

# **Motherboard User's Guide**

**November 1998**

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Statement  
FCC Notice - Part 15**

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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- ◆ Reorient or relocate the receiving antenna.
- ◆ Increase the separation between the equipment and the receiver.
- ◆ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ◆ Consult the dealer or an experienced radio/TV technician for help.

Use only shielded cables to connect I/O devices to this equipment.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

**Canadian Department of Communication Radio  
Frequency Interference Statement**

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

## About This Guide

Congratulations on your purchase of this new motherboard. This user's guide provides information on the installation and setup procedures for your new motherboard.

**Chapter 1: Specifications** lists the standard features and technical specifications of the motherboard.

You can find the motherboard layout in **Chapter 2: Connectors and Jumpers**. Through this chapter, you can acquaint yourself with the functions and locations of different connectors and jumpers on your motherboard.

For information on BIOS Setup Utility, please refer to **Chapter 3: BIOS Setup**. You may need to look into this chapter if you are installing new peripherals into your system, or would like to change system settings such as power management, ...

If you need to install or replace CPU or memory, refer to **Chapter 4: Installation**.

For procedures on device driver installations, refer to **Chapter 5: Device Driver Installations**.

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# Chapter 1

## *Specifications*

This chapter lists standard features and technical specifications of your motherboard.

### **Standard Features**

- ☆ High performance system using Intel Celeron, Mendocino or Pentium II CPU
- ☆ Designed using Intel 440 Basic PC processor
- ☆ Intel 82443EX (82443LX) PCI/AGP controller (PAC)
- ☆ Intel 82371EB PCI/ISA/IDE Xcelerator (PIIX4E)
- ☆ Integrated ATI Rage IIC 1X AGP (Rage Pro Turbo 2X AGP) controller
- ☆ Integrated IDE, USB and DMA controllers
- ☆ 2MB Flash ROM with AMI BIOS
- ☆ Two 3.3V, 168-pin DIMM sockets, for maximum of 256MB SDRAM memory
- ☆ Integrated ESS Solo-1 PCI sound chip
- ☆ Integrated SMC FDC37M707QFP Super I/O controller
- ☆ Supports ACPI 1.0 and APM 1.2 power management, Plug & Play compatible and single-jumper configuration
- ☆ Built-in ports: serial port, parallel, PS/2 keyboard, PS/2 mouse, IrDA-compatible interface, USB ports x2, game/MIDI port, microphone in, audio line in, and audio line out
- ☆ Expansion slots: ISA slot x1, PCI slots x2
- ☆ micro-ATX form-factor, ATX backwards compatible
- ☆ Runs under Windows 98

## Technical Specifications

### **CPU (Central Processing Unit)**

- Advanced Intel CPU: Single Celeron → 266MHz core without L2 cache; Mendocino → 300MHz core with 128KB L2 cache integrated on the CPU die; or Pentium II → 233/266/300/333MHz core with 512KB L2 cache
- 66MHz CPU-Host bus speed
- Supports all Pentium II processor speeds, voltages, and bus frequencies
- Slot 1 connector
- Numeric Coprocessor that significantly increases the speed of floating-point operations and complies with ANSI/IEEE standard 754-1985

### **Intel 440 Basic PC Processor**

- Intel 82443EX (82443LX) PCI/AGP controller (PAC):  
*Integrated PCI bus mastering controller and Integrated Accelerated Graphics Port (AGP) controller*
- Intel 82371EB PCI/ISA/IDE Xcelerator (PIIX4E)
- Supports up to four IDE drives or devices: *Multifunction PCI-to-ISA bridge; USB and DMA controllers; two fast IDE interfaces; power management logic; real-time clock*

### **Power Management**

- PC97 compliant APM (Advanced Power Management) 1.2 power management feature supported
- ACPI (Advanced Configuration and Power Interface) 1.0 power management feature supported in hardware. To enable this feature, OS support and BIOS upgrade is necessary.

## **Memory**

- 2MB Flash ROM with AMI BIOS
- Two DIMM (dual inline memory module) sockets provided for expansion to 256MB maximum memory
- 168-pin 3.3V SDRAMs<sup>1</sup> supported, memory access time of SDRAMs must be 66MHz
- 64-bit non-ECC memory
- Different sizes of SDRAMs can be installed, BIOS automatically detects the memory size
- Single- or double-sided SDRAMs in the following sizes are supported:

<b>DIMM Size</b>	<b>Non-ECC type</b>
8MB	1Mbit x 64
16MB	2Mbit x 64
32MB	4Mbit x 64
64MB	8Mbit x 64
128MB	16Mbit x 64

## **Built-in I/Os**

- SMC FDC37M707QFP Super I/O controller
- Floppy Disk Controller (FDC)
- FIFO serial port and multi-mode parallel port
- PS/2 Keyboard and mouse controller
- IrDA-compatible interface
- Real-time clock/calendar
- CMOS RAM to maintain system configuration
- Two USB (Universal Serial Bus) port interfaces
- Game/MIDI port

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<sup>1</sup> SDRAM (Synchronous DRAM) improves memory performance by having memory access time in synchronous with memory clock cycle. This simplifies the timing design and increases memory speed since all timing is dependent on the number of memory clock cycles.

- Microphone in jack, audio line in jack, and audio line out jack
- Expansion slots: PCI slots x2, ISA slot x1

### **Integrated ATI Rage IIC 1X AGP (Rage Pro Turbo 2X AGP) Controller**

### **Integrated ESS Solo-1 PCI Sound Chip**

### **Wake-on-LAN (WOL) feature**

This feature enables a management application to remotely power up your system, perform remote PC setup, update and perform asset tracking after office hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted.

## **Environmental Specifications**

### **Ambient Temperature**

*Operating: 50 °F to 104 °F (10 °C to 40 °C)*

*Non-operating: 5 °F to 140 °F (- 15 °C to 60 °C)*

NOTE: Safety regulations for operating temperature is set at 25°C ±5°C.

### **Humidity**

*Operating: 15% to 80%, no condensation*

*Non-operating: 10% to 90%, no condensation*

## **Unit Dimensions**

*Motherboard: 225.4 x 243.8 mm*

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**REMARK**

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*Specifications are subject to change without prior notice.*

