

**Intel 845 Chipset Family
Motherboard
USER'S MANUAL
Pentium® 4 Processors**

Intel 845 Chipset Family Motherboard

Supporting Pentium 4 (Socket 478PIN) Series Processors
400MHz Front Side Bus

Intel® 845 Chipset

Welcome!

Congratulations on your purchase of this great value motherboard, with its range of special features and innovative onboard functions, built around the advanced architecture of the new Intel® 845 Chipset. More details will follow later in this manual.

Your User's Manual

This User's Manual is designed to help end users and system manufacturers to setup and install the motherboard. All of the information within has been carefully checked for accuracy. However, the manufacturer is not responsible or liable for any errors or inaccuracies, which this manual may contain. This includes references to products and software. In addition, the information and specifications are subject to change without prior notice.

Disclaimer

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Manual Version: 1.0

Release Date: November 2001

BIOS Upgrading Utility and Motherboard Shield

BIOS Upgrading Utility—One Click is All it Takes!

We are proud to inform you that your new motherboard comes with a BIOS upgrading and motherboard protection utility. This BIOS updating program makes BIOS updating easy, and enhances the security and stability of systems built with your motherboard.

BIOS Upgrading Utility Features:

- **Anti-Virus BIOS Protection** – This motherboard comes with a new hardware monitoring function that can prevent any unauthorized BIOS updating caused by viruses. Only this BIOS upgrading utility can update the BIOS for this motherboard.
 - **BIOS Updating Confidence** – Beyond preventing viruses, the BIOS upgrading utility allows BIOS updating with confidence. In the past, any failure or incorrect operation during BIOS updating could crash the whole system. Normally the user wouldn't have the capability to retrieve and reestablish the system, they could only return the computer to the supplier for costly, time-consuming repairs. With the enhanced security of this BIOS upgrading utility, users of this motherboard can completely avoid these problems. No matter what happens during BIOS updating, the user's system can still boot from the floppy drive, allowing the updating command to be executed again.
 - **One-Click, Online BIOS Updating** – For users of Windows 9X/Me/2000/XP/NT 4.0, the BIOS upgrading utility allows you to use an innovative online updating technology. Just one click can detect the BIOS version of your system, download the latest version, and execute all the updating commands automatically from the Internet. Restarting the computer completes the BIOS updating. This feature should be very handy for users who need to update BIOS repeatedly, especially MIS staff. The online BIOS updating program is included on the drivers CD-ROM included in the box with your motherboard. Following the step-by-step instructions, you can easily update or backup your BIOS. (If you have a different OS, see "Chapter 4 BIOS Upgrade" for your BIOS updating procedure.)
 - **Linear Overclocking** – the BIOS upgrading utility also provides a linear overclocking function. Users can fine-tune the Front Side Bus (FSB) by increasing or reducing it by as little as 1.0MHz to find the optimum FSB setting for the system. Should the FSB be set too high, the system can be returned to the default setting by pressing the "INS" key.
-

Table of Contents

CHAPTER 1 INTRODUCTION	1
1.1 Essential Handling Precautions	1
1.2 Package Contents	3
1.3 Specifications and Features	3
CHAPTER 2 HARDWARE INSTALLATION	5
2.1 Intel 845 Chipset Family Motherboard	5
2.2 Layout of Intel 845 Chipset Family Motherboard	7
2.3 Using Jumper JP3 to Clear CMOS	8
2.4 RAID/ATA100 Selection Jumper	9
2.5 Floppy Disk Drive Connector	9
2.6 Primary/Secondary IDE Connectors	10
2.7 Fan Power Connectors	11
2.8 Memory Configuration	12
2.9 Panel Connectors	14
2.10 Internal USB Port Connector	15
2.11 Wake-on-LAN Connector	16
2.12 Internal Audio Connectors	16
2.13 Power Connectors	17
2.14 External Back Panel I/O Ports	18
2.15 IrDA-Compliant Infrared Module Connector	19

CHAPTER 3 BIOS SETUP	20
3.1 BIOS Setup	20
3.2 The Main Menu	20
3.3 Standard CMOS Features	22
3.4 Advanced BIOS Features	25
3.5 Advanced Chipset Features	28
3.6 Integrated Peripherals	30
3.7 Power Management Setup	34
3.8 PnP/PCI Configuration Setup	38
3.9 PC Health Status	39
3.10 Frequency/Voltage Control	40
3.11 Load Fail-Safe Defaults	42
3.12 Load Optimized Defaults	42
3.13 Supervisor Password	43
3.14 User Password	44
3.15 Save & Exit Setup	44
3.16 Exit Without Saving	45
CHAPTER 4 BIOS UPGRADE	46
4.1 How to Upgrade Your Motherboard BIOS	46

CHAPTER 1 INTRODUCTION

1.1 Essential Handling Precautions

IMPORTANT. Read this page before unpacking your motherboard!

- **Power Supply**

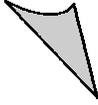
Be careful! Always ensure that the computer is disconnected from the power supply when working on the motherboard and its components. (The red power on LED lights when there is power reaching the motherboard.)

- **Static Electricity**

Static electricity may cause damage to the delicate integrated circuit chips on your motherboard. Before handling the motherboard outside of its protective packaging, ensure that there is no static electrical charge in your body. A static discharge sufficiently strong enough to damage computer components is not perceptible by a human. To avoid this risk, please observe these simple precautions while handling the motherboard and other computer components:

1. If possible, wear an anti-static wrist strap connected to a natural earth ground.
2. Touch a grounded or anti-static surface, or a metal fixture such as a pipe or the chassis of your system, before touching the motherboard.
3. When you have removed the motherboard from its anti-static packaging, try to hold it only by the edges, without touching any components.
4. Avoid contacting the components on add-on cards, motherboards, and modules with the gold-colored connectors which plug into the expansion slots.
5. It is safest to handle system components only by their mounting brackets.
6. Keep components which are not connected to the system in the anti-static packaging whenever possible.

These precautions help to reduce the risk of static build-up and ensure any static discharge is harmless to your equipment.



- **AGP Card Use Warning**

If you are using this motherboard as a DIY (do-it-yourself) system upgrade, and you intend to transfer and use an older AGP card with this motherboard, please make sure your AGP card is 1.5V and supports the AGP2.0 standard. Intel has designed and manufactured the Intel 845 chipset's north bridge to only support 1.5V AGP cards. This chipset does not support older, 3.3V AGP cards. Use of a 3.3V AGP card in the AGP slot will damage the motherboard. If this motherboard is part of a completely new system, it is your system vendor's responsibility to be sure that the AGP card provided with the system is compatible with the Intel 845 chipset. If you are performing a DIY system upgrade and don't know the detailed specifications of your AGP card, please contact your AGP card vendor.

- **Battery Replacement**

The battery which holds the system settings memory (CMOS RAM) on your motherboard should not require replacement for at least five years, and probably much longer. The battery is located near the bottom of the motherboard as shown in the pictures in "2.1 Intel 845 Chipset Family Motherboard". Incorrect computer time and/or loss of time may indicate a weak motherboard battery. Please replace your battery only with the same type, or a similar type recommended by the battery manufacturer. If the battery is replaced incorrectly, there is a risk of a short circuit or explosion. Used batteries should be disposed of in accordance with the manufacturer's instructions and local environmental regulations.

- **Electric Screwdrivers**

To reduce the risk of damage to the motherboard due to excessive torque, avoid setting electric screwdrivers above 7.5 kg/cm.

1.2 Package Contents

This motherboard package should contain the following items. Please check them as soon as you unpack. If you find any damaged or missing items, please contact your retailer.

- Intel 845 Chipset Family Motherboard
- 1 x CD-ROM
- 1 x FDD cable
- User's Manual
- 1 x Ultra DMA 66/100 cable

1.3 Specifications and Features

- **CPU**
 - Supports Intel® Pentium 4 Socket 478 CPUs
 - **Chipset**
 - Intel® 845(MCH) or 845D(MCH)
 - **DRAM Memory** (845D DDR Chipset Motherboard)
 - Supports 200/266MHz Double Data Rate SDRAM
 - 2 x 184-pin DIMM module slots onboard
 - 32MB~2GB memory capacity
 - 64/128/256/512MB/1GB
 - 64 data bits structure only (72 bit with ECC)
 - **DRAM Memory** (845 Chipset Motherboard)
 - Supports 133MHz Synchronous DRAM
 - 3 x 168-pin DIMM module slots onboard
 - 32MB~3GB memory capacity
 - 64/128/256/512MB/1GB
 - 64 data bits structure only (72 bit with ECC)
 - **I/O Bus Slots**
 - 5 x Master/Slave PCI Bus slots (PCI 2.2 compliant)
 - 1 x CNR (Communication and Networking Riser) slot
 - **Award BIOS**
 - Supports PC99, Plug-and-Play
 - Supports ACPI, APM, DMI, Green Features
-

- **I/O Functions**

- Supports PIO Mode 3, 4, 5 ATAPI devices and Ultra DMA/33/66/100
- Supports 2 high speed UART 16550 COM ports
- Supports 4 USB (Universal Serial Bus) ports
- Supports Line-out, Line-in and MIC-in jacks
- Supports Game/MIDI port
- Supports SPP/EPP/ECP LPT port
- Supports 1.44/2.88MB floppy disk drives
- Supports PS/2 Mouse and PS/2 Keyboard
- Supports IrDA port
- Optional 10/100 Mbps LAN port
- Optional IDE RAID 0,1 Function

- **Switching Voltage Regulator**

- Intel VRM 9.0 compliant

- **Other Features**

- Year 2000 compliant
- Power failure resume
- FWH (Firmware Hub) supports security manageability
- BIOS Virus protection (warning)
- PS/2 Mouse and Keyboard Wake-Up
- Supports Wake-on-LAN function
- Remote Ring Wake-Up
- Time Wake-Up
- Board voltage monitors for CPU core, +3.3V, +/-5.0V, +/-12.0V, VBAT, 5VSB
- CPU overheat alarm
- CPU fan auto-off in suspend mode

