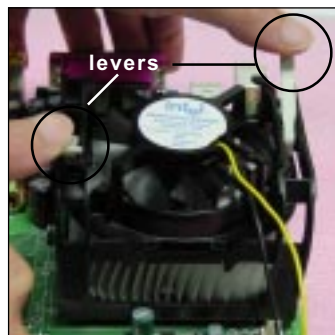
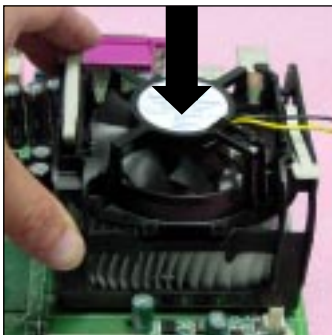
As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly important. To dissipate heat, you need to attach the CPU cooling fan and heatsink on top of the CPU. Follow the instructions below to install the Heatsink/Fan:

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

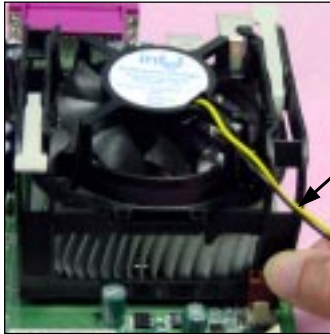
retention mechanism



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



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



fan power cable

CPU Core Speed Derivation Procedure

| | | | |
|-------------|-----------------------|---|------------------------------------|
| If | <u>CPU Clock</u> | = | 100MHz |
| | <u>Core/Bus ratio</u> | = | 14 |
| then | <u>CPU core speed</u> | = | <u>Host Clock x Core/Bus ratio</u> |
| | | = | 100MHz x 14 |
| | | = | 1.4GHz |

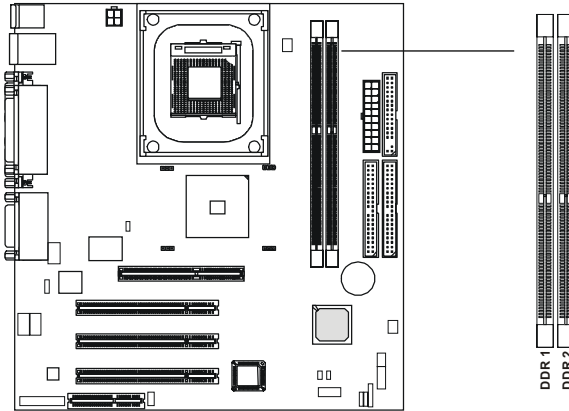


Overclocking

*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

The mainboard provides 2 slots for 184-pin, 2.5V unbuffered DDR DIMM with 4 memory banks. You can install **PC1600 or PC2100** DDR SDRAM modules on the DDR DIMM slots (DDR 1~2). To operate properly, at least one DIMM module must be installed.



Note: The DDR DIMM slots *DO NOT* support PC2700 modules.

Introduction to DDR SDRAM

DDR (Double Data Rate) SDRAM is similar to conventional SDRAM, but doubles the rate by transferring data twice per cycle. It uses 2.5 volts as opposed to 3.3 volts used in SDR SDRAM, and requires 184-pin DIMM modules rather than 168-pin DIMM modules used by SDR SDRAM. Three types of DDR SDRAM are available at the time of writing: PC1600, PC2100 and PC2700.

The following table shows the clock and peak bandwidth of each type of DDR SDRAM module:

| | PC2700 (DDR333) | PC2100 (DDR266) | PC1600 (DDR200) |
|-------------------|--------------------|--------------------|--------------------|
| Clock | 166MHz | 133MHz | 100MHz |
| Peak Bandwidth | 2666MB/s | 2133MB/s | 1600MB/s |

DDR Module Combination

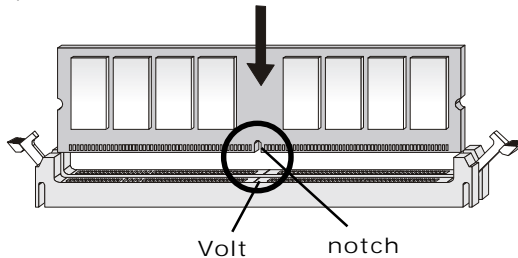
You can install either single sided or double sided 184-pin DDR DIMM modules into DDR DIMM slots to meet your needs. Different from the SDR DIMM, the DDR DIMM has only one notch on the center of module. The number of pins on either side of the breaks are different. The module will only fit in the right orientation.

You can install memory modules in any combination as follows:

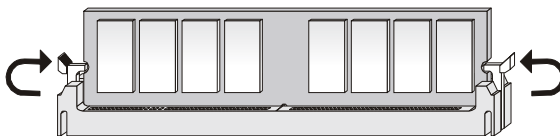
| Slot | Memory Module | Total Memory |
|----------------------------------------|-----------------------------------|--------------|
| Slot 1 (Bank 0 & Bank 1) | 64MB, 128MB, 256MB, 512MB, 1GB | 64MB~1GB |
| Slot 2 (Bank 2 & Bank 3) | 64MB, 128MB, 256MB, 512MB, 1GB | 64MB~1GB |
| Maximum System Memory Supported | | 64MB~2GB |

Installing DDR Modules

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



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



Power Supply

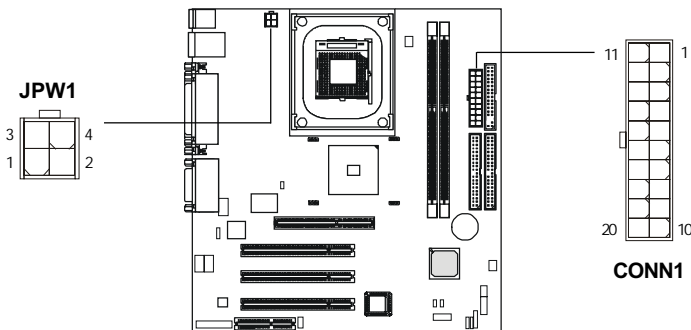
The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 20-Pin Power Connector: CONN1

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.

ATX 12V Power Connector: JPW1

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



CONN1 Pin Definition

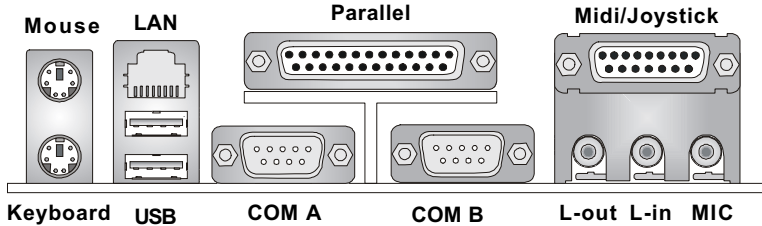
| PIN | SIGNAL | PIN | SIGNAL |
|-----|--------|-----|--------|
| 1 | 3.3V | 11 | 3.3V |
| 2 | 3.3V | 12 | -12V |
| 3 | GND | 13 | GND |
| 4 | 5V | 14 | PS_ON |
| 5 | GND | 15 | GND |
| 6 | 5V | 16 | GND |
| 7 | GND | 17 | GND |
| 8 | PW_OK | 18 | -5V |
| 9 | 5V_SB | 19 | 5V |
| 10 | 12V | 20 | 5V |

