MSI

MICRO-STAR INTERNATIONAL

MS-6378 (v3.X) Micro-ATX Mainboard

Version 3.1

G52-MA00585

Manual Rev: 3.1
Release Date: Mar. 2002

CE   **✔ N1996**

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.
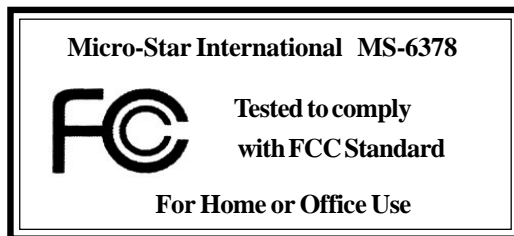
Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2
Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

Micro-Star International MS-6378
FC Tested to comply with FCC Standard
For Home or Office Use

ii

Edition

Mar. 2002

Copyright Notice

Trademarks

All trademarks are the properties of their respective owners.

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

Revision History

Revision	Revision History	Date
3.1	Add JWOL1, JMDM1, JCASE1	Mar. 2002

Safety Instructions

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

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

CONTENTS

Getting Started 1

Thank you for purchasing the MS-6378 (v3.X) Micro-ATX mainboard. The MS-6378 (v3.X) is a high-performance computer mainboard based on **VIA®** **Apollo KLE133 (VT8361+VT82C686B)** chipset for optimal system efficiency. Designed to fit the advanced AMD® Athlon™, Athlon™ XP and Duron™ processors in the 462 pin package, the motherboard provides an inexpensive and professional desktop platform solution.

Mainboard Specification

CPU
- Supports Socket 462 for AMD® Duron™/Athlon™ /Athlon™ XP processors
- Supports Athlon XP 1900+ MHz and higher processor

Chipset
- VIA® VT8361 chipset (552 BGA)
  - FSB @200/266MHz
  - Integrated Trident Blade 2D/3D video accelerator
  - PCI advanced high performance memory controller
  - Supports PC100/133 SDRAM, VCM & ESDRAM technology
- VIA® VT686B chipset (352 BGA)
  - Enhanced Power Management Features
  - Integrated Super I/O (FDC, LPT, COM 1/2 and IR)
  - Dual bus Master IDE Ultra DMA 33/66/100
  - Integrated Hardware Soundblaster
  - Direct Sound AC97 Audio
  - ACPI

Clock Generator
- Supports 100/133MHz clocks

Main Memory
- Supports four memory banks using 168-pin unbuffered DIMM
- Supports a maximum memory size of 1GB (256 MB DRAM technology)
- Supports 3.3V SDRAM DIMM

Slots
- Three 32-bit Master PCI Bus slots (support 3.3V/5V PCI bus interface)
- One CNR (Communication Network Riser) slot
- One ISA slot (optional)

On-Board IDE
- An IDE controller on the VIA® VT82C686B chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA 33/66/100 operation modes
- Can connect up to four IDE devices

On-Board Peripherals

❏ On-Board Peripherals include:
- 1 floppy port supports 2 FDDs with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
- 1 serial port (COM A)
- 1 parallel port supports SPP/EPP/ECP mode
- 4 USB ports (Rear * 2/ Front * 2)
- 1 IrDA connector for SIR/CIR/FIR/ASKIR/HPSIR
- 1 VGA port
- 1 Audio/Game port

Network (Optional)

❏ ADMtek AN983B

Audio

❏ Audio controller integrated in 686B chipset
❏ Software audio codec Realtek ALC101T
- Onboard Front Audio Pin Header

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: 24.4 cm (L) x 21.5 cm (W)

Mounting

❏ 6 mounting holes

Others

❏ Suspend to Disk S4/S3
❏ Plug and Play function
❏ Supports PCI 2.2
❏ Hardware Monitoring (optional)
❏ Modem (External/Internal) Ring Wake up Function
❏ LAN Wake up Function

Mainboard Layout
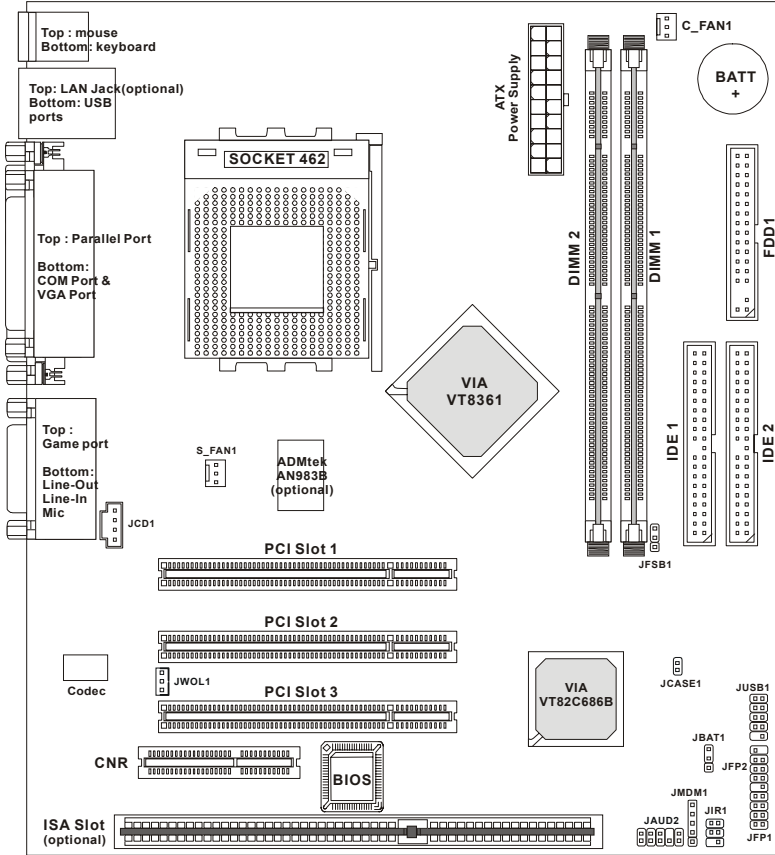
MS-6378 (v3.X) Micro-ATX Mainboard

Quick Components Guide

Component	Function	Reference
DIMM 1~2	Installing memory modules	See p. 2-5~2-6
Socket 462	Installing CPU	See p. 2-2~2-3
C_FAN1	Connecting to CPUFAN	See p. 2-15
S_FAN1	Connecting to SYSFAN	See p. 2-15
ATX Power Supply	Installing power supply	See p. 2-7
IDE1& IDE2	Connecting to IDE hard disk drive	See p.2-14
FDD1	Connecting to floppy disk drive	See p.2-13
JUSB1	Connecting to USB interfaces	See p. 2-19
JCASE1	Connecting to chassis intrusion switch	See p. 2-19
PCI Slot 1~3	Installing expansion cards	See p. 2-23
CNR Slot	Installing CNR cards	See p. 2-23
ISA Slot	Installing ISA cards	See p. 2-23
JFP1/2	Connecting to the case	See p. 2-17
JIR1	Connecting to IrDA infrared module	See p. 2-16
JAUD2	Connecting to Audio ports	See p. 2-18
JMDM1	Connecting to modem module	See p. 2-20
JWOL1	Connecting to LAN card	See p. 2-20
JBAT1	Clearing CMOS data	See p. 2-21
JFSB1	Setting CPU Front Side Bus frequency	See p. 2-22
JCD1	Connecting to CD-ROM audio connector	See p. 2-16

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.