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# Chapter 2

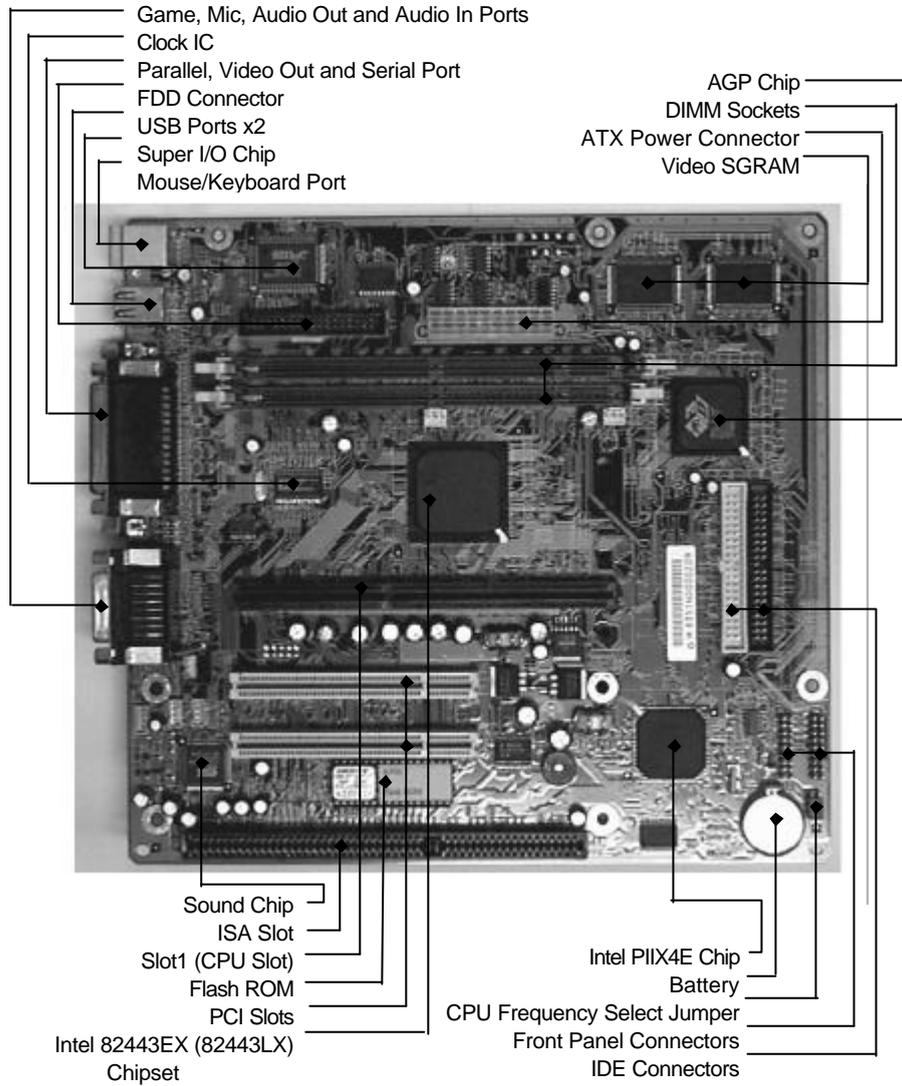
## *Connectors & Jumpers*

This chapter provides the layout, descriptions and functions of the connectors and jumpers of your motherboard.

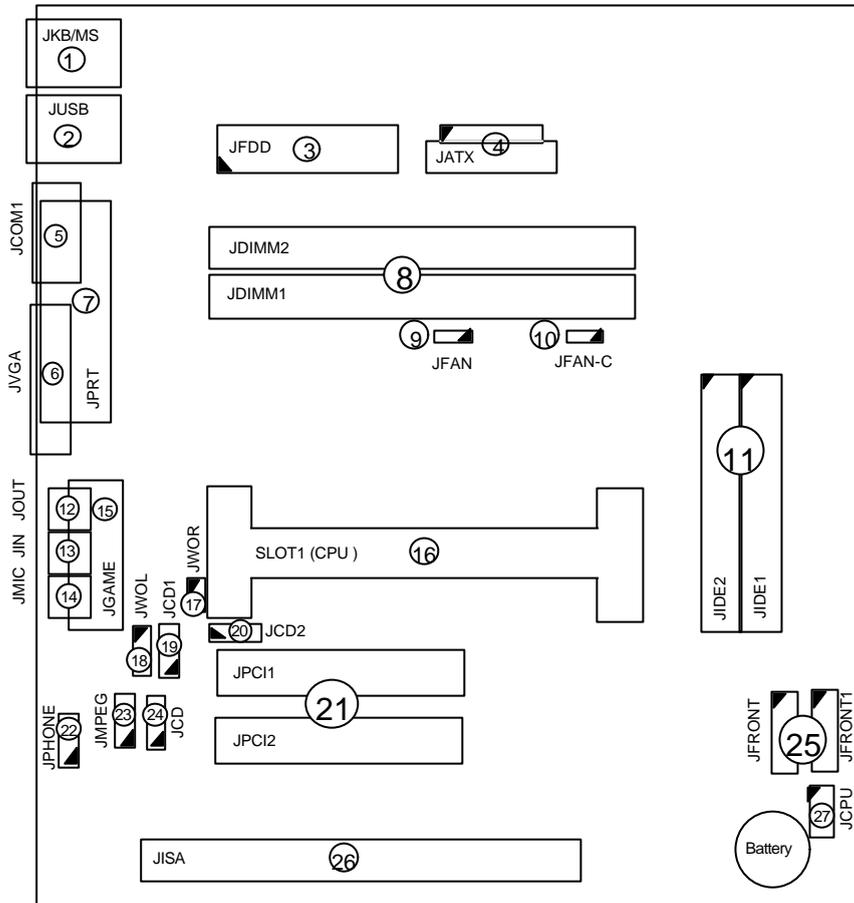
There are a number of connectors and jumpers on the motherboard. Connectors allow you to connect to different peripherals and/or devices. Jumpers, on the other hand, provide you flexibility and different functions when set to different values.

These jumpers were set to factory default before shipping, which gives you the best performance. You should not alter these settings unless you are sure of what you are doing. If you want to change any setting, please make sure that the computer has been turned OFF and make a note of what the original settings are. This way, you can always revert to the original settings if the new settings do not work.

## Parts of the Motherboard



# Motherboard Layout



## Quick Reference

Pointer No.	Jumpers/ Connectors	Function	Page
1	JKB/MS	PS/2 Keyboard/Mouse Connector	2-5
2	JUSB	USB Connector	2-5
3	JFDD	Floppy Drive Connector	2-9
4	JATX	Power Supply Connector	2-10
5	JCOM1	Serial Port Connector	2-5
6	JVGA	VGA Port Connector	2-6
7	JPRT	Print Port Connector	2-6
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9	JFAN	CPU Fan 2 Headers	2-10
10	JFAN-C	CPU Fan 1 Headers	2-10
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26	JISA1	ISA Bus Connector	2-12
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## Description on Connectors & Jumpers

### 1 PS/2 Keyboard/Mouse Connector (JKB/MS)

The PS/2 enhanced keyboard and mouse is connected to the computer via a female mini-DIN connector **JKB/MS** that is mounted on the motherboard.

Pin	Signal	Pin	Signal
1	Data	4	+5V (fused)
2	NC	5	CLK
3	GND	6	NC

### 2 USB Connector (JUSB)

The USB (Universal Serial Bus) connector, **JUSB**, is a 2-layered connector mounted on the motherboard for connecting up to two USB devices.

Pin	Signal
1	Power
2	USBP0# [USBP1#]
3	USBP0 [USBP1]
4	GND

### 3 Serial Port Connector (JCOM1)

Pin	Signal	Pin	Signal	Pin	Signal
1	DCD	4	DTR#	7	RTS
2	Serial In#	5	GND	8	CTS
3	Serial Out#	6	DSR	9	RI

**JCOM1** is a male DB9 (9-pin) serial port connector built-in on the motherboard. To enable or disable this, perform BIOS Setup.

#### 4 Print Port Connector (JPRT)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	Strobe#	7	Data bit 5	13	Select	19	GND
2	Data bit 0	8	Data bit 6	14	Auto Feed#	20	GND
3	Data bit 1	9	Data bit 7	15	Fault#	21	GND
4	Data bit 2	10	ACK#	16	INIT#	22	GND
5	Data bit 3	11	Busy	17	SLCT IN#	23	GND
6	Data bit 4	12	Error	18	GND	24	GND
						25	GND

**JPRT** is a female DB25 (25-hole) parallel port built-in on the motherboard. You can select the mode of parallel port through BIOS Setup utility.

#### 5 VGA Port Connector (JVGA)

Pin	Signal	Pin	Signal	Pin	Signal
1	R	7	GND	13	HSYNC
2	G	8	GND	14	VSYNC
3	B	9	NC	15	MONID2
4	NC	10	GND	16	GND
5	GND	11	NC	17	GND
6	GND	12	MONID1		

VGA interface is built-in. Video cable of a VGA/SVGA monitor is connected to **JVGA** (15-hole) of the motherboard.

