

# **4MBO**

**Version 1.0**  
**G52-MA00435**

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### **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.

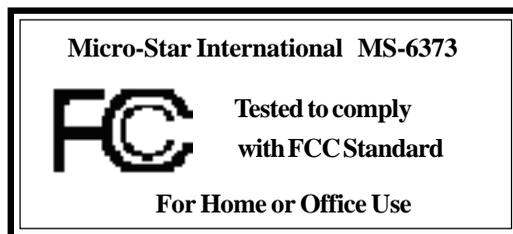
#### **Notice 1**

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**

Sep. 2001

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## **Revision History**

<b>Revision</b>	<b>Revision History</b>	<b>Date</b>
V1.0	First release	Sep. 2001

## 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°C (140°F), IT MAY DAMAGE THE EQUIPMENT.**



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

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# Chapter 1

## Getting Started

### Topic

<i>Specification</i>	1-2
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Congratulations on purchasing the MSI mainboard. *MS-6373* ATX mainboard is an excellent computer mainboard based on the innovative *nForce 420D* chipset, which supports the latest **AMD® Athlon/Athlon XP** processor series and provides you with a cost-effective solution.

This chapter introduces the product features and major components.



# Specification

## **CPU**

- Support Socket A (Socket 462) for AMD Athlon/Athlon XP Processor

## **Chipset**

- nForce 420D chipset
  - Support 200/266MHz FSB
  - Twinbank Memory Architecture/128-bit DDR memory controller
  - Integrated GeForceMX-class advanced Graphics Processing Unit
  - AGP 4x support
  - Hyper Transport interface to MCP (800MB/sec max.)
- MCP (Media Communications Processor)
  - Dual ATA/100 controller
  - Support USB UHCI 1.0a, provide up to six USB ports
  - IEEE 802.3 compatible MAC (MII)
  - Integrated Audio Processor Unit, AC'97 2.1 compliant
  - SPDIF output function (MCP-D)

## **Main Memory**

- Support up to three DDR DIMMs
  - Maximum memory size up to 1.5GB
  - Support 128-bit system memory

## **Slots**

- One AGP slot
  - Support AGP 2.0 2x/4x (1.5V only)
- One CNR slot
- Five PCI slots
  - 32-bit Master PCI 2.2 compliant
  - Support 3.3v/5v PCI bus interface

## **On-board IDE**

- An IDE controller on the MCP chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA 100 operation modes
- Support up to four IDE devices connection

**Video**

- 256-bit 2D/3D graphics accelerator
- The second generation T&L engine, nVIDIA Shading Rasterizer support.

**Audio**

- APU (audio processing unit) integrated in MCP
  - Support up to 256 hardware-processed voices or 64 hardware voice in 3D; support multi-speaker 3D audio
  - S/PDIF out (MCP-D)

**Network**

- Chipset integrated 10/100 Base-T Ethernet/Fast Ethernet

**On-board Peripherals**

- One floppy port that supports two FDD with 360KB, 720KB, 1.44MB and 2.88MB
- One serial port (COM A)
- One parallel port that supports SPP/EPP/ECP modes
- One VGA connector
- Six USB ports (2 x rear connectors and 2 x USB front pin header to support four ports)
- One IrDA connector
- One RJ-45 connector for Ethernet
- One Audio/Game port

**BIOS**

- The mainboard BIOS provides “Plug & Play” BIOS that can detect the peripheral devices and expansion cards installed on the board automatically
- Support Desktop Management Interface (DMI) function that can record your mainboard specifications

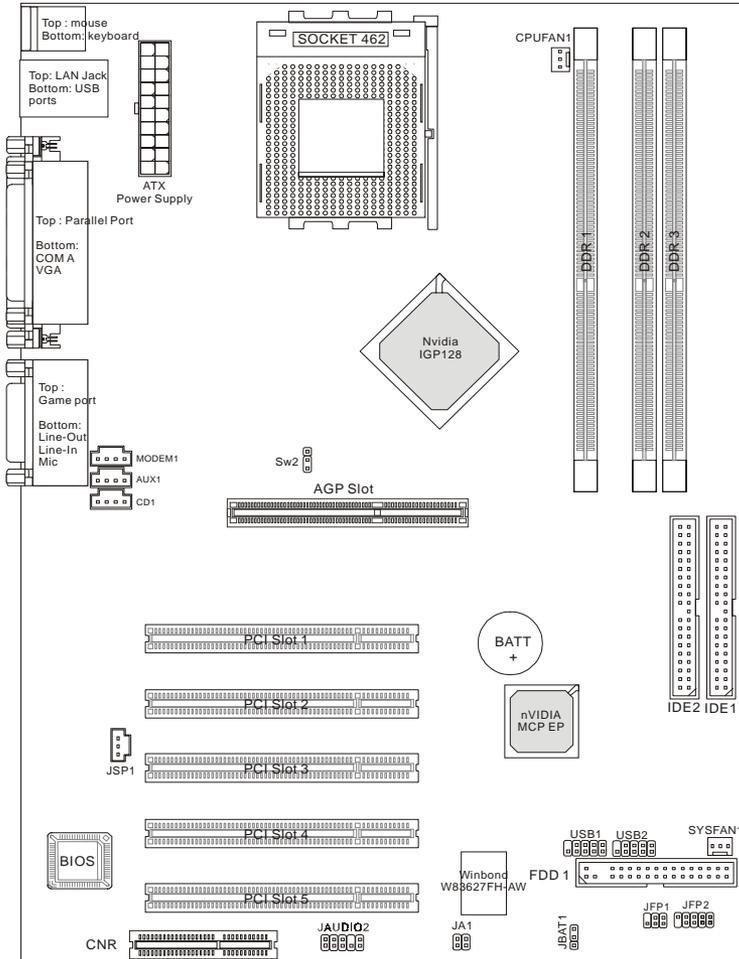
**Dimension**

- 30.5cm x 22.5cm

**Mounting**

- Six mounting holes

# Mainboard Layout



MS-6373 ATX Mainboard

# Features

## General Features

- PC 2001 Compliant
- USB ports support  
The USB (Universal Serial Bus) standard provides you the benefits of having one single interface for connecting multiple devices.
- AGP interface support  
The AGP interface is integrated into the system.
- Plug & Play support  
Your system is PnP version 1.01a compliant.
- Audio subsystem  
Allows you to record, playback, and edit music and voice easily.
- Video subsystem  
Allows you to play video CD, clip files and 3D games easily.
- Build-in LAN function  
Allows your system to be connected to a LAN (Local Area Network) environment easily.
- Power management  
ACPI (Advanced Configuration Power Interface) support.