Central Processing Unit: CPU

The mainboard supports AMD® Athlon™, Athlon™ XP and Duron™ processors in the 462 pin package. The mainboard uses a CPU socket called Socket A 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 cut edge. The cut edge 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.
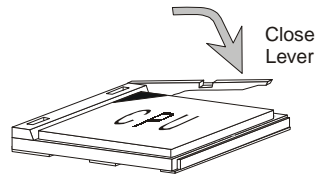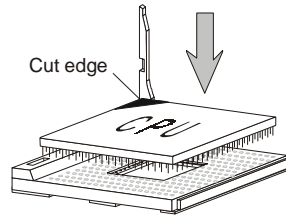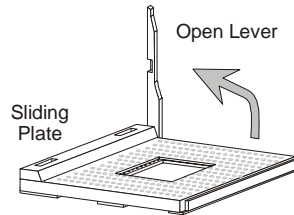
> **STOP**
> **WARNING!**
>
> *Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.*

STOP

WARNING! Thermal Issue for CPU

As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly crucial when building computer systems. Maintaining the proper thermal environment is key to reliable operation. As such, the processor must be maintained in the specified thermal requirements.

AMD Athlon™/Duron™/Athlon™ XP processor with a speed of **600MHz and above** requires LARGER heatsink and fan. You also need to add thermal grease between the CPU and heatsink to improve heat dissipation. Then, make sure that the CPU and heatsink are securely fastened and in good contact with each other. These are needed to prevent damaging the processor and ensuring reliable operation. If you want to get more information on the proper cooling, you can visit AMD's website for reference.

CPU Core Speed Derivation Procedure

If   CPU Clock   =   100MHz
        Core/Bus ratio   =   7
then CPU core speed   =   Host Clock x Core/Bus ratio
                            =   100MHz x 7
                            =   700MHz

CPU Clock Selection

To make a 100MHz CPU run at 100MHz or a 133MHz CPU run at 133MHz, you need to adjust the CPU clock frequency through the jumper JFSB1.

For more information on the issue, refer to *CPU Clock Selection Jumper: JFSB1* later in this chapter.

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

Memory

The mainboard provides 2 sockets for 168-pin **unbuffered** SDRAM DIMM (Double In-Line Memory Module) modules and supports the memory size up to 1 GB. The socket supports 256MB technology.
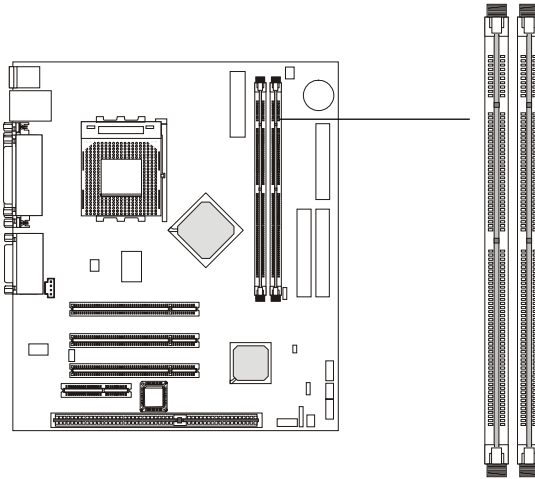
DIMM Slots
(DIMM 1~2)

Introduction to SDRAM

Synchronous DRAM (SDRAM) is a type of dynamic RAM memory chip that has been widely used starting in the latter part of the 1990s. SDRAMs are based on standard dynamic RAM chips, but have sophisticated features that make them considerably faster. First, SDRAM chips are fast enough to be synchronized with the CPU's clock, which eliminates wait states. Second, the SDRAM chip is divided into two cell blocks, and data is interleaved between the two so that while a bit in one block is being accessed, the bit in the other is being prepared for access. This allows SDRAM to burst the second and subsequent, contiguous characters at a rate of 10ns, compared to 60ns for the first character.

SDRAM provides 800 MBps or 1 GBps data transfer depending on whether the bus is 100MHz or 133MHz.

DIMM Module Combination

Install at least one DIMM module on the slots. Memory modules can be installed on the slots in any order. You can install either single- or double-sided modules to meet your own needs.

Memory modules can be installed in any combination as follows:

Slot	Memory Module	Total Memory
DIMM 1 (Bank 0 & 1)	S/D	32MB~512MB
DIMM 2 (Bank 2 & 3)	S/D	32MB~512MB
Maximum System Memory Supported		32MB~1GB

S: Single Side   D: Double Side

Installing DIMM Modules

The DIMM slot has 2 Notch Keys "VOLT and DRAM". The module will only fit in the right orientation.

1. Insert the DIMM memory module vertically into the DIMM slot. Then push it in.

DRAM   notch   VOLT   notch
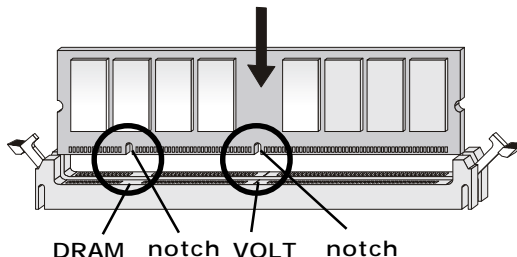
2. The plastic clip at each side of the DIMM slot will automatically close.
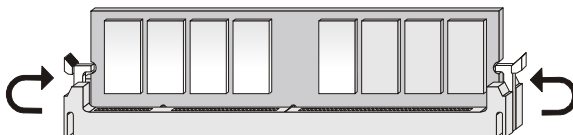
Power Supply

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: JPWR1

This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.
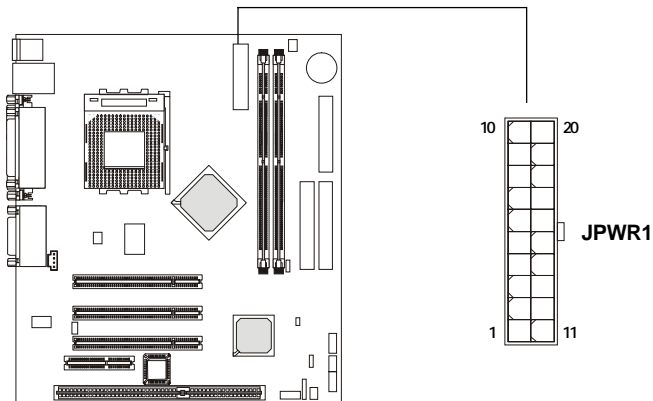
JPWR1 Pin Definition

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

Back Panel

The Back Panel provides the following connectors:
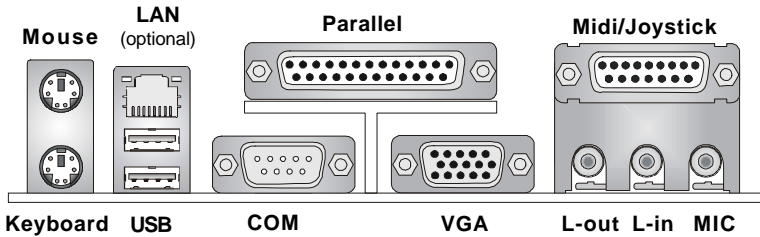
Mouse Connector

The mainboard provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this connector. The connector location and pin assignments are as follows:
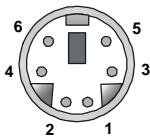
PS/2 Mouse (6-pin Female)

Pin Definition

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

Keyboard Connector

The mainboard provides a standard PS/2® keyboard mini DIN connector for attaching a PS/2® keyboard. You can plug a PS/2® keyboard directly into this connector.
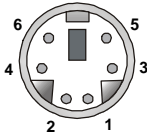
PS/2 Keyboard (6-pin Female)

Pin Definition

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

USB Connectors

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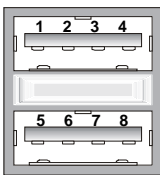
USB Ports

USB Port Description

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

Serial Port Connector: COM A

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

Pin Definition

1 2 3 4 5

6 7 8 9
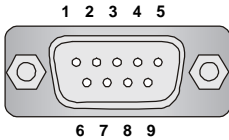
9-Pin Male DIN Connector

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

VGA DB 15 Pin Connector

One DB 15-pin VGA connector is supplied for connection to a VGA monitor.