### 6 Audio Line In Connector (JIN)

**JIN** is for connecting audio output of peripheral devices such as CD/cassette player.

Pin	Signal
1	GND
2	Audio Left In
3	Audio Right In

### 7 Audio Line Out Connector (JOUT)

**JOUT** is for connection to an amplifier system or other audio peripheral devices.

Pin	Signal
1	GND
2	Audio Left Out
3	Audio Right Out

### 8 Audio Mic In Connector (JMIC)

**JMIC** is for connection to an external microphone.

Pin	Signal
1	GND
2	Mono In
3	Electret Bias Voltage

### 9 Game/MIDI Port Connector (JGAME)

Pin	Signal	Pin	Signal	Pin	Signal
1	+5V (fused)	6	GP1 (JSY1R)	11	GP2 (JSX2R)
2	GP4 (JSBUT0)	7	GP5 (JSBUT1)	12	MIDI-OUTR
3	GP0 (JSX1R)	8	+5V (fused)	13	GP3 (JSY2R)
4	GND	9	+5V (fused)	14	GP7 (JSBUT3)
5	GND	10	GP6 (JSBUT2)	15	MIDI-INR

**JGAME** is a 15-pin connector mounted on the motherboard for connection of joystick or MIDI devices.

**10 Fax/Modem Speaker Connector (JPHONE)**

**JPHONE** is for connection to an add-on fax/modem card's speaker.

**11 Wake-on-LAN Connector (JWOL)**

Wake-on-LAN is a key feature for corporate systems. **JWOL** jumper allows a management application to remotely power on a computer that is originally turned off.

Pin	Signal
1	5V standby
2	Ground
3	MP_Wakeup

**12 Wake-on-Ring Connector (JWOR)**

This jumper is for connection to an optional modem card to turn on the system when a modem phone call is received.

Pin	Signal
1	Telephone In
2	GND
3	GND
4	Telephone Out

**13 ATAPI CD Audio Connectors (JCD, JCD1, JCD2)**

Pin	JCD	JCD1	JCD2
1	CD_IN-Left	CD_IN-Left	CD_IN-Left
2	GND	GND	GND
3	GND	CD_IN-Right	CD_IN-Right
4	CD_IN-Right	GND	GND
Type	Connector	Connector	Base & Pin

The audio output signals of CD-ROM drive is connected to **JCD, JCD1** or **JCD2**.

**NOTE**

You can connect to only one of these at a time. Check the output signals from your CD-ROM drive manual.

#### 14 MPEG Connector (JMPEG)

**JMPEG** is for connecting MPEG-I audio in signals.

Pin	Signal
1	CD/MPEG Right Channel Input
2	GND
3	GND
4	CD/MPEG Left Channel Input

#### 15 Floppy Drive Connector (JFDD)

Pin	Signal	Pin	Signal
1	GND	2	DENSEL
3	GND	4	Reserved
5	Key	6	FDEIN
7	GND	8	FDINDX# (Index)
9	GND	10	FDMO0# (Motor Enable A)
11	GND	12	FDSD1# (Drive Select B)
13	GND	14	FDSD0# (Drive Select A)
15	GND	16	FDMO1# (Motor Enable B)
17	MSEN1	18	FDDIR# (Stepper Motor Direction)
19	GND	20	FDSTEP# (Step Pulse)
21	GND	22	FDWD# (Write Data)
23	GND	24	FDWE# (Write Enable)
25	GND	26	FDTRK0# (Track 0)
27	MSEN0	28	FDWPD# (Write Protect)
29	GND	30	FDRDATA# (Read Data)
31	GND	32	FDHEAD# (Side 1 Select)
33	GND	34	DSKCHG# (Diskette Change)

Floppy disk drives are connected to the motherboard by using a 34-pin flat cable connected to **JFDD**.

**16 CPU Fan 2 Header (JFAN)**

**JFAN** becomes active when the system's power is turned on.

Pin	Signal
1	GND
2	+12V
3	GND

**17 CPU Fan 1 Header (JFAN-C)**

**JFAN-C** becomes active when the system is in suspend mode.

Pin	Signal
1	X
2	FAN_CTRL (+12V)
3	GND

**18 Power Supply Connector (JATX)**

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	+3.3V	6	+5V	11	+3.3V	16	GND
2	+3.3V	7	GND	12	-12V	17	GND
3	GND	8	PWRGD	13	GND	18	-5V
4	+5V	9	+5VSB	14	PS-ON#	19	+5V
5	GND	10	+12V	15	GND	20	+5V

The 20-pin connector from the switching power supply is connected to **JATX**.

If the switching power supply used is an ATX-compliant power supply, remote power on/off is supported and the system's power can be turned off through software control. This feature is called soft-off control.

Soft-off control allows your computer to automatically go back to the power state (on, off, or suspend) after being interrupted either by power outage or by disconnection of power cord. To enable this feature, your system's advanced power management must be enabled both in BIOS setup utility and in the operating system.

### 19 PCI Bus Connectors (JPCI1, JPCI2)

There are a total of two PCI slots available on the motherboard, namely, **JPCI1** and **JPCI2**.

Pin	A	B	Pin	A	B
1	GND	-12 V	32	AD16	AD17
2	+12 V	GND	33	+3.3 V	C/BE2#
3	+5 V	GND	34	FRAME#	GND
4	+5 V	No Connect	35	GND	IRDY#
5	+5 V	+5 V	36	TRDY#	+3.3 V
6	PIRQ#A	+5 V	37	GND	DEVSEL#
7	PIRQ#C	PIRQ#B	38	STOP#	GND
8	+5 V	PIRQ#D	39	+3.3 V	PLOCK#
9	Reserved	No Connect	40	+5 V	PERR#
10	+5 V (I/O)	Reserved	41	+5 V	+3.3 V
11	Reserved	No Connect	42	GND	SERR#
12	GND	GND	43	PAR	+3.3 V
13	GND	GND	44	AD15	C/BE1#
14	Reserved	Reserved	45	+3.3 V	AD14
15	PCIRST#	GND	46	AD13	GND
16	+5 V (I/O)	CLK	47	AD11	AD12
17	GNT#	GND	48	GND	AD10
18	GND	REQ#	49	AD09	GND
19	PCI_PM#	+5 V (I/O)	50	Key	Key
20	AD30	AD31	51	Key	Key
21	+3.3 V	AD29	52	C/BE0#	AD08
22	AD28	GND	53	+3.3 V	AD07
23	AD26	AD27	54	AD06	+3.3 V
24	GND	AD25	55	AD04	AD05
25	AD24	+3.3 V	56	GND	AD03
26	AD26	C/BE3#	57	AD02	GND
27	+3.3 V	AD23	58	AD00	AD01
28	AD22	GND	59	+5 V (I/O)	+5 V (I/O)
29	AD20	AD21	60	PU_ACK64#	+5V
30	GND	AD19	61	+5 V	+5 V
31	AD18	+3.3 V	62	+5 V	+5 V

## 20 ISA Bus Connector (JISA1)

JISA1 is an ISA slot available on the motherboard for expansion purposes.

Pin	B	A	D	C
1	GND	IOCHK#	MEMCS16#	SBHE#
2	BRSTDRV	SD7	IOCS16#	LA23
3	+5 V	SD6	IRQ10	LA22
4	IRQ9	SD5	IRQ11	LA21
5	-5 V	SD4	IRQ12	LA20
6	DRQ2	SD3	IRQ15	LA19
7	-12 V	SD2	IRQ14	LA18
8	ZEROWS#	SD1	DACK0#	LA17
9	+12 V	SD0	DRQ0	MEMR#
10	GND	IOCHRDY	DACK5#	MEMW#
11	SMEMW#	AEN	DRQ5	SD8
12	SMEMR#	SA19	DACK6#	SD9
13	IOW#	SA18	DRQ6	SD10
14	IOR#	SA17	DACK7#	SD11
15	DACK3#	SA16	DRQ7	SD12
16	DRQ3	SA15	+5 V	SD13
17	DACK1#	SA14	RMASTER#	SD14
18	DRQ1	SA13	GND	SD15
19	REFRESH#	SA12		
20	SYSCLK	SA11		
21	IRQ7	SA10		
22	IRQ6	SA9		
23	IRQ5	SA8		
24	IRQ4	SA7		
25	IRQ3	SA6		
26	DACK2#	SA5		
27	TC	SA4		
28	BALE	SA3		
29	+5 V	SA2		
30	OSC1	SA1		
31	GND	SA0		
	Key	Key		