JPW1 Pin Definition

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

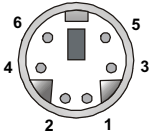
Back Panel

The Back Panel provides the following connectors:



Mouse Connector

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



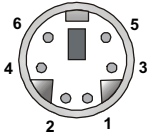
PS/2 Mouse (6-pin Female)

Pin Definition

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

Keyboard Connector

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



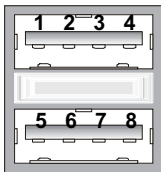
PS/2 Keyboard (6-pin Female)

Pin Definition

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

USB Connectors

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



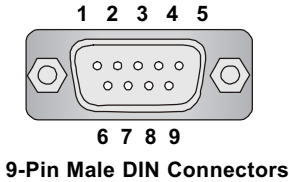
USB Ports

USB Port Description

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

Serial Port Connector: COM A & COM B

The mainboard offers two 9-pin male DIN connectors as 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.

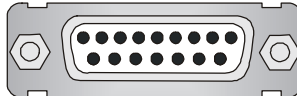


Pin Definition

| 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 |

Joystick/Midi Connectors

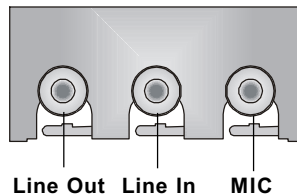
You can connect a joystick or game pad to this connector.



Audio Port Connectors

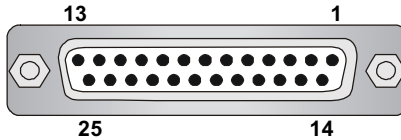
Line Out is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones.

1/8" Stereo Audio Connectors



Parallel Port Connector

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.

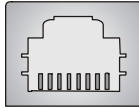


Pin Definition

| 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 |

LAN Jack (RJ-45)

The mainboard provides one standard RJ-45 jack for connection to Local Area Network (LAN). You can connect a network cable to the LAN jack.



RJ-45 LAN Jack

Pin Definition

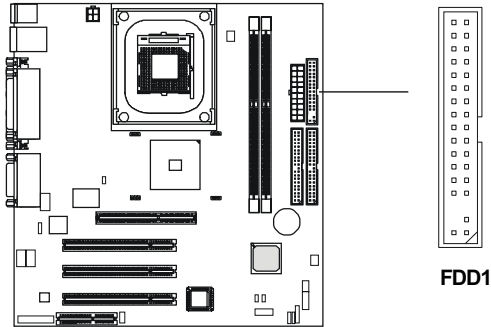
| PIN | SIGNAL | DESCRIPTION |
|-----|--------|----------------------------|
| 1 | TDP | Transmit Differential Pair |
| 2 | TDN | Transmit Differential Pair |
| 3 | RDP | Receive Differential Pair |
| 4 | NC | Not Used |
| 5 | NC | Not Used |
| 6 | RDN | Receive Differential Pair |
| 7 | NC | Not Used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

Connectors

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

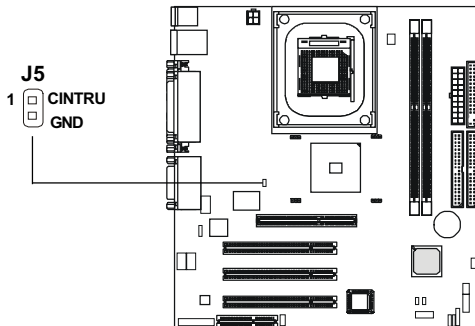
Floppy Disk Drive Connector: FDD1

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



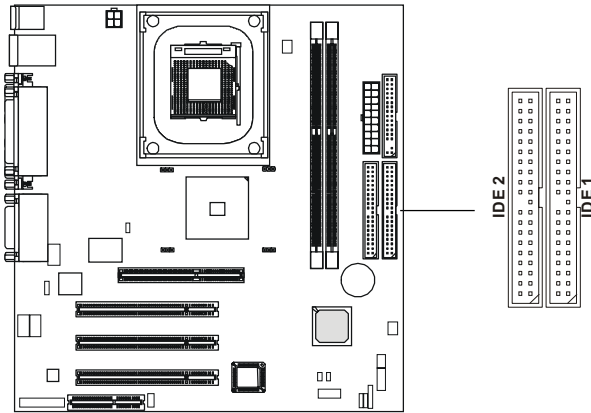
Chassis Intrusion Switch Connector: J5

This connector is connected to 2-pin connector chassis switch. If the Chassis is open, the switch will be short. The system will record this status. To clear the warning, you must enter the BIOS setting and clear the status. J5 is compliant with Intel® Front Panel I/O Connectivity Design Guide.



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 DMA33/66/100 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.

CD-In Connector: CD_IN1

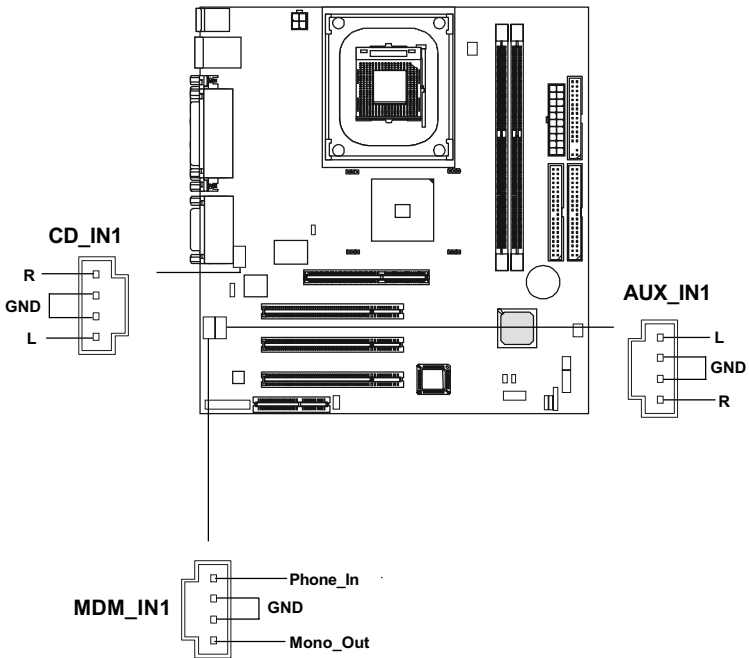
The connector is for CD-ROM audio connector.

Aux Line-In Connector: AUX_IN1

The connector is for DVD add-on card with Line-in connector.

