

**AK12**

**AMD Socket-A Based  
MAIN BOARD**

*User's Manual*

# Shuttle AK12

## AMD Socket-A based Mainboard Manual Version 3.0

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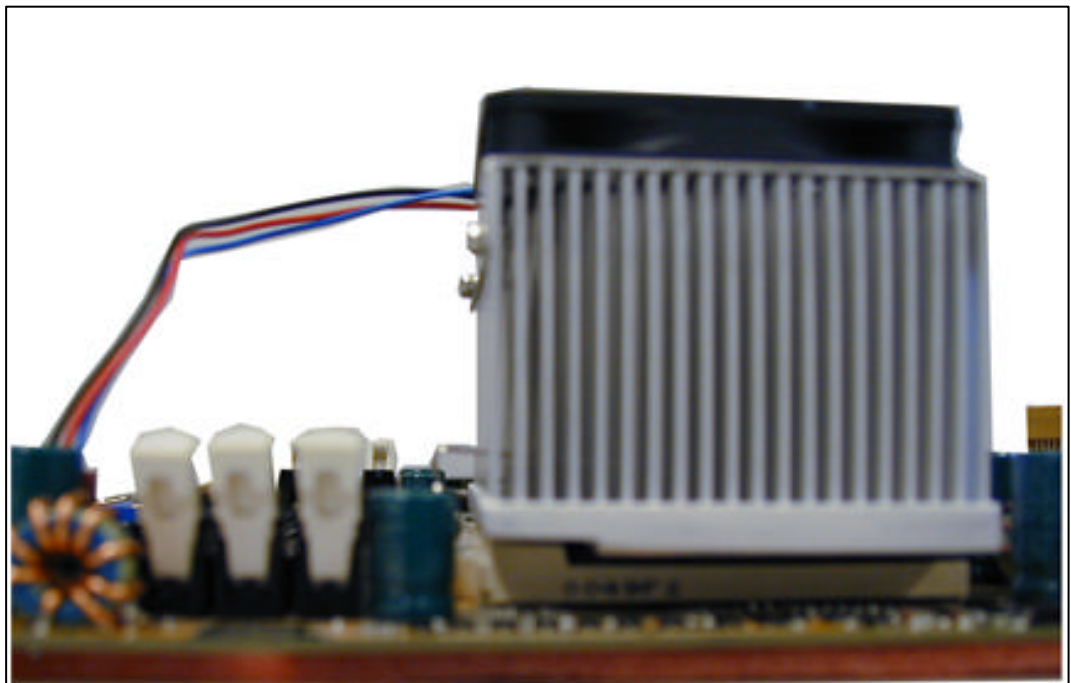
# WARNING

Thermal issue is highly essential for processors with a speed of 600MHz and above. Hence, we recommend you to use the CPU fan qualified by AMD or motherboard manufacturer. Meanwhile, please make sure CPU and fan are securely fastened well. Otherwise, improper fan installation not only gets system unstable but also could damage both CPU and motherboard because insufficient thermal dissipation.

If you would like to know more about thermal topic please see AMD website for detailed thermal requirement through the address:

<http://www.amd.com/products/athlon/thermals>

<http://www.amd.com/products/duron/thermals>



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## About This Manual

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# 1 INTRODUCTION

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## 1.1 To Different Users

### First-Time DIY System Builder

Welcome to the DIY world! Building your own computer system is not as difficult as you may think. To make your first computer DIY experience successful, right from the start, we have designed the **3 Hardware Installation** section in a step-by-step fashion for all the first-time DIY system builders. Prior to installation, we also suggest you to read the whole manual carefully to gain a complete understanding of your new AK12 mainboard.

### Experienced DIY User

Congratulate on your purchase of the Shuttle AK12 mainboard. You will find that installing your new Shuttle AK12 mainboard is just easy. Bundled with an array of onboard functions, the highly-integrated AK12 mainboard provides you with a total solution to build the most stable and reliable system. Refer to sections **3.2 Jumper Settings** and **Chapter 4 Software Utility** to find out how to get the best out of your new mainboard. **Chapter 5 BIOS Setup** also contains the relevant information on how to tune up your system to achieve higher performance.

### System Integrator

You have wisely chosen Shuttle AK12 to construct your system. Shuttle AK12 incorporates all the state-of-the-art technology of the VT8363A chipset from VIA. It integrates the most advanced functions you can find to date in a compact ATX board. Refer to sections **3.2 Jumper Settings** and **Chapter 4 Software Utility** for an in-depth view of system construction.