Pin Definition

5   1

15   11
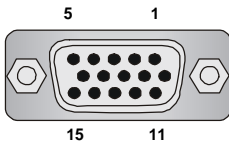
DB 15-Pin Female Connector

Analog Video Display Connector (DB-15S)	
PIN	SIGNAL DESCRIPTION
1	Red
2	Green
3	Blue
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Power
10	Ground
11	Not used
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

Parallel Port Connector: LPT1

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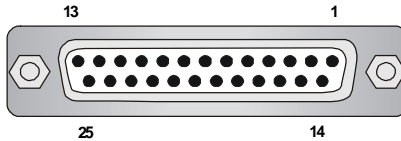
Pin Definition

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

LAN (RJ-45) Jack (Optional)

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.
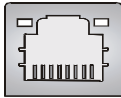
Pin Definition

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

Joystick/Midi Connector

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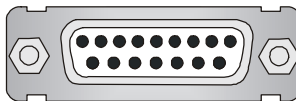
Audio Port Connectors

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

Line Out   **Line In**   **MIC**
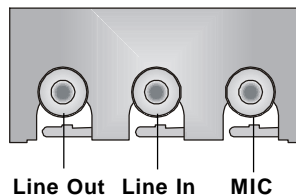
Connectors

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.
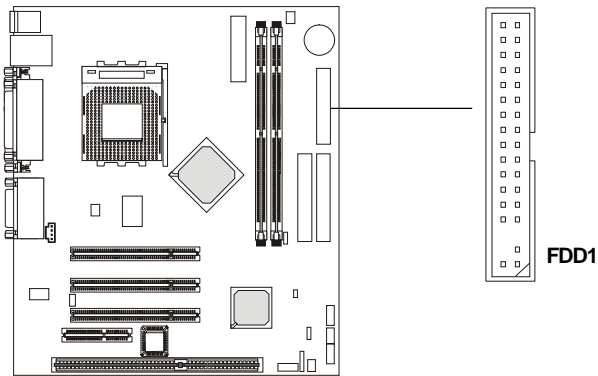
Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 33/66/100 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA 33/66/100 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices. These connectors support the provided IDE hard disk cable.
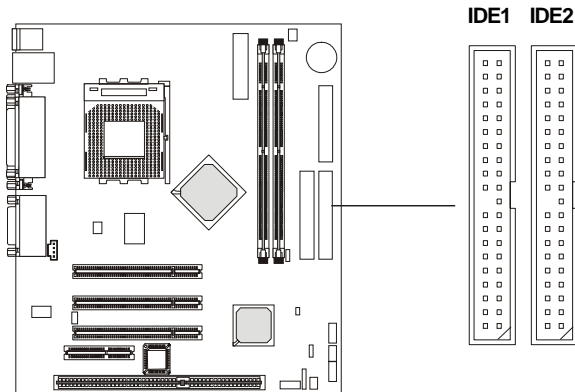
IDE1 (Primary IDE Connector)

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

IDE2 (Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

TIP:

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

Fan Power Connectors: C_FAN1/S_FAN1

The C_FAN1 (processor fan) and 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.

GND
+12V
SENSOR

C_FAN1

GND
+12V
SENSOR

S_FAN1
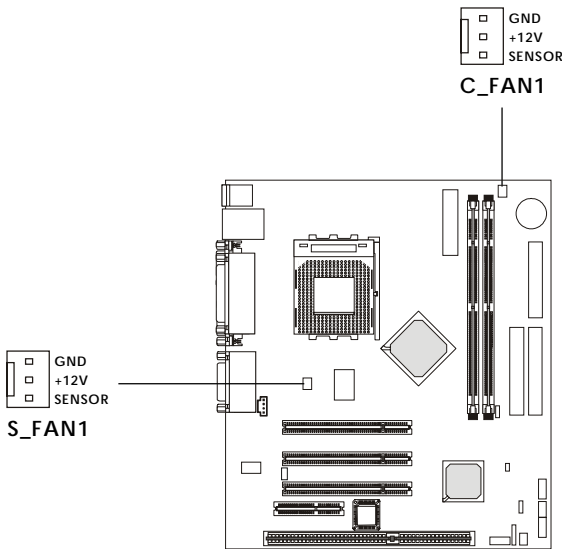
Note:
1. *Always consult the vendor for proper CPU cooling fan.*
2. *CPU Fan supports the fan control. You can install the PC Alert utility that will automatically control the CPU Fan speed according to the actual CPU temperature.*

IrDA Infrared Module Header: JIR1

The connector allows you to connect to IrDA Infrared module. You must configure the setting through the BIOS setup to use the IR function. JIR1 is **compliant with Intel® Front Panel I/O Connectivity Design Guide.**

JIR1 Pin Definition

Pin	Signal
1	NC
2	NC
3	VCC
4	GND
5	IRTX
6	IRRX

JIR1

6 □□ 5
□□
2 □ 1
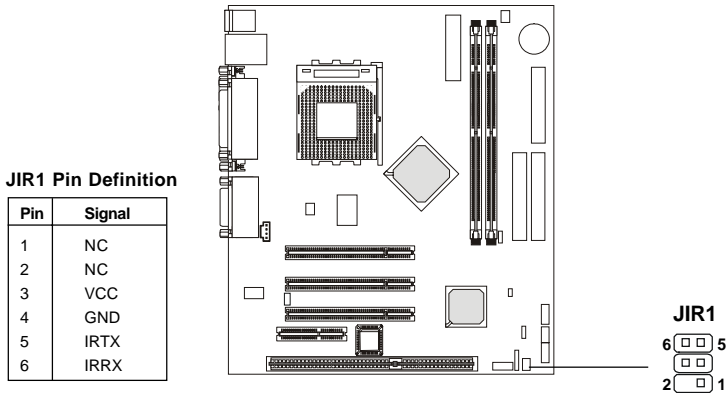
CD-In Connector: JCD1

JCD1 connector is for CD-ROM audio connector.

L
GND
R

JCD1
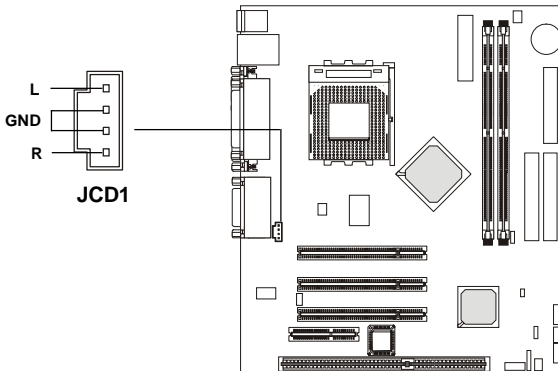
Front Panel Connectors: JFP1 & JFP2