# *Chapter 2*

# *Hardware Setup*

## **Topic**

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

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



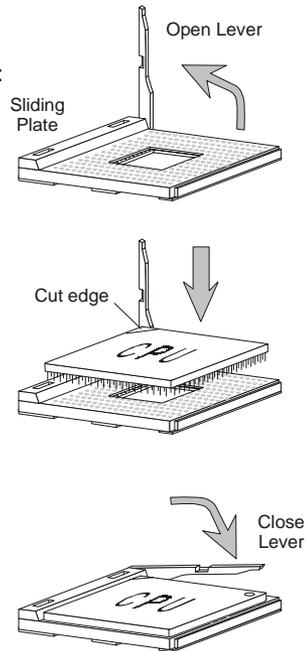
# Central Processing Unit (CPU)

The mainboard provides a Socket A (Socket 462) to support the latest AMD Athlon/Athlon XP processor series. **To avoid the thermal issue\* of the CPU, please make sure that the CPU has a heatsink and a cooling fan attached on its top.**

## CPU Installation Procedure

To install the CPU, please follow the steps below:

1. Pull the lever sideways away from the socket; then, raise it up to a 90-degree angle.
2. Locate the cut edge on the CPU, and point it towards the lever pivot. Insert the pins of the CPU directly into the holes on the socket.
3. Press the lever down to complete the installation.



**Note:** The CPU is designed with the “corner pin” on the two of the four corners; thus, it should only fit in one correctly orientation as installing. In addition, with the weight of the heatsink and cooling fan attached, you can insert the CPU into the socket easily. **DO NOT** press the CPU down by force when installing in wrong orientation, this would bend and damage the CPU’s pins.

## **CPU Core Speed Derivation Procedure**

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

### **\* Thermal issue for CPU**

As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly crucial when building computer system. Maintaining the proper thermal environment is key to reliable operation. As such, the processor must be maintained in the specified thermal requirements. AMD recommends the use of high performance thermal interface material.

AMD Athlon/Athlon XP processors with a speed of 600MHz and above require the LARGER heatsink and cooling fan. You also need to add thermal grease between the CPU and heatsink to improve heat dissipation; then, make sure that the CPU and the heatsink are securely fastened and in good contact with each other. These are needed to prevent damaging the processor and ensuring reliable operation.

For more information on the issue and proper cooling solution, please visit AMD website at: [http:// www.amd.com/products/cpg/athlon/pdf/cooling\\_guide.pdf](http://www.amd.com/products/cpg/athlon/pdf/cooling_guide.pdf)



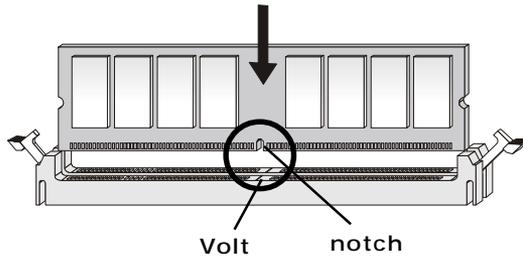
You can install PC1600/PC2100 DDR SDRAM modules on the DDR DIMM slots (DDR 1~3) in any combination as follows:

Socket	Memory Module	Total Memory
DIMM 1	64MB, 128MB, 256MB, 512MB	64MB ~ 512MB
DIMM 2	64MB, 128MB, 256MB, 512MB	64MB ~ 512MB
DIMM 3	64MB, 128MB, 256MB, 512MB	64MB ~ 512MB
Maximum System Memory Supported		64MB ~ 1.5GB

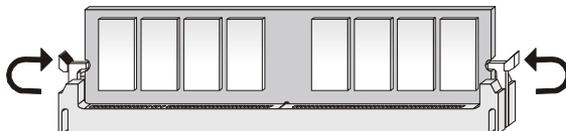
### DDR Module Installation Procedure

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.

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.

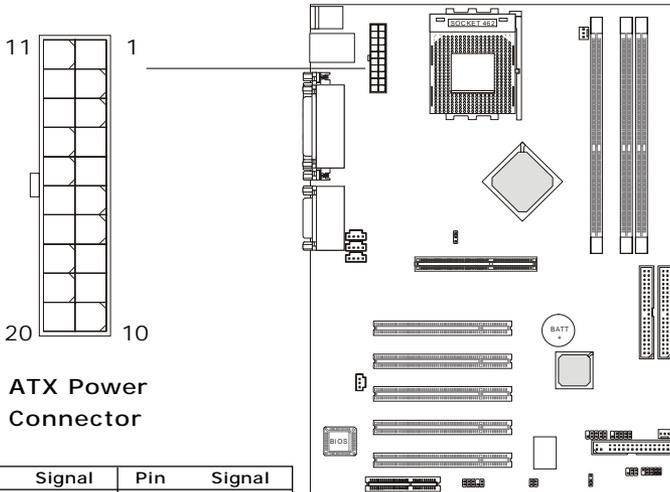


# Power Supply

The mainboard supports ATX power supply for the power system. Before connecting the power supply, always make sure that all components are installed properly.

## ATX 20-pin Power Supply Connector

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

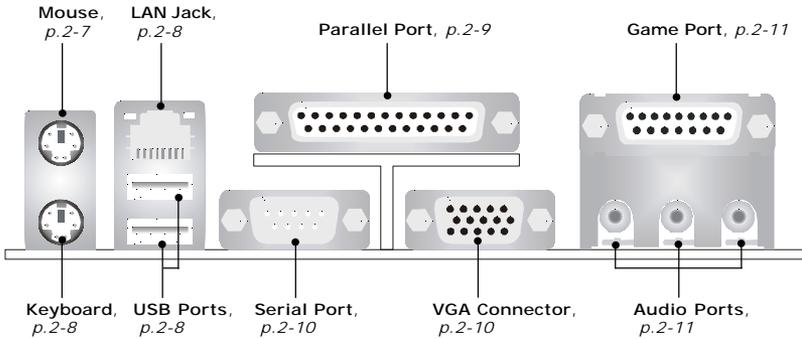


ATX Power Connector

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 on the mainboard provides the following connectors to connect the peripheral devices:



## PS/2 Mouse Connector

The mainboard provides a standard PS/2 mouse mini-DIN connector for attaching a PS/2 mouse.



**PS/2 Mouse**  
(6-pin female)

Pin	Signal	Description
1	Mouse Data	Mouse data
2	N/C	No connection
3	GND	Ground
4	VCC	+5V
5	Mouse Clock	Mouse clock
6	N/C	No connection

## PS/2 Keyboard Connector

The mainboard provides a standard PS/2 keyboard mini-DIN connector for attaching a PS/2 keyboard.

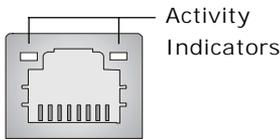


**PS/2 Keyboard**  
(6-pin female)

Pin	Signal	Description
1	Keyboard Data	Keyboard data
2	N/C	No connection
3	GND	Ground
4	VCC	+5V
5	Keyboard Clock	Keyboard clock
6	N/C	No connection

## LAN Jack (RJ-45)

The mainboard provides a RJ-45 connector that allows your computer to be connected to a network environment.



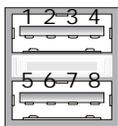
**LAN Jack**  
(RJ-45)

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

## USB Ports

The mainboard provides a UHCI (Universal Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse and other USB-compatible devices. Two USB ports are available on the back panel; for additional USB ports, please use the USB pin header\* to expand the USB ports.