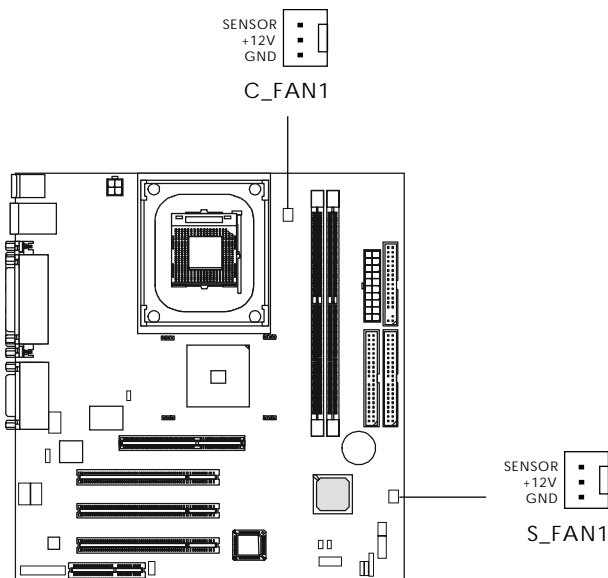
Modem-In Connector: MDM_IN1

The connector is for modem with internal audio connector.



Fan Power Connectors: C_FAN1/S_FAN1

The C_FAN1 (processor fan) & S_FAN1 (system fan) support system cooling fan with +12V. It supports three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

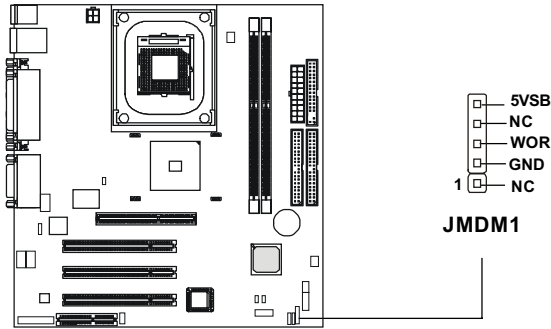


Note:

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 temperature.

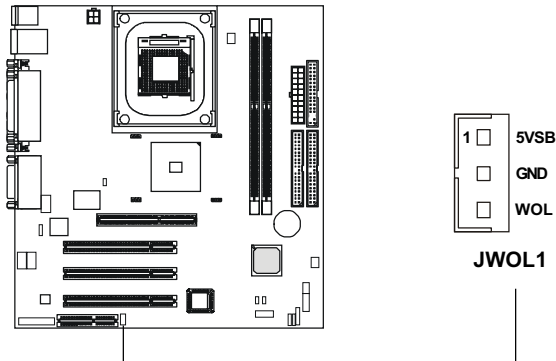
Wake On Ring Connector: JMDM1

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. JMDM1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.



Wake On LAN Connector: JWOL1

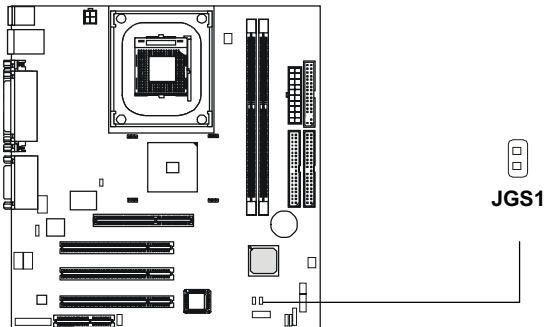
This connector allows you to connect to a LAN card with Wake On LAN function. You can wake up the computer via remote control through a local area network. JWOL1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.



Note: To be able to use this function, you need a power supply that provides enough power for this feature. (750 mA 5V Stand-by)

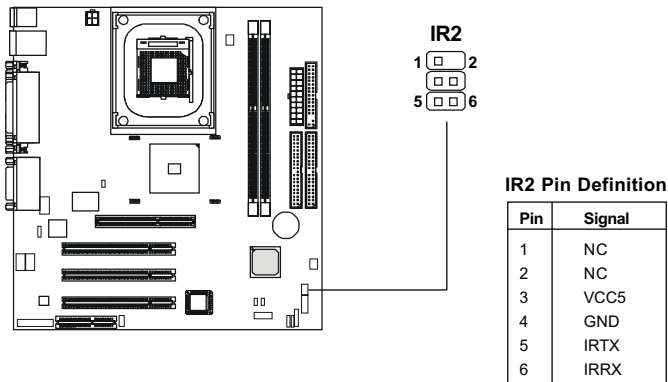
Power Saving Switch Connector: JGS1

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.



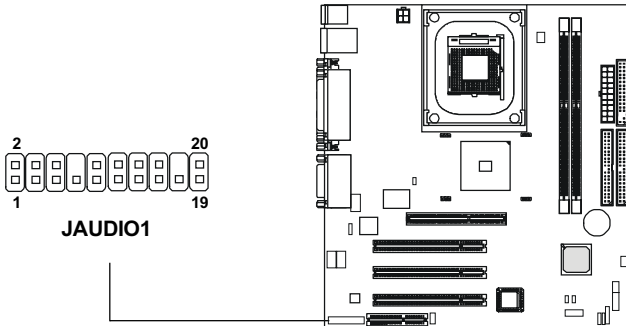
IrDA Infrared Module Header: IR2

This connector allows you to connect to IrDA Infrared modules and is compliant with Intel® Front Panel I/O Connectivity Design Guide. You must configure the setting through the BIOS setup to use the IR function.



Front Panel Audio Connector: JAUDIO1

You can connect an optional audio connector to the Front Panel Audio Header. Pin number 1 to 10 of the audio pin header is compliant with Intel® Front Panel I/O Connectivity Design Guide.



JAUDIO1 Pin Definition (1~10)

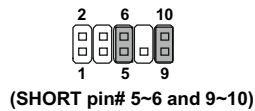
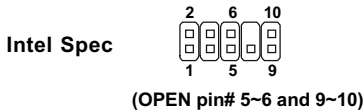
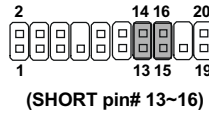
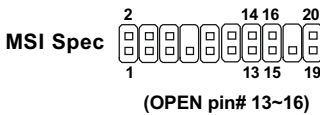
| Pin | Signal | Description |
|-----|--------------|----------------------------------------------------|
| 1 | AUD_MIC | Front Panel Microphone input signal |
| 2 | AUD_GND | Ground used by Analog Audio Circuits |
| 3 | AUD_MIC_BIAS | Microphone Power |
| 4 | AUD_VCC | Filtered +5V used by Analog Audio 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 | RSVD for future use to control Headphone Amplifier |
| 8 | NC | No Connection |
| 9 | AUD_FPOUT_L | Left Channel Audio signal to Front Panel |
| 10 | AUD_RET_L | Left Channel Audio signal Return from Front Panel |

JAUDIO1 Pin Definition (11~20)

| Pin | Signal | Description |
|-----|-------------|----------------------------------------------------|
| 11 | AUD_MIC | Front Panel Microphone input signal |
| 12 | AUD_GND | Ground used by Analog Audio Circuits |
| 13 | AUD_FPOUT_R | Right Channel Audio signal to Front Panel |
| 14 | AUD_RET_R | Right Channel Audio signal Return from Front Panel |
| 15 | AUD_FPOUT_L | Left Channel Audio signal to Front Panel |
| 16 | AUD_RET_L | Left Channel Audio signal Return from Front Panel |
| 17 | AUD_GND | Ground used by Analog Audio Circuits |
| 18 | NC | No Connection |
| 19 | LINE-IN-R | Line in Right |
| 20 | LINE-IN-L | Line in Left |



Note: To have the Line-out connector on the back panel work properly, you need to **place jumpers on pin# 13~16 (MSI spec) or on pin#5~6 and 9~10 (Intel spec) of the JAUDIO1 connector.** Otherwise, this Line-out connector will not function and nothing can be heard through speakers or headphones attached to the Line-out connector on the back panel. But front panel audio connector is enabled at this point and allows you to connect speakers or headphones through front panel.