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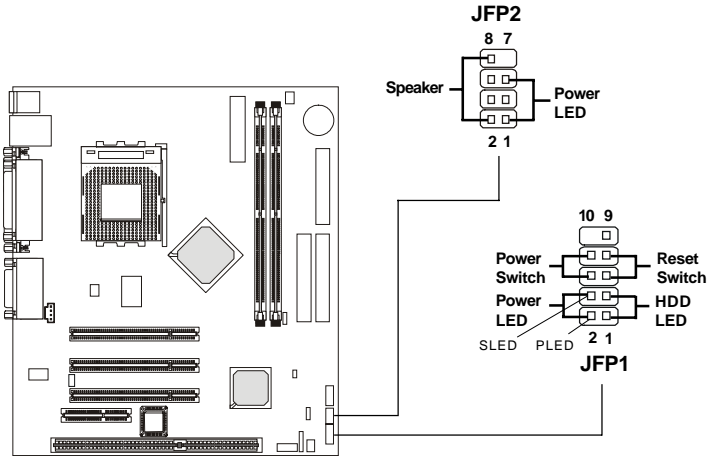
JFP1 Pin Definition

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

JFP2 Pin Definition

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

Front Panel Audio Connector: JAUD2

The JAUD2 front panel audio connector allows you to connect to the front panel audio and is **compliant with Intel Front Panel I/O Connectivity Design Guide.**

JAUD2

2   10

1   9
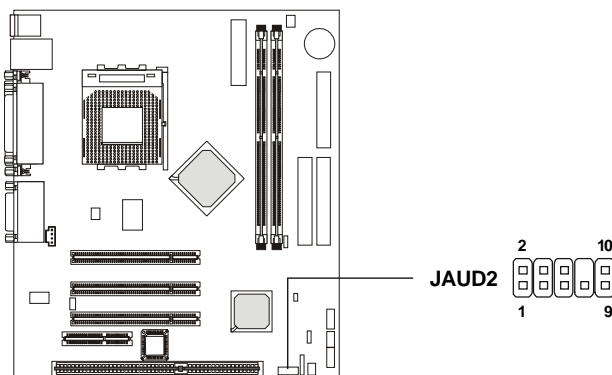
Pin Definition

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

Note:

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

6   10

5   9
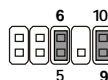
Front USB Connector: JUSB1

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

JUSB1 Pin Definition

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

1 □□ 2
9 □ 10

JUSB1
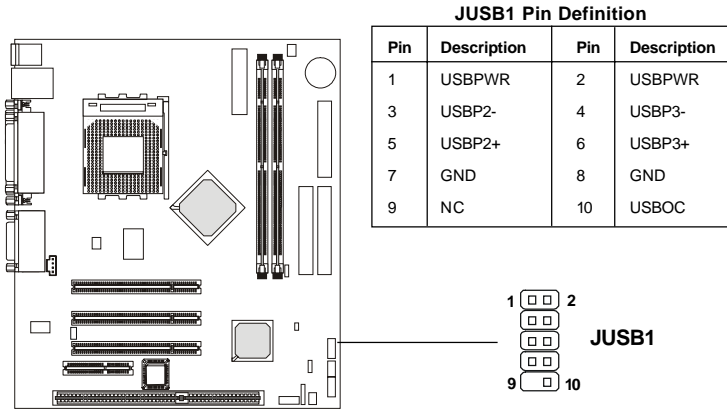
Chassis Intrusion Switch Connector: JCASE1

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

JCASE1
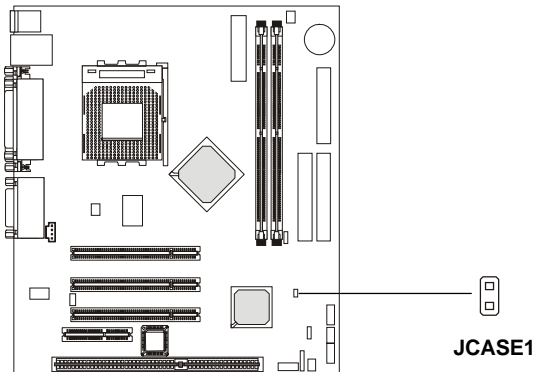
Wake On Ring Connector: JMDM1

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.


```
5VSB
NC
WOR (wake-up on ring)
GND
1   NC
    JMDM1
```
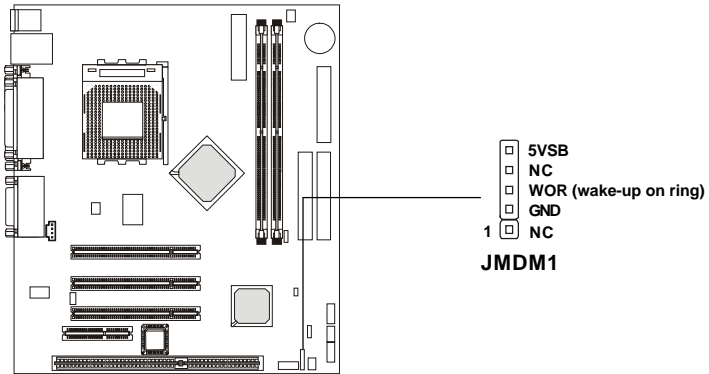
Wake On LAN Connector: JWOL1

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.

```
    WOL (wake-up on LAN)
    GND
1   5VSB
JWOL1
```
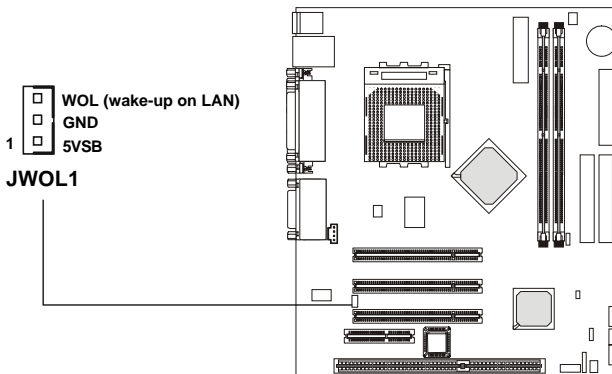
Jumpers

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

Clear CMOS Jumper: JBAT1

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

JBAT1

3

1

Keep Data

3

1

Clear Data

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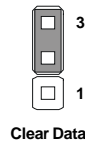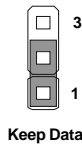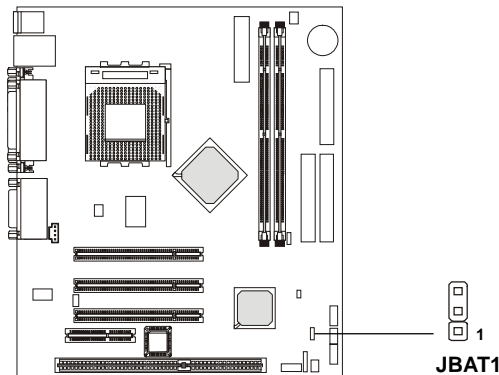
You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

CPU Clock Selection Jumper: JFSB1

Use the jumper to select the appropriate Front Side Bus frequency for your CPU.

JFSB1

3

1

FSB = 133MHz

3

1
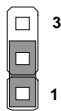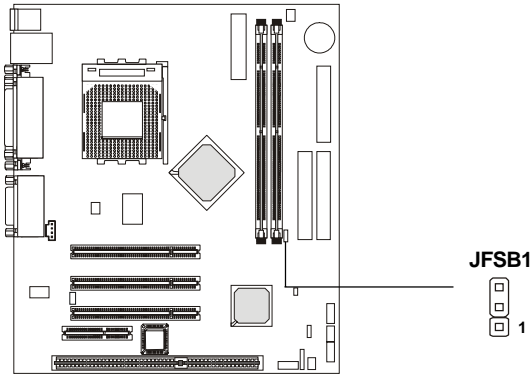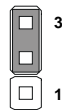
FSB = 100MHz

Slots

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

PCI Slots

CNR Slot

ISA Slot
(OPTIONAL)
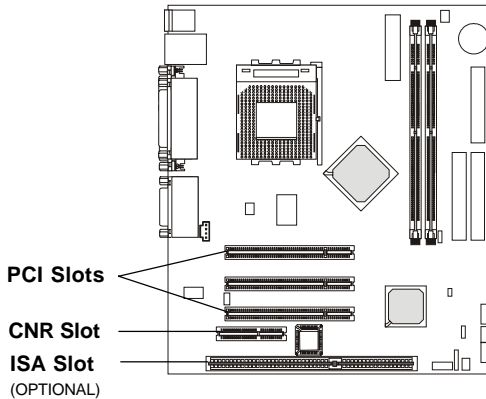
PCI Slots

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) Slot

The CNR slot allows you to insert the CNR expansion cards. CNR is a specially designed network, audio, or modem riser card for ATX family motherboards. Its main processing is done through software and controlled by the motherboard's chipset. Please note the CNR slot of the mainboard **only supports audio and modem that are set in Slave (Secondary) mode**.