## 21 PCI IDE Connectors (JIDE1, JIDE2)

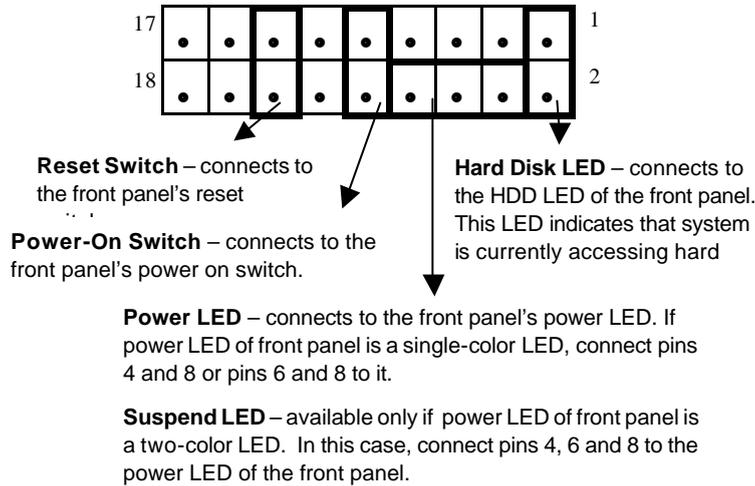
The PCI-bus IDE type devices are connected to the motherboard by using a 40-pin Daisy-chained cable to **JIDE1** and **JIDE2**. JIDE1 is for the primary IDE connector while JIDE2 is for the secondary IDE connector. Those signals in brackets are signals for the secondary IDE connector.

Pin	Signal	Pin	Signal
1	Reset IDE	2	GND
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	GND	20	Key
21	DDRQ0 [DDRQ1]	22	GND
23	I/O Write#	24	GND
25	I/O Read#	26	GND
27	IOCHRDY	28	P_ALE (Cable Select pull-up)
29	DDACK0# [DDACK1#]	30	GND
31	IRQ14 [IRQ15]	32	Reserved
33	Address 1	34	Reserved
35	Address 0	36	Address 2
37	Chip Select 1P# [Chip Select 1S#]	38	Chip Select 3P# [Chip Select 3S#]
39	Activity#	40	GND

## 22 Front Panel I/O Connectors (JFRONT, JFRONT1)

Note that **JFRONT** connector is a manufacturer reserved function and is therefore not available to the user.

**JFRONT1** allows connection of I/O controls to the front panel.



Pin descriptions as follows:

Pin	Signal	Pin	Signal
1	Vcc (HD-LED(+))	2	HD-LED (-)
3	Vcc	4	Power_LED (+) (Green)
5	GND	6	Power_LED (+) (Yellow)
7	GND	8	GND (Power_LED(-))
9	GND	10	POWER-ON
11	No Connect	12	No Connect
13	GND	14	Reset Switch
15	No Connect	16	No Connect
17	No Connect	18	No Connect

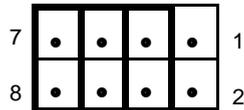
### 23 CPU Frequency Select Jumper (JCPU)

JCPU jumper is used to set CPU speed.

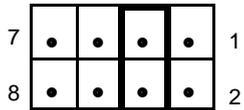
CPU Model	Frequency	Ratio	Bus Freq.	1-2	3-4	5-6	7-8
Celeron	266MHz	4X	66MHz	OUT	IN	IN	IN
Celeron	300MHz	4.5X	66MHz	OUT	IN	OUT	OUT
Celeron 300AMHz	300MHz	4.5X	66MHz	OUT	IN	OUT	OUT
Celeron	333MHz	5X	66MHz	OUT	OUT	IN	IN
Pentium II	233MHz	3.5X	66MHz	IN	OUT	OUT	OUT
Pentium II	266MHz	4X	66MHz	OUT	IN	IN	IN
Pentium II	300MHz	4.5X	66MHz	OUT	IN	OUT	OUT
Pentium II	333MHz	5X	66MHz	OUT	OUT	IN	IN

JCPU settings for different CPUs:

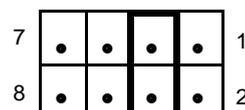
Celeron 266MHz



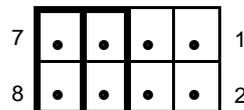
Celeron 300MHz



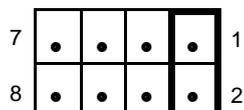
Celeron 300AMHz



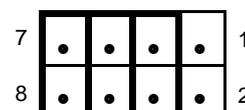
Celeron 333MHz



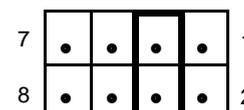
Pentium II 233MHz



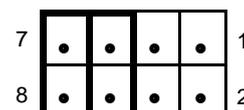
Pentium II 266MHz



Pentium II 300MHz



Pentium II 333MHz





# Chapter 3

## *BIOS Setup*

The AMI BIOS Setup Utility of your system is discussed in this chapter.

The system Basic Input and Output System (BIOS) is the interface between the hardware and the operating system software. Its function is to provide a series of software interrupts and functions that control operations on certain devices connected to your system. Aside from this, it performs a series of Power On Self Test (POST) every time you boot the system. POST checks your actual system configuration with the system configuration data stored in a non-volatile memory known as CMOS RAM. These tests are to ensure that your system is properly configured to recognize the devices such as memory, FDD, HDD, etc.

Usually, you may need to perform setup due to the following circumstances:

- Adding or removing devices to or from the system, such as FDD, HDD, adapter cards, or memory
- Changing the type of video display
- Setting the built-in clock/calendar to the correct time and/or date
- Enabling or disabling special features such as power management functions, system passwords, etc.
- Setting or resetting configuration data if these were accidentally lost or if the on-board battery was replaced.

## Entering System Setup

When you turn on your system, the following message is shown while your system is executing POST:

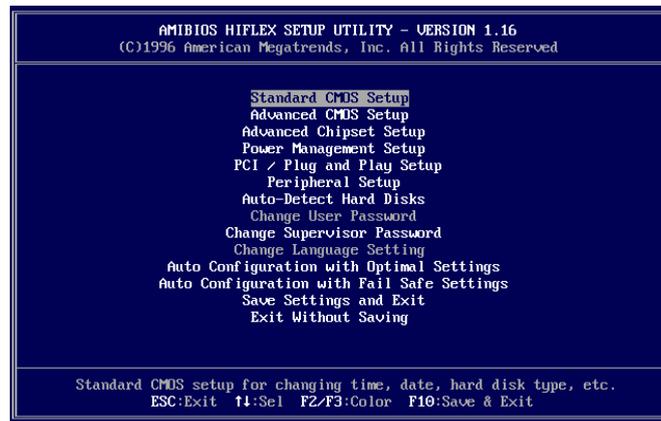
**Hit <DEL> if you want to run SETUP**

In order to enter Setup Utility, you have to press <DEL> key fast enough before it starts up the operating system.

If you are not able to enter the Setup Utility through this, reboot your computer and repeat the above procedure.

If the computer detects discrepancies between your CMOS data and actual system configuration, it will prompt you with an error message and request you to run setup. Just the same, you can enter setup by pressing <DEL> key.

The following screen appears upon entering Setup Utility:



You can use up and down arrow keys to move to the desired option, then press <Enter> on that option to select it or to open its sub-menu. Press <ESC> to return to the previous menu or to exit setup utility.

If you want to modify the option for an item, you have to select that item and press <PgUp> or <PgDn> key. The options for an item will be shown either at the bottom of the screen, or at the right column of the screen.

To change the color of text and background of your screen display, press <F2> or <F3>.