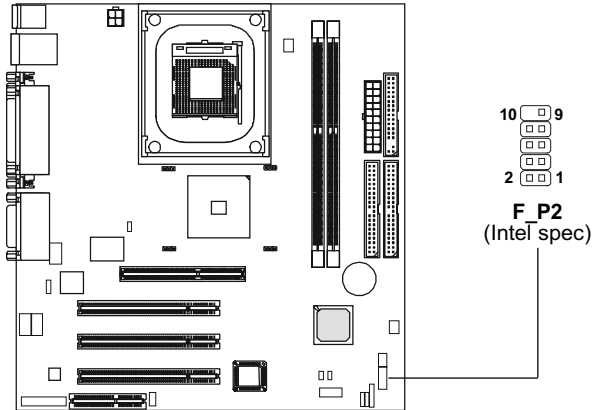


- Disable Line-out connector on the back panel
- **Enable Front Panel Audio Connector**

- Enable Line-out connector on the back panel
- **Disable Front Panel Audio Connector**

Front Panel Connector: F_P2

The mainboard provides one front panel connector for electrical connection to the front panel switches and LEDs. F_P2 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

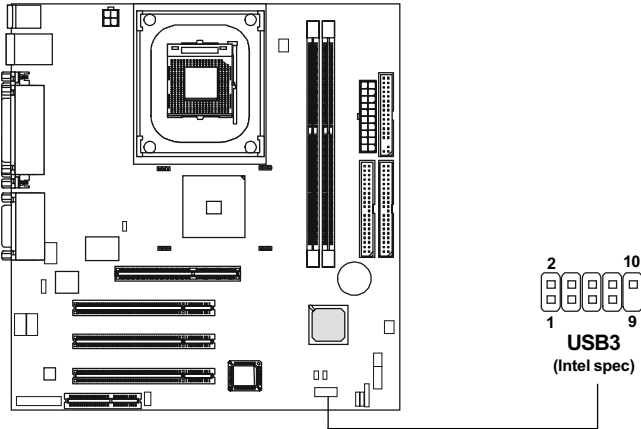


F_P2 Pin Definition

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

Front USB Connector: USB3

The mainboard provides one front Universal Serial Bus connector for users to connect to USB devices. USB3 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

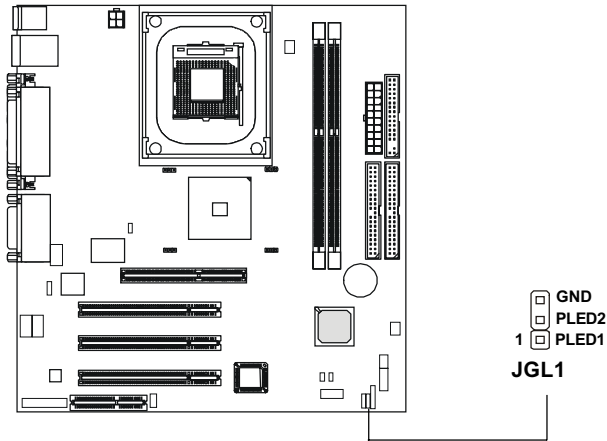


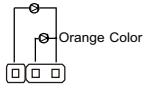
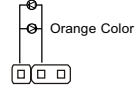
USB3 Pin Definition

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | USBPWR | 2 | USBPWR |
| 3 | USBP0- | 4 | USBP1- |
| 5 | USBP0+ | 6 | USBP1+ |
| 7 | GND | 8 | GND |
| 9 | NC | 10 | USBOC- |

Power Saving LED Connector: JGL1

JGL1 is connected to a power saving LED. There are three types of LED that you can use: 3-pin dual color or 2-pin single/dual color LED. If connected to a dual color LED, the LED light is green when system is turned on, and turns to orange color while entering the sleep state. For single color LED, the LED is lit when the system is on, and blinks during the sleep state.



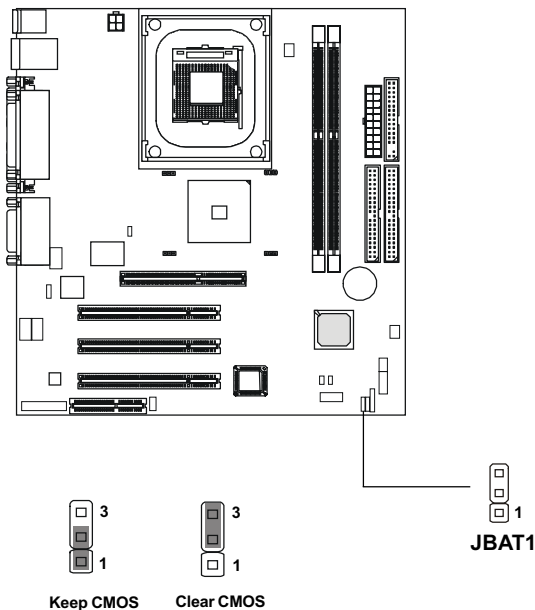
| 3-Pin LED | 2-Pin LED |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p data-bbox="362 1036 441 1052">Green Color</p>  <p data-bbox="415 1086 505 1102">Orange Color</p> <p data-bbox="370 1146 421 1161">1 3</p> | <p data-bbox="633 1036 712 1052">Green Color</p>  <p data-bbox="686 1086 768 1102">Orange Color</p> <p data-bbox="641 1146 692 1161">1 3</p> |
| <p data-bbox="318 1177 538 1232">Green: Full-on Mode Orange: Sleep Mode</p> | <p data-bbox="624 1177 736 1201">Dual Color</p> |

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:

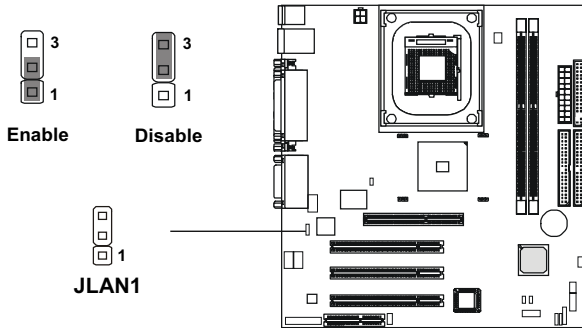


WARNING!

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.

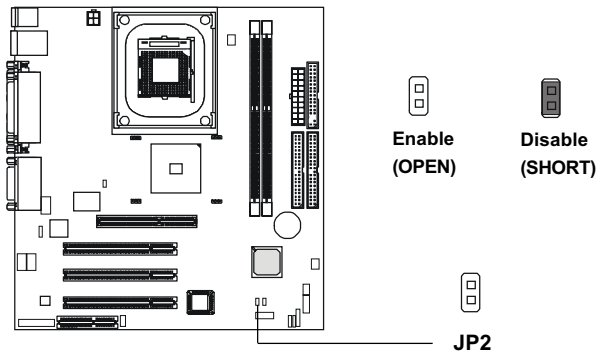
Onboard LAN Jumper: JLAN1

This jumper is used to enable/disable the onboard LAN controller.