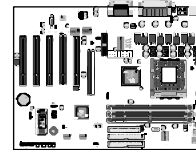


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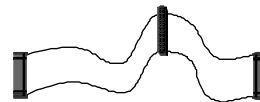
## 1.2 Item Checklist

Check all items with your AK12 mainboard to make sure nothing is missing. The complete package should include:

- ★ One Shuttle AK12 Mainboard



- ★ One ATA 100/66 Ribbon Cable



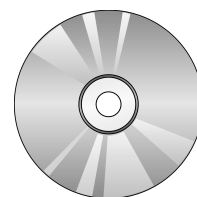
- ★ One Floppy Ribbon Cable



- ★ AK12 User's Manual



- ★ One CD-ROM containing:
  - AK12 user's manual on PDF format
  - VIA 4 IN 1 Drivers
  - Audio Device Software
  - Award Flashing Utility



# 2 FEATURES

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AK12 mainboard is carefully designed for the demanding PC user who wants high performance and maximum intelligent features in a compact package.

## 2.1 Specifications

### ★ CPU Support

Supports AMD Athlon processor with 100/133 MHz FSB.  
and AMD Duron processor with 100 MHz FSB.

### ★ Chipset

Features VIA Apollo KT133A Chipset VT8363A with super south I/O bridge VT82C686B.

### ★ Jumperless CPU Configuration

Soft-configure CPU Speed (CPU operating speed is software configurable through Frequency/Voltage Control of BIOS Setup program).

### ★ Versatile Memory Support

Equipped with three DIMM banks of PC 100/133 compliant SDRAM and VCM SDRAM to provide up to 1.5GB of system memory.

### ★ AGP Slot

A component level of device interconnected to AGP cards which supports up to 4x Accelerated Graphics Port cards for high performance and is directed to the 3D graphical display application.

### ★ PCI Expansion Slots

Provides five 32-bit PCI slots.

---

### **\* Super I/O Interface:**

Provides a variety of I/O interfaces:

- 1 × Floppy interface for 3.5-inch FDD with 720KB, 1.44MB, 2.88MB format or for 5.25-inch FDD with 360KB or 1.2MB format.
- 1 × PS/2 mouse connector
- 1 × PS/2 Keyboard connector
- 2 ports of USB connectors on back panel
- One set of 2-port USB headers on the mainboard
- 2 × DB9 Serial connectors 16550 UART compatible
- 1 × Infrared communication port ASKIR and HPSIR compatible.  
(Serial port COM2 can also be redirected to an external IrDA Adapter for wireless connection.)
- 1 × DB25 Parallel port supporting Standard Parallel Port (SPP), Enhanced Parallel Port (EPP) and Extended Capabilities Port (ECP) data transmission schemes.
- 1 × DB15 MIDI/GAME port , and another 3 ports which are Line\_out, Line-In and Microphone.

### **\* PCI Bus Master IDE Controller Onboard**

Two Ultra DMA 33/66/100 Bus Master Dual-channel IDE ports provide support to a maximum of four IDE devices (one Master and one Slave per channel). The IDE Bus implements the data transfer speed up to 33/66/100 MB/sec and also supports Enhanced PIO Modes 0 ~ 4.

### **\* ATX Power Supply Connector**

ATX power supply unit can be connected to the onboard 20-pin ATX power connector, supporting Suspend and Soft-On/Off by dual-function power button.

### **\* Advanced Configuration and Power Interface**

Features four power saving mode: Snoop, Suspend to RAM, Suspend to Disk, and Soft-Off. ACPI provides more efficient Energy Saving Features controlled by your operating system that supports OS Direct Power Management (OSPM) functionality.

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## ★ **System BIOS**

Provides licensed Award BIOS on 2Mb Flash EEPROM.  
Supports Green PC and Desktop Management Interface (DMI).

## ★ **ATX Form Factor**

System board conforms to the ATX specification.  
Board dimension: 305mm × 220mm

## ★ **Advanced Features**

- **Dual Function Power Button** - The system can be in one of two states; one is Suspend mode and the other is Soft-Off mode. Pushing the power button for less than 4 seconds places the system into Suspend mode. When the power button is pressed for longer than 4 seconds, the system enters the Soft-Off mode.
- **Wake-on-LAN** - The onboard WOL1 connector can be attached to a network card that supports this function to wake up the system via LAN.
- **Modem Ring Power-On** - The system can be powered on automatically by the activation of modem ring.

## ★ **Other Features**

- **Voltage Monitoring** - Monitors various voltages of key elements, such as the CPU, and other critical system voltage levels to ensure stable current reach to mainboard components. System voltages include Vcore on CPU, and +2.5V, +3.3V, +5V, +12V etc. on system.
- **Fan Status Monitoring** - To prevent overheating of CPU, the CPU fan is monitored for RPM and failure. (CPU cooling fan with RPM sensor is required.)
- **Temperature Monitoring** - This item allows users to make sure whether the CPU or system operates in a suitable temperature.