ISA Slot (Optional)

The ISA slot allows you to install the ISA expansion card.

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/USB/AC97/AN983B" 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#
USB-1	INT D#	INT A#	INT B#	INT C#
USB-2	INT D#	INT A#	INT B#	INT C#
AC97	INT C#	INT D#	INT A#	INT B#
AN983B	INT D#			

PCI Slot 3 & AC97 shared.
USB & AN983B shared.

PCI Slot 1~3: Bus Master

BIOS Setup

3

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

You may need to run the Setup program when:
■ An error message appears on the screen during the system booting up, and requests you to run SETUP.
■ You want to change the default settings for customized features.

Entering Setup

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

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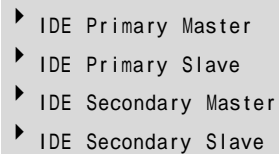
After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

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

Sub-Menu

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

> ▶ IDE Primary Master
> ▶ IDE Primary Slave
> ▶ IDE Secondary Master
> ▶ IDE Secondary Slave

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 will appear on the screen. The Main Menu allows you to select from twelve setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

```
           CMOS Setup Utility - Copyright(C) 1984-2000 Award Software
  ┌────────────────────────────────────────────────────────────────────────┐
  │                                                                          │
  │  ▶ Standard CMOS Features          ▶ Frequency/Voltage Control           │
  │                                                                          │
  │  ▶ Advanced BIOS Features            Load Fail-Safe Defaults             │
  │                                                                          │
  │  ▶ Advanced Chipset Features         Load Optimized Defaults             │
  │                                                                          │
  │  ▶ Integrated Peripherals            Set Supervisor Password             │
  │                                                                          │
  │  ▶ Power Management Setup            Set User Password                    │
  │                                                                          │
  │  ▶ PnP/PCI Configurations            Save & Exit Setup                    │
  │                                                                          │
  │  ▶ PC Health Status                 Exit Without Saving                  │
  │                                                                          │
  ├────────────────────────────────────────────────────────────────────────┤
  │  ESC : Quit     F9 : Menu in BIOS    ↑↓←→ : Select Item                  │
  │                                                                          │
  │  F10 : Save & Exit Setup                                                 │
  ├────────────────────────────────────────────────────────────────────────┤
  │                                                                          │
  │                    Time, Date, Hard Disk Type…                           │
  └────────────────────────────────────────────────────────────────────────┘
```

Standard CMOS Features
Use this menu for basic system configurations.

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

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

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

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

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

PC Health Status
This entry shows your PC health status.

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

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 Password
Use this menu to set Supervisor Password.

Set User Password
Use this menu to set User Password.

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

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

Chapter 3

Standard CMOS Features

The items in Standard CMOS Features Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

```
          CMOS Setup Utility - Copyright(C) 1984-2000 Award Software
                          Standard CMOS Features

   Date (mm:dd:yy) :              Wed, Dec 12 2001
   Time (hh:mm:ss) :              00:00:00                 Item Help

 ▶ IDE Primary Master
 ▶ IDE Primary Slave                                    Menu Level  ▶
 ▶ IDE Secondary Master
 ▶ IDE Secondary Slave                                  Change the day, month,
                                                        year and century
   Drive A                       1.44 M, 3.5 in.
   Drive B                       None

   Video                         EGA/VGA
   Halt On                       All, But Keyboard

   Base Memory                       640K
   Extended Memory                   65472K
   Total Memory                      66212K


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

Date
The date format is <day><month> <date> <year>.

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

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

IDE Primary/Secondary Master/Slave
Press PgUp/<+> or PgDn/<-> to select *Manual*, *None* or *Auto* type. Note that

the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use *Manual* to define your own drive type manually.

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

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

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

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

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

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

Chapter 3

Advanced BIOS Features

CMOS Setup Utility - Copyright(C) 1984-2000 Award Software
Advanced BIOS Features

Anti-Virus Protection	Disabled	Item Help
CPU Internal Cache	Enabled	
External Cache	Enabled	
CPU L2 Cache ECC Checking	Enabled	Menu Level ▸
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	Allows you to choose
Second Boot Device	HDD-0	the VIRUS warning
Third Boot Device	LS120	feature for IDE Hard
Boot Other Device	Enabled	Disk boot sector
Swap Floppy Drive	Disabled	protection. If this
Boot Up Floppy Seek	Enabled	function is enabled
Boot Up NumLock Status	On	and someone attempt to
Gate A20 Option	Normal	write data into this
Typematic Rate Setting	Disabled	area, BIOS will show a
x Typematic Rate (Chars/Sec)	6	warning message on
x Typematic Delay (Msec)	250	screen and alarm beep.
Security Option	Setup	
APIC Mode	Disabled	
MPS Version Control For OS	1.4	

OS Select for DRAM > 64MB	Non-OS2
Video BIOS Shadow	Enabled
C8000-CBFFF Shadow	Disabled
CC000-CFFFF Shadow	Disabled
D0000-D3FFF Shadow	Disabled
D4000-D7FFF Shadow	Disabled
D8000-DBFFF Shadow	Disabled
DC000-DFFFF Shadow	Disabled

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

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*, *Enabled*.

CPU Internal Cache/External Cache
The items allow you to turn on or off CPU's internal (L1) and external (L2) cache. Settings: *Enabled*, *Disabled*.

CPU L2 Cache ECC Checking

This allows you to enable or disable the ECC (Error-Correcting Code) feature for error detection and correction when data passes through L2 cache memory. Settings: *Enabled*, *Disabled*.

Quick Power On Self Test

The option speeds up Power On Self Test (POST) after you power on the computer. When setting the item to *Enabled*, BIOS will shorten or skip some check items during POST. Settings: *Enabled*, *Disabled*.

First/Second/Third Boot Device

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

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

Boot Other Device

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

Swap Floppy Drive

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

Boot Up Floppy Seek

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

Boot Up NumLock Status

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

Setting options: *On*, *Off*.

Gate A20 Option
This item is to set the Gate A20 status. A20 refers to the first 64KB of extended memory. When *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*, *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*, *1000*.

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

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

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

MPS Version Control For OS
This field allows you to select which MPS (Multi-Processor Specification)

version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Settings: *1.4*, *1.1*.

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

Video BIOS Shadow
This item sets if the Video BIOS will be copied to RAM and increase video speed accordingly. Settings: *Enabled*, *Disabled*.

C8000-CBFFF/CC000-CFFFF/D0000-D3FFF/D4000-D7FFF/D8000-DBFFF/ DC000-DFFFF Shadow
These items specify whether the contents of the adapter ROM named in the items will be copied into RAM to improve the performance of ROM firmware for adapters. You need to know the address of each adapter ROM occupies to shadow (copy) it into the correct area of RAM. Settings: *Enabled*, *Disabled*.

Advanced Chipset Features

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