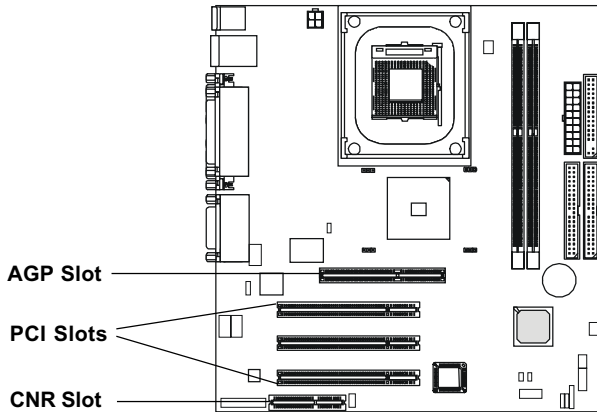
Onboard Audio Codec Jumper: JP2

This jumper is used to disable/enable the onboard software audio codec. When enabling the onboard audio codec, the system will use the onboard codec as the PRIMARY audio adapter and the installed CNR card as the SECONDARY one. But some type of CNR cards cannot be set to the secondary one, then the onboard audio codec must be disabled to resolve the system conflict.



Slots

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



AGP (Accelerated Graphics Port) Slot

The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory. The slot only supports **1.5V 4x** AGP card.

PCI Slots

Three 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)

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 INT A# ~ INT D# pins as follows:

| | Order 1 | Order 2 | Order 3 | Order 4 |
|------------|---------|---------|---------|---------|
| PCI Slot 1 | INT A# | INT B# | INT C# | INT D# |
| PCI Slot 2 | INT B# | INT C# | INT D# | INT A# |
| PCI Slot 3 | INT C# | INT D# | INT A# | INT B# |

AMI® BIOS Setup

3

This chapter provides information on the AMI® BIOS Setup program and allows you to configure the system for optimum use.

You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

TOPICS

| | |
|------------------------------------------|------|
| <i>Entering Setup</i> | 3-2 |
| <i>The Main Menu</i> | 3-4 |
| <i>Standard CMOS Features</i> | 3-6 |
| <i>Advanced BIOS Features</i> | 3-8 |
| <i>Advanced Chipset Features</i> | 3-12 |
| <i>Power Management Setup</i> | 3-14 |
| <i>PNP/PCI Configurations</i> | 3-17 |
| <i>Integrated Peripherals</i> | 3-19 |
| <i>Hardware Monitor Setup</i> | 3-22 |
| <i>Load Fail-Safe/Optimized Defaults</i> | 3-24 |
| <i>Supervisor/User Password</i> | 3-25 |
| <i>IDE HDD AUTO Detection</i> | 3-26 |

Entering Setup

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

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

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

Selecting the First Boot Device

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

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

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

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

Control Keys

| | |
|---------|----------------------------------------------------------------------------|
| <↑> | Move to the previous item |
| <↓> | Move to the next item |
| <←> | Move to the item 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 |
| <F5> | Restore the previous CMOS value from CMOS, only for Option Page Setup Menu |
| <F6> | Load Fail-Safe Defaults |
| <F7> | Load Optimized Defaults |
| <F10> | Save all the CMOS changes and exit |

Getting Help

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

Main Menu

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

Default Settings

The BIOS setup program contains two kinds of default settings: the Fail-Safe and Optimized Defaults. Fail-Safe Defaults provide stable but minimal performance settings for all devices and the system, while Optimized Defaults provide the best system performance but may affect the system stability.

The Main Menu

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



Standard CMOS Features

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

Advanced BIOS Features

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

Advanced Chipset Features

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

Power Management Setup

Use this menu to specify your settings for power management.

PNP/PCI Configurations

This entry appears if your system supports PnP/PCI.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

Hardware Monitor Setup

This entry shows your PC's current status, and allows you to adjust CPU clock, core voltage, ratio and DDR voltage.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for minimal but stable system performance.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal system operations.

Supervisor Password

Use this menu to set Supervisor Password.

User Password

Use this menu to set User Password.

Save & Exit Setup

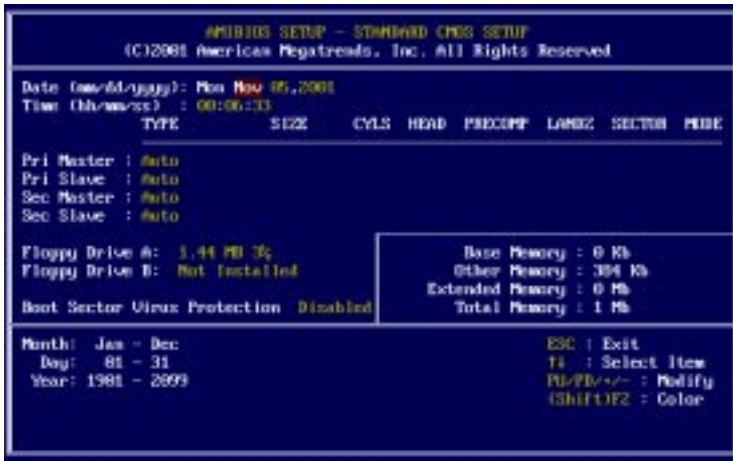
Save changes to CMOS and exit setup.

Exit Without Saving

Abandon all changes and exit setup.

Standard CMOS Features

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



Date

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

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

Time

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

Pri Master/Pri Slave/Sec Master/Sec Slave

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

| | |
|----------------|------------------------------------|
| <u>TYPE</u> | Type of the device. |
| <u>SIZE</u> | Capacity of the device. |
| <u>CYLS</u> | Number of cylinders. |
| <u>HEAD</u> | Number of heads. |
| <u>PRECOMP</u> | Write precompensation. |
| <u>LANDZ</u> | Cylinder location of Landing zone. |
| <u>SECTOR</u> | Number of sectors. |
| <u>MODE</u> | Access mode. |

Floppy Drive A:/B:

This item allows you to set the type of floppy drives installed. Available options: *Not Installed*, *360 KB 5¼*, *1.2 MB 5¼*, *720 KB 3½*, *1.44 MB 3½* and *2.88 MB 3½*.