## Standard CMOS Setup

Standard CMOS setup allows you to set the system date and time; to specify floppy disk drives installed in your system; to indicate up to four IDE type storage devices (HDDs or CD-ROM drive); to enable or disable virus protection; and to know the base and extended memory size. When this option is selected, the following appears on screen:



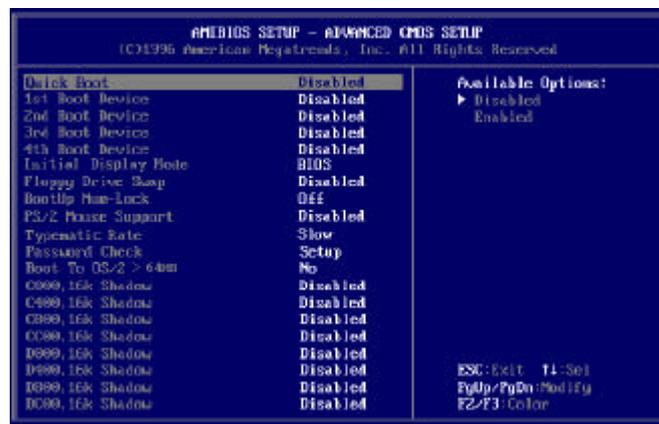
Options and description of each item as follows:

Item	Options	Description
Date (mm/dd/yy)	Month:day:year	Sets system date and time to current date and time.
Time (hh/mm/ss)	hour:min:sec	
Floppy Drive A:	Not Installed	Selects the type of floppy drive installed.
Floppy Drive B:	360 KB 5¼	
	1.2 MB 5¼	
	720 KB 3½	
	1.44 MB 3½	
	2.88 MB 3½	
Pri Master	Not Installed	Selects type of IDE devices installed. <i>Auto</i> - BIOS automatically detects hard disk parameters. <i>User</i> - You enter hard disk parameters. <i>1~46</i> - Select parameters from a pre-determined set of values. <i>Floptical</i> refers to removable devices.
Pri Slave	1	
Sec Master	⋮	
Sec Slave	46	
	User	
	Auto	
	CD-ROM	
	Floptical	
LBA	Off	Selects <i>On</i> if the drive has a capacity greater than 540MB.
	On	
Bik	Off	<i>On</i> allows block mode data transfers. Check if your hard disk supports this mode. If it does not support this mode, data may be destroyed when turned <i>On</i> .
	On	
PIO	Auto	Selects PIO Mode of the IDE device. It is best to select <i>Auto</i> to let the BIOS detect the mode. If you selected a mode that is not supported by the IDE drive, that drive will not work properly.
	0	
	1	
	2	
	3	
	4	
32Bit	Off	<i>On</i> allows 32-bit data transfers.
	On	

Boot Sector Virus Protection	Disabled	Protect the boot sector and partition table of the hard disk from virus intrusion when this is enabled.
Base Memory	N/A	Detect and display the size of base memory and extended memory installed in your system.
Extd Memory		

## Advanced CMOS Setup

Advanced CMOS Setup allows you to configure basic system performance parameters.



Options and description of each item as follows:

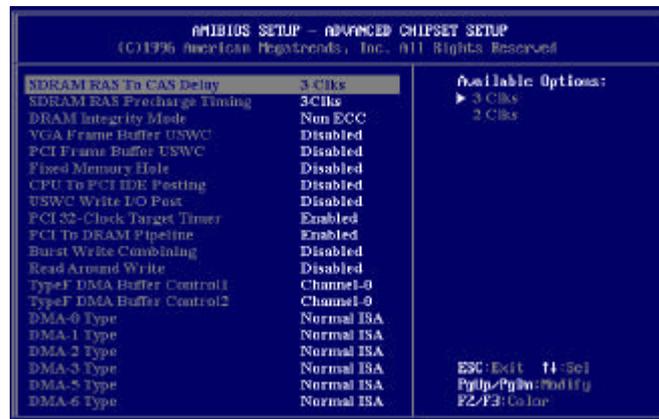
Item	Options	Description
Quick Boot	Disabled Enabled	<i>Enabled</i> allows the BIOS to skip certain tests to speed up boot process. If enabled, the message "Hit <DEL> if you want to run SETUP" will not appear on screen during boot.

1st Boot Device	Disabled IDE-0 IDE-1	BIOS will attempt to read the boot record from first, second, then third device in the selected order until it is successful in reading the boot record.
2nd Boot Device	IDE-2 IDE-3	
3rd Boot Device	Floppy LS-120	
4th Boot Device	ZIP Drive CDROM SCSI Network	
Initial Display Mode	BIOS Silent	<i>BIOS</i> displays AMIBIOS messages before booting the system.
Floppy Drive Swap	Disabled Enabled	<i>Enabled</i> allows drive A: and B: to be swapped.
Boot Up Num-Lock	On Off	<i>On</i> turns the Num Lock key off when system is powered on.
PS/2 Mouse Support	Enabled Disabled	Enables or disables the support for PS/2 type mouse.
Typematic Rate	Slow Fast	This option sets the rate at which characters on the screen repeat when a key is pressed and held down.
Password Check	Always Setup	Enables password checking: <i>Always</i> - every time the system boots <i>Setup</i> - if BIOS Setup Utility is accessed
Boot to OS/2 > 64MB	No Yes	<i>Yes</i> allows BIOS to run with OS/2 and use more than 64MB of system memory.

C000, 16K Shadow	Disabled	<p>Enables the shadowing of the contents of selected ROM area. ROM area not used by ISA adapter cards is allocated to PCI adapter cards.</p> <p><i>Disabled</i> - contents of video ROM are not copied to RAM.</p> <p><i>Enabled</i> - contents of video ROM area from C0000h-C7FFFh are copied from ROM to RAM for faster execution.</p> <p><i>Cached</i> - contents of video ROM area from C0000h - C7fffh are copied from ROM to RAM and can be written to or read from cache memory.</p>
C400, 16K Shadow	Enabled	
C800, 16K Shadow	Cached	
CC00, 16K Shadow		
D000, 16K Shadow		
D400, 16K Shadow		
D800, 16K Shadow		
DC00, 16K Shadow		

## Advanced Chipset Setup

Advanced Chipset Setup configures the functions of the chipset used. Be sure you are familiar with the chipset before you attempt to make any changes on these.





Options and description of each item as follows:

Item	Options	Description
SDRAM RAS To CAS Delay	3 Clks 2 Clks	Specifies the length of the delay inserted between the RAS and CAS signals of the DRAM system memory access cycle.
SDRAM RAS Precharge Timing		Specifies the length of the RAS precharge part of the DRAM system memory access cycle.
DRAM Integrity Mode	Non-ECC EC Only ECC	Sets the type of system memory checking: <i>Non-ECC</i> - No error checking or reporting done. <i>EC only</i> - Multi-bit errors are detected and reported as parity errors. Single-bit errors are corrected by the chipset. Corrected bits are not written back to DRAM. <i>ECC</i> - Multi-bit errors are detected and reported as parity errors. Single-bit errors are corrected by the chipset and written back to DRAM.

VGA Frame Buffer USWC*	Enabled Disabled	Enables or disables VGA video frame buffer using USWC. Note that older ISA card drivers may not behave correctly if this option is not set to <i>Disabled</i> .
PCI Frame Buffer USWC	Enabled Disabled	Enables or disables USWC memory attribute. Enabling this improves video performance when a PCI video adapter is installed.
Fixed Memory Hole	Disabled 512KB-640KB 15 MB-16 MB	Specifies the location of an area of memory that cannot be addressed on the ISA bus.
CPU To PCI IDE Posting	Disabled Enabled	Enables or disables the corresponding items.
USWC Write I/O Post		
PCI 32-Clock Target Timer		
PCI To DRAM Pipeline		
Burst Write Combining		
Read Around Write		
TypeF DMA Buffer Control1		
TypeF DMA Buffer Control2		

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\* USWC - Uncacheable, Speculatable, Write-Combined

DMA-0 Type	Normal ISA	Specifies the bus that the specified DMA channel can be used on.
DMA-1 Type		
DMA-2 Type		
DMA-3 Type		
DMA-5 Type		
DMA-6 Type		
DMA-7 Type		
AGP Aperture Size	4 MB 8 MB 16MB 32MB 64MB 128MB 256MB	Specifies the amount of memory that can be used by AGP (Accelerated Graphics Port).
AGP Common SERR#	Disabled Enabled	<i>Enabled</i> permits a common SERR# signal for AGP and the standard PC bus.
AGP System Error Forwarding	Disabled Enabled	<i>Enabled</i> allows AGP system errors to be forwarded.
AGP Parity Error Response	Disabled Enabled	Enables or disables the corresponding items.
PIIX4 SERR#		
USB Passive Release		
PIIX4 Passive Release		
PIIX4 Delayed Transaction		
USB Function	Disabled Enabled	Enables or disables USB functions.
USB Keyboard Legacy Support	Disabled Enabled	Enables or disables USB keyboard and mouse if USB function is enabled.