```
CMOS Setup Utility - Copyright(C) 1984-2000 Award Software
                  Advanced Chipset Features

    DRAM Timing by SPD        Yes               Item Help
  x SDRAM Cycle Length        Auto
  x DRAM Clock                Auto
    Memory Hole               Disabled       Menu Level  ▶
    P2C/C2P Concurrency       Enabled
    Fast R-W Turn Around      Enabled
    System BIOS Cacheable     Disabled
    Video RAM Cacheable       Disabled
    Frame Buffer Size         8M
    AGP Aperture Size         64M
    OnChip USB                Enabled
    USB Keyboard Support      Disabled
    OnChip Sound              Auto
    OnChip Modem              Auto
    CPU to PCI Write Buffer   Enabled
    PCI Dynamic Bursting      Enabled
    PCI Master 0 WS Write     Enabled
    PCI Delay Transaction     Enabled
    PCI#2 Access #1 Retry     Enabled


    AGP Master 1 WS Write       Disabled
    AGP Master 1 WS Read        Disabled
    Memory Parity/ECC Check     Disabled

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

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

DRAM Timing by SPD
Selects whether DRAM timing is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to *Yes* enables SDRAM Cycle Length and DRAM Clock automatically to be determined by BIOS based on the configurations on the SPD. Selecting *No* allows users to configure these fields manually.

SDRAM Cycle Length

This controls the timing delay (in clock cycles) before SDRAM starts a read command after receiving it. Settings: *Auto*, *2*, *3* (clocks). *2* (clocks) increases the system performance the most while *3* (clocks) provides the most stable performance. *Auto* allows BIOS to determine the best CAS latency length.

DRAM Clock

The chipset supports synchronous and asynchronous mode between host clock and DRAM clock frequency. Settings: *Auto*, *100*, *133* (MHz). *Auto* allows BIOS to determine the best DRAM clock frequency.

Memory Hole

In order to improve performance, certain space in memory can be reserved for ISA peripherals. This memory must be mapped into the memory space below 16MB. When this area is reserved, it cannot be cached. Settings: *Enabled*, *Disabled*.

P2C/C2P Concurrency

This field enables or disables the PCI to CPU and CPU to PCI concurrency feature, which allows synchronous data transmission from PCI to CPU and vice versa. Selecting *Enabled* will increase system performance.

Fast R-W Turn Around

This is used to control the fast read/write turn around feature for DRAM timing. Settings: *Enabled*, *Disabled*. *Enabled* improves system perform-ance while *Disabled* provides stability.

System BIOS Cacheable

System BIOS ROM at F0000h-FFFFFh is always copied to RAM for faster execution. Selecting *Enabled* allows the contents of F0000h RAM memory segment to be written to and read from cache memory, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Settings: *Enabled*, *Disabled*.

Frame Buffer Size

Frame Buffer is the video memory that stores data for video display (frame). This field is used to determine the memory size for Frame Buffer. Larger frame buffer size increases video performance. Settings: *2M*, *4M*, *8M*.

AGP Aperture Size (MB)

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

OnChip USB

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

USB Keyboard Support

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

OnChip Sound

Auto allows the mainboard to detect whether an audio device is used. If the device is detected, the onboard audio 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*.

OnChip Modem

Auto allows the mainboard to detect whether a modem is used. If the device is detected, the onboard modem controller will be enabled; if not, it is disabled. Disable the controller if you want to use other controller cards to connect a modem. Settings: *Auto*, *Disabled*.

CPU to PCI Write Buffer

When *Enabled*, CPU can write up to four words of data into the PCI write buffer before the CPU must wait for PCI bus cycles to finish. When *Disabled*, the CPU must wait after each write cycle until the PCI bus signals that it is ready to receive more data.

PCI Dynamic Bursting

When *Enabled*, every write transaction goes to the write buffer. Then burstable transactions burst on the PCI bus and nonburstable transactions do not.

PCI Master 0 WS Write
When *Enabled*, writes to the PCI bus are executed with zero wait state.

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

PCI #2 Access #1 Retry
When *Disabled*, PCI#2 will not be disconnected until access finishes.
When *Enabled*, PCI#2 will be disconnected if max retries are attempted without success.

AGP Master 1 WS Write
When *Enabled*, writes to the AGP bus are executed with one wait state inserted.

AGP Master 1 WS Read
When *Enabled*, one wait state is inserted in the AGP read cycle.

Memory Parity/ECC Check
Users can set the field to *Enabled* for memory checking if the type of DRAM installed in your system is Parity or ECC (Error-Correcting Code) DRAM.

Integrated Peripherals

CMOS Setup Utility - Copyright(C) 1984-2000 Award Software
Integrated Peripherals

			Item Help
OnChip IDE Channel0		Enabled	
OnChip IDE Channel1		Enabled	
IDE Prefetch Mode		Enabled	
Primary Master	PIO	Auto	Menu Level ▸
Primary Slave	PIO	Auto	
Secondary Master	PIO	Auto	
Secondary Slave	PIO	Auto	
Primary Master	UDMA	Auto	
Primary Slave	UDMA	Auto	
Secondary Master	UDMA	Auto	
Secondary Slave	UDMA	Auto	
Init Display First		PCI Slot	
Onboard Lan Device		Enabled	
IDE HDD Block Mode		Enabled	
Onboard FDD Controller		Enabled	
Onboard Serial Port 1		Auto	
Onboard Serial Port 2		Disabled	
x UART 2 Mode		Standard	
x IR Function Duplex		Half	

x TX, RX inverting enable	No, Yes	
Onboard Parallel Port	378/IRQ7	
Onboard Parallel Mode	Normal	
x ECP Mode Use DMA	3	
x Parallel Port EPP Type	EPP1.9	
Onboard Legacy Audio	Enabled	
Sound Blaster	Disabled	
SB I/O Base Address	220H	
SB IRQ Select	IRQ 5	
SB DMA Select	DMA 1	
MPU-401	Disabled	
MPU-401 I/O Address	330-333H	
Game Port (200-207H)	Enabled	

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

OnChip IDE Channel 0/1
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Choose *Enabled* to activate each channel separately.

IDE Prefetch Mode
The onboard IDE drive interfaces supports prefetching, for faster drive accesses. Set to *Disabled* if your primary and/or secondary add-in IDE interface does not support prefetching.

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

Primary/Secondary Master/Slave UDMA
Ultra DMA/33/66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, Ultra DMA/66 or even Ultra DMA/100, select *Auto* to enable BIOS support. Settings: *Auto, Disable*.

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

Onboard Lan Device (Optional)
The field is available only when LAN is integrated on the board. It determines whether the onboard LAN controller is activated. Setting options: *Enabled*, *Disabled*.

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

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

Onboard Serial Port 1/2
The items specify the base I/O port address and IRQ for the onboard Serial Port

1 (COM A)/Serial Port 2 (COM 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*, *Auto*. If you have ISA add-on card, the suggested configuration is as the following:

If the ISA add-on card has				Onboard Serial port to be set at			
COM1 (I/O:3F8H)	COM2 (I/O:3F8H)	COM3 (I/O:3E8H)	COM4 (I/O:2E8H)	PORT1	IRQ ASSIGNED	PORT2	IRQ ASSIGNED
✓	✓	✓	✓	DISABLED	X	DISABLED	X
✓	✓	X	X	COM3	4	COM4	3
X	X	✓	✓	COM1	4	COM2	3
✓	X	X	✓	COM2	3	COM3	4
X	✓	✓	X	COM1	4	COM4	3
✓	✓	✓	X	COM4	3	DISABLED	X
✓	✓	X	✓	COM3	4	DISABLED	X
✓	X	✓	✓	COM2	3	DISABLED	X
X	✓	✓	✓	COM1	4	DISABLED	X
X	X	X	X	COM1	4	COM2	3
✓	X	X	X	COM2	3	COM3	4
X	✓	X	X	COM1	4	COM3	4
X	X	✓	X	COM1	4	COM2	3
X	X	X	✓	COM1	4	COM2	3

Note: To use the IR function, you need to enable the serial port 2.