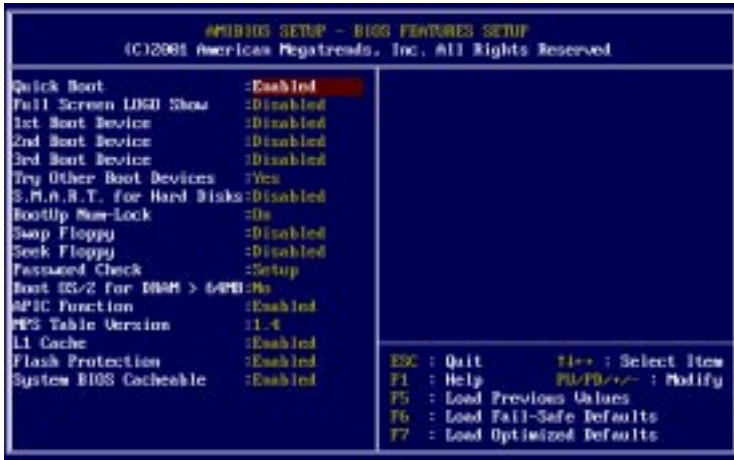
Boot Sector Virus Protection

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



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

Advanced BIOS Features



Quick Boot

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

Full Screen LOGO Show

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

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

1st/2nd/3rd Boot Device

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

| | |
|-----------------|-------------------------------------------------|
| <i>IDE-0</i> | The system will boot from the first HDD. |
| <i>IDE-1</i> | The system will boot from the second HDD. |
| <i>IDE-2</i> | The system will boot from the third HDD. |
| <i>IDE-3</i> | The system will boot from the fourth HDD. |
| <i>Floppy</i> | The system will boot from floppy drive. |
| <i>ARMD-FDD</i> | The system will boot from any ARMD device, such |

| | |
|-----------------|----------------------------------------------------------------------------------------------------|
| | as LS-120 or ZIP drive, that functions as a floppy drive. |
| <i>ARMD-HDD</i> | The system will boot from ARMD device, such as MO or ZIP drive, that functions as hard disk drive. |
| <i>CDROM</i> | The system will boot from the CD-ROM. |
| <i>SCSI</i> | The system will boot from the SCSI. |
| <i>NETWORK</i> | The system will boot from the Network drive. |
| <i>BBS-0</i> | The system will boot from the first BBS (BIOS Boot Specification) compliant device. |
| <i>BBS-1</i> | The system will boot from the second BBS (BIOS Boot Specification) compliant device. |
| <i>BBS-2</i> | The system will boot from the third BBS (BIOS Boot Specification) compliant device. |
| <i>BBS-3</i> | The system will boot from the fourth BBS (BIOS Boot Specification) compliant device. |
| <i>Disabled</i> | Disable this sequence. |



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

Try Other Boot Devices

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

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

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

Boot Up Num-Lock

This item is to set the Num Lock status when the system is powered on. Setting to *On* will turn on the Num Lock key when the system is powered on. Setting to *Off* will allow end users to use the arrow keys on the numeric keypad. Setting options: *On* and *Off*.

SwapFloppy

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

Seek Floppy

This setting causes the BIOS to search for floppy disk drives at boot time. When enabled, the BIOS will activate the floppy disk drives during the boot process: the drive activity light will come on and the head will move back and forth once. First A: will be done and then B: if it exists. Settings: *Disabled* and *Enabled*.

Password Check

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

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

Boot OS/2 for DRAM > 64MB

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

APIC Function

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

MPS Table Version

This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Settings: *1.4* and *1.1*.

L1 Cache

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

Flash Protection


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

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*.

Advanced Chipset Features



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

DRAM Frequency

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

Configure DRAM Timing by

This setting determines whether DRAM timing is configured by reading the contents of the SPD (Serial Presence Detect) EPROM on the DRAM module. Selecting *SPD* makes CAS# Latency, RAS# Precharge, RAS# to CAS# Delay and Precharge Delay automatically determined by BIOS according to the configurations on the SPD. Selecting *Manual* allows users to configure these fields manually.

CAS# Latency

The field controls the CAS latency, which determines the timing delay before SDRAM starts a read command after receiving it. Setting options: *2.5 Clocks*, *2 Clocks*. *2 Clocks* increases system performance while *2.5 Clocks* provides more stable system performance.

RAS# Precharge

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

RAS# to CAS# Delay

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

Precharge Delay

This setting controls the precharge delay, which determines the timing delay for DRAM precharge. Setting options: *5 Clocks, 6 Clocks, 7 Clocks*.

AGP Aperture Size

The field selects the size of the Accelerated Graphics Port (AGP) aperture. Aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. Settings: *4MB, 8MB, 16MB, 32MB, 64MB, 128MB, 256MB*.

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. The settings are: *Enabled* and *Disabled*.

Power Management Setup



IPCA Function

This item is to activate the ACPI (Advanced Configuration and Power Management Interface) function. If your operating system is ACPI-aware, such as Windows 98SE/2000/ME, select *Yes*. Available options: *Yes* and *No*.

ACPI Standby State

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

USB Wakeup From S3

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

Mouse Wakeup From S3

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

Keyboard Wakeup From S3

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

Specific Key for Wakeup

This setting allows users to set a specific key to wake up the system when the *Keyboard Wakeup From S3* function is set to *Specific Key*.

Power Management/APM

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

Power/Sleep LED

This item configures how the system uses power LED on the case to indicate the sleep state. Available options are:

- Single LED* The power LED blinks to indicate the sleep state without changing its color.
- Dual LED* The power LED changes its color to indicate the sleep state.

Suspend Time Out (Minute)

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

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

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

Power Button Function

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

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

more than four seconds, the computer is turned off.

Wake Up On Ring/LAN

When setting to *Enabled*, the features allow your system to be awakened from the power saving modes through an incoming call from the modem or any incoming signal received via the LAN. Settings: *Enabled* and *Disabled*.



Note: You need to install a modem/LAN card supporting power on function for Wake Up On Ring/LAN function.

Wake Up On PME

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

Resume By RTC Alarm

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

RTC Alarm Date/Hour/Minute/Second

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

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



Note: If you change these settings, you must reboot the system until it enters the operating system and then power off the system. By doing so, the changed settings will come into effect next time when you power on the system.

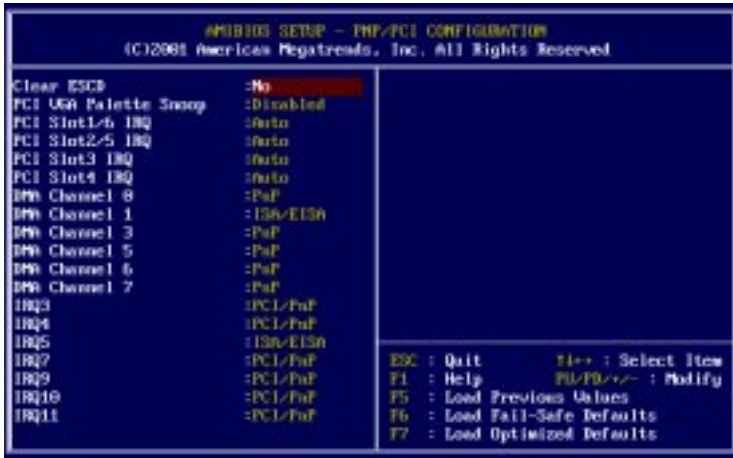
Power Again

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

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

PNP/PCI Configurations

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



Clear ESCD

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

PCI 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 |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Disabled</i> | Data read or written by the CPU is only directed to the PCI VGA device's palette registers. |
| <i>Enabled</i> | 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.