## Power Management Setup

Power Management Setup allows you to configure power conservation features.

AMIBIOS SETUP - POWER MANAGEMENT SETUP		
(C)1996 American Megatrends, Inc. All Rights Reserved		
<b>Power Management-APM</b>	Disabled	Available Options: ▶ Disabled Enabled
Video Power Down Mode	Disabled	
Hard Disk Power Down Mode	Disabled	
Standby Time Out (Minute)	Disabled	
Suspend Time Out (Minute)	Disabled	
Throttle Slow Clock Ratio	0-12.5%	
Modem Use IRQ	N/A	
Device 6 (Serial port 1)	Ignore	
Device 7 (Serial port 2)	Ignore	
Device 8 (Parallel port)	Ignore	
Device 5 (Floppy disk)	Ignore	
Device 0 (Primary master IDE)	Ignore	
Device 1 (Primary slave IDE)	Ignore	
Device 2 (Secondary master IDE)	Ignore	
Device 3 (Secondary slave IDE)	Ignore	
Power Button Function	Suspend	
Wake On Ring	Disabled	ESC:Exit F4:Sel PgUp/PgDn:Modify F2/F3:Color
Wake On LAN	Disabled	
RTC Alarm Resume From Soft-Off	Disabled	
RTC Alarm Date	Every Day	

AMIBIOS SETUP - POWER MANAGEMENT SETUP		
(C)1996 American Megatrends, Inc. All Rights Reserved		
Standby Time Out (Minute)	Disabled	Available Options: ▶ Disabled Enabled
Suspend Time Out (Minute)	Disabled	
Throttle Slow Clock Ratio	0-12.5%	
Modem Use IRQ	N/A	
Device 6 (Serial port 1)	Ignore	
Device 7 (Serial port 2)	Ignore	
Device 8 (Parallel port)	Ignore	
Device 5 (Floppy disk)	Ignore	
Device 0 (Primary master IDE)	Ignore	
Device 1 (Primary slave IDE)	Ignore	
Device 2 (Secondary master IDE)	Ignore	
Device 3 (Secondary slave IDE)	Ignore	
<b>Power Button Function</b>	Suspend	
Wake On Ring	Disabled	ESC:Exit F4:Sel PgUp/PgDn:Modify F2/F3:Color
Wake On LAN	Disabled	
RTC Alarm Resume From Soft-Off	Disabled	
RTC Alarm Date	Every Day	
RTC Alarm Hour	00	
RTC Alarm Minute	00	
RTC Alarm Second	00	

Options and descriptions of each item as follows:

Item	Options	Description
Power Management/ APM	Disabled Enabled	<i>Enabled</i> lets the BIOS control the power conservation features.
Video Power Down Mode	Disabled Standby	Specifies the power state that the display or hard disk enters after the specified period of inactivity has expired.
Hard Disk Power Down Mode	Suspend	
Standby Time Out (Minute)	Disabled 1 2 4 8	Specifies the length of period of system inactivity while in full power/standby state before it enters standby/suspend power state.
Suspend Time Out (Minute)	10 20 30 40 50 60	
Throttle Slow Clock Ratio	0-12.5% 12.5-25% 25-37.5% 37.5-50% 50-62.5% 62.5-75% 75-87.5%	Indicates the percentage of time the STPCLK# signal is asserted while in the thermal throttle mode.
Modem Use IRQ	N/A 3 4 5 7 9 10 11	Sets the IRQ address used by modem.

Device 6 (Serial port 1)	Monitor	Enables event monitoring on the selected item. <i>Monitor</i> allows BIOS to enter Full On state if any activity occurs on that specific item when the computer is in a power saving state.
Device 7 (Serial port 2)		
Device 8 (Parallel port)		
Device 5 (Floppy disk)		
Device 0 (Primary master IDE)		
Device 1 (Primary slave IDE)		
Device 2 (Secondary master IDE)		
Device 3 (Secondary slave IDE)		
Power Button Function	On/Off Suspend	When power button is pressed: <i>On/Off</i> turns the computer on or of. <i>Suspend</i> places the computer in suspend mode or full power mode.
Wake on Ring	Disabled Enabled	<i>Enabled</i> allows you to wake up the system through modem or LAN.
Wake on LAN		
RTC Alarm Resume From Soft-Off	Disabled Enabled	Sets the RTC alarm to wake up the system on a specified period.
RTC Alarm Date	Every Day 01 : 31	Specifies the date and time to wake up the system if 'RTC Alarm Resume From Soft-Off' is enabled.
RTC Alarm Hour	00 : 23	
RTC Alarm Minute	00 : 59	

RTC Alarm Second	00 : 59	
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## PCI/Plug and Play Setup

PCI/Plug and Play Setup configures PCI and Plug-and-Play features.

AMIBIOS SETUP - PCI / PLUG AND PLAY SETUP (C) 1996 American Megatrends, Inc. All Rights Reserved		
Plug and Play Aware O/S	No	Available Options: ▶ No Yes
Onboard Sound Function	Disabled	
PCI Latency Timer (PCI Clocks)	32	
PCI VGA Palette Snoop	Disabled	
Allocate IRQ to PCI VGA	Yes	
PCI IDE BusMaster	Disabled	
PCI Slot1 IRQ Priority	Auto	
PCI Slot2 IRQ Priority	Auto	
DMA Channel 0	PnP	
DMA Channel 1	PnP	
DMA Channel 3	PnP	
DMA Channel 5	PnP	
DMA Channel 6	PnP	
DMA Channel 7	PnP	
IRQ3	PCI/PnP	
IRQ4	PCI/PnP	
IRQ5	PCI/PnP	
IRQ7	PCI/PnP	
IRQ9	PCI/PnP	
IRQ10	PCI/PnP	
		ESC:Exit F4:Sel PgUp/PgDn:Modify F2/F3:Color

AMIBIOS SETUP - PCI / PLUG AND PLAY SETUP (C) 1996 American Megatrends, Inc. All Rights Reserved		
PCI IDE BusMaster	Disabled	Available Options: ▶ No Yes
PCI Slot1 IRQ Priority	Auto	
PCI Slot2 IRQ Priority	Auto	
DMA Channel 0	PnP	
DMA Channel 1	PnP	
DMA Channel 3	PnP	
DMA Channel 5	PnP	
DMA Channel 6	PnP	
DMA Channel 7	PnP	
IRQ3	PCI/PnP	
IRQ4	PCI/PnP	
IRQ5	PCI/PnP	
IRQ7	PCI/PnP	
IRQ9	PCI/PnP	
IRQ10	PCI/PnP	
IRQ11	PCI/PnP	
IRQ14	PCI/PnP	
IRQ15	PCI/PnP	
Reserved Memory Size	Disabled	
Reserved Memory Address	C0000	
		ESC:Exit F4:Sel PgUp/PgDn:Modify F2/F3:Color

Options and descriptions of each item as follows:

Item	Options	Description
Plug and Play-Aware OS	No Yes	Set this to Yes if your operating system is aware of and follows the Plug and Play specification.
Onboard Sound Function	Disabled Enabled	Enables or disables system's onboard sound feature.
PCI Latency Timer (PCI Clocks)	32 64 96 128 160 192 224 248	Specifies the latency timings in PCI clocks for all PCI devices.
PCI VGA Palette Snoop	Disabled Enabled	This option must be set to <i>Enabled</i> if any ISA adapter card installed in the system requires VGA palette snooping.
Allocate IRQ to PCI VGA	Yes No	Assigns an interrupt signal to the PCI VGA card.
PCI IDE Busmaster	Disabled Enabled	Specifies if the IDE controller on the PCI bus has bus mastering capabilities.
PCI Slot1 IRQ Priority	Auto 3 4 5	Sets the interrupt priority of the PCI slots.
PCI Slot2 IRQ Priority	7 9 10 11	
DMA Channel 0	PnP ISA	Specifies which channels to control the data transfers between I/O devices and system memory.
DMA Channel 1		
DMA Channel 3		
DMA Channel 5		
DMA Channel 6		
DMA Channel 7		

IRQ3	PCI/PnP ISA	Specifies which bus the specified IRQ line is used on and allows you to reserve interrupts for legacy ISA adapter cards. If more interrupts must be removed from the pool, you can use these options to reserve the IRQ by assigning an ISA/EISA setting to it. Onboard I/O is configured by the BIOS and are configured as PCI/PnP.  IRQ14 and 15 will not be available if onboard PCI IDE is enabled. If all IRQs are set to ISA/EISA IRQ14 and 15 are allocated to the onboard IDE, IRQ 9 will still be available for PCI and PnP devices.
IRQ4		
IRQ5		
IRQ7		
IRQ9		
IRQ10		
IRQ11		
IRQ14		
IRQ15		
Reserved Memory Size	Disabled 16K 32K 64K	Specifies the size of the memory area reserved for legacy ISA adapter cards.
Reserved Memory Address	C0000 C4000 C8000 CC000 D0000 D4000 D8000 DC000	Specifies the beginning address (in hex) of the reserved memory area. The specified ROM memory area is reserved for use by legacy ISA adapter cards if "Reserved Memory Size" is not disabled.

## Peripheral Setup

Peripheral Setup allows you to configure system I/O support.



Options and descriptions of each item as follows:

Item	Options	Description
OnBoard FDC	Auto Disabled Enabled	Enables the floppy drive controller on the motherboard.
Floppy Drive Access	Read/Write Read Only	Specifies the read/write access mode that is set when booting from a floppy drive.
OnBoard Serial Port1	Auto Disabled 3F8h/COM1 2F8h/COM2 3E8h/COM3 2E8h/COM4	Specifies the base I/O port address of serial port 1/2.
OnBoard Parallel Port	Auto Disabled 378h 278h 3BCh	Specifies the base I/O port address of the parallel port on the motherboard.

Parallel Port Mode	Normal Bi-Directional EPP ECP	<i>Normal</i> → normal parallel mode <i>EPP</i> (Enhanced Parallel Port) → provide asymmetric bidirectional data transfer driven by the host device. <i>ECP</i> (Extended Capabilities Port) → achieve data transfer rates of up to 2.5 Mbps. Uses DMA protocol and provides symmetric bidirectional communication.
EPP Version	1.7 1.9	Options available only if 'Parallel Port Mode' is <i>EPP</i> .
Parallel Port IRQ	5 7	Specifies IRQ to be used by the parallel port.
Parallel Port ECP DMA Channel	0 1 3	Options available only if 'Parallel Port Mode' is <i>ECP</i> .
On-Board IDE	Disabled Primary Secondary Both	Specifies the onboard IDE controller channels to be used.

## Auto Detect Hard Disks

Your system can automatically detect and configure the IDE devices installed in your system. When you select this item from the main menu, the Standard CMOS Setup menu will be displayed to show you the results of the automatic detection.

## Change User Password Change Supervisor Password

Passwords prevent unauthorized use of your computer. There are two levels of security provided by your system, that is, supervisor and user.

If "Password Check" item in the "Advanced CMOS Setup" is set to "Always", you shall need your user password before you are able to access your system. If it is set to "Supervisor", you shall need supervisor password if configuration changes are to be made. However, note that you need to set your supervisor password first before setting your user password.

To enter new password, change a password or disable a password, choose "Change User Password" or "Change Supervisor Password" from the main menu.

To enter a new password, you will be required to type in that password twice (for confirmation purposes) before the system will accept that password. Your system accepts passwords that contain maximum of six characters. When entering the password, "\*" appears in place of the characters you typed. If password (supervisor) is successfully installed, the system displays the message below:

**New supervisor password installed, press any key to continue**

If you want to change an existing password, system will prompt you to enter the old password, then enter the new password twice. The same message appears on screen when password installation is successful.

If you want to disable or clear a password, just press <Enter> key when you are prompted to type in new password. The following message (for supervisor password) is displayed:

**Supervisor password disabled, press any key to continue**

Note that if you disabled the supervisor password, user password is automatically disabled, too.

Wrong password entered provides the following message:

**Incorrect password, press any key to continue**

If you forgot your password, you have to clear CMOS data and reconfigure the system.

## **Change Language Setting**

This item is intended for users to select the type of language characters displayed on screen. Currently, only "English" is the available option.

## **Auto Configuration with Optimal Settings**

### **Auto Configuration with Fail Safe Settings**

Two sets of default values were permanently stored in your system allowing it to load these automatically if there are invalid CMOS data. If you want to load one of these, you can select it from the main menu.

Optimal settings are best-case values that would optimize system performance. If CMOS data are corrupt, system will load these settings automatically. Fail safe settings offer the most stable settings but are far from optimal system performance. Use this option as a diagnostic aid if the system is behaving erratically.

When one of these items was selected from the main menu, you will be prompted to confirm your selection by entering "Y" for yes and "N" for no.

## Save Settings and Exit

When you are finished with the modifications and would like to quit setup, press <ESC> key until the following dialog box appears on screen:



Type "Y" to save all changes made into CMOS RAM before leaving Setup utility. Your system will then reboot to reflect the modifications made.

If you do not want to quit setup yet, type "N".

## Exit Without Saving

If you would like to restore the original contents of CMOS data and disregard current changes made, choose this item from the main menu and type "Y" if prompted with:

Quit without saving (Y/N)? N

Your system will exit Setup Utility and reboot.

Type "N" if you would like to continue with your setup operations.



# Chapter 4

## *Installation*

This chapter provides the installation procedures for CPU and system memory.

Before proceeding with the installation procedure, read through some safety tips and precautions first:

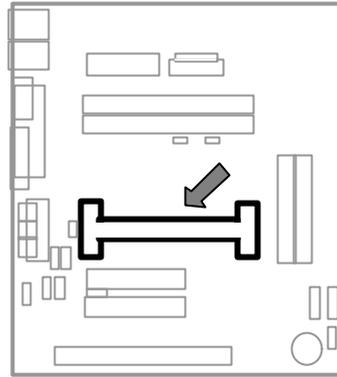
- Use a grounded wrist strap designed for static discharge.
- Discharge static electricity from your hands by touching a grounded metal object before removing the motherboard from its anti-static packaging.
- Hold the motherboard by its edges only. Do not touch its components, peripheral chips, memory modules, or gold contacts.
- Avoid touching pins of chips or modules.
- Put the motherboard back into its anti-static bag when not in use.
- Do not put the motherboard on an unstable surface, near water, nor near sources of extreme heat.

## CPU Installation

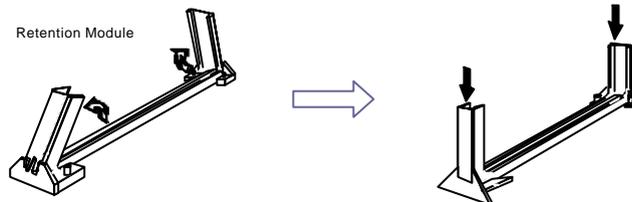
### NOTE

*There are different kinds of CPU packaging, retention module, and fan assembly that can fit into this motherboard. The figures on this section show one type for your reference. You can consult your dealer for the installation of items that were different from what were shown here.*

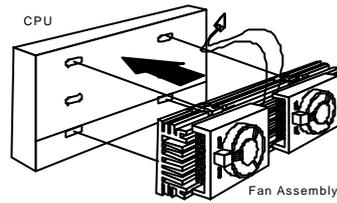
- 1 Locate Slot 1 on the motherboard. You can see the retention module mounted on the motherboard.