UART 2 Mode
This setting allows you to specify the operation mode for serial port 2. Setting options: *IrDA, ASKIR, Normal*.

HPSIR	IrDA-compliant Serial Infrared Port
ASKIR	Amplitude Shift Keyed Infrared Port
Standard	RS-232C Serial Port

IR Function Duplex
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.

TX, RX inverting enable

This item allows you to enable the TX, RX inverting which depends on different H/W requirement. This field is not recommended to change its default setting for avoiding any error in your system. Settings: "*No, No*", "*No, Yes*", "*Yes, No*" and "*Yes, Yes*."

Parallel Port

This specifies the I/O port address and IRQ of the onboard parallel port. Settings: *378/IRQ7*, *278/IRQ5*, *3BC/IRQ7*, *Disabled*. If you have an ISA add-on card, the suggested configuration is as below:

If the ISA add-on card has			Onboard parallel port to be set as	
LPT1 I/O:378H	LPT2 I/O:278H	LPT3 I/O:3BCH	PORT ASSIGNED	IRQ ASSIGNED
✓	✓	✓	Disabled	X
✓	✓	X	LPT3	5
✓	X	✓	LPT2	5
X	✓	✓	LPT1	7
✓	X	X	LPT2	5
X	✓	X	LPT1	7
X	X	✓	LPT1	7
X	X	X	LPT1	7

> *Note: If the onboard parallel port interrupt and ISA add-on card interrupt are in conflict, the parallel port will not work properly. Please disable one of the devices.*

Onboard Parallel Mode

This item selects the operating mode for the parallel port: *Normal*, *EPP*, *ECP* or *ECP/EPP*.

> Normal: Standard Parallel Port
> EPP: Enhanced Parallel Port
> ECP: Extended Capability Port
> ECP/EPP: Extended Capability Port + Enhanced Parallel Port

ECP Mode Use DMA

The ECP mode has to use the DMA channel, so after the user chooses the onboard parallel port with the ECP feature, the setting "ECP Mode Use

DMA" should be set. At this time, the user can choose between DMA channel *3* or *1*.

Parallel Port EPP Type
The onboard parallel port is EPP Spec. compliant, so after the user chooses the onboard parallel port with the EPP function, the setting "Parallel Port EPP Type" should be set. At this time either *EPP1.7* spec or *EPP1.9* spec can be chosen.

Onboard Legacy Audio
The item enables or disables the onboard audio features of the mainboard and the following audio options in the BIOS.

Sound Blaster
The item turns on/off the Sound Blaster feature of the board. If you want to play the Sound Blaster compatible games, you need to set the field to *Enabled*.

SB I/O Base Address
This item specifies the I/O Base Address for the Sound Blaster.

SB IRQ Select
This item specifies the IRQ for the Sound Blaster.

SB DMA Select
This item specifies the DMA channel for the Sound Blaster.

MPU-401
The field enables or disables the MPU-401 interface (the Yamaha Sound Blaster mode).

MPU-401 I/O Address
This item selects the base I/O port address for the MPU-401 interface.

Game Port (200-207H)
This will determine which address the game port will use.

Power Management Setup

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

```
           CMOS Setup Utility - Copyright(C) 1984-2000 Award Software
                          Power Management Setup
  ┌──────────────────────────────────────────┬─────────────────────────┐
  │ IPCA function            Enabled          │       Item Help         │
  │▶ Power Management         Press Enter      │                         │
  │ ACPI Sleep Type          S1 (POS)         │                         │
  │ PM Control by APM         Yes             │  Menu Level  ▸          │
  │ Video Off Option         Suspend --> Off  │                         │
  │ Video Off Method         V/H SYNC + Blank │                         │
  │ MODEM Use IRQ            3                 │                         │
  │ Soft-Off by PWRBTN       Instant-Off      │                         │
  │ State After Power Failure Off             │                         │
  │ LED In Suspend           Single           │                         │
  │▶ Wake Up Events          Press Enter      │                         │
  │                                           │                         │
  │                                           │                         │
  │                                           │                         │
  │                                           │                         │
  │                                           │                         │
  │                                           │                         │
  ├──────────────────────────────────────────┴─────────────────────────┤
  │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help│
  │     F5:Previous Values   F6:Fail-Safe Defaults   F7:Optimized Defaults │
  └─────────────────────────────────────────────────────────────────────┘
```

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*, *Disabled*.

Power Management
Press <Enter> to enter the sub-menu for power management options.

```
                           Power Management
  ┌──────────────────────────────────────────┬─────────────────────────┐
  │ Power Management         User Define      │       Item Help         │
  │ HDD Power Down           Disable          │                         │
  │ Doze Mode                Disable          │                         │
  │ Suspend Mode             Disable          │  Menu Level  ▸ ▸        │
  │                                           │                         │
  │                                           │                         │
  └──────────────────────────────────────────┴─────────────────────────┘
```

Power Management

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

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

HDD Power Down

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

Doze Mode

If system activity is not detected for the length of time specified in this field, the CPU clock will run at slower speed while other devices still run at full speed. Settings: *Disable*, *1 Min*, *2 Min*, *4 Min*, *6 Min*, *8 Min*, *10 Min*, *20 Min*, *30 Min*, *40 Min*, *1 Hour*.

Suspend Mode

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

ACPI Sleep Type

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

S1(POS)	The S1 sleep mode is a low power state. In this state, no system context (CPU or chipset) is lost and hardware maintains all system context.
S3(STR)	The S3 sleep mode is a power-down state in which power is supplied only to essential components such as main memory and wake-capable devices and all system con-

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

PM Control by APM
Setting to *Yes* will activate an Advanced Power Management (APM) device to enhance Max Saving mode and stop CPU internal clock. Settings: *Yes*, *No*.

Video Off Option
The settings are *Always On*, *Suspend* and *All Modes*. This option is used to determine whether and when the monitor will turn off.

Always On	Always turn on.
Suspend --> Off	During Suspend mode, the monitor will turn off.
All Modes --> Off	The monitor turns off during Doze, Standby or Suspend mode

Video Off Method
This determines the manner in which the monitor is blanked.

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

MODEM Use IRQ
This setting names the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system. Setting options: *3, 4, 5, 7, 9, 10, 11, NA*.

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

Instant-Off	The power button functions as a normal power-on/-off button.
Delay 4 Sec	When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

State After Power Failure

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

On   Reboots the computer.

Off   Leaves the computer in the power off state.

Auto   BIOS automatically determines the best mode.

LED In Suspend

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

Single   The power LED turns off during the sleep/suspend mode.

Dual   The power LED changes its color to indicate the sleep/ suspend state.

Wake Up Events

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

Wake Up Events		
USB Resume from S3	Disabled	Item Help
VGA	OFF	
LPT & COM I/O Access	LPT/COM	
HDD & FDD I/O Access	ON	Menu Level ▸ ▸
PCI Master	OFF	
PowerOn by PCI Card	Disabled	
Wake Up On LAN/Ring	Disabled	
RTC Alarm Resume	Disabled	
x Date (of Month)	0	
x Resume Time (hh:mm:ss)	0 0 0	
IRQs Wake Up Event	ON	
▸ IRQs Activity Monitoring	Press Enter	

USB Resume from S3, VGA, LPT & COM I/O Access, HDD & FDD I/O Access, PCI Master, PowerOn by PCI Card, Wake Up On LAN/Ring, IRQs Wake Up Event

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 LAN/Ring" , you need to install a modem/LAN card supporting power on function.*

RTC Alarm Resume

The field is used to enable or disable the feature of booting up the system

on a scheduled time/date.