PCI Slot1/6 IRQ, PCI Slot2/5 IRQ, PCI Slot3 IRQ, PCI Slot4 IRQ

This item specifies the IRQ line for each PCI slot. Settings: *3, 4, 5, 7, 9, 10, 11* and *Auto*. Selecting *Auto* allows BIOS to automatically determine the IRQ line for each PCI slot.

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

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

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

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

These items specify the bus where the specified IRQ line is used.

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

Integrated Peripherals



USB Controller

This setting is used to enable/disable the onboard USB controllers. Settings: *All USB Port, Disabled, USB Port 0&1, USB Port 2&3.*

USB Legacy Support

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

On-Chip IDE

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

Onboard LAN Chip

This allows you to enable/disable the onboard LAN controller. Setting options: *Disabled, Enabled.*

Onboard Audio Chip

This setting is used to enable or disable the onboard audio controller. Setting options: *Disabled, Enabled.*

6 Channels Control

This setting is used to enable or disable the *6 Channels Control* function of the onboard audio controller. Setting options: *Disabled, Enabled*.

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*.

Floppy Controller

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

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

Serial Port A/B

These items specify the base I/O port addresses of the onboard Serial Port 1 (COM A)/Serial Port 2 (COM B). Selecting *Auto* allows AMIBIOS to automatically determine the correct base I/O port address. Settings: *Auto, 3F8/COM1, 2F8/COM2, 3E8/COM3, 2E8/COM4* and *Disabled*.

Serial PortB Mode

This item sets the operation mode for Serial Port B. Settings: *Normal, 1.6uS, 3/16 Baud* and *ASKIR* (the last three operation modes are setting options for IR function).

IR Duplex Mode

This field specifies a duplex value for the IR device connected to COM B. Full-Duplex mode permits simultaneous two-direction transmission. Half-

Duplex mode permits transmission in one direction only at a time. Settings: *Half Duplex* and *Full Duplex*.

IR Pin Select

Set to *IRRX/IRTX* when using an internal IR module connected to the IR connector. Set to *SINB/SOUTB*. when connecting an IR adapter to COM B.

Parallel Port

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

Parallel Port Mode

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

EPP Version

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

IRQ

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

DMA Channel

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

OnBoard Midi Port

The field specifies the base I/O port address for the onboard Midi Port.

Midi IRQ Select

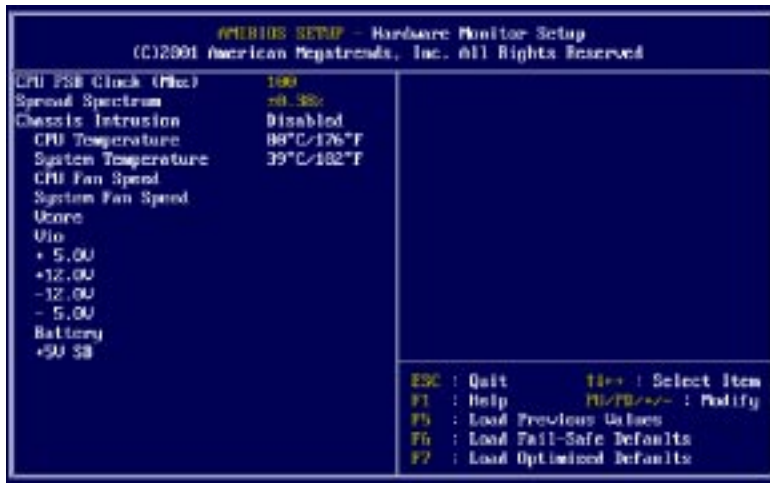
The item is used to select the IRQ line for onboard Midi port.

OnBoard Game Port

This item is used to specify the address for the onboard game port.

Hardware Monitor Setup

This section describes how to set the Chassis Intrusion feature, CPU FSB frequency, monitor the current hardware status including CPU/system temperatures, CPU/System Fan speeds, Vcore etc. Monitor function is available only if there is hardware monitoring mechanism onboard.



CPU FSB Clock (Mhz)

This setting allows you to select the CPU Front Side Bus clock frequency. Setting options: *100MHz~161MHz* at 1MHz increment.

Spread Spectrum

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

Chassis Intrusion

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

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

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

Load Fail-Safe/Optimized Defaults

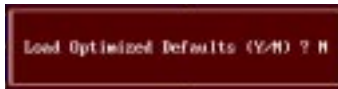
The two options on the main menu allow users to restore all of the BIOS settings to the default Fail-Safe or Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard. The Fail-Safe Defaults are the default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

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



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

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



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

Supervisor/User Password

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



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

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

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

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



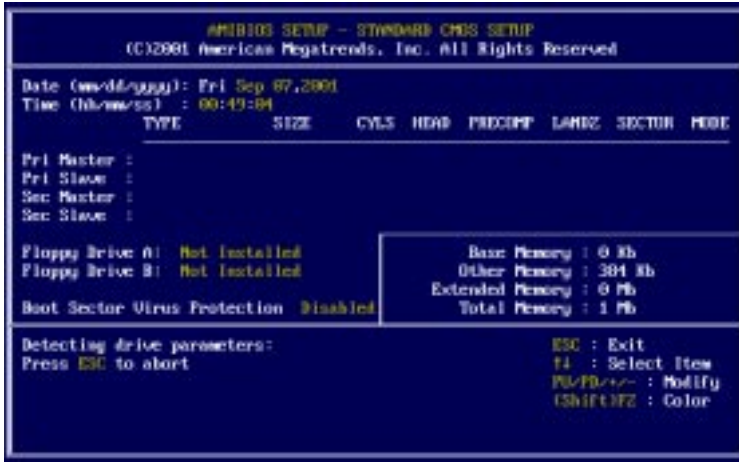
About Supervisor Password & User Password:

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

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

IDE HDD AUTO Detection

You can use this utility to AUTOMATICALLY detect the characteristics of most hard drives.



AWARD® BIOS Setup

4

This chapter provides information on the AWARD® BIOS Setup program and allows you to configure the system for optimum use.

You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

TOPICS

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| <i>Entering Setup</i> | 4-2 |
| <i>The Main Menu</i> | 4-4 |
| <i>Standard CMOS Features</i> | 4-6 |
| <i>Advanced BIOS Features</i> | 4-8 |
| <i>Advanced Chipset Features</i> | 4-12 |
| <i>Integrated Peripherals</i> | 4-14 |
| <i>Power Management Setup</i> | 4-18 |
| <i>PNP/PCI Configurations</i> | 4-22 |
| <i>PC Health Status</i> | 4-24 |
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Entering Setup

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

Press DEL to enter SETUP

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

Control Keys

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

Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter.

You can use control keys (↑↓) to highlight the field and press <Enter> to call up the



```

▶ IDE Primary Master
▶ IDE Primary Slave
▶ IDE Secondary Master
▶ IDE Secondary Slave
  
```

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 the <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.



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.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for minimal but stable system performance.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal 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.



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:

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

Advanced BIOS Features



Quick Boot

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. Settings: *Enabled* and *Disabled*.

Anti-Virus Protection

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

CPU L1 & L2 Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. The settings enable/disable 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*.