\* See page 2-20, **USB Front Connector: USB1 & USB2**

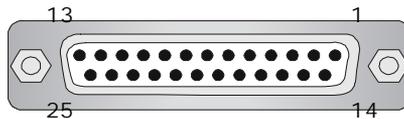


**USB Ports**

Pin	Signal	Description
1	VCC	+5V
2	-Data 0	Negative data channel 0
3	+Data 0	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

## Parallel Port

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



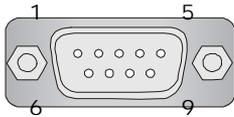
**Parallel Port**

Pin	Signal	Description
1	STROBE	Strobe
2	DATA 0	Data 0
3	DATA 1	Data 1
4	DATA 2	Data 2
5	DATA 3	Data 3
6	DATA 4	Data 4
7	DATA 5	Data 5
8	DATA 6	Data 6
9	DATA 7	Data 7
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

## Serial Port: COM A

The mainboard provides a 9-pin male DIN connector for serial port COM A on the back panel. To connect the second serial port COM B, please use the COM2 connector\* to expand the COM port.

\* See page 2-17, *Serial Port Connector: COM2*



**Serial Port**  
(9-pin male)

Pin	Signal	Description
1	DCD	Data carry detect
2	SIN	Serial in or receive date
3	SOUT	Serial out or transmit date
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 Connector

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

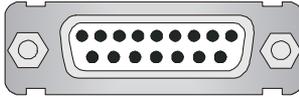


**VGA Connector**  
(DB 15-pin)

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

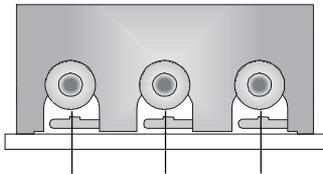
## **Game Port & Audio Ports**

The mainboard provides a game port that allows you to connect the joystick/game pad or MIDI device.



**Game Port**

The mainboard provides the audio ports that allow you to connect the audio input/output devices. **Line Out** is to connect the speakers or earphone; **Line In** is a connector for external CD player, tape player or other audio devices; **MIC** is used to connect to a microphone.

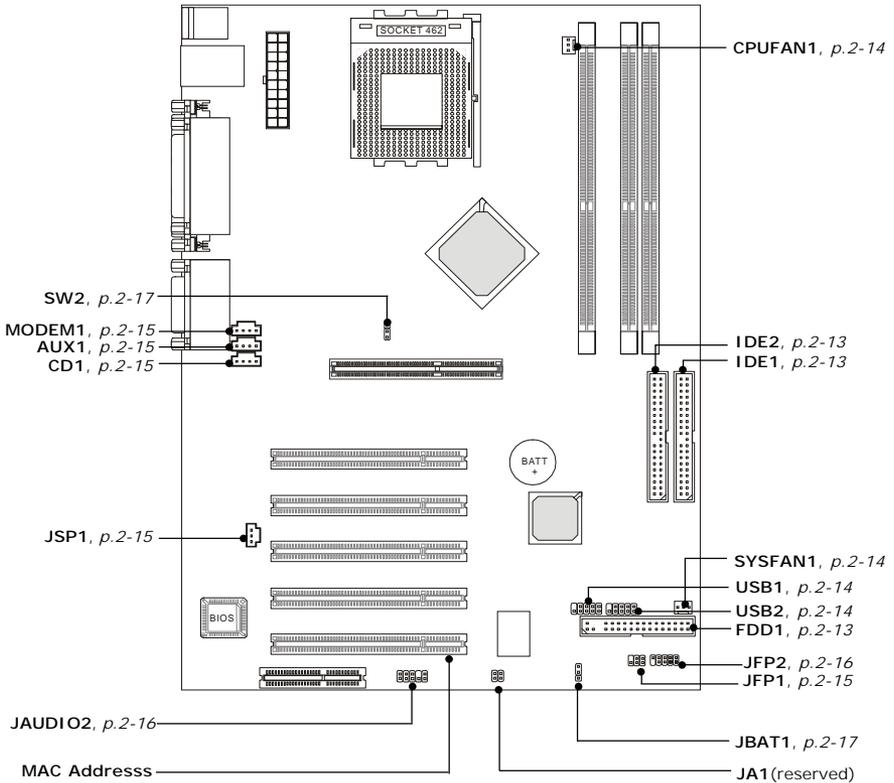


Line-out Line-in MIC

**Audio Ports**

# Connectors & Jumpers

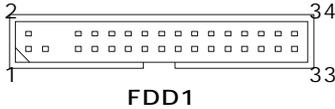
The mainboard provides the connectors to connect to FDD, IDE HDD/CD-ROM, case, modem, USB ports, IR module and the cooling fans. It also provides you with the jumpers that allow you to set the mainboard's function.



**Note:** The MAC Address allows you to check the unique MAC address for LAN.

### **Floppy Disk Drive Connector: FDD1**

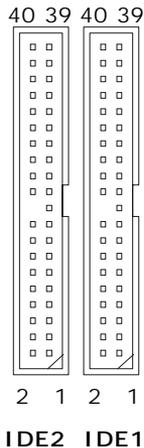
The mainboard provides a standard floppy disk drive connector that supports 360KB, 720KB, 1.2MB, 1.44MB and 2.8MB floppy disk types.



### **IDE Connectors: IDE1/2**

The mainboard provides a 32-bit Enhanced PCI IDE and Ultra DMA 33/66/100 controller that supports PIO mode 0~4, Bus Master, and Ultra DMA 33/66/100 function. You can connect up to four IDE-compliant devices, such as hard disk drive and CD-ROM.

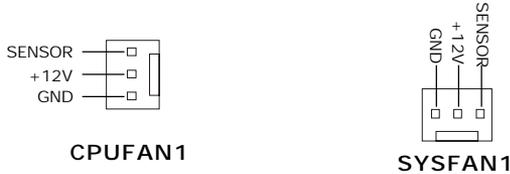
- **IDE1 Connector (Primary IDE):** The first hard disk drive (boot disk) should always be connected to IDE1. You can connect two IDE devices to IDE1.
- **IDE2 Connector (Secondary IDE):** You can connect two IDE devices to IDE2.



 **Tip:** If you install two IDE devices on a IDE connector through a ribbon cable, you must configure the first drive to “**Master**” mode and the second drive to “**Slave**” mode. Refer to the products’ documentation provided by the respective vendors for the jumper setting instructions.

## Fan Connectors: CPUFAN1/SYSFAN1

The CPUFAN1 (CPU fan) and SYSFAN1 (system fan) support system cooling fan with +12V. It supports 3-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 can use a fan designed with speed sensor to take advantage of the CPU fan control.



**Note:**

1. Always consult the vendors for proper CPU cooling fan.
2. CPUFAN 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.

## USB Front Connector: USB1 & USB2

The mainboard provides the Front USB (Universal Serial Bus) pin headers that allow you to connect optional USB ports for front panel.

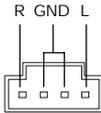


USB1 & USB2 Pin Definition

Pin	Description	Pin	Description
1	VREG_FP_USBPWR0	2	VREG_FP_USBPWR0
3	USB_FP_P0-	4	USB_FP_P1-
5	USB_FP_P0+	6	USB_FP_P1+
7	Ground	8	Ground
9	Key	10	USB_FP_OC0

**CD-In Connector:CD1**

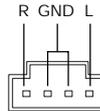
This connector is for CD-ROM audio connector.



**CD1**

**AUX Line-In Connector:AUX1**

This connector is for DVD add-on card with line-in connector.

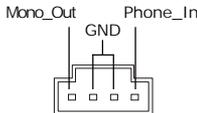


**AUX1**

**Modem-In Connector:**

**MODEM1**

This connector is for modem with internal audio connector.



**MODEM1**

**SPDIF-Out Connector:JSP1**

This connector is used to connect to the audio device with digital signal input.



**JSP1**

---

**IrDA Infrared Module Connector: JFP1**

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



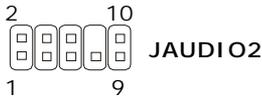
**JFP1**

**JFP1Pin Definition**

Pin	Signal	Pin	Signal
1	Not Assigned	2	
3	+5V	4	GND
5	IRTX	6	IRRX

## Front Panel Audio Connector: JAUDIO2

You can connect an optional audio connector to the Front Panel Audio Header.

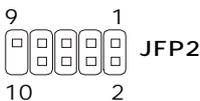


**JAUD2 Pin Definition**

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	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

## Case Connector: JFP2

The case connector block JFP2 allows you to connect to the Power switch, Reset Switch, Keylock, Speaker, Power LED and HDD LED on the case.

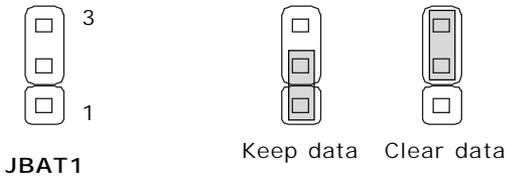


**JFP2 Pin Definition**

PIN	SIGNAL	DESCRIPTION
1	HD_LED_P	Hard disk LED pull-up
2	FP_PWR/SLP	MSG LED pull-up
3	HD_LED_N	Hard disk active LED
4	FP_PWR/SLP	MSG LED pull-up
5	RST_SW_1	Reset Switch 1
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_2	Reset Switch 2
8	PWR_SW_N	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

## 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 and reset the system configuration, use the JBAT1 jumper to clear date.

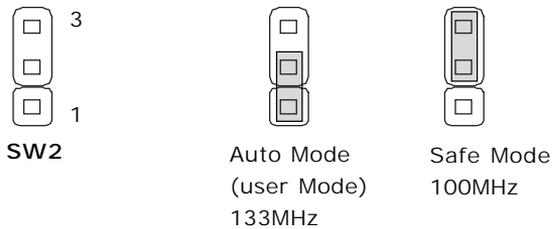


*Note: The battery is suggested to be replaced with a new one if it's not used for more than one year.*

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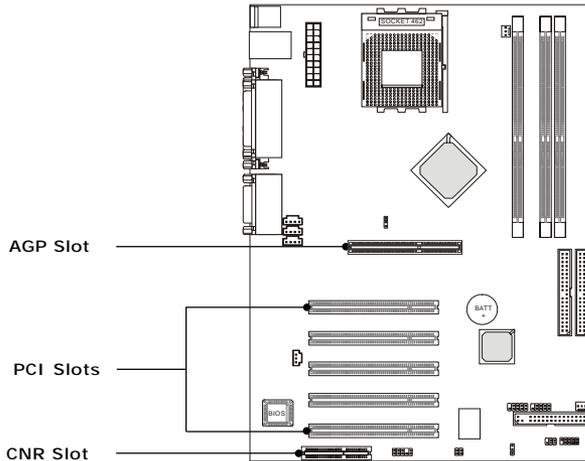
## FSB Mode Jumper: SW2

This jumper allows you to set the CPU FSB mode.



# Slots

The mainboard provide a AGP slot, five 32-bit Master PCI slots, and a CNR slot.



## AGP slot

The AGP slot allows you to install the AGP 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 and provides three levels of throughput: 1x (266Mbps), 2x (533Mbps) and 4x (1.07Gbps).

## PCI slots

The five PCI slots allow you to install the expansion cards to meet your advanced needs, such as the sound card, LAN card, IEEE 1394 card, etc. When adding the expansion card to your system, please read the related documentation provided by the vendors to make any necessary hardware or software settings.

*Note: Do not insert the long card into PCI Slot1 to avoid damaging the battery.*

## CNR slot

The CNR (Communication & Networking Riser) slot allows you to install the CNR card. CNR is a specially designed network/audio/modem riser card for ATX family mainboards. Its main processing is done through software and controlled by the mainboard's chipset.

# Chapter 3

## BIOS Setup

### Topic

<i>Entering SETUP</i>	3-2
<i>Getting Help</i>	3-3
<i>Setup Menus</i>	3-4

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

Turn on the computer. When the below message appears briefly at the bottom of the screen during the POST (Power On Self Test), press <Delete> key or simultaneously press <Ctrl>, <Alt> and <Esc> to enter the SETUP program.

TO ENTER SETUP BEFORE BOOT, PRESS <CTRL-ALT-ESC>  
OR <DEL> KEY

If the message disappears before you respond and you still want to enter SETUP, restart the system by turning off then on the power or pressing the Reset button to try again. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

## Control Keys

After entering the BIOS setup program, you can use the keyboard to navigate through the setup menus and change the settings. A brief description of keyboard usage is listed below:

Key(s)	Function
 	Move to the previous/next item
 	Move to the item in the left/right hand
  or 	Increase/decrease the numeric value or make changes
	Select the item
	Jump to the Exit menu or return to the Main menu from a sub-menu
	General help
	Restore the previous CMOS value from CMOS
	Load BIOS Setup defaults
	Save all the CMOS changes and exit

# Getting Help

## 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 as below) appears to the left of certain fields, which 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 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, 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.

## Default Settings

The BIOS setup program contains two kinds of default settings: the High Performance and BIOS Setup defaults. The High Performance defaults provide the best system performance but may affect the system stability. The BIOS Setup defaults provide basic and stable performance settings for all devices and the system. *Please note that the “default” value described in the chapter usually refers to the*

# Setup Menus

## 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 enter the sub-menu.



## Standard CMOS Features

Use this menu for basic system configurations.

## Advanced BIOS Features

Use this menu to set the items of Award special enhanced features.

## Advanced Chipset Features

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

## Integrated Peripherals

Use this menu to specify your settings of integrated peripherals.

**Power Management Setup**

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

**Load Fail-Safe Defaults**

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

**Load Optimized Defaults**

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

**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 program.

**Exit Without Saving**

Abandon all CMOS value changes and exit Setup program.

## Standard CMOS Features

The items in Standard CMOS Features menu are divided into 13 categories. Each category includes none, 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(mm:dd:yy)

This item allows you to set the system to the date that you specify (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, depends on the year of the BIOS.

### Time(hh:mm:ss)

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

**IDE Primary/Secondary Master/Slave**

Press PgUp/<+> or PgDn/<-> to select the hard disk drive category. The specification of hard disk drive will show on the right hand according to your selection. You can press <Enter> to enter the sub-menu. The sub-menu will appear as the following example:



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

**Drive A/B**

The two items allow you to set the type of floppy drivers installed. Available options are [None], [360K, 5.25 in], [1.2M, 5.25 in], [720k, 3.5 in], [1.44M, 3.5in], and [2.88M, 3.5in].

**Video**

This item allows you to set the type of video card. Available options are [EGA/VGA], [CGA40], [CGA80], and [MONO].

**Halt on**

This item allows you to set the type of errors that will cause system halt on. Available options are [All Errors], [No Errors], [All, But Keyboard], [All, But Diskette], and [All, But Disk/Key].

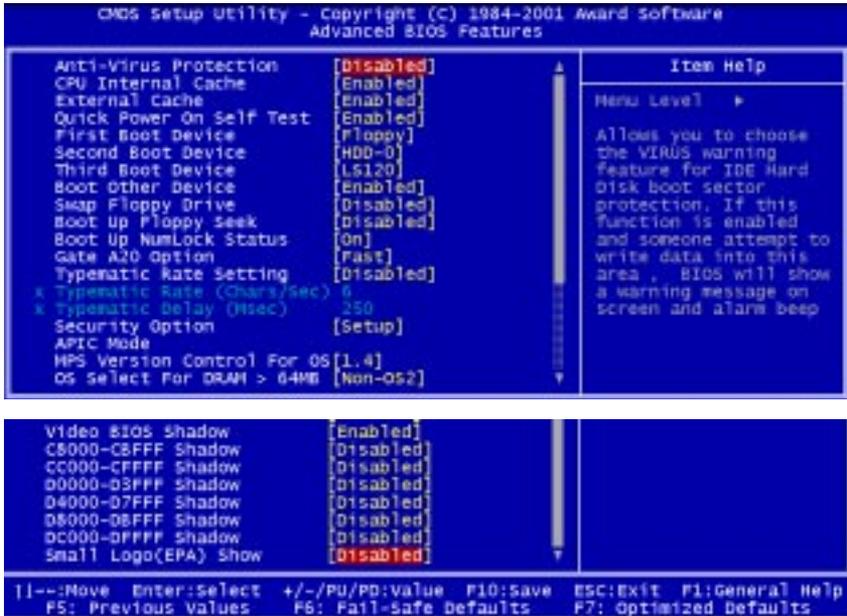
## **CHAPTER 3**

- All Errors***            The system will halt on and display the error message if any error happens.
- No Errors***            The system will not halt on no matter any error happens.
- All, But Keyboard***    The system will halt on if any error happens. But the system will not halt on if the keyboard function is not normal.
- All, But Diskette***    The system will halt on if any error happens. But the system will not halt on if the disk drive function is not normal.
- All, But Disk/Key***    The system will halt on if any error happens. But the system will not halt on if the disk drive and keyboard function is not normal.

### **Base/Extended/Total Memory**

The three items show the memory status of your system (read only).

## Advanced BIOS Features



### Anti-Virus Protection

This item allows you to choose the virus-warning feature for IDE hard disk boot sector protection. If this function is enabled and someone attempts to write data into this area, BIOS will show a warning message on screen and alarm beeps. Available options are [Disabled] and [Enabled].

### CPU Internal Cache

Cache memory is additional memory that is much faster than the system memory. This item allows you to enable or disable the level 1 (L1) cache. The internal cache is built in the processor. Available options are [Disabled] and [Enabled].

### External Cache

This item allows you to enable or disable the level 2 (L2) cache. Available options are [Disabled] and [Enabled].

## **CHAPTER 3**

### **Quick Power On Self Test**

This item allows you to speed up Power On Self Test (POST) after you power on the computer. If this is set to [Enabled], BIOS will shorten or skip some check items during POST. Available options are [Disabled] and [Enabled].

### **First/Second/Third Boot Device**

These three items allow you to set the sequence of boot device from that the BIOS attempts to load the operating system. Available options are [Floppy], [LS120], [HDD-0], [SCSI], [CDROM], [HDD-1], [HDD-2], [HDD-3], [ZIP100], [LAN], and [Disabled].

### **Boot Other Device**

This item allows the system to try to boot from other device if the system fails to boot from the 1st/2nd/3rd boot device. Available options are [Disabled] and [Enabled].

### **Swap Floppy Drive**

This item allows you to choose from the default of [Disabled] or choose [Enabled] to switch the floppy disk drives between being designated as A and B. Available options are [Disabled] and [Enabled].

### **Boot Up Floppy Seek**

This function allows the system to check if floppy installed or uninstalled when booting up the computer. Available options are [Disabled] and [Enabled].

### **Boot Up Num-Lock Status**

This item allows you to set the NumLock status when you boot up your computer. When you choose from the default of [On], the keypad is numeric keys; when you choose [Off], the keypad is arrow keys. Available options are [On] and [Off].

### **Gate A20 Option**

This allows you to set the Gate A20 status. When set to [Fast], Gate A20 is controlled by chipset. When set to [Normal], Gate A20 is controlled by a specific pin from the keyboard controller. Available options are [Fast] and [Normal].

**Typematic Rate Setting**

This item allows you to set the keystrokes repeat rate determined by keyboard controller. When set to [Enabled], the following two items **Typematic Rate** and **Typematic Delay** can be selected. Available options are [Disabled] and [Enabled].

**Typematic Rate (Chars/Sec)**

This item allows you to set the number of times a second to repeat a keystroke when you hold the key down. Available options are [6], [8], [10], [12], [15], [20], [24], and [30]. Default value is [6].

**Typematic Delay (Msec)**

This item allows you to set the delay time before the key begins to repeat the keystroke while holding down the key. Available options are [250], [500], [750], and [1000]. Default value is [250].

**Security Option**

This item allows you to limit access to the system and Setup program, or just to Setup program. When set to [Setup], the system will boot, but access to Setup program will be denied if the correct password is not entered at the prompt. When you choose [System], the system will not boot and access to Setup program will be denied if the correct password is not entered at the prompt. Available options are [Setup] and [System].

**APICMode**

This item 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. Available options are [Enabled] and [Disabled].

**MPS Version Control For OS**

This item 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. Available options are [1.4] and [1.1].

## **CHAPTER 3**

### **OS Select For DRAM > 64MB**

This item is set for the users running OS/2® operating system. When set to [Non-OS2], you can not run the OS/2® operating system when DRAM installed is larger than 64 MB. When set to [OS2], it is possible. Available options are [Non-OS2] and [OS2].

### **Video BIOS Shadow**

This item allows you to increase the video performance by caching the data from video ROM to Shadow RAM. When set to [Enabled], the system obtains better video performance but, at this time, any program attempts to write to this memory area will cause a system error. Available options are [Disabled] and [Enabled].

### **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. Available options are [Disabled] and [Enabled].

### **Small Logo (EPA) Show**

This item allows you to enable or disable the full screen Logo show capability. Available options are [Disabled] and [Enabled].

## Advanced Chipset Features



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

### 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. Available options are [Enabled] and [Disabled].

### Video RAM Cacheable

Selecting [Enabled] allows caching of the video RAM, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Available options are [Enabled] and [Disabled].

### DDRAM Auto Precharge (W/R)

This allows you to set the function of DDR Auto Precharge Write or Read. Available options are [Enabled] and [Disabled].

### Monochrome Access

This allows you to control when MDA (Monochrome Display Adapter) accesses are sent to the AGP device or to PCI bus. Available options are [AGP] and [PCI].

## **CHAPTER 3**

### **AGP Aperture Size (MB)**

This item allows you to select 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. Available options are [Disabled], [32MB], [64MB], [128MB], [256MB], and [512MB].

### **AGP Bus Driving Control**

This field is used to adjust the AGP driving force. Selecting [Manual] allows you to select an AGP driving force in **AGP Bus Driving Value**. It is strongly suggested to select [Auto] to avoid causing any system error.

### **AGP Bus Driving Value**

This item specifies an AGP bus driving value. Available options are [Weakest], [Medium], and [Strongest].

### **Frame Buffer Size**

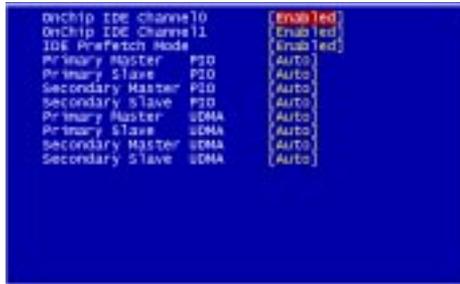
Frame Buffer is the video memory that stores data for video display (frame). Larger frame buffer size increases video performance. Available options are [16M], [32M], and [Disabled].

## Integrated Peripherals



### MCP OnChip IDE Device

Press <Enter> to enter the sub-menu, which contains the following items for advanced control:



### OnChip IDE Channel0/1

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.

## CHAPTER 3

### Primary/Secondary Master/Slave PIO

The four fields 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.

### 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, select [Auto] to enable BIOS support.

### MCP OnChip PCI Device

Press <Enter> to enter the sub-menu, which contains the following items for advanced control:



### MCP AC97 Audio

This item allows you to enable/disable the MCP chipset's feature to support AC97 Audio.

### MCP OnChip Lan

This item allows you to enable/disable the onboard LAN function.

### MCP SPDIF Out

This item allows you to enable/disable the onboard S/PDIF function.

**Onboard SuperIO Device**

Press <Enter> to enter the sub-menu, which contains the following items for advanced control:



**Onboard FDC Controller**

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

**Onboard Serial Port 1**

Select an address and corresponding interrupt for the first and second serial ports. Available options are [3F8/IRQ4], [2E8/IRQ3], [3E8/IRQ4], [2F8/IRQ3], [Disabled], and [Auto].

**UART Mode Select**

This item allows you to determine which InfraRed(IR) function of the onboard I/O chip, this functions uses.

**RxD, TxD Active**

This item allows you to determine the active of RxD, TxD. Available options are [Hi, Hi], [Lo,Lo], [Lo,Hi], and [Hi,Lo].

**IR Transmission Delay**

This item allows you to enable/disable the IR transmission delay. Available options are [Enabled] and [Disabled].

## **CHAPTER 3**

### **UR2 Duplex Mode**

This item allows you to select the IR half/full duplex function. Available options are [Half] and [Full].

### **Use IR Pins**

Consult your IR peripheral documentation to select the correct setting of the TxD and RxD signals.

### **Onboard Parallel Port**

Select a logical LPT port address and corresponding interrupt for the physical parallel port.

### **Parallel Port Mode**

The item allows you to select the operating mode for the parallel port. Available options are [SPP], [EPP], [ECP], and [ECP+EPP].

### **EPP Mode Select**

The item allows you to select the EPP version by the parallel port when the port is set to [EPP] or [ECP+EPP] mode. Available options are [EPP1.7] and [EPP1.9].

### **ECP Mode Use DMA**

The item automatically specifies an DMA channel 1 or 3 for the parallel port when it is set to [EPP] or [ECP+EPP] mode.

### **Game Port Address**

The items disable or assign the address of the Game port.

### **Midi Port Address**

The items disable or assign the address of the Midi port.

### **Midi Port IRQ**

The item specifies an IRQ for the Midi port.

### **Init Display First**

Initialize the AGP video display before initializing any other display device on the system. Thus the AGP display becomes the primary display. Available options are [PCI slot] and [AGP].

**OnChip USB**

Select [Enabled] if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. Available options are [Enabled] and [Disabled].

**USB Keyboard Support**

Select [Enabled] if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard. Available options are [Enabled] and [Disabled].

**BIOS Protect**

This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When set to [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 BIOS protection function.

**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. Available options are [Enabled] and [Disabled].

**POWER ON Function**

This function allows you to select the item to power on the system. Available options are [BUTTON ONLY], [Keyboard 98], [Password], [Hot Key], [Mouse Left], and [Mouse Right].

**KB Power ON Password**

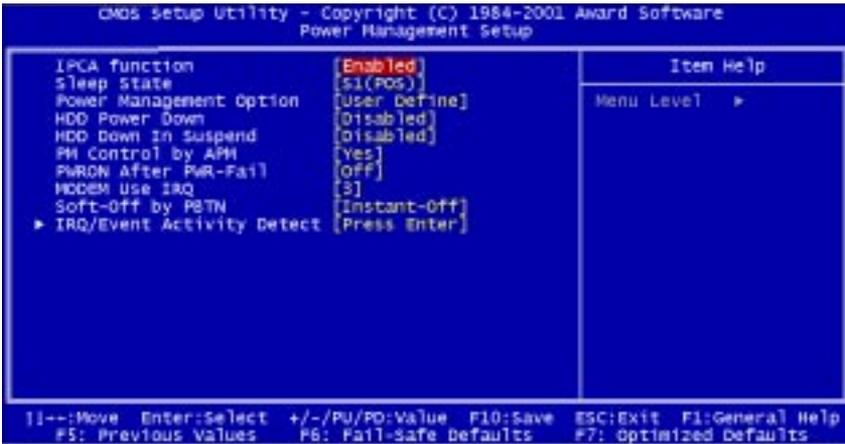
Normally, this item is unselectable. To enable this function, choose the [Password] setting in **POWER ON Function**. This will allow you to input the password for the KB power on function.

**Hot Key Power ON**

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

## 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 allows you to set ACPI (Advanced Configuration and Power Management) function. Available options are [Enabled] and [Disabled].

### Sleep State

This item specifies the power saving modes for ACPI function. Available options are.

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

***S3(STR)*** The S3 state is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains power 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.

**Power Management Option**

This category allows you to select the type (or degree) of power saving and is directly related to the following items: **Standby Mode** and **HDD Power Down**. There are three selections for Power Management, two of which have fixed mode settings:

<b><i>Min Power Saving</i></b>	Minimum power management. Standby Mode = 1 Hour; HDD Power Down = 15 min.
<b><i>Max Power Saving</i></b>	Maximum power management. Standby Mode = 30 Sec; HDD Power Down = 1 min.
<b><i>User Defined</i></b>	Allows you to set the values of each mode individually.

**HDD Power Down**

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

**HDD Down In Suspend**

This item determines whether the hard disk drive will be turned off during suspend mode. Available options are [Enabled] and [Disabled].

**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 are *Yes* and *No*. Default is *Yes*.

**PWRON After PWR-Fail**

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

<b><i>Off</i></b>	Leaves the computer in the power off state.
<b><i>On</i></b>	Reboots the computer.
<b><i>Former-Sts</i></b>	Restores the system to the state before power failure.

**MODEMUseIRQ**

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*.

## CHAPTER 3

### Soft-Off by RBTN

This item allows you to configure the power button as a normal power ON/OFF button or a soft-off button. Settings are:

***Instant-Off***

The power button functions as a normal power ON/OFF button.

***Delay 4 Sec.***

Pressing the power button for more than 4 seconds will place the system in a very low-power-usage state (Soft-Off state), with only enough circuitry receiving power to detect power button activity or Wake Up On LAN/Ring activity.

### IRQ/Event Activity Detect

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



### USB Resume from S3/S4/S5

Allows the activity of USB device to wake up the system from S3, S4 or S5 power saving modes. Settings are *Enabled* and *Disabled*.

*Note: S3/S4/S5 are three system states for ACPI, which reduce different amount of power consumption. S3 is STR (Suspend to RAM) sleep mode, S4 is Suspend to Disk mode and S5 is Soft-Off state.*

**Power On by PCI Card/Wake Up On LAN/Ring**

These items 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.

**RTC Resume**

This is to enable or disable the feature of booting up the system on a scheduled time/date. Settings are *Enabled* and *Disabled*.

**IRQs Activity Monitoring**

Press <Enter> to enter the sub-menu. A similar screen to the following appears:



IRQ3 ~ IRQ15 enable or disable 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 the PCI bus system configuration. PCI (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 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 98. When set to [No], BIOS will initialize all the PnP cards. So, select [Yes] if your 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. Available options are [Enabled] and [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. When set to [manual], you can choose specific resources by going into each of the sub menu that follows this field (a sub-menu is preceded by a “8”). Available options are [Auto(ESCD)] and [Manual]. (If you choose *Auto*, the IRQ Resources will not have function.)

**IRQ Resources**

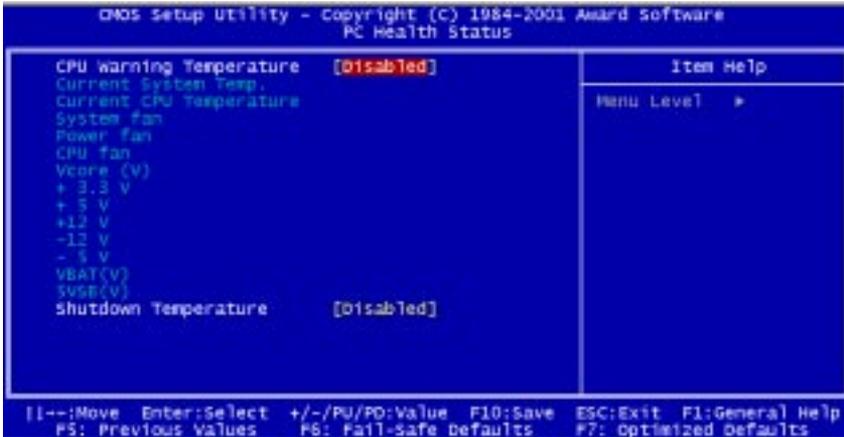
This item is adjustable only when **Resources Controlled By** is set to [Manual]. Press [Enter] and you will enter the sub-menu of the items. This item lists IRQ 3/4/5/7/9/10/11/12/14/15 for users to set each IRQ a type depending on the type of device using the IRQ/DMA.

**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). Available options are [Enabled] and [Disabled].

## PC Health Status

This section helps you to get more information about your system including CPU temperature, FAN speed and voltages. It is recommended that you contact with your mainboard supplier to get proper value about your setting of the CPU temperature.



### CPU Warning Temperature

Select the combination of lower and upper limits for the CPU temperature. If the CPU temperature extends beyond either limit, any warning mechanism programmed into your system will be activated. Available options are [50°C/122°F], [53°C/127°F], [56°C/133°F], [60°C/140°F], [63°C/145°F], [66°C/151°F], [70°C/158°F], and [Disabled].

### Current SystemTemp./Current CPU Temperature/System fan/Power fan/CPU fan/Vcore(V)/+3.3V/+ 5V/+ 12V/- 12V/- 5V/VBAT(V)/5VSB(V)

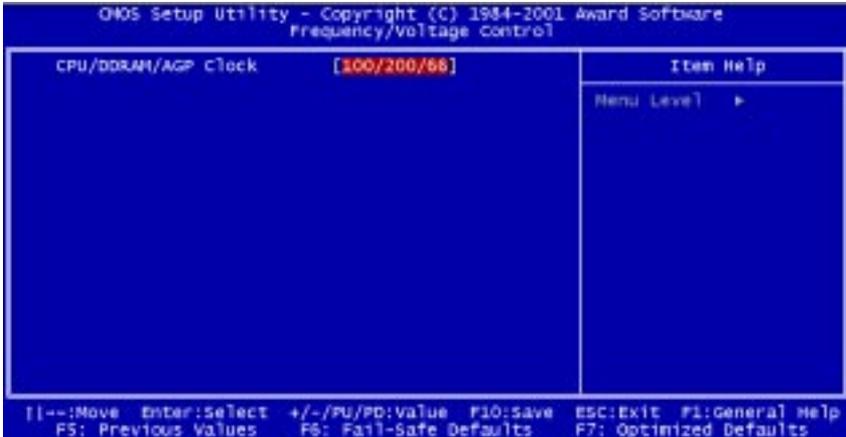
These items display the current status of all of the monitored hardware devices and components such as CPU voltages, temperatures and all fans's speed.

### Shutdown Temperature

This item allows you to set the shutdown temperature level for the processor. When the processor reach the temperature you set, this will shutdown the system. This function only works in ACPI-aware OS (such as Windows 98/ME/2000). Available options are [60°C/140°F], [65°C/149°F], [70°C/158°F], [75°C/167°F], and [Disabled].

## Frequency/Voltage Control

This section is for setting CPU Frequency/Voltage Control.



### CPU/DDRAM/AGP Clock

This item specifies the clock frequency of CPU host bus, DDR RAM bus, and AGP bus. Available options are [100/200/66], [100/266/66], [133/200/66], and [133/266/66].

## **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 the optimal performance of the mainboard. The Fail-Safe Defaults are the default values set by the BIOS vendor for the 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 system performance.

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



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 clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

When a password has been enabled, 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 require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

### About Supervisor Password & User Password:

- ◆ **Supervisor Password:** Can enter and change the options of the setup menus.
- ◆ **User Password:** Can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

## **Save & Exit Setup/Exit without Saving**

When you finish the changes and want to quit the Setup program, select **Save & Exit Setup**. A message as below will appear on the screen:



SAVE to CMOS and EXIT (Y/N)? Y

Type “Y” to quit the Setup program and save the user setup value to RTC CMOS. Type “N” to return to Setup program.

When you want to quit the Setup program and leave the original settings, select **Exit without Saving**. A message as below will appear on the screen:



Quit Without Saving (Y/N)? N

Type “Y” to quit the Setup Utility without saving data to RTC CMOS. Type “N” to return to the Setup program.

## ***Appendix A: Recommended Devices***

### **DDR MEMORY**

SEC K4H280838B-TCBO 128MB PC2100  
Hyundai HY5DU28822T-H 128MB PC2100  
Winbond W942516AH-7 128MB PC2100  
Micron MT46V16M8TG-75 128MB PC2100  
Toshiba TC59WM807BFT-70 256MB PC2100  
Winbond W942508AH-7 256MB PC2100  
Micron MT46V16M8TG-75A 256MB PC2100  
SAMSUNG K4H28083C-TCBO 128 MB PC2100

### **USB Device**

Microsoft Natural Keyboard Pro  
Microsoft Internet USB Keyboard Pro  
BTC Keyboard 5200TU  
Logitech M-UB48  
Logitech M-BA47  
Logitech Wheel Mouse M-BJ58  
Microsoft IntelliMouse Optical  
DEXIN A2U800A USB Mouse  
Microsoft Side Winder Dual Strike  
Microsoft Side Winder FreeStyle Pro  
Microsoft Side Winder Game Pad Pro  
Logitech Wingman Force 3D  
Logitech Wingman Force Strike  
Logitech Wingman Formula Force GP  
Microsoft Side Winder Precision Pro  
Microsoft Side Winder Precision 2  
Plustek Opticam 500U  
Logitech Quick WEB V-UD10  
Logitech Quick Cam Pro 3000 V-UF6  
Microsoft Digital Sound System 80  
EPSON Expression 1600 Scanner  
HP DESKJET 1220C

EPSON STYLIS PHOTO 290  
Iomega Z100 USB ZIP  
Iomega 250USB ZIPData FAB USB-SLIM FloppyData  
FAB USB-SLIM FloppyData  
FAB MD2 (E)-USB (2.5" Hard disk)  
Detroit LinQ USB Cable  
3COM 3C19250 10M

## **CD ROM**

Philip PCR804  
Creative RW8433E  
RICOH MP7120A  
RICOH MP9120A  
RICOH MP7200A-NP  
Lite-On LTR-0841  
Lite-On LTR-16102B  
SAMSUNG SW-216BEN

## **DVD ROM**

Hitachi GD-7500  
Pioneer DVD-116  
Aopen DVD-1648  
Panasonic SR-8586-B  
Lite-On LTD-163CD ROM  
TEAC CD-540E 40X  
ARTEC DHI-G40  
MSI MS-8212

## **CDRW ROM**

TEAC CD-540E

Mitsumi CRMC-FX4820T

Philips PCCD048

Gateway CRD-8483

ACER CD-650P

SONY CDU5211

Lite-On LTN-526

AOPEN CD-952E/TKU

MSI MS-8152

## **PCI Modem Card**

CIS WS-5614HSM PCI 2.2

CIS WS-5614PSL PCI 2.2 (Motorola)

CIS WS-5614PM3C PCI 2.2 (Rockwell)

GVC Gateway Telepath Internet 56K WinModem (Lucent)

E-Tech PCI56PVP+ 56K V.90 (Pctel Plus)

Jaton Win Mod V9.0 56K (Lucent)

# Appendix B: DDR DIMM Configuration

## Configuration Rules

Observe the following rules when configuring DDR DIMMs:

1. Follow correct DIMM installation order. DIMMs must be populated consecutively, in order, starting with the DIMM1 socket.
2. Do not populate DIMM3 socket with any dual load (dual bank) modules.

**Note:** Dual load refers to physical device beds on the data bus

**Note:** For best performance on 128bit system, we recommend you to use the same DDR DIMM for both slots.

Socket	Data Width	Bandwidth
DIMM1	64bit	2.1GB/s
DIMM2	128bit	4.2GB/s
DIMM3	128bit	4.2GB/s

## Population Rules

Table 1. Memory Loads

Capacity	DIMM1 (A0)	DIMM2 (B0)	DIMM3 (B1)
128MB	64MB - 1B or 2B	64MB - 1B or 2B	X
192MB	128MB - 1B or 2B	64MB - 1B or 2B	X
256MB	128MB - 1B or 2B	128MB - 1B or 2B	X
128MB - 1B or 2B	64MB - 1B or 2B	64MB - 1B	64MB - 1B
384MB	256MB - 1B or 2B	128MB - 1B or 2B	X
128MB - 1B or 2B	128MB - 1B or 2B	128MB - 1B	128MB - 1B
512MB	256MB - 1B or 2B	256MB - 1B or 2B	X
256MB - 1B or 2B	128MB - 1B or 2B	128MB - 1B	128MB - 1B
768MB	512MB - 1B or 2B	256MB - 1B or 2B	X
256MB - 1B or 2B	256MB - 1B or 2B	256MB - 1B	256MB - 1B
1GB	512MB - 1B or 2B	512MB - 1B or 2B	X
512MB - 1B or 2B	256MB - 1B or 2B	256MB - 1B	256MB - 1B
1.25GB	512MB - 1B or 2B	512MB - 1B or 2B	256MB - 1B
1.5GB	512MB - 1B or 2B	512MB - 1B or 2B	512MB - 1B

**Note:**

Memory loads must be distributed as provided in the Table 1. Not all possible combinations are listed in the table. Populate designs only with DIMMs that follow JEDEC standard 184-pin unbuffered non-ECC DDR DIMMs. DDR DIMMS with CAS LATENCY of 2.0 (PC2100A) or 2.5 (PC2100B) are supported.

**Legend:**

1B: A one bank (single load) module

2B: A two bank (dual load) module

64MB - 1B: 64MB DDR DIMM using 4 8Mx16 (128Mb) devices - ONE BANK

64MB - 2B: 64MB DDR DIMM using 8 4Mx16 (64Mb) devices - TWO BANKS 1

128MB - 1B: 128MB DDR DIMM using 8 16Mx8 (128Mb) devices - ONE BANK

128MB - 2B: 128MB DDR DIMM using 8 8Mx16 (128Mb) devices - TWO BANKS

256MB - 1B: 256MB DDR DIMM using 8 32Mx8 (256Mb) devices or 16 32Mx4  
(128Mb) devices - ONE BANK 2

256MB - 2B: 256MB DDR DIMM using 16 16Mx8 (128Mb) devices – TWO BANKS

512MB - 1B: 512MB DDR DIMM using 16 64Mx4 (256Mb) devices – ONE BANK

512MB - 2B: 512MB DDR DIMM using 16 32Mx8 (256Mb) devices – TWO BANKS

X: DO NOT POPULATE

**Notes:**

1 64MB - 2B is an uncommon configuration and is included in the population matrix for completeness

2 256MB - 1B using 16 32Mx4 devices is an uncommon configuration and is included in the population matrix for completeness

3 512MB - 1B using 16 64Mx4 devices is an uncommon configuration and is included in the population matrix for completeness