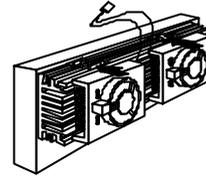
- 2 Pull up the sides of the retention module until it is perpendicular with the motherboard. Then, push to lock it securely in place. As shown:



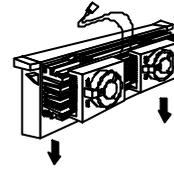
- 3 Attach the fan assembly to Pentium II processor by aligning and inserting the two clips near the bottom of the assembly into the two bottom notches found on the CPU. (Note that the fan's power cable should be on top.)



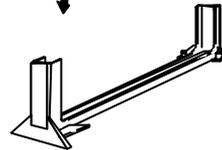
- 4 Then, push the two clips near the top of the assembly to snap these into the CPU's top notches.



- 5 Afterwards, vertically insert the CPU and fan assembly into the retention module, until it clicks into place.



- 6 Then, connect the fan's power cable to fan connector on the motherboard.

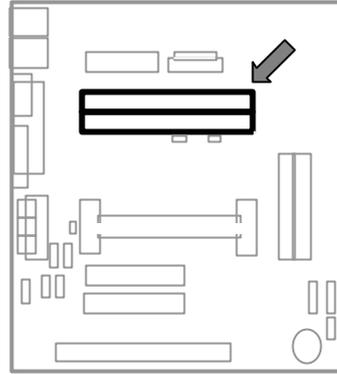
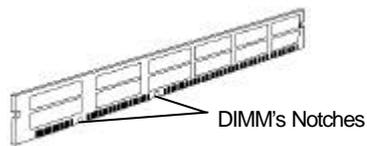


## Memory Installation

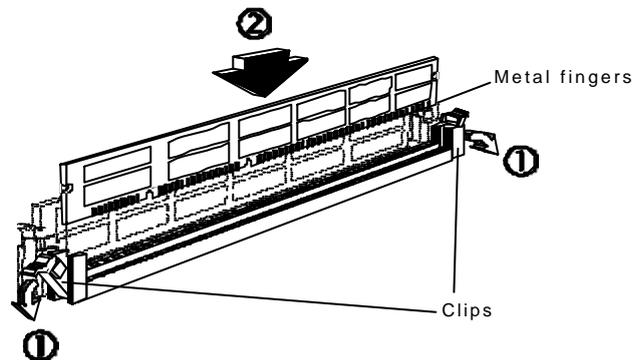
Your system provides two DIMM slots for the installation of SDRAMs.

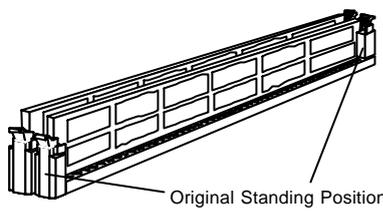
Installation procedures as follows:

- 1 Locate the DIMM sockets on the motherboard.
- 2 Align the two notches of the DIMM with the receptive points on the DIMM socket. You cannot insert the DIMM into its socket if this is not aligned properly.



- 3 Press the clips on both sides of the DIMM socket outward to release it.



- 4 Insert the DIMM vertically with its metal fingers aligned with the socket's grooved slot.
- 5 Press until the DIMM is locked onto the socket. (The clips will return to its original standing position when the DIMM is properly inserted into the socket, as shown.)
- 6 To ensure proper operation, check if the clip is properly locked onto the hollow of the DIMM. If not, press slightly to lock it.
- 7 You do not have to change jumpers or BIOS setting. Your system automatically detects the size and type of memory installed.



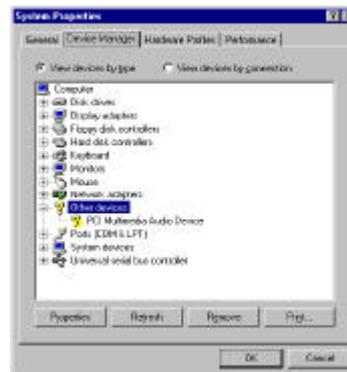
# Chapter 5

## *Device Drivers Installation*

This chapter provides you the procedures for installing several device drivers included with your motherboard.

### ESS PnP Audio System

1. Complete the installation of Windows 98 operating system. If you are not so familiar with the installation procedure, please refer to the user's guide of Microsoft Windows 98 software package.
2. Double click on “**My Computer**” icon, located on the top left part of your screen.
3. Choose “**Control Panel**” icon by double clicking on it, then select “**System**” icon. The “System Properties” window will be displayed on the screen.
4. Click on “**Device Manager**” and select “**Other Devices**”.



5. Double click on “**PCI Multimedia Audio Device**”.



6. Click on “**Driver**” tab.



7. Click “**Update Driver**” button.

8. The “**Update Device Driver Wizard**” window is displayed. Click “**Next >**” button.

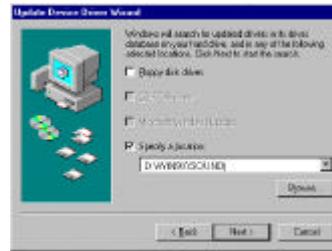


9. Insert the “**Device Driver CD**” disk into the CD-ROM drive, designated as D:\ in this procedure. Click “**Next >**” button.

(Note that “Search for a better driver than the one you already have using your Windows CD” option should be selected.)



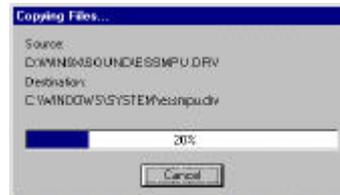
10. Click the white box beside “Specify a location:” and enter the drive and filename of the device driver, “D:\WIN9X\SOUND”. Then, click “**Next >**” button.



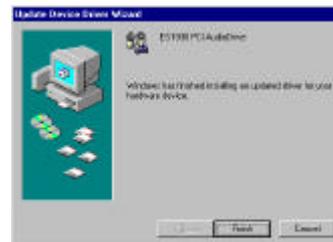
11. Click “**Next >**” button again.



12. The following screen informs you that the system is copying files.



13. When this screen is displayed, click “**Finish**” button.



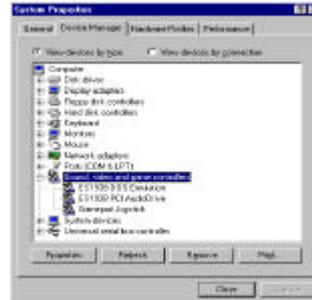
14. Click “**Close**” button.



15. Your audio driver is now properly installed.

16. Check the “System Properties” for the newly installed audio driver:

- Double click on “**My Computer**” icon
- Select “**Control Panel**”
- Choose “**System**”
- Click “**Device Manager**” tab
- Double click on “**Sound, video and game controls**”

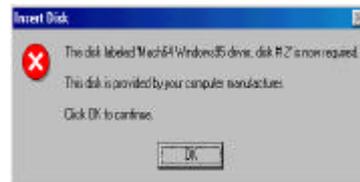




8. Click "**Finish**". Your system now starts copying files into your hard disk.



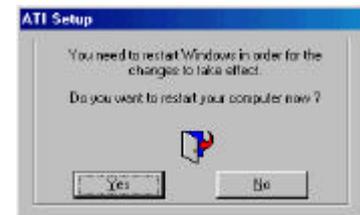
9. When this dialog box is displayed, press "**OK**".



10. Now, select the following sub-directory:  
**E:\vga\win98\disk2.**  
System copies other required files.



11. In order to reflect changes made onto your system, you will be requested to restart your operating system. Click "**Yes**".



12. Your VGA driver is now properly installed.

13. To check your Device Manager entries for the newly installed driver:

- Double click on "**My Computer**"
- Select "**Control Panel**"
- Click "**System**"
- Select "**Device Manager**" tab
- Double click on "**Display adapters**"