1st/2nd/3rd Boot Device

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

| | |
|-----------------|----------------------------------------------|
| <i>Floppy</i> | The system will boot from floppy drive. |
| <i>LS120</i> | The system will boot from LS-120 drive. |
| <i>HDD-0</i> | The system will boot from the first HDD. |
| <i>SCSI</i> | The system will boot from the SCSI. |
| <i>CDROM</i> | The system will boot from the CD-ROM. |
| <i>HDD-1</i> | The system will boot from the second HDD. |
| <i>HDD-2</i> | The system will boot from the third HDD. |
| <i>HDD-3</i> | The system will boot from the fourth HDD. |
| <i>ZIP</i> | The system will boot from ATAPI ZIP drive. |
| <i>LAN</i> | The system will boot from the Network drive. |
| <i>Disabled</i> | 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 1st/2nd/3rd boot device.

SwapFloppy

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

Seek Floppy

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

Boot Up Num-Lock LED

This item is to set the Num Lock status when the system is powered on. Setting to *On* will turn on the Num Lock key when the system is powered on. Setting to *Off* will allow end users to use the arrow keys on the numeric keypad. Settings: *On* and *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 item 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 |
|---------------|----------------------------------------------------------------------------------------------------------|
| <i>Setup</i> | The password prompt appears only when end users try to run Setup. |
| <i>System</i> | 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 with PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQ resources for the system. Settings: *Enabled* and *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*.

Boot OS/2 For DRAM > 64MB

This allows you to run the OS/2® operating system with DRAM greater than 64MB. Setting options: *Yes, No*.


Hard Disk S.M.A.R.T.

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*.

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.



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

Configure DRAM Timing

This setting determines whether DRAM timing is configured by reading the contents of the SPD (Serial Presence Detect) EPROM on the DRAM module. Selecting *SPD* makes the following settings automatically determined by BIOS according to the configurations on the SPD. Setting options: *SPD*, *User*.

CAS# Latency

The field controls the CAS latency, which determines the timing delay before SDRAM starts a read command after receiving it. Setting options: 1.5, 2, and 2.5. 1.5 increases system performance while 2.5 provides more stable system performance.

Precharge Delay

This setting controls the number of clock cycles for DRAM to be allowed to precharge from the active state. Setting options: 7, 6, 5.

RAS# to CAS# Delay

This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. *Fast*

gives faster performance; and *Slow* gives more stable performance. This field applies only when synchronous DRAM is installed in the system. The settings are: *2* and *3*.

RAS# Precharge

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

DRAM Data Integrity Mode

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

DRAM Frequency

Use this item to configure the clock frequency of the installed SDRAM. Settings are: *Auto*, *DDR200*, *DDR266*.

Memory Hole At 15M-16M

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements. The settings are: *Enabled* and *Disabled*.

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. The settings are: *Enabled* and *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 *4*, *8*, *16*, *32*, *64*, *128*, and *256* (MB).

Integrated Peripherals



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, select *Auto* to enable BIOS support.

USB Controller

Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. The settings are: *Enabled, Disabled*.

USB Keyboard Support

Set to *Enabled* if you 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.

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* and *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* and *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.

Floppy 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.

Serial Port A/B

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.

Serial Port B Mode

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.*

IRDuplexMode

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.

IR Pin Select

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

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

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 Version

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.

Onboard Game Port

This setting disables or assigns an address for the onboard game port.

Onboard Midi Port

This setting disables or assigns an address for the onboard midi port.

Midi IRQ Select

This setting specifies an IRQ for the onboard midi port.

Power Management Setup

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



IPCA Function

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

ACPI Standby State

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 context 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.

Power Management/APM

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:

- Min Saving* Minimum Power Management. Suspend Mode = 1 Hour.
- Max Saving* Maximum Power Management. Suspend Mode = 1 Min.
- User Define* Allows end users to configure each mode separately.

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 Time Out

If system activity is not detected for the length of time specified in this field, all devices except CPU will be shut off. Settings are *Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min* and *1 Hour*.

Power Button Function

This setting determines the function of the power button. When set to *Power Off*, the power button works as normal power off button. When set to *Suspend*, the computer will enter the suspend/sleep mode if you press the power button. But if the button is pressed for more than four seconds, the computer is turned off. Setting options: *Power Off, Suspend*.

Wake Up On PME, Wake Up On Ring, Wake Up On LAN, USB Wakeup 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 “Wake Up On Ring” and “Wake Up On LAN”, you need to install a modem/LAN card supporting power on function.

CPUTHRM-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 RTC 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 RTC Alarm*. Settings: 0~31.

Time (hh:mm:ss) Alarm

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

POWER ON Function

This setting controls which part on the PS/2 mouse or keyboard can power on the system. Settings: *Password, Hot KEY, Mouse Left, Mouse Right, BUTTON ONLY* and *Keyboard 98*. Please note that this function will only work under S3 mode.

KB Power ON Password

If *POWER ON Function* is set to *Password*, then you can set a password in the field for the PS/2 keyboard to power on the system. Please note that this function will only work under S3 mode.

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*. Please note that this function will only work under S3 mode.

After AC Power Lost

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

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

Power/Sleep LED

This item configures how the system uses power LED on the case to indicate the sleep state. Available options are:

| | |
|-------------------|------------------------------------------------------------------------------|
| <i>Single LED</i> | The power LED blinks to indicate the sleep state without changing its color. |
| <i>Dual LED</i> | The power LED changes its color to indicate the sleep state. |

Reload Global Timer Events: Primary/Secondary Master/Slave IDE, FDC/LPT/COM Ports

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.



PNP OS Installed

When set to *Yes*, BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Windows® 95 or 98. When set to *No*, BIOS will initialize all the PnP cards. So, select *Yes* if the operating system is Plug & Play aware.

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/DMA 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 & DMA Resources* list IRQ 3/4/5/7/9/10/11/12/14/15 and DMA 0/1/3/5/6/7 for users to set each IRQ/DMA a type depending on the type of device using the IRQ/DMA. Settings are:

- PCI/ISA PnP* For Plug & Play compatible devices designed for PCI or ISA bus architecture.
- Legacy ISA* For devices compliant with the PC AT bus specification, requiring a specific interrupt.

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 |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Disabled</i> | Data read or written by the CPU is only directed to the PCI VGA device’s palette registers. |
| <i>Enabled</i> | 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.

CPU Critical 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, System/CPU Fan, Vcore, VTT, 3.3V, +5V, +12V, -12V, -5V, VBAT(V), 5VSB(V)

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

CPU Shutdown Temperature

This option is for setting the shutdown temperature level for the processor. When the processor reaches the temperature you set, the ACPI-aware system will be shut down.

Frequency/Voltage Control

This section describes how to set the Chassis Intrusion feature, CPU FSB frequency, monitor the current hardware status including CPU/system temperatures, CPU/System Fan speeds, Vcore etc. Monitor function is available only if there is hardware monitoring mechanism onboard.

Auto Detect PCI Clock

This option allows you to enable/disable the feature of auto detecting the clock frequency of the installed PCI bus. 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 which may just cause your overclocked processor to lock up.

CPU Host/PCI Clock

This setting controls the clock frequency of the CPU host bus (FSB)/PCI bus on the motherboard.

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

Glossary

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.

Glossary

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.