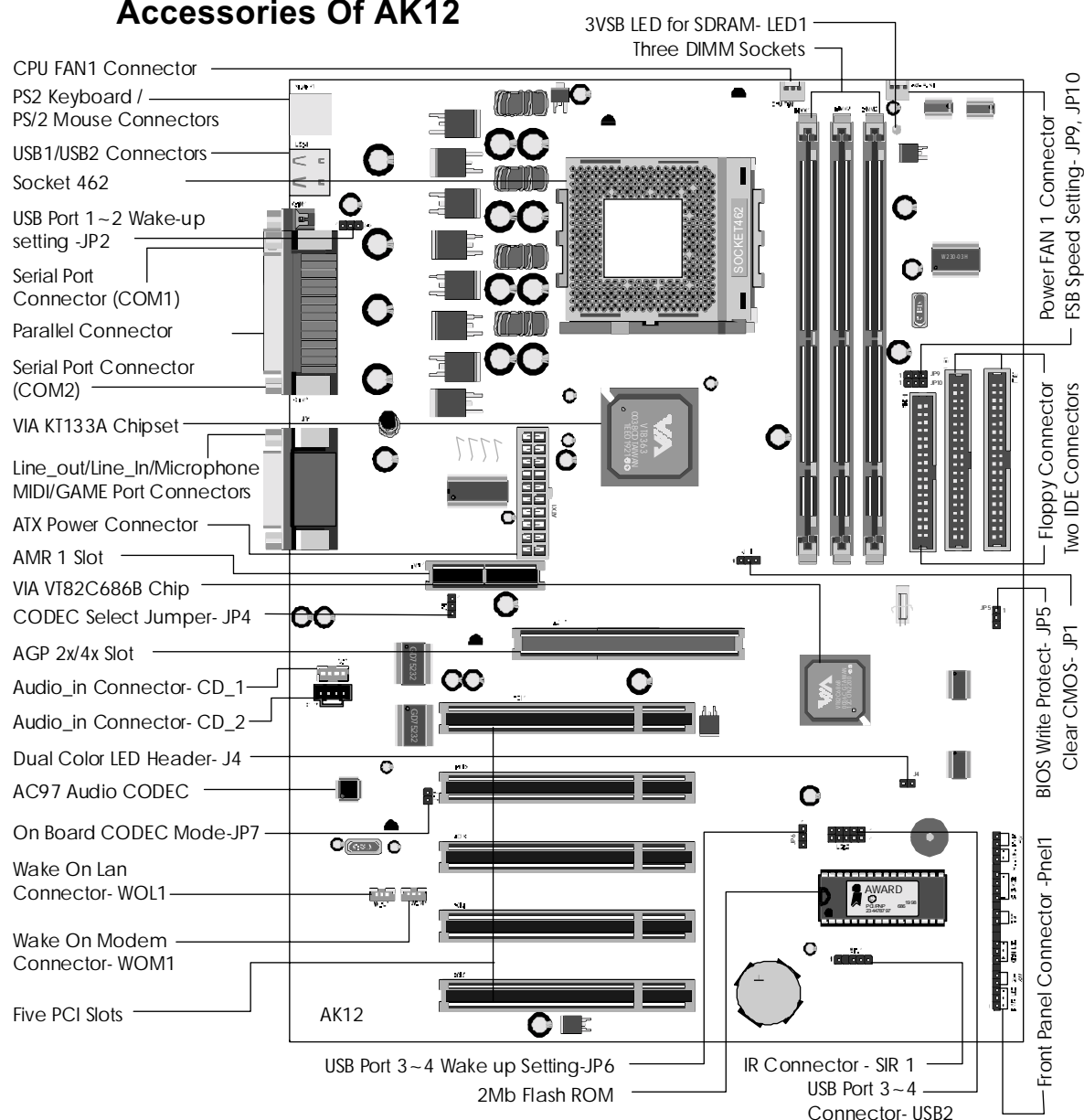
# 3 HARDWARE INSTALLATION

Before removing or installing any of these devices including CPU, DIMMs, Add-On Cards, Cables, please make sure to unplug the onboard power connector.

This section outlines how to install and configure your AK12 mainboard. Refer to the following mainboard layout to help you identify various jumpers, connectors, slots, and ports. Then follow these steps designed to guide you through a quick and correct installation of your system.

## 3.1 Step-by-Step Installation

### Accessories Of AK12