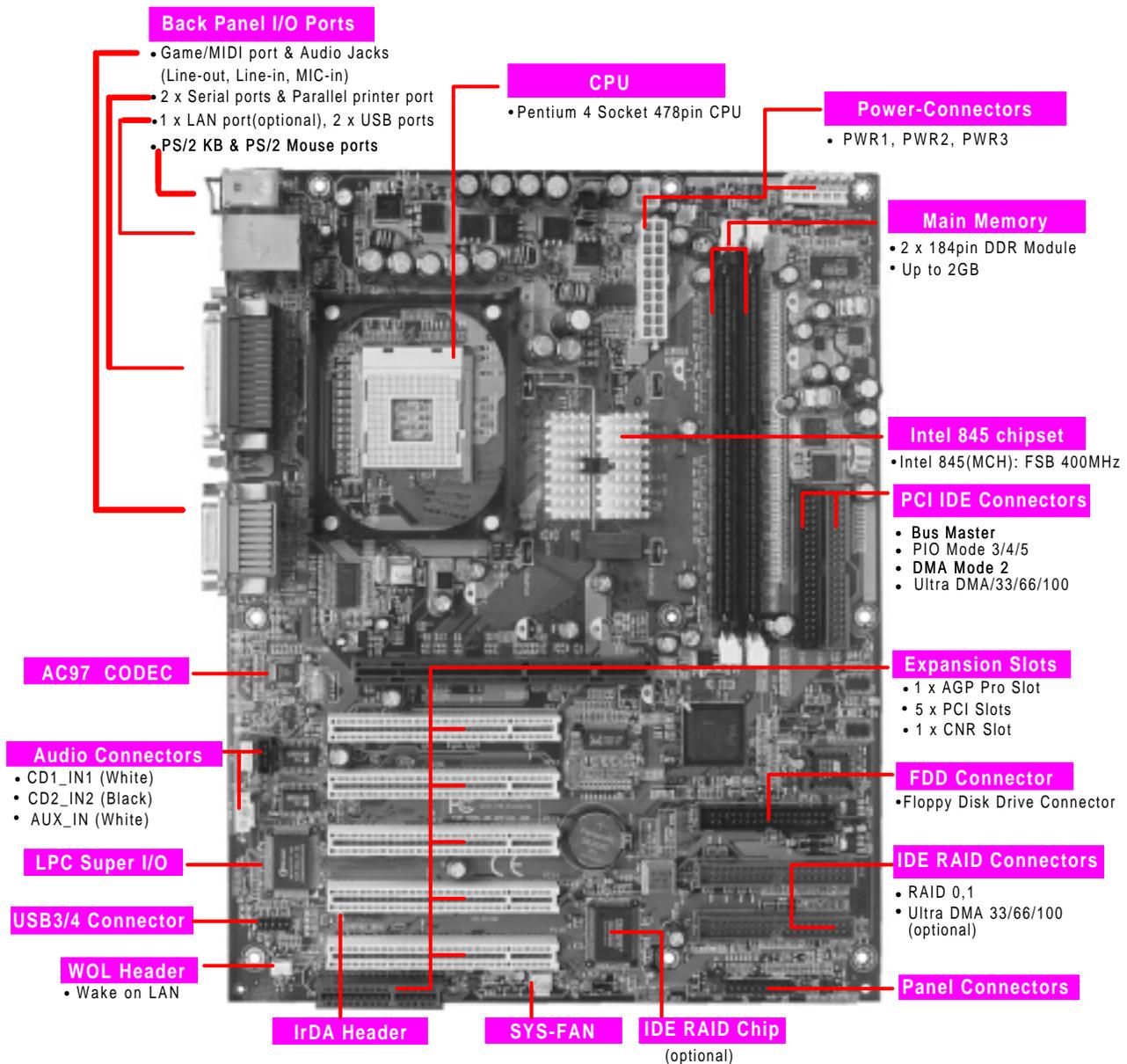
- **PCB Dimensions**

- ATX form factor, 4-layer PCB, 24.5cm x 30.5cm (9.6-inch x 12-inch)
-

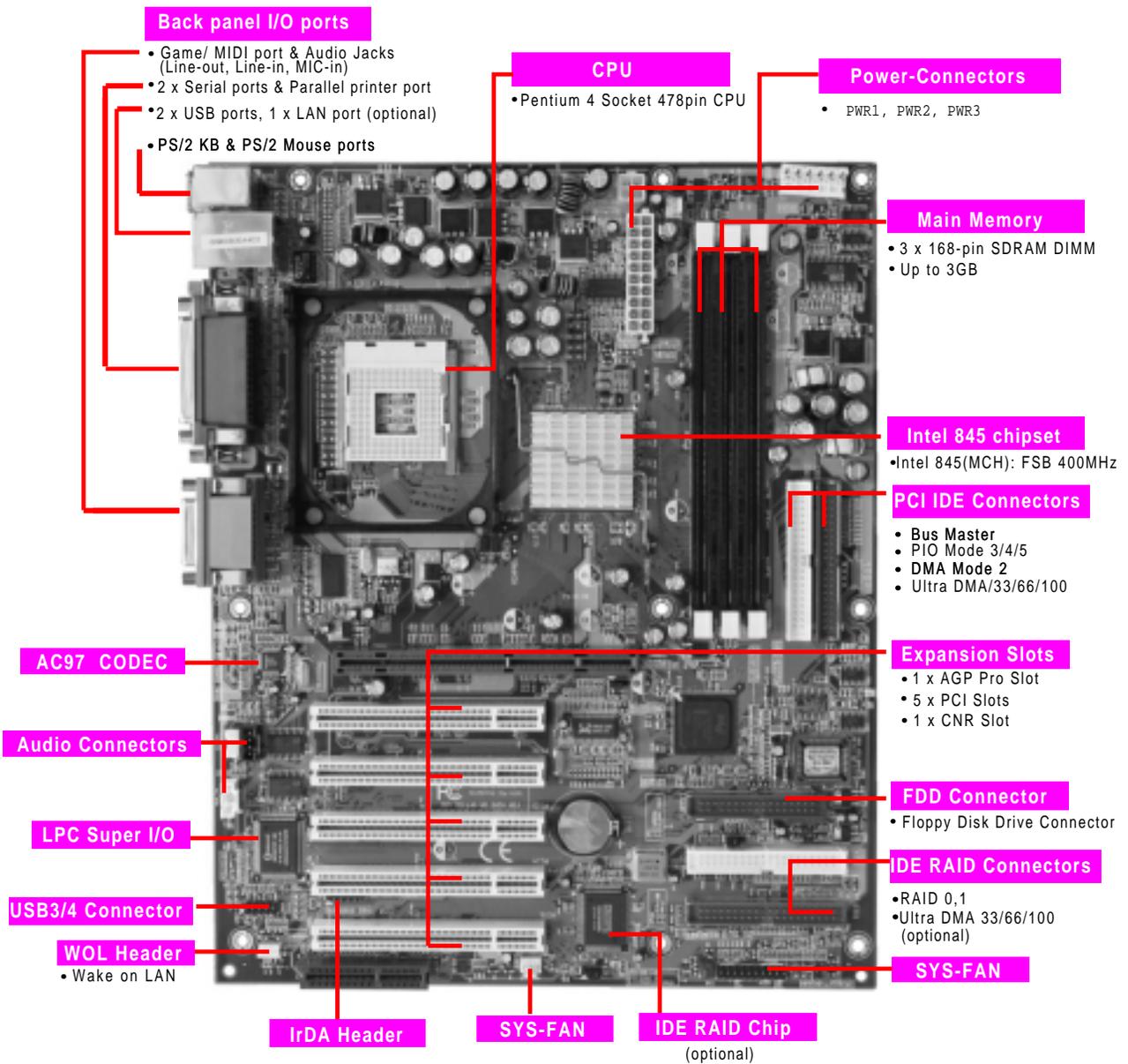
CHAPTER 2 HARDWARE INSTALLATION

2.1 Intel 845 Chipset Family Motherboard

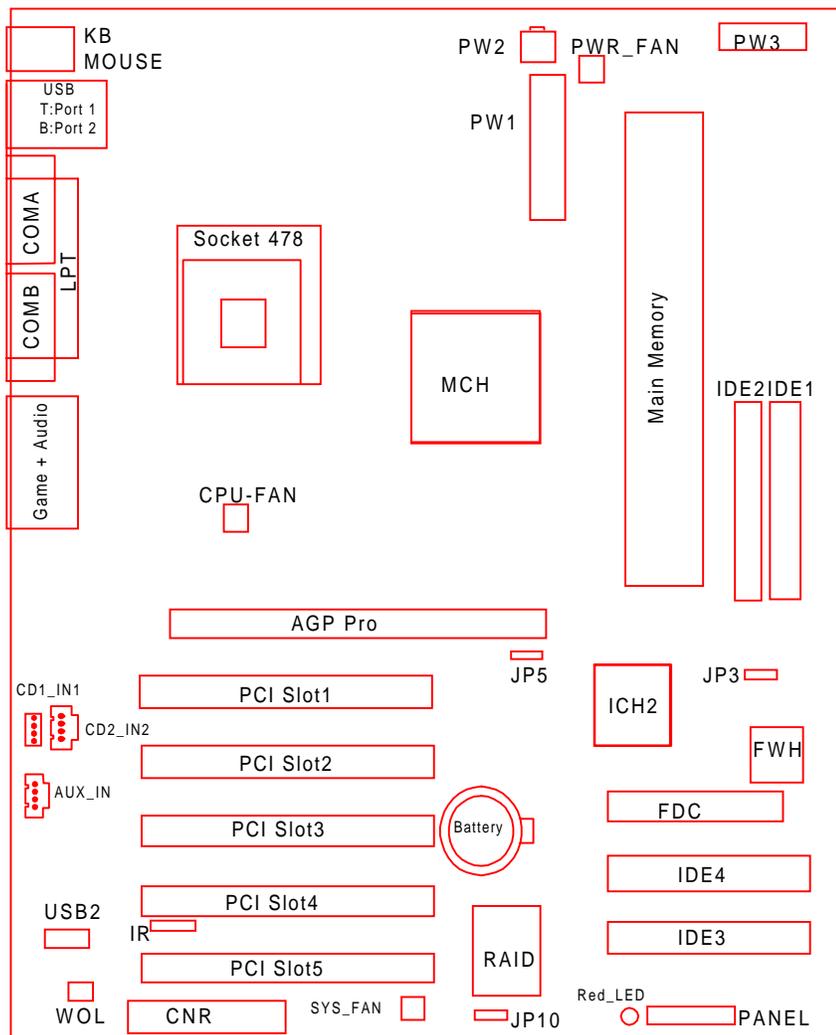
(1) 845D DDR Chipset Motherboard



(2) 845 Chipset Motherboard



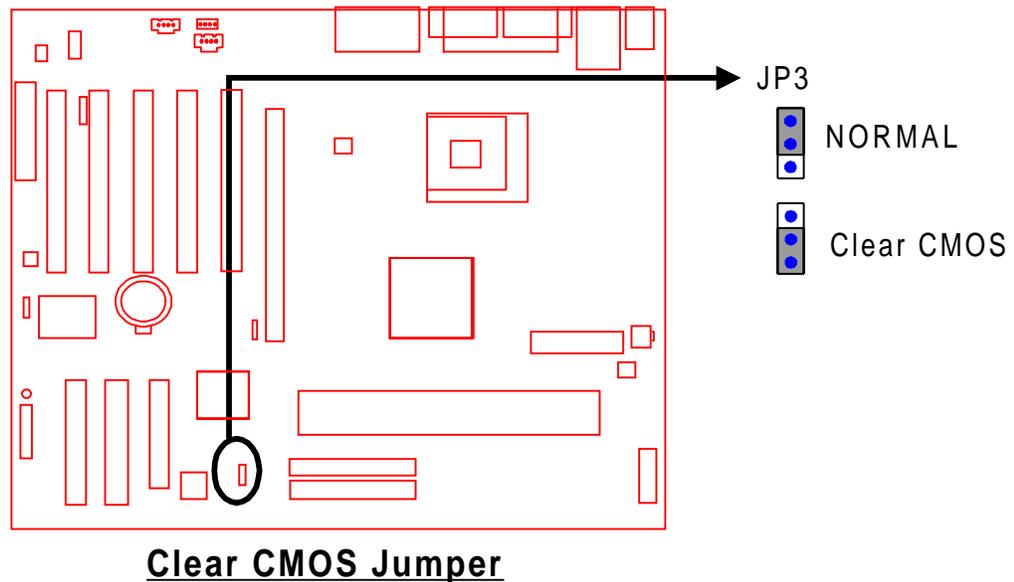
2.2 Layout of Intel 845 Chipset Family Motherboard



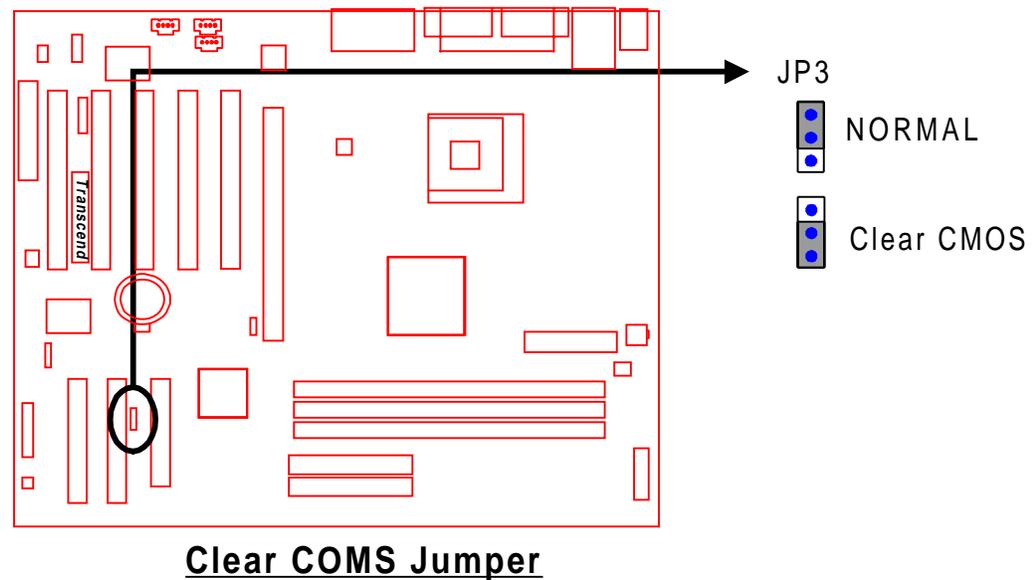
2.3 Using Jumper JP3 to Clear CMOS

To clear the CMOS data, you should turn off your computer's power and put Jumper JP3 in the Clear CMOS position as shown below for at least 10 seconds. Return the jumper to NORMAL and reboot.

(1) 845D DDR Chipset Motherboard

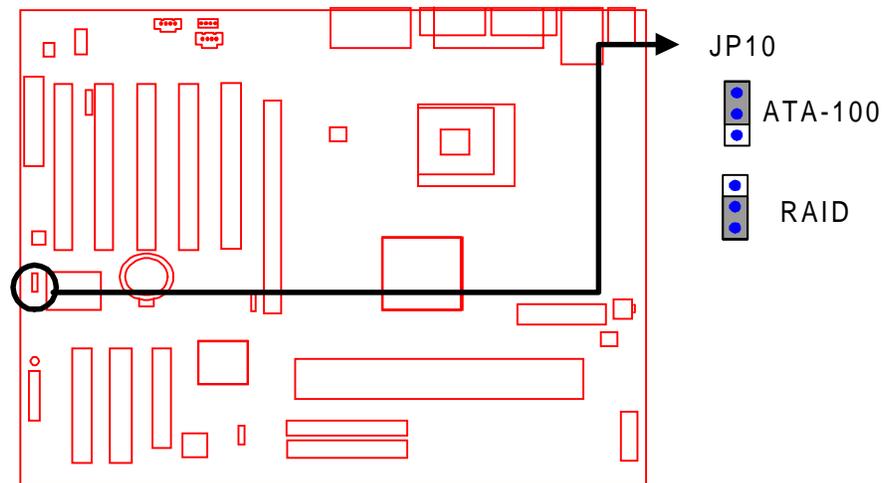


(2) 845 Chipset Motherboard



2.4 RAID/ATA100 Selection Jumper (JP10) (Optional)

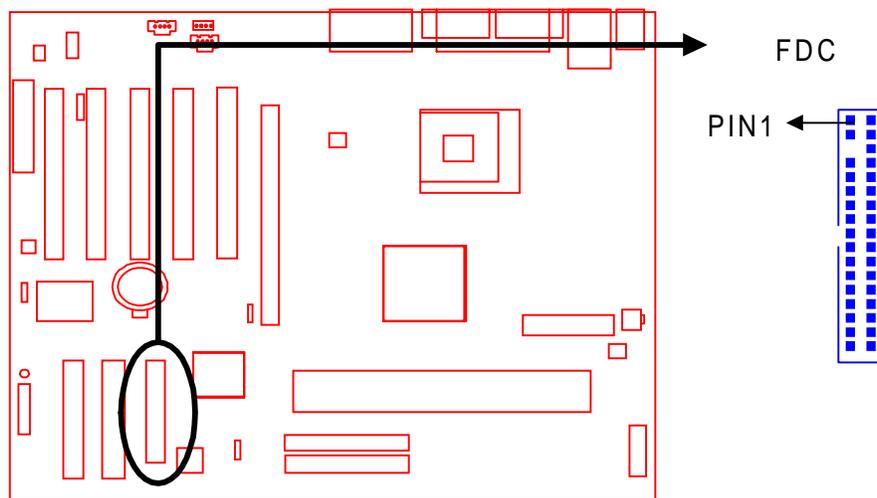
The optional onboard Promise IDE RAID controller features 2 additional ATA 100 channels or RAID (Redundant Array of Independent Disks). JP10 is used for ATA100 or RAID mode selection.



RAID/ATA100 Selection

2.5 Floppy Disk Drive Connector (34-pin FDC)

This connector supports up to two floppy disk drives (FDDs). A FDD ribbon cable is provided in your motherboard package. After connecting the single end to the board, connect the plug(s) at the other end to the FDD(s). Remember, the red stripe on the edge of the ribbon cable must be the nearest to PIN1 or your connection won't work.

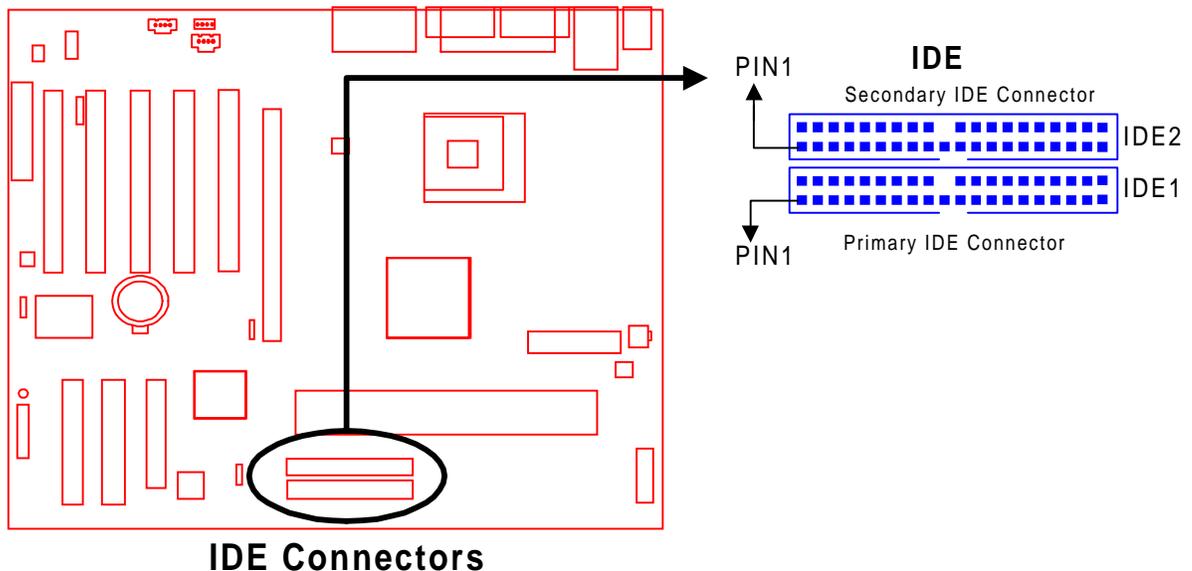


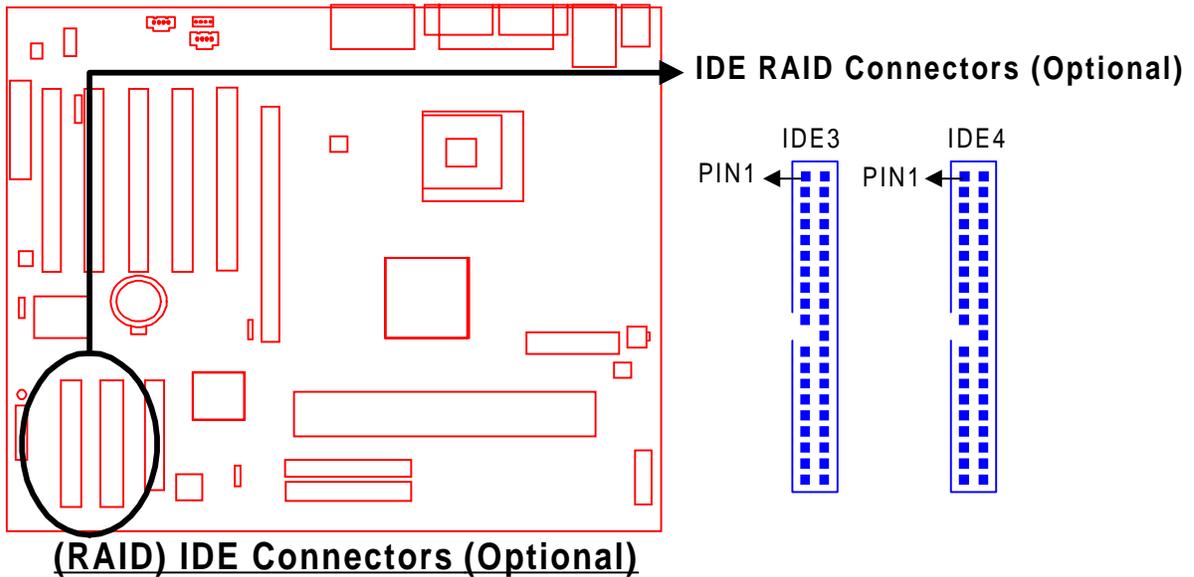
Floppy Disk Drive Connector

2.6 Primary/Secondary IDE Connectors (Two 40-pin IDE)

The standard configuration of the 845 Chipset Family Motherboard supports two 40-pin IDE connectors marked as IDE1 (primary channel) and IDE2 (secondary channel). Each channel supports two IDE devices for a total of four devices. However, the optional IDE RAID controller comes with additional two IDE connectors (IDE3/primary and IDE4/secondary). These two channels support up to four more IDE devices. Connect the main HDD, if you are using more than one, to the “Master” connector (at the end of the cable) and connect it to IDE1 (or IDE3 if using RAID function) (see important note below). If your HDD supports Ultra DMA/66/100, the 80-wire cable must be used or the HDD won’t be able to reach the faster speed. If you intend to operate two IDE devices from the same channel, one device must be set to “Master” mode, the other to “Slave” mode. A HDD, CD ROM or other IDE device can have either setting depending on the device’s jumper. Refer to the device’s manual for more information.

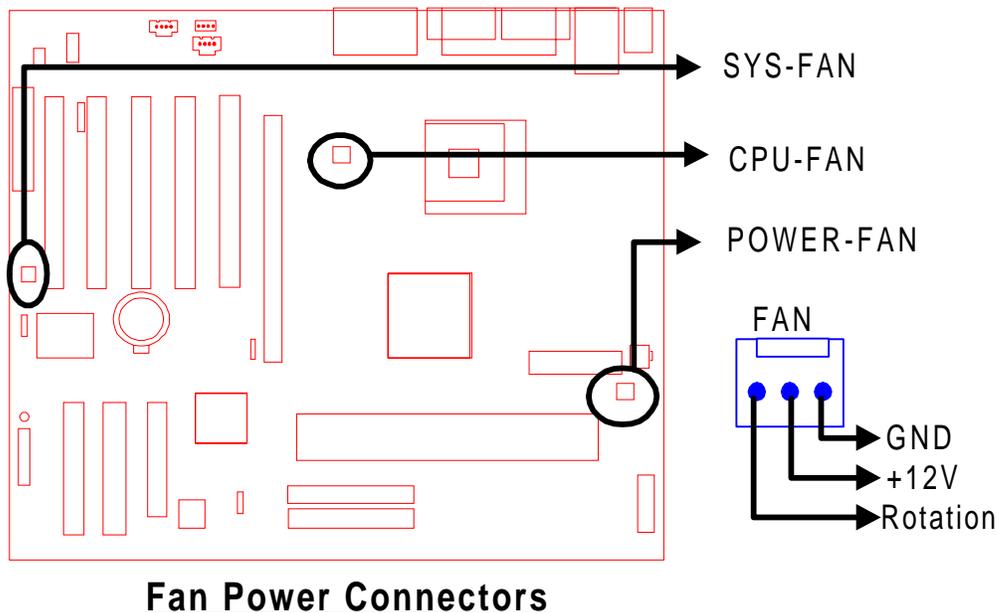
NOTE: The connectors must be attached to the IDE channels in the correct direction. Make sure that the red stripe on one edge of the ribbon cable (this may be faint and could also be a dotted line) is nearest to PIN1 (on the left for IDE1 and IDE 2 and at the top for IDE3 and IDE4 as the motherboard is shown in the following pictures).





2.7 Fan Power Connectors

There are three fan power connectors on the motherboard: CPU-FAN, POWER-FAN, and SYS-FAN. Each connector provides +12V power. The cables can only be attached the correct way. If you try to put them in the wrong way, they won't fit. These connectors support cooling fans of 500 mA (6W) or less.

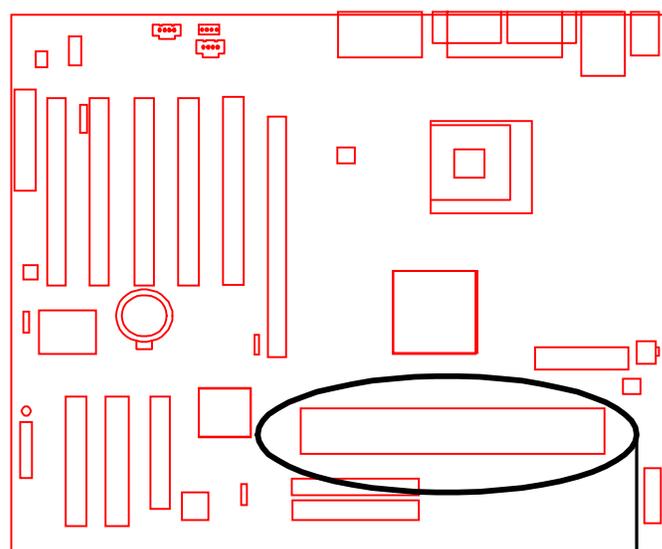


2.8 Memory Configuration

The 845D DDR Chipset Motherboard must be installed with PC1600 or PC2100 DDR DIMMs (Dual Inline Memory Modules), while the 845 Chipset Motherboard must be installed with PC100 or PC133 SDRAM DIMMs. You can install either single-sided or double-sided memory modules in any combination of memory capacities (listed below) in any slot, but never exceed 2GB total memory capacity for the 845D DDR Chipset Motherboard, or 3GB total memory capacity for the 845 Chipset Motherboard.

NOTE: Different types of DRAM modules (eg. DDR200 and DDR266 DIMMs/PC100 and PC133 DIMMs) should not be installed on one motherboard at the same time. This motherboard supports memory modules with capacities of 64/128/256/512MB and 1GB.

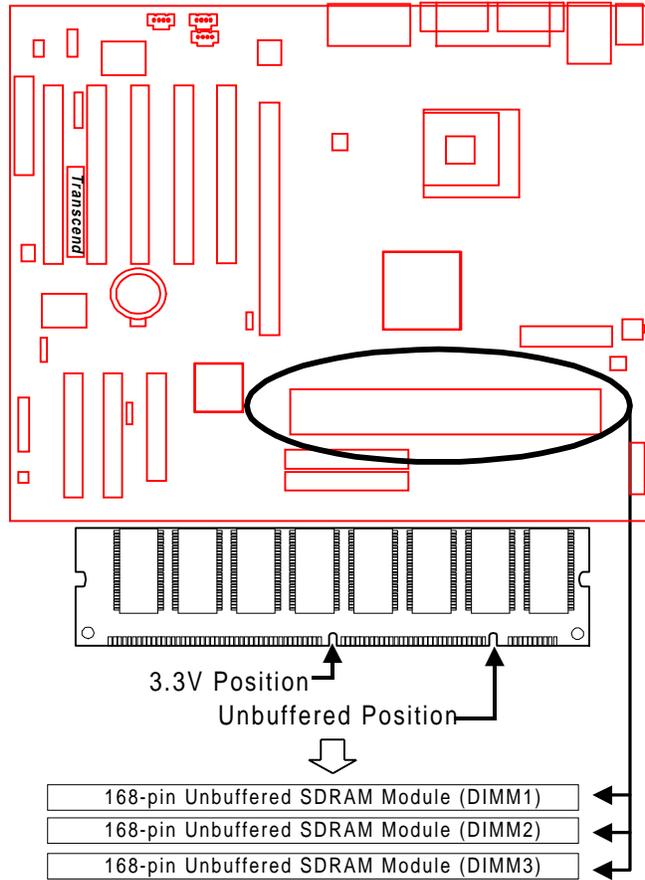
(1) 845D DDR Chipset Motherboard



184pin DDR Module (DIMM1)
184pin DDR Module (DIMM2)

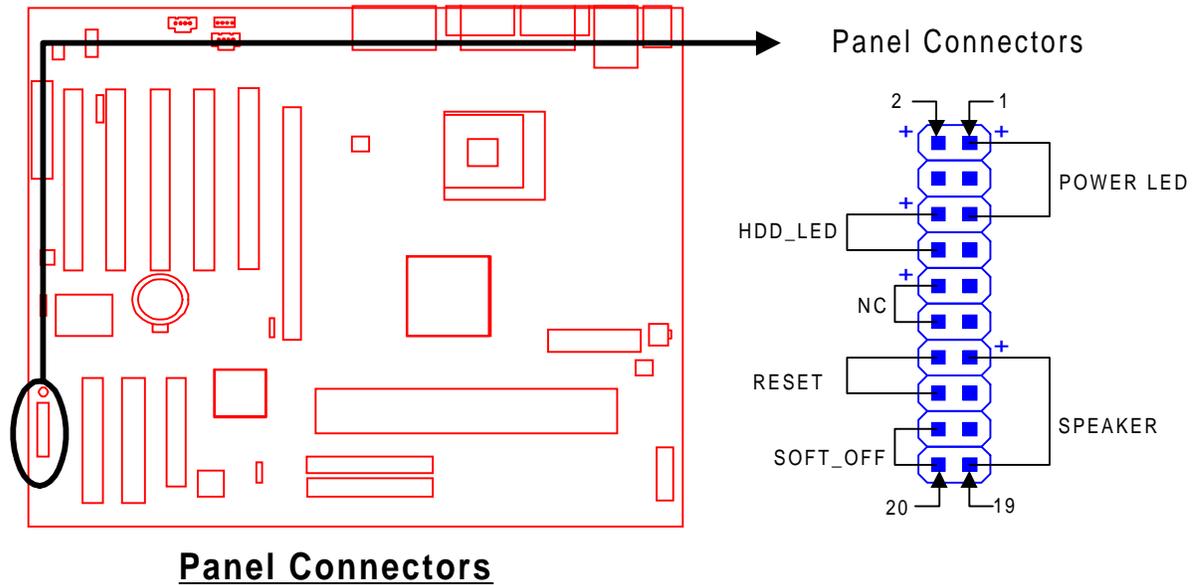
184Pin Memory DIMM Slots

(2) 845 Chipset Motherboard



168Pin Memory DIMM Sockets

2.9 Panel Connectors



Power LED (3-pin POWER LED)

This 3-pin connector attaches to the power LED.

- Pin1: +5V
- Pin3: NC
- Pin5: GND

Speaker (4-pin SPEAKER)

This 4-pin connector connects to the case-mounted speaker.

- Pin13: +5V
- Pin15: GND
- Pin17: NC
- Pin19: SPK

Hard Disk LED (2-pin HDD_LED)

This 2-pin connector connects to the LED of the HDD. The LED lights when a HDD is active.

- Pin6: +5V
- Pin8: GND

Reset Switch (2-pin RESET)

This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without turning on your power switch.

Pin14	RESET
Pin16	GND

Soft Power-Off (2-pin SOFT_OFF)

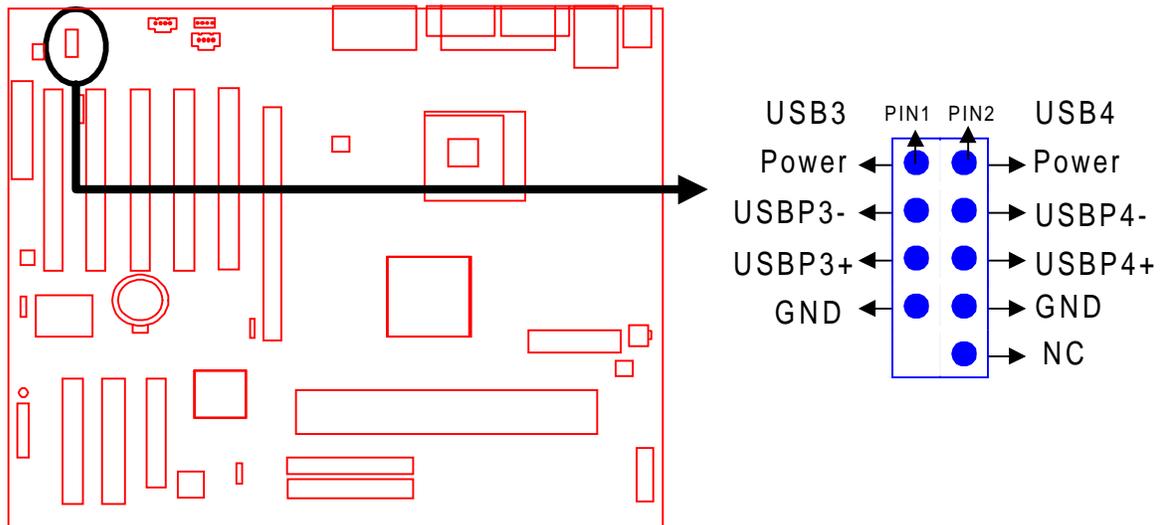
Attach the SOFT_OFF switch of the panel to this connector. Use the switch to Power On/Off your system. Set “Soft-Off by PWR-BTTN” in “Power Management Setup” in BIOS to either “Instant-Off” or “Delay 4 Sec.”

Pin18	SOFT_OFF
Pin20	GND

2.10 Internal USB Port Connector (9-Pin USB3/4)

You can use the optional USB port bracket to add 2 serial ports for additional serial devices. Regarding the external onboard USB ports (USB1/2), please refer to “Section 2.15 External Back Panel I/O Ports”.

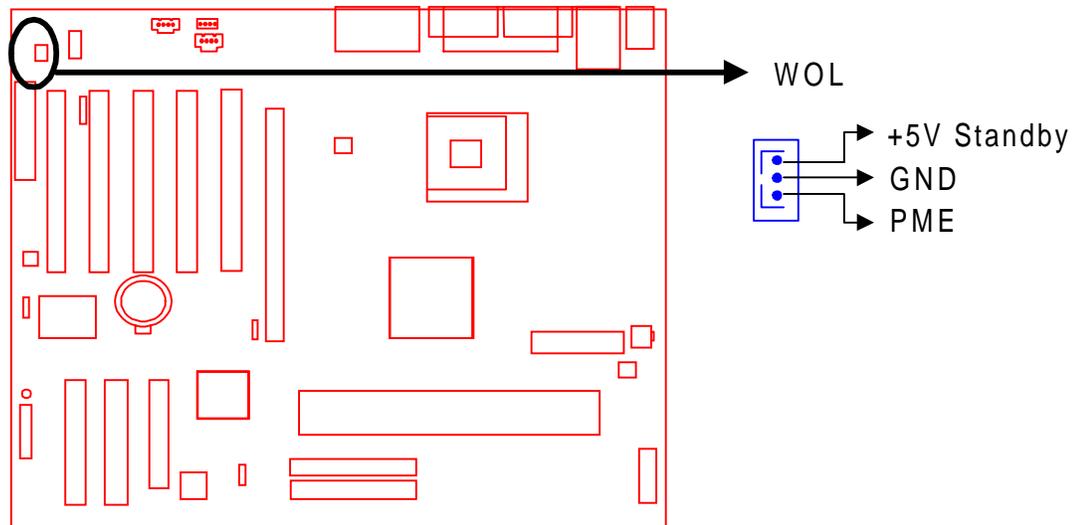
NOTE: Please make sure that the two red stripes on the cable are seated on pin1 and pin2 (at the top as shown below).



USB 3/4 Connector

2.11 Wake-on-LAN Connector (3-pin WOL)

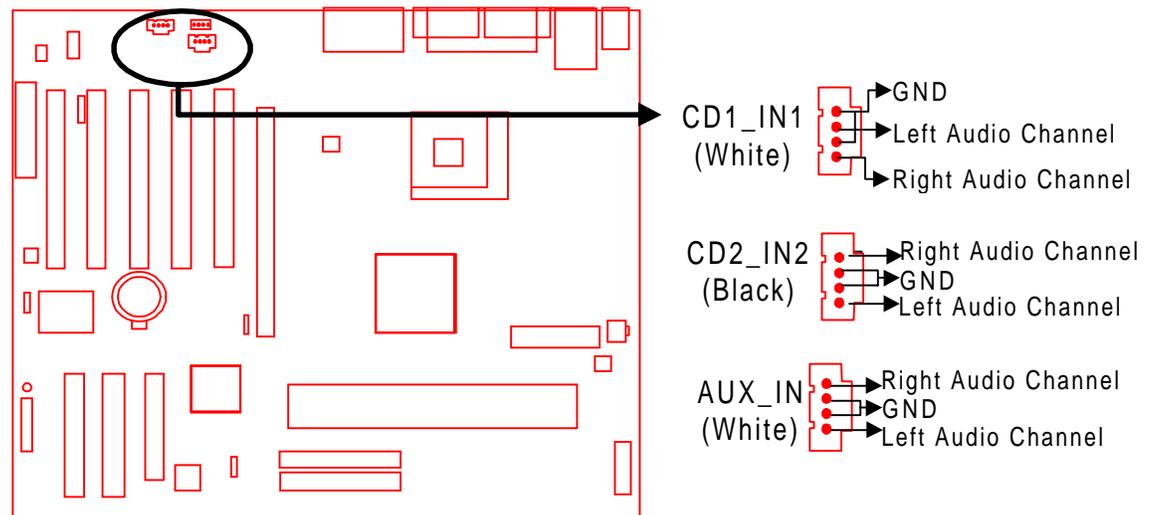
This connector connects to LAN cards with a Wake-on-LAN output. The system can Power Up when a wake-up packet or signal is received from the LAN card. "Wake-Up by PCI" must be "Enabled" in "Power Management Setup" in BIOS.



Wake-on-LAN Connector

2.12 Internal Audio Connectors

These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.

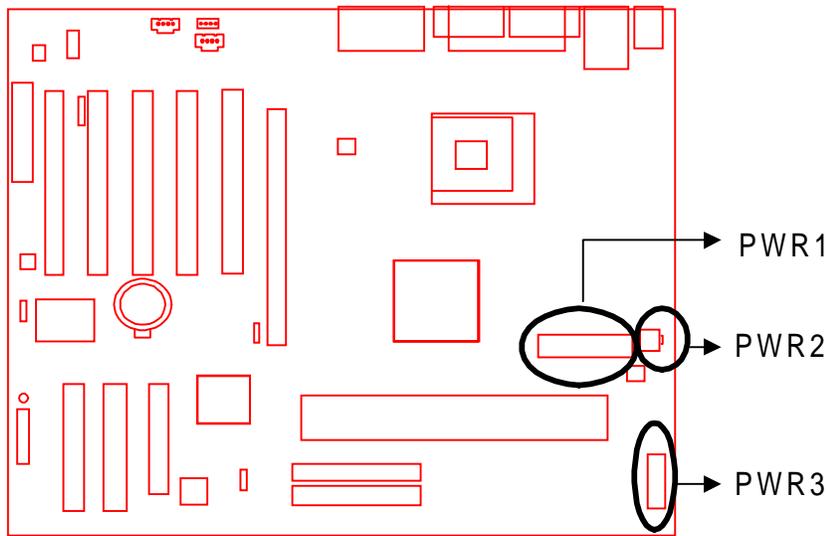


Internal Audio Connectors

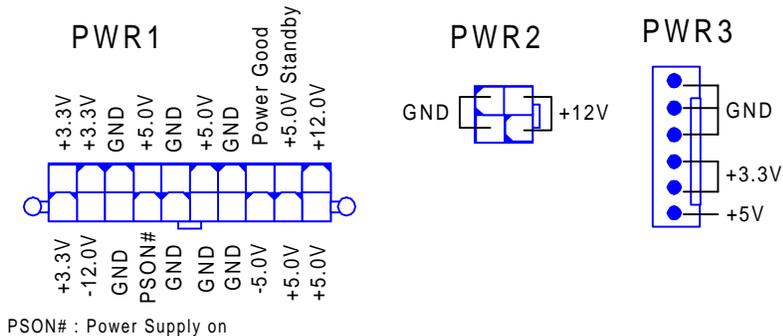
2.13 Power Connectors (20-pin PWR1, 4-pin PWR2, 6-pin PWR3)

First, make sure you have a power supply designed for Pentium 4 CPUs. The power supply must have three connectors: PWR1, PWR2, and PWR3. Make sure you plug the ATX12V power supply connectors into PWR1, PWR2, and PWR3 properly. The pin definition is shown below.

NOTE: Make sure that your ATX power supply can support at least 720mA +5V standby power for the Advanced Configuration and Power Interface (ACPI) functions.



Power Connectors

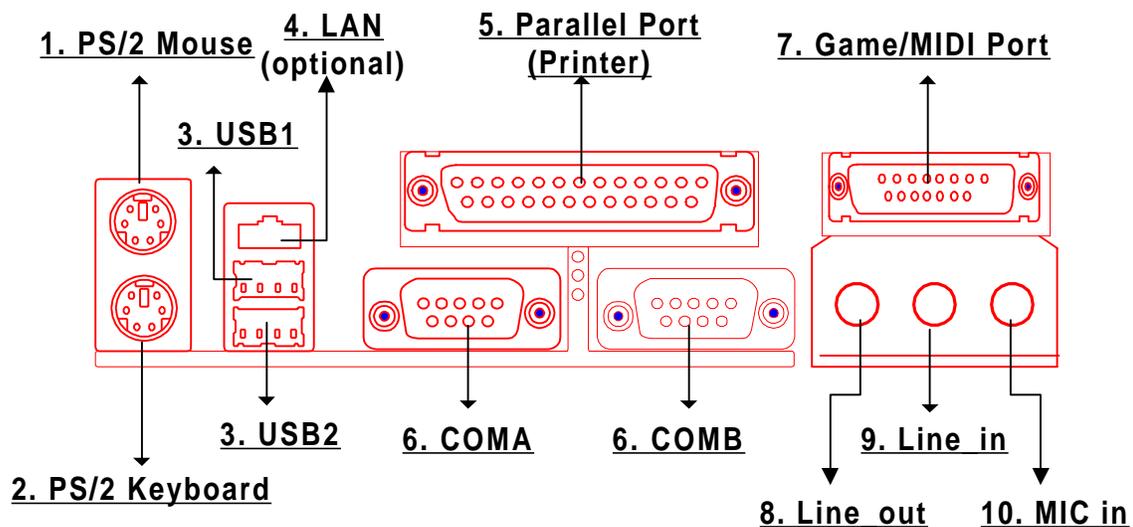


2.14 External Back Panel I/O Ports

There are 9 or 10 kinds of external connectors on the back panel of the motherboard.

The view in the drawing below is the back panel of the motherboard housing.

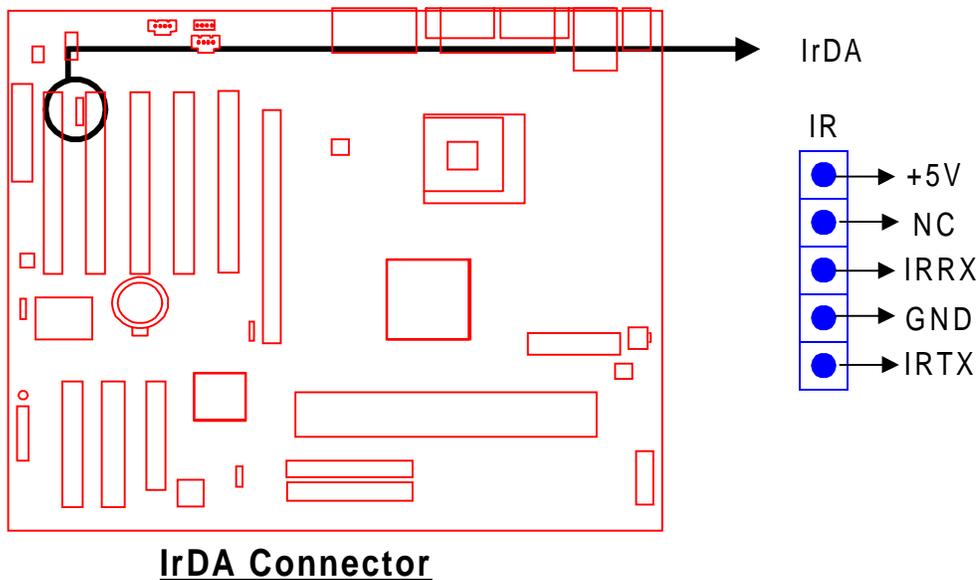
1. PS/2 Mouse Port (Green 6-pin MOUSE)
2. PS/2 Keyboard Port (Purple 6-pin KB)
3. USB (Universal Serial Bus) Ports USB1 & USB2 (Black two 4-pin USBs)
4. LAN Port (Black 8-pin LAN)(Optional)
5. Parallel Port (Burgundy 25-pin PRN)
6. Serial Port COMA & COMB (Turquoise 9-pin COMA & COMB)
7. Game Port/MIDI Port (Gold 15-pin GAME)
8. Line_out (Lime Green 1/8" LINE_OUT)
9. Line_in (Light blue 1/8" LINE_IN)
10. MIC_in (Pink 1/8" MIC)



External Back Panel I/O Ports

2.15 IrDA-Compliant Infrared Module Connector (5-pin IrDA)

The IrDA connector can be configured to support a wireless infrared module. With this module and application software such as Laplink or Windows Direct Cable Connection, users can transfer files to or from laptops (notebooks), PDAs and printers. You must also configure the setting through “UART Mode Select” in “Integrated Peripherals” in BIOS to select “IrDA”. Connect the Standard IR (SIR) device to the onboard SIR connector according to the pin definitions.



Congratulations! You have completed Hardware Setup!

You may now continue with “Chapter 3 BIOS Setup” and turn on your PC.

CHAPTER 3 BIOS SETUP

3.1 BIOS Setup

Award BIOS has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in CMOS RAM, so it can retain the Setup information when the power is turned off. If the battery for CMOS fails, these data will be lost. If that happens, please set up your configuration parameters again after replacing the battery. Please refer to Section 1.1, Essential Handling Precautions, for instructions on replacing the battery.

3.2 The Main Menu

As you turn on or reboot the system, the BIOS is immediately activated. It will read the system configuration information and check the system through the Power On Self Test (POST). During the POST process, pressing the [Del] key allows you to enter the Award BIOS configuration system. The following screen will appear.



In the Award BIOS system you can use the arrows (\uparrow \downarrow \rightarrow \leftarrow) to highlight an item and then enter its submenu by pressing the [Enter] key. The following keys help you navigate in Setup.

- [Esc] Main Menu: Quit without saving changes into CMOS RAM
Other pages: Exit the current page and return to the Main Menu
- [PgUp] Increase the numeric value or make changes
- [PgDn] Decrease the numeric value or make changes

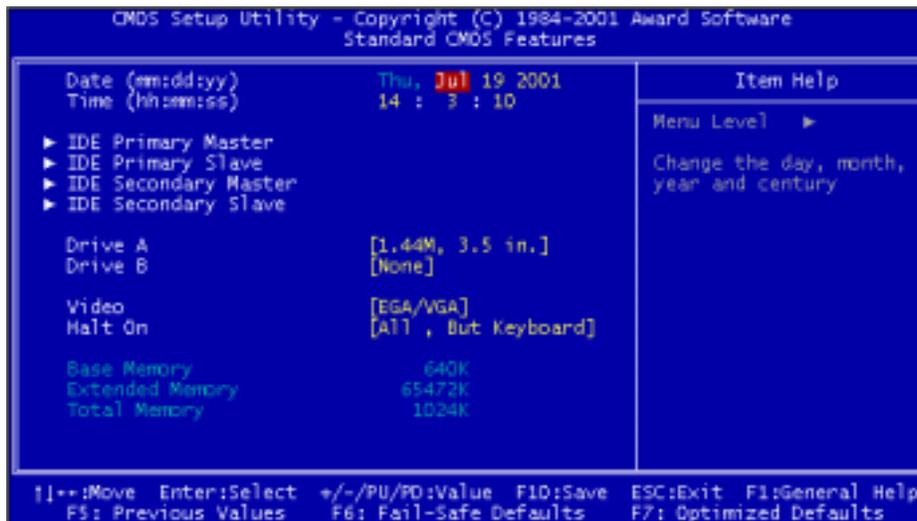
[+]	Increase the numeric value or make changes
[-]	Decrease the numeric value or make changes
[F1]	General help on Setup navigation keys
[F5]	Load previous values from CMOS
[F6]	Load the Fail-Safe Defaults from the BIOS default table
[F7]	Load the Optimized Defaults
[F10]	Save all the CMOS changes, and exit

The Following is a brief summary of each Setup category:

- **Standard CMOS Features**
Options in the original PC AT-compatible BIOS
 - **Advanced BIOS Features**
Award enhanced BIOS options
 - **Advanced Chipset Features**
Available options specific to your system's Chipset
 - **Integrated Peripherals**
I/O subsystems that depend on the integrated peripheral controllers in your system
 - **Power Management Setup**
Advanced Power Management (APM) and Advanced Configuration Power Interface (ACPI) options
 - **PnP/PCI Configurations**
Plug and Play standard and PCI Local Bus configuration options
 - **PC Health Status**
To display status of fans, CPU temperature, system temperature, etc., and provide the temperature monitoring option
 - **Frequency/Voltage Control**
To control the frequency and voltage of the CPU
 - **Load Fail-Safe Defaults**
To load the most basic BIOS default values required for your system to operate
-

- **Set Supervisor/User Password**
To change, set, or disable a password
- **Save & Exit Setup**
To save settings in nonvolatile CMOS RAM and exit Setup
- **Exit Without Saving**
To abandon all changes and exit Setup
- **Load Optimized Defaults**
To load the BIOS default values that are factory settings for optimal system performance

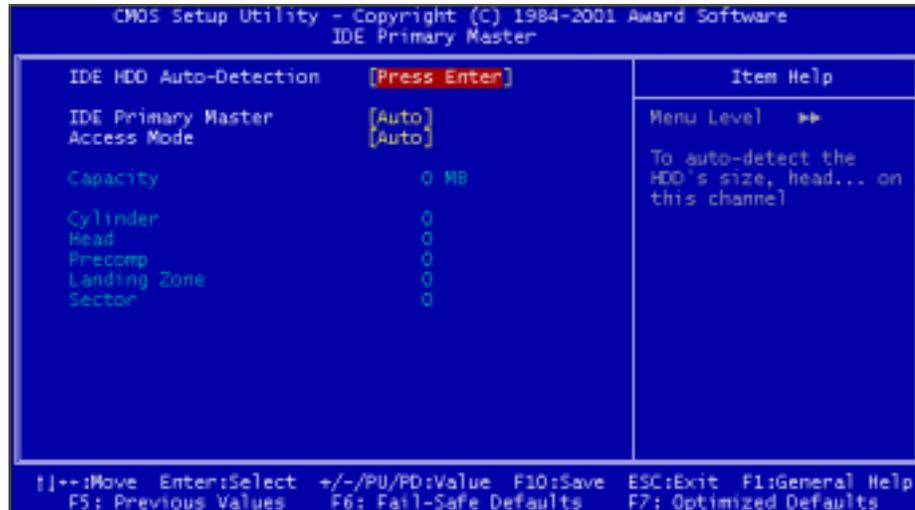
3.3 Standard CMOS Features



- **Date (mm:dd:yy)/Time (hh:mm:ss)**
Highlight the items and use [PageUp]/[PageDown] to change the value of Date/Time.

- **IDE Primary/Secondary Master/Slave**

Press [Enter] to enter the submenu shown below.



- IDE HDD Auto-Detection: Detect the HDD on this channel. If the detection is successful, it fills the remaining fields on this menu.
- IDE Primary/Secondary Master/Slave: We recommend that you select “AUTO” for all drives. The BIOS can automatically detect the specifications during POST while the system boots. You can also choose “Manual” to set the specifications yourself. “None” indicates that there is no device installed on this IDE channel.
- Access Mode: “Auto”, “CHS”, “LBA”, or “Large”.
 - CHS: Maximum number of cylinders, heads, and sectors supported are 1024, 16, and 63 respectively.
 - LBA (Logical Block Addressing): During drive access, the IDE controller transforms the data address described by sector, head, and cylinder number into a physical block address. This will significantly improve data transfer rates for drives with more than 1024 cylinders.
 - Large: For drives that do not support LBA and have more than 1024 cylinders.
 - Auto: The BIOS automatically determines the optimal access mode.
- Capacity: Disk drive capacity. Note that this size is slightly greater than the size of a formatted disk given by a disk-checking program.
- Cylinder: Number of cylinders
- Head: Number of heads
- Precomp: Write precompensation cylinder

- Landing Zone: Landing zone
- Sector: Number of sectors

- **Drive A/Drive B**

Select the correct types of diskette drive(s) installed in the computer.

- None: No diskette drive installed
- 360K, 5.25 in.: 5-1/4-inch standard drive; 360 kilobyte capacity
- 1.2M, 5.25 in.: 5-1/4-inch high-density drive; 1.2 megabyte capacity
- 720K, 3.5 in.: 3-1/2-inch double-sided drive; 720 kilobyte capacity
- 1.44M, 3.5 in.: 3-1/2-inch double-sided drive; 1.44 megabyte capacity
- 2.88M, 3.5 in.: 3-1/2-inch double-sided drive; 2.88 megabyte capacity

- **Video**

Select the type of primary video subsystem in your computer. The BIOS will detect the correct video type automatically.

- EGA/VGA: Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters.
- CGA 40: Color Graphics Adapter, powers up in 40-column mode.
- CGA 80: Color Graphics Adapter, powers up in 80-column mode.
- MONO: Monochrome adapter, including high resolution.

- **Halt On**

During POST, the computer stops if the BIOS detects a hardware error. You can set the BIOS to ignore certain errors during POST and continue the boot-up process. The following are the available selections.

- All Errors: If the BIOS detects any nonfatal errors, POST stops and prompts you to take corrective action.
 - No Errors: POST does not stop for any error.
 - All, But Keyboard: If the BIOS detects any nonfatal errors except keyboard, POST stops and prompts you to take corrective action.
 - All, But Diskette: If the BIOS detects any nonfatal error except floppy disk drive, POST stops and prompts you to take corrective action.
 - All, But Disk/Key: If the BIOS detects any nonfatal error except floppy disk drive or keyboard, POST stops and prompts you to take corrective action.
-

3.4 Advanced BIOS Features

This “Advanced BIOS Features” option allows you to improve your system performance and setup system features according to your preferences.



- **Virus Warning**

When this function is enabled, you will receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then execute an anti-virus program. Keep in mind that this feature protects the boot sector only, not the entire hard drive.

NOTE: Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you disable the virus warning first.

- **CPU L1/L2 Cache**

Select “Enabled” to start the CPU function for L1/L2 Cache.

- **CPU Fast-Strings**

Select “Enabled” to start the CPU Fast-Strings.

- **Quick Power On Self Test**

Select “Enabled” to reduce the amount of time required to run POST. The Quick POST skips certain steps. We recommend that you normally disable Quick POST. It is better to find a problem during POST than to lose data during your work.

- **ATA/100 & SCSI Boot Order**

Options are: “SCSI, RAID” or “RAID, SCSI”. This parameter only exists for motherboards with the optional RAID controller onboard.

- **First/Second/Third/Other Boot Device**

The original IBM PCs loaded the DOS operating system from drive A (floppy disk). IBM PC-compatible systems therefore search for an operating system first on drive A and then on drive C (hard disk). However, BIOS attempts to load the operating system from the devices in the sequence selected in this field. In addition to drives A (“Floppy”) and C (“HDD-0”), options include: “LS120”, a “SCSI” bootable drive, “CDROM”, “HDD-1”, “HDD-2”, “HDD-3”, a “ZIP100” drive, and a “LAN” drive. If your boot device is not in the list, set “Boot Other Device” to “Enabled” to let the system detect the drive automatically.

- **Swap Floppy Drive**

This field is effective only in systems with two floppy drives. Selecting “Enabled” assigns physical drive B to logical drive A, and physical drive A to logical drive B. This item is useless in OS/2.

- **Boot Up Floppy Seek**

When you select “Enabled”, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360KB floppy drives have 40 tracks; drives with 720KB, 1.2MB, and 1.44MB capacity all have 80 tracks. Because very few modern PCs have 40-track floppy drives, we recommend that you set this field to “Disabled” to save time.

- **Boot Up NumLock Status**

Toggle between “On” and “Off” to control the state of the NumLock key when the system boots. When toggled “On”, the numeric keypad area of the keyboard generates numbers instead of controlling cursor operations.

- **Gate A20 Option**

Choose “Fast” (default) or “Normal”. “Fast” allows RAM access above 1MB to use the fast Gate A20 line.

- **Typematic Rate Setting**

When this function is “Disabled”, the following two items (Typematic Rate and Typematic Delay) are irrelevant, and keystrokes repeat at a rate determined by the keyboard controller in your system. When this function is “Enabled”, you can select a typematic rate and typematic delay.

- **Typematic Rate (Chars/Sec)**

When the Typematic Rate setting is “Enabled”, you can select a typematic rate (the rate at which a character repeats) when you hold down a key of: “6”, “8”, “10”, “12”, “15”, “20”, “24” or “30” characters per second.

- **Typematic Delay (Msec)**

When the Typematic Delay setting is “Enabled”, you can select a typematic delay (the delay before key strokes begin to repeat) of: “250”, “500”, “750” or “1000” milliseconds.

- **Security Option**

If you have set a password, you can select whether the password is required while the system boots (“System”), or only when you enter “Setup”.

- **APIC Mode**

Options are: “Enabled” or “Disabled. Remain “Enabled” to have more IRQ, for peripheral devices.

- **MPS Version Control For OS**

Options are: “1.1” or “1.4”. This is an option for future PC2002 specification requirement.

- **OS Select for DRAM > 64MB**

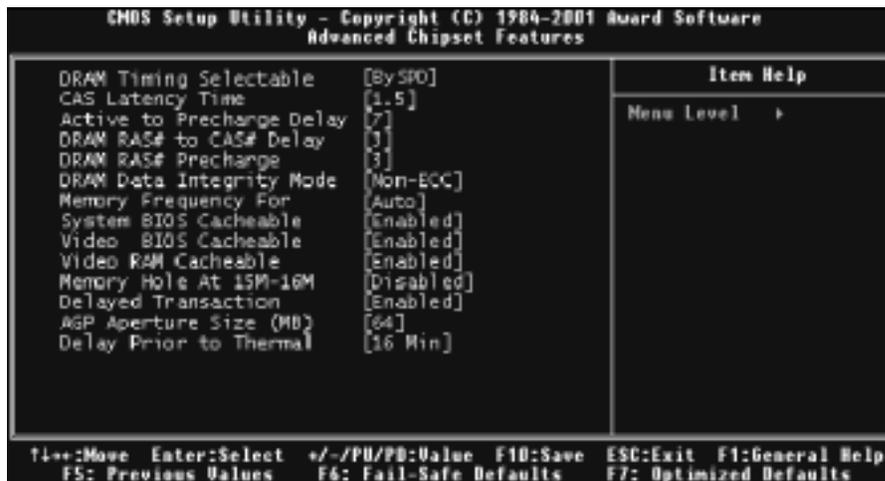
Select “OS2” only if you are running OS/2 operating system with more than 64 MB of RAM on your system. Otherwise select “Non-OS2”.

- **Report No FDD For WIN 95**

Select “Yes” to release IRQ6 when there is no floppy disk drive, for compatibility with WIN 95 logo certification.

3.5 Advanced Chipset Features

This option will change the values of the chipset registers and the system settings will alter. Do not change any values if you are unfamiliar with the chipset.



- **DRAM Timing Selectable**

This controls the SDRAM performance: default is “By SPD”. BIOS will auto detect the SPD information of the Memory Module and choose the proper setting. “By User” allows the timing to be set manually.

- **CAS Latency Time**

This allows the CAS Latency to be set to: “1.5”, “2”, “2.5”, or “3”.

- **Active to Precharge Delay**

This controls the idle clocks after issuing a precharge command to memory. Leave it on the default setting. Options are: “7”, “6”, or “5”.

- **DRAM RAS# to CAS# Delay**

This controls the latency between memory active command and the read/write command. Leave it on the default setting. Options are: “3” or “2”.

- **DRAM RAS# Precharge**

This controls the idle clocks after issuing a precharge command to memory. Leave it on the default setting. Options are: “3” or “2”.

- **DRAM Data Integrity Mode**

Options are: “Non-ECC” and “ECC”.

- **Memory Frequency For (845D DDR Chipset Motherboard)**

This can be used to manually set DRAM Frequency to “DDR200” or “DDR266”. Use “Auto” for auto detection of the memory frequency.
 - **Memory Frequency For (845 Chipset Motherboard)**

This can be used to manually set DRAM Frequency to “PC133” or “PC100”. Use “Auto” for auto detection of the memory frequency.
 - **System BIOS Cacheable**

Selecting “Enabled” allows caching of the system BIOS. This action can increase system performance.
 - **Video BIOS Cacheable**

Selecting “Enabled” allows caching of the video BIOS. This action can increase system performance.
 - **Video RAM Cacheable**

Selecting “Enabled” allows caching of the Video RAM. This action can increase system performance.
 - **Memory Hole at 15M-16M**

Enabling this feature reserves memory address space (between 15 and 16MB) to ISA expansion cards that specifically require this setting. This makes between 15 and 16MB of memory unavailable to the system. Expansion cards can only access memory up to 16MB. The default setting is “Disabled”.
 - **Delayed Transaction**

PCI access speed is faster than ISA. If “Enabled”, PCI will release the master bus to the ISA interface for accessing data. The master bus control will then go back to PCI again.
 - **AGP Aperture Size (MB)**

The Aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Access to the aperture range is forwarded to AGP without any translation. Available options are “4MB” to “256MB”.
 - **Delay Prior to Thermal**

Options are: “4”, “8”, “16”, or “32 minutes”.
-

3.6 Integrated Peripherals

Choose this option and the following display appears.



- **On-Chip Primary/Secondary PCI IDE**

The chipset contains a PCI IDE interface which supports two IDE channels. Select “Enabled” to activate the first and/or second IDE interface. Select “Disabled” to deactivate this interface, when you install a primary and/or secondary add-in IDE interface.

- **IDE Primary/Secondary Master/Slave PIO**

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In “Auto” mode, the system automatically determines the best one for each device.

- **IDE Primary/Secondary Master/Slave UDMA**

Ultra DMA/33/66/100 implementation is possible only if your IDE HDD(s) can support it, and if the operating environment includes a DMA driver (Windows 95 OSR2 or higher or a third-party IDE bus master driver). If your HDD(s) and your system software can support Ultra DMA/33/66/100, select “Auto” to enable BIOS support.

- **USB Controller**

Select “Enabled” if your system contains a Universal Serial Bus (USB) controller and USB peripheral(s).

- **USB Keyboard Support**

Select “Enabled” if you intend to use a USB Keyboard.

- **Onboard Audio**

Select “Enabled” or “Disabled” depending on whether you wish to use the Onboard Audio function.

- **AC97 Audio/AC 97 Modem**

If you select “Auto”, BIOS will detect whether you are using any Audio or Modem devices. When an Audio or Modem device is detected, the onboard Audio/Modem controller will be enabled. If you want to use your own Audio and/or Modem card, set these fields to “Disabled”. If not, set these fields to “Auto”.

- **Init Display First**

This item allows you to decide which to activate first depending on the location of your video card: the “PCI Slot” or the “AGP” slot.

- **IDE HDD Block Mode**

Block Mode is also called Block Transfer, Multiple Commands, or Multiple Sector Read/Write. If your IDE HDD supports Block Mode (most new drives do), select “Enabled” for automatic detection of the optimal number of Block Read/Write per sector the drive can support.

- **Power On Function**

- Password: Power On only if you key in the correct password.
- Hot Key: You can use a hot key to Power On the system.
- Mouse Left: Power On with the Mouse Left Button.
- Mouse Right: Power On with the Mouse Right Button.
- Any Key: Press any key to Power On the system.
- Button only: Power On only by pushing the button on the case (Default).
- Keyboard 98: You can Power On the system by pushing the [Power-On] key on a Keyboard 98.

- **KB Power On Password**

Enter the Power On Password here. Activated only when “Password” is selected in the Power On Function Menu (See above).

- **Hot Key Power On**

Choose [CTRL] +[F1] ~ [F12] as a hot key to Power On the system. Activated only when “Hot Key” is selected on the Power On Function Menu (See above).

- **Onboard FDC Controller**

You can use this function to “enable” or “disable” the onboard FDC controller.

- **Onboard Serial Port 1/Port 2**

Select an address and the corresponding interrupt for each of the first and second serial ports. The choices are: “Disabled”, “3F8/IRQ4”, “2F8/IRQ3”, “3E8/IRQ4”, “2E8/IRQ3”, and “Auto”. The second serial port shares resources (address and IRQ) with IrDA.

- **UART Mode Select**

Choose the right type of infrared device:

- IrDA: IrDA compliant serial infrared port
- ASKIR: Amplitude Shift Keyed Infrared Port
- Normal: Normal operation

- **RxD, TxD Active**

Consult your IR peripheral documentation to select the correct combination of RxD and TxD (“Hi, Hi”, “Hi, Lo”, “Lo, Hi”, or “Lo, Lo”).

- **IR Transmission Delay**

Consult your IR peripheral documentation to select “Enabled” or “Disabled” for the IR Transmission Delay.

- **UR2 Duplex Mode**

This item allows you to select the IR half/full duplex function.

- **Use IR Pins**

This option selects IR transmission routing. The two choices are:

RxD2,TxD2 => COMB Connector

IR-Rx2Tx2 => IR Connector

- **Onboard Parallel Port**

Select a logical LPT port name and matching address for the physical parallel (printer) port. The choices are: “378/IRQ7”, “278/IRQ5”, “3BC/IRQ7” and “Disabled”.

- **Parallel Port Mode**

This field allows you to set the operation mode of the parallel port.

- SPP: Allows normal-speed operation, but in one direction only.
- EPP: Allows bi-directional parallel port operation at maximum speed.
- ECP: Allows DMA and bi-directional operation. It is faster than EPP mode.
- ECP + EPP: Allows normal speed operation in two-way mode.
- Normal: Allows normal speed operation of the parallel port.

- **EPP Mode Select**

Select EPP port type “EPP1.7” or “EPP1.9”.

- **ECP Mode Use DMA**

Assign DMA channel “1” or “3” to the port for ECP mode operation.

- **PWR-ON After PWR-Fail**

Choose if you want the system to automatically Power On after a power failure.

- Off: Disables this function
 - On: Enables this function
 - Former-Sts: Not only powers on the system, but returns it to its former status.
-

- **Game Port Address**

Set Joystick Game Port Address. The choices are: "Disabled", "201" and "209".

- **Midi Port Address**

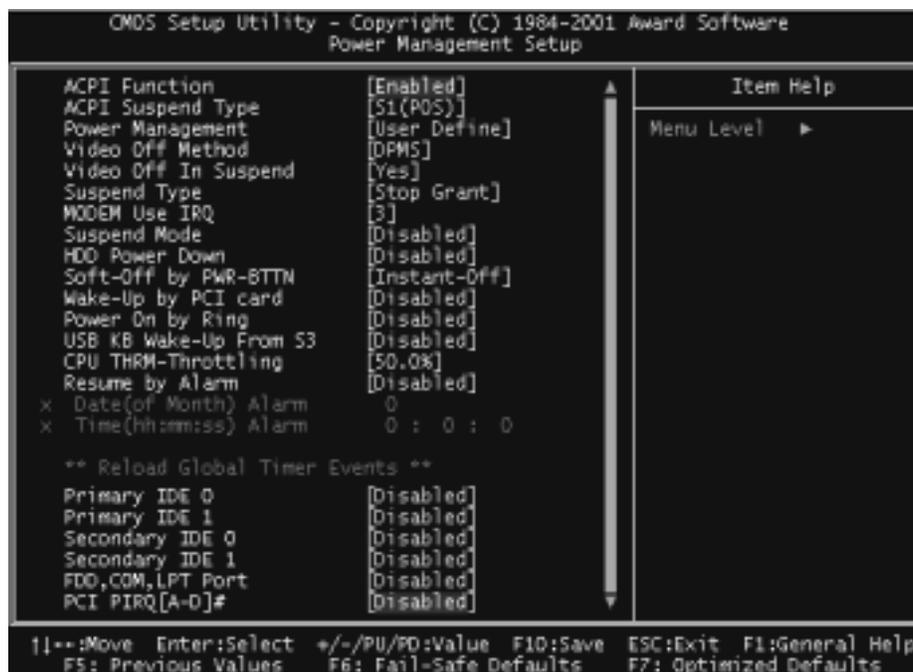
Set Midi Port Address. The choices are: "Disabled", "330", "300" and "290".

- **Midi Port IRQ**

Assigns IRQ "5" or "10" to the Midi Port.

3.7 Power Management Setup

The Power Management Setup allows you to configure your system to minimize energy consumption, according to your own style of computer use.



- **ACPI Function**

This item allows you to enable/disable the Advanced Configuration and Power Interface (ACPI).

- **ACPI Suspend Type**

Select the ACPI Suspend Type: “S1 (POS)” or “S3 (STR)”. If your expansion cards do not support the STR (Suspend-to-RAM) function, you must leave this field on “S1 (POS)” setting. STR is an energy-saving feature. It takes only a few seconds to wake up the system and return to the previous situation.

NOTE: This feature (STR) requires an ATX power supply with at least 720mA and 5V standby power for the Advanced Configuration and Power Interface (ACPI) functions. Otherwise, the system will fail to return from suspend mode.

- **Power Management**

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. Suspend Mode
2. HDD Power Down

There are three selections for Power Management. Two of them have fixed mode settings.

1. Min. Power Saving:

Minimum power management mode. Inactivity period is defined below:

Suspend Mode = 1 hr. HDD Power Down = 15 min.

2. Max. Power Saving:

Maximum power management mode. Inactivity period is defined below:

Suspend Mode = 1 min. HDD Power Down = 1 min.

3. User Define:

Allows you to set each mode individually. Select the time-out period for each mode shown above.

- **Video Off Method**

Defines the Video Off features.

- Blank Screen: Only blanks the screen. Use this for monitors without power management and “green” features.
- V/H SYNC+BLANK: Blanks the screen and turns off vertical and horizontal scanning.
- DPMS: The DPMS (Display Power Management System) feature allows the BIOS to control the video display card if it supports the DPMS feature.

- **VIDEO Off In Suspend**

This determines the manner in which the monitor is blanked. Select “Yes” to blank the monitor when the system enters suspend mode.

- **Suspend Type**

Select Suspend Type: “Stop Grant” or “PWR ON Suspend”.

- **MODEM Use IRQ**

You can select one of the following interrupt resources for modem use: “N/A”, “3”, “4”, “5”, “7”, “9”, “10”, or “11”.

- **Suspend Mode**

After the selected period of system inactivity (1 minute to 1 hour), all devices except the CPU will be shut down. You may also select “Disabled” to cancel Suspend Mode.

- **HDD Power Down**

After the selected period of system inactivity (1 to 15 minutes), the HDD powers down while all other devices remain active. This feature doesn't effect SCSI hard drives.

- **Soft-Off by PWR-Bttn**

When set to “Instant-off”, the ATX switch can be used as a normal system Power Off button. When set to “Delay 4 seconds”, you need to press the Power Off button down for more than 4 seconds if you want to Power Off the system.

- **Wake-Up by PCI Card**

Select “Enabled” if you want to Power On your system when a PCI event occurs.

- **Power On by Ring**

Select "Enabled" to Power On your system when the external modem receives a call.

NOTE: This function requires an external modem which supports the Ring Wake-Up function.

- **USB KB Wake-Up From S3**

When your system is in S3 (Suspend to RAM) mode, you can wake-up the system by pressing the wake-up key on the USB Keyboard.

- **CPU THRM-Throttling**

Select the CPU Thermal-Throttling rate. If BIOS detects that the CPU temperature is too high, it will slow down the CPU's speed according to this field. The choices are: "87.5%", "75.0%", "62.5%", "50.0%", "37.5%", "25.0%" and "12.5%".

- **Resume by Alarm**

Select "Enabled" if you want to power up your system at a certain time on the same day every month, or at a certain time every day.

- **Date/Time**

Set the Date and Time to Power On the system. Activated only when the "Resume by Alarm" field is enabled.

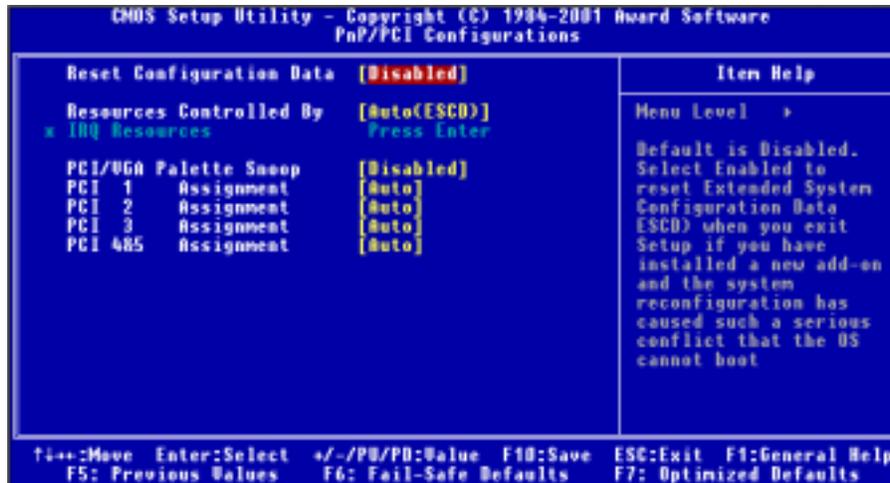
- **Reload Global Timer Events**

When "Enabled", an event occurring on any device listed below restarts the global timer

Primary IDE 0
Primary IDE 1
Secondary IDE 0
Secondary IDE 1
FDD, COM, LPT Port
PCI PIRQ[A-D]#

The settings in these fields enable or disable the detection of IDE, floppy, serial and parallel port activities for powering down state transition. Actually, it detects read/write to/from I/O ports.

3.8 PnP/PCI Configuration Setup



- **Reset Configuration Data**

Normally, you leave this field “Disabled”. Select “Enabled” to reset Extended System Configuration Data (ESCD) if you have just installed a new add-on card and the system reconfiguration has caused such a serious conflict that the operating system cannot boot. The setting will automatically be set back to “Disabled” the next time the system reboots.

- **Resources Controlled by**

The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play (PnP) compatible devices. If you select “Auto”, all of the Interrupt Requests (IRQs) and DMA assignment fields will be activated as the BIOS automatically assigns them. The choices are: “Auto (ESCD)” and “Manual”.

- **IRQ Resources**

- “IRQ-n Assigned to”

When the resources are controlled manually, assign each System Interrupt to one of the following, depending on which type of device is using the interrupt:

- Reserved: Devices requiring a specific interrupt (such as IRQ4 for serial port1), compliant with the original PC AT bus specification.
- PCI Device: Devices, whether designed for PCI or ISA bus architecture, compliant with the Plug and Play standard.

- **PCI/VGA Palette Snoop**

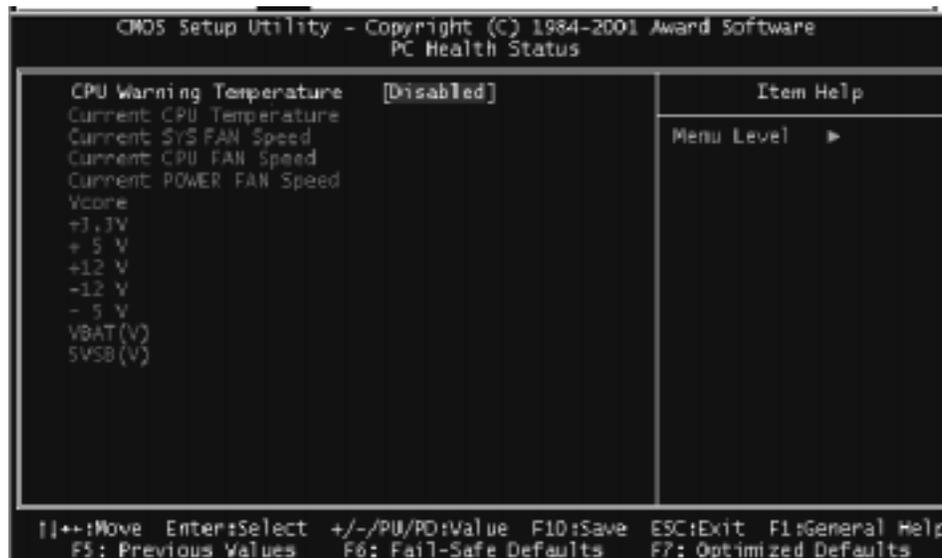
Some VGA cards, such as graphics accelerators or MPEG video cards, might not show colors properly. Select “Enabled” to correct this problem. If you don’t have such problems, leave this field “Disabled”.

- **PCI 1, 2, 3, 4 & 5 Assignment (845D DDR Chipset Motherboard Only)**

Options are: “Auto”, “3”, “4”, “5”, “7”, “9”, “10”, “11”, “12”, “14” and “15”.

3.9 PC Health Status

This menu provides two thermo-protection functions (CPU warning temperature and shutdown temperature) and a hardware monitoring center. These features let you know the health status



- **CPU Warning Temperature**

This field allows you to set the CPU warning temperature. You can choose from “50°C/ 122°F” to “70°C/158°F” or even “Disabled” if you like.

- **Current CPU Temperature**

This field displays temperature for the CPU.

- **Current SYS/CPU/POWER Fan Speed**

These fields display the fan speeds of the SYS fan, CPU fan, and Power fan.

- **VCORE**

This field displays the CPU working voltage.

- **+3.3V/+5V/+12V/-12V/-5V**

These fields show the power supply voltages.

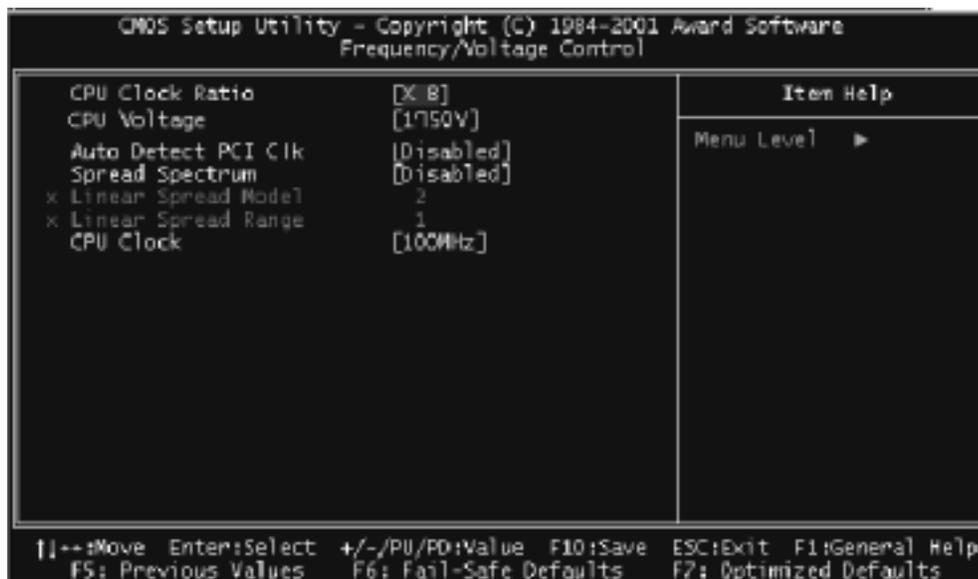
- **VBAT(V)**

This field displays the CMOS battery voltage.

- **5VSB(V)**

This field displays the 5V standby power.

3.10 Frequency/Voltage Control



- **CPU Clock Ratio**

This function allows you to set the CPU internal frequency ratio. It determines the CPU internal frequency according to the following formula:

$$\text{CPU internal frequency} = \text{frequency ratio} \times \text{system bus frequency.}^*$$

The choices for CPU Clock Ratio are: "8", "9", "10", "11", "12", "13", "14", "15", "16", "17", "18", "19", "20", "21", "22", or "23".

*System bus frequency is set below in the field "CPU Clock".

NOTE: Because Intel has locked the frequency ratio for new CPU settings, this field to adjust the frequency ratio is usually useless. However, it is effective for older version CPUs.

- **CPU Voltage**

You may change your CPU voltage for overclocking; but, this may cause the CPU to malfunction. Be careful if you want to adjust the CPU voltage.

- **Auto Detect PCI Clk**

“Enable” can stop the frequency output for unused DIMM/PCI slots.

- **Spread Spectrum**

If “Enabled”, you may manually input settings for the fields “Linear Spread Model” and “Linear Spread Range.”

- **Linear Spread Model**

If “Spread Spectrum” is “Enabled” you may enter a decimal number from a minimum of “0” to a maximum of “7”.

- **Linear Spread Range**

If “Spread Spectrum” is “Enabled” you may enter a decimal number from a minimum of “0” to a maximum of “10”.

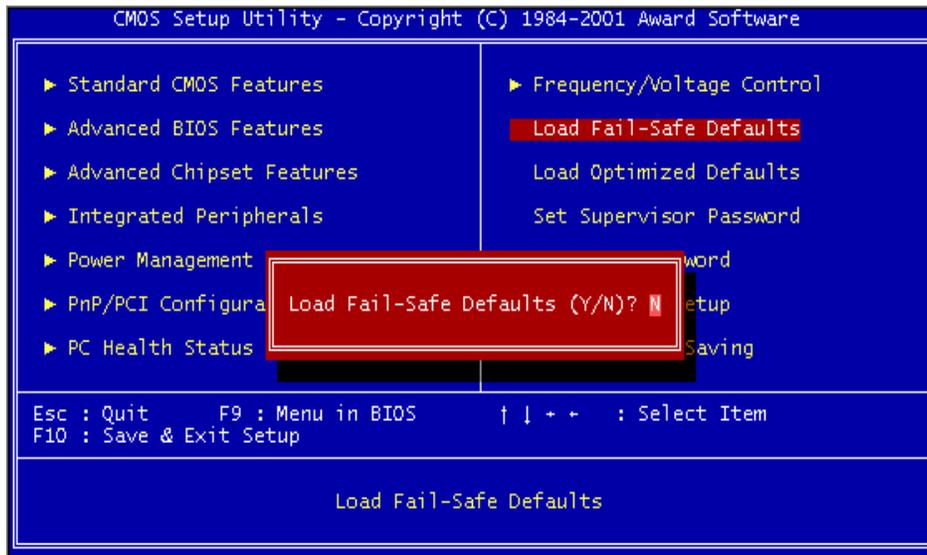
- **CPU Clock**

This field allows you to set the CPU Clock Frequency from a minimum of “100” to a maximum of “132”.

3.11 Load Fail-Safe Defaults

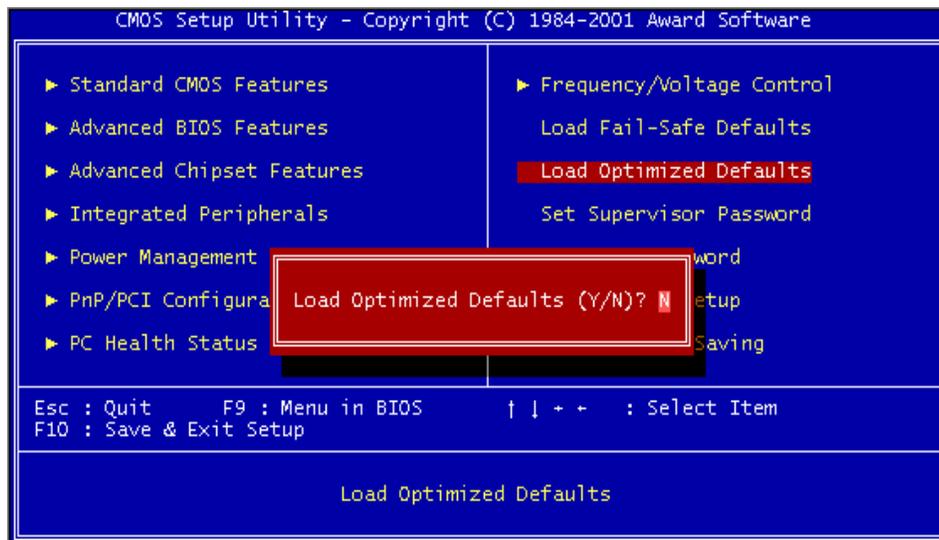
This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM.

NOTE: These default settings are non-optimal and disable all high performance features.



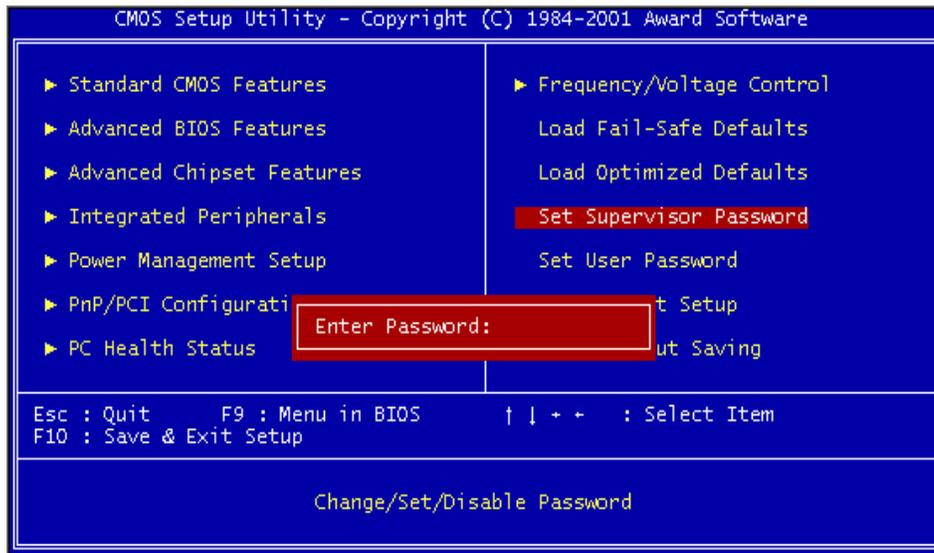
3.12 Load Optimized Defaults

This option allows you to load the default values to the system configuration fields. These default values are the optimized configuration settings for the system.



3.13 Supervisor Password

This option allows you to set a password to prevent others from changing the BIOS settings of your system.



The password prevents any unauthorized use of your computer. If you set a password, the system prompts for the correct password before you boot or access “Setup”.

To set a password:

1. At the prompt, type your password. Your password can be up to 8 alpha-numeric characters. When you type the characters, they appear as asterisks (*) in the password screen box.
2. After typing the password, press [Enter] key.
3. At the next prompt, re-type your password and press [Enter] key again to confirm the new password. After the password entry, the screen automatically reverts to the main screen. To disable the password, press [Enter] key when prompted to enter the password.

The screen displays a message confirming that the password has been disabled.

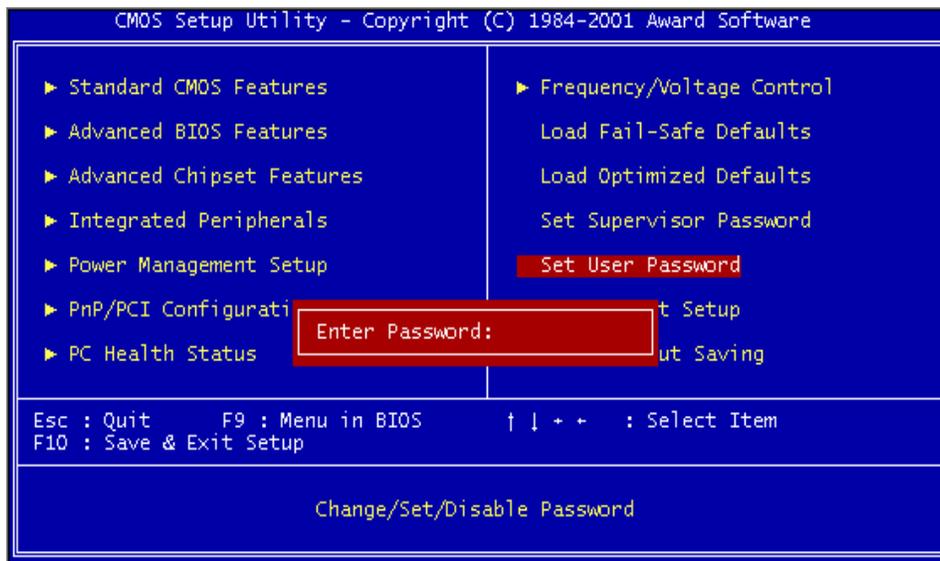
Forget the password?

If you forget the password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM with jumper JP3. See “2.3 Using Jumper JP3 to Clear CMOS”. To erase the RTC RAM:

1. Record your BIOS settings. Unplug your computer.
 2. Set the JP3 to “Clear CMOS” for about 10 seconds, and then return to “NORMAL”.
 3. Turn on your computer.
 4. Hold down [Delete] key during POST. Enter BIOS setup to re-configure BIOS settings.
-

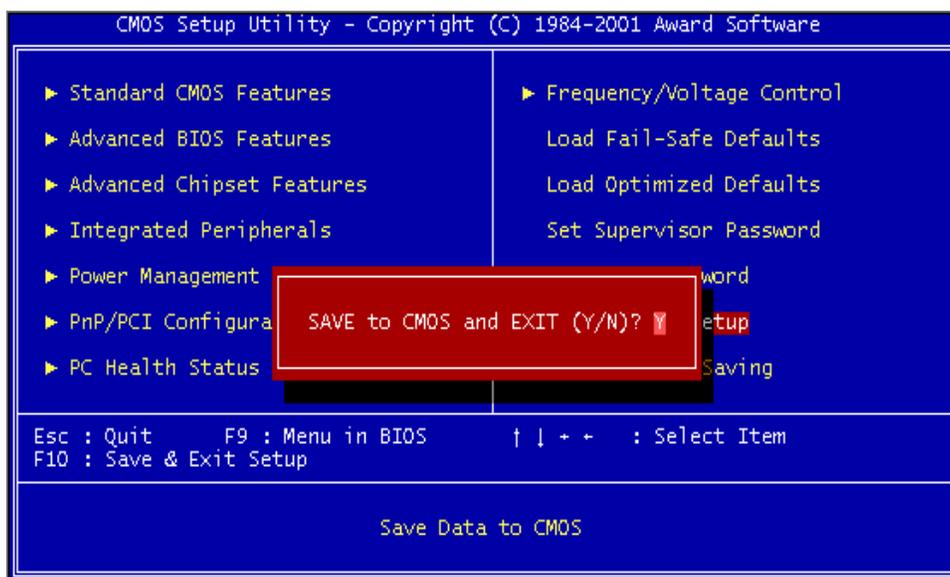
3.14 User Password

This option allows you to set a password to prevent others from changing the BIOS settings of your system. This operation is the same as Supervisor Password.



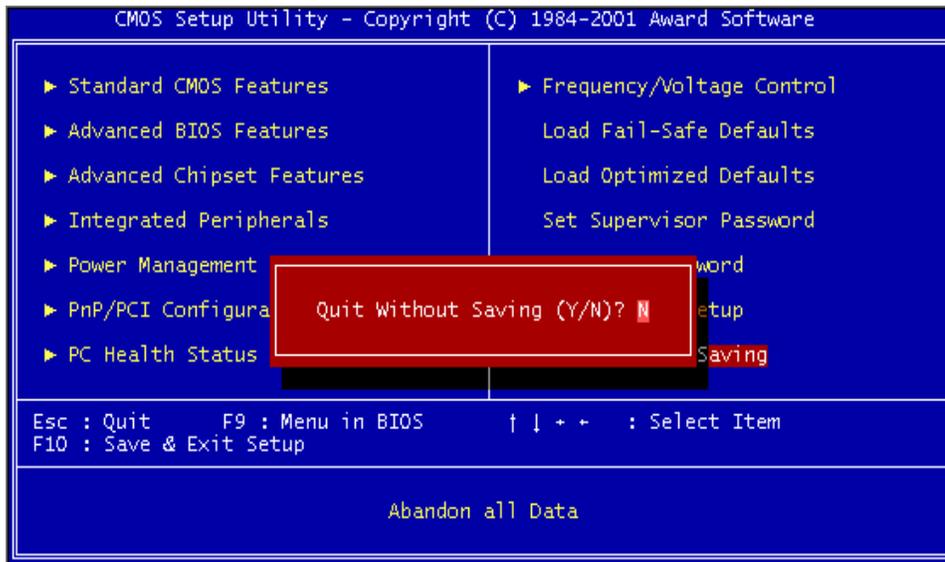
3.15 Save & Exit Setup

Save the settings and exit the BIOS utility.



3.16 Exit Without Saving

Abort current changes and exit the BIOS utility.



CHAPTER 4 BIOS UPGRADE

Caution!

Only users familiar with the upgrade procedure are recommended to update the BIOS of the motherboard and only when there is a need to do so. Please note that you have to download and install the right file for your motherboard. Otherwise, you might cause some serious system malfunctions.

Warning! Your system could be damaged if the wrong BIOS version is accidentally used. If you are not sure what version you should choose, do not attempt to update the BIOS yourself. Get professional assistance.

4.1 How to Upgrade Your Motherboard BIOS

Please follow the 5 steps listed below to upgrade your BIOS.

Step 1: Make a record of your original or existing BIOS Setup parameters.

- Press [Del] during the Power On Self Test to enter the BIOS Setup Program when you start your system.
- Write down the value of each parameter in order to re-configure your system after BIOS updating.

Step 2: Make a System Disk

- Put a clean 3.5" disk in Drive A

MS-DOS: Key in **Format A:/S** and press [Enter].

Windows O/S: Select the **My Computer** icon.

Click [3.5" Floppy (A:)]

Select [File/Format] from Command Bar

Under **Format 3.5** Floppy (A:) **Menu** select

Format type = Full item, and

Other Options = Copy system files

Click [Start] button

Step 3: Download the correct updated **Bios.exe** file from the Internet to a floppy disk or other storage device.

Step 4: Type **Bios.exe** to decompress it.

Step 5: Please read the **Readme.txt** file carefully, and follow the instructions step-by-step.

Continue upgrading BIOS and reconfigure your system