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

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

IRQs Activity Monitoring
Press <Enter> to enter the sub-menu and the following screen appears.

IRQ Activity Monitoring		
IRQ3 (COM 2)	Enabled	Item Help
IRQ4 (COM 1)	Enabled	
IRQ5 (LPT 2)	Enabled	
IRQ6 (Floppy Disk)	Enabled	Menu Level ▸ ▸ ▸
IRQ7 (LPT 1)	Enabled	
IRQ8 (RTC Alarm)	Disabled	
IRQ9 (IRQ2 Redir)	Disabled	
IRQ10 (Reserved)	Disabled	
IRQ11 (Reserved)	Disabled	
IRQ12 (PS/2 Mouse)	Enabled	
IRQ13 (Coprocessor)	Enabled	
IRQ14 (Hard Disk)	Enabled	
IRQ15 (Reserved)	Disabled	

IRQ3 ~ IRQ15
Enables or disables the monitoring of the specified IRQ line. If set to *Enabled*, the activity of the specified IRQ line will prevent the system from entering power saving modes or awaken it from power saving modes.

Note: IRQ (Interrupt Request) lines are system resources allocated to I/O devices. When an I/O device needs to gain attention of the operating system, it signals this by causing an IRQ to occur. After receiving the signal, when the operating system is ready, the system will interrupt itself and perform the service required by the I/O device.

PnP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **P**eripheral **C**omponent **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

```
               CMOS Setup Utility - Copyright(C) 1984-2000 Award Software
                              PnP/PCI Configurations
 ┌──────────────────────────────────────────────────┬──────────────────────────┐
 │  PNP OS Installed              No                  │                          │
 │  Reset Configuration Data      Disabled            │      Item Help           │
 │                                                    ├──────────────────────────┤
 │  Resources Controlled By       Auto (ESCD)         │  Menu Level      ▸       │
 │ x IRQ Resources                Press Enter         │                          │
 │ x DMA Resources                Press Enter         │  Select Yes if you are   │
 │                                                    │  using a Plug and Play   │
 │  PCI/VGA Palette Snoop          Disabled           │  capable operation       │
 │  Assign IRQ For VGA             Enabled            │  system Select No if     │
 │  Assign IRQ For USB             Enabled            │  you need the BIOS to    │
 │  Assign IRQ For ACPI            Auto               │  configure non-boot      │
 │                                                    │  devices                 │
 │                                                    │                          │
 │                                                    │                          │
 │                                                    │                          │
 │                                                    │                          │
 │                                                    │                          │
 ├──────────────────────────────────────────────────┴──────────────────────────┤
 │ ↑↓→←:Move   Enter:Select   +/-/PU/PD:Value   F10:Save   ESC:Exit   F1:General Help │
 │          F5:Previous Values   F6:Fail-Safe Defaults   F7:Optimized Defaults   │
 └──────────────────────────────────────────────────────────────────────────────┘
```

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® 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 card and the system reconfiguration has caused such a serious conflict that the operating system can not boot. Settings: *Enabled*, *Disabled*.

Resources 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® 98/2000. If you set this field to "manual", choose specific resources by going into each sub menu that follows this field. Settings: *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 each item. *IRQ Resources* list IRQ-3/4/5/7/9/10/11/12/14/15 and *DMA Resources* list 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 bus architecture.
Legacy ISA	The IRQ will be reserved for further request.

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

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

The setting must be set to *Enabled* if any ISA adapter card installed in the system requires VGA palette snooping.

Assign IRQ For VGA/USB
Set to *Enabled* allows BIOS to assign an IRQ to VGA card/USB device.
Choose *Disabled* if you want to release the IRQ.

Assign IRQ For ACPI
Selecting *Auto* allows BIOS to automatically assign an IRQ for SCI (System Control Interrupt) of ACPI spec. Settings: *Auto*, *IRQ 9*, *IRQ 10* and *IRQ 11*.

PC Health Status

This section shows the status of your system temperature, CPU core voltage, etc. Monitor function is available only if there is hardware monitoring mechanism onboard.

```
            CMOS Setup Utility - Copyright(C) 1984-2000 Award Software
                               PC Health Status
┌──────────────────────────────────────────┬─────────────────────────┐
│ Current CPU Temp.                          │        Item Help        │
│ Current System Temp.                       │                         │
│ Vcore                                      ├─────────────────────────┤
│   2.5V                                     │  Menu Level   ▸         │
│   3.3V                                     │                         │
│    5V                                      │                         │
│   12V                                      │                         │
│                                            │                         │
│                                            │                         │
│                                            │                         │
│                                            │                         │
│                                            │                         │
│                                            │                         │
│                                            │                         │
│                                            │                         │
│                                            │                         │
├────────────────────────────────────────────────────────────────────┤
│ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help │
│        F5:Previous Values   F6:Fail-Safe Defaults   F7:Optimized Defaults     │
└────────────────────────────────────────────────────────────────────┘
```

Current CPU/System Temp., Vcore, 2.5V, 3.3V, 5V, 12V
These items display the current status of all monitored hardware devices/ components such as CPU voltages, temperatures and so on.

Frequency/Voltage Control

This section describes how to set the CPU FSB frequency, spread spectrum etc.

```
                CMOS Setup Utility - Copyright(C) 1984-2000 Award Software
                              Frequency/Voltage Control
   ┌─────────────────────────────────────────────┬──────────────────────────┐
   │  Auto Detect DIMM/PCI Clk        Enabled     │                          │
   │  Spread Spectrum Modulated       Enabled     │        Item Help         │
   │  CPU Host/PCI Clock              Default      │                          │
   │                                              │  Menu Level    ▸         │
   │                                              │                          │
   │                                              │                          │
   │                                              │                          │
   │                                              │                          │
   │                                              │                          │
   │                                              │                          │
   │                                              │                          │
   │                                              │                          │
   │                                              │                          │
   ├─────────────────────────────────────────────┴──────────────────────────┤
   │  ↑↓→←:Move   Enter:Select   +/-/PU/PD:Value   F10:Save   ESC:Exit   F1:General Help│
   │          F5:Previous Values    F6:Fail-Safe Defaults   F7:Optimized Defaults       │
   └─────────────────────────────────────────────────────────────────────────┘
```

Auto Detect DIMM/PCI Clk
This item is used to auto detect the DIMM/PCI slots. When set to *Enabled*, the system will remove (turn off) clocks from empty DIMM/PCI slots to minimize the electromagnetic interference (EMI). Settings: *Enabled*, *Disabled*.

Spread Spectrum Modulated
This item is used to configure the clock generator's Spread Spectrum feature. Settings: *Disabled*, *Enabled*. Always disable the feature when overclocking the processor.

CPU Host/PCI Clock
This item specifies the clock frequency of CPU host bus (FSB) and PCI bus. It provides a method for end users to overclock the processor. If the item shows *Default*, the clock frequency will use the default value for the CPU host bus and PCI bus.

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:

Load Fail-Safe Defaults (Y/N)? N

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:

Load Optimized Defaults (Y/N)? N

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

Set Supervisor/User Password

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

Enter Password:

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

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

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

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

Glossary

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

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

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

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

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

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

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

example, a modem chipset contains all the primary circuits for transmitting and receiv-ing 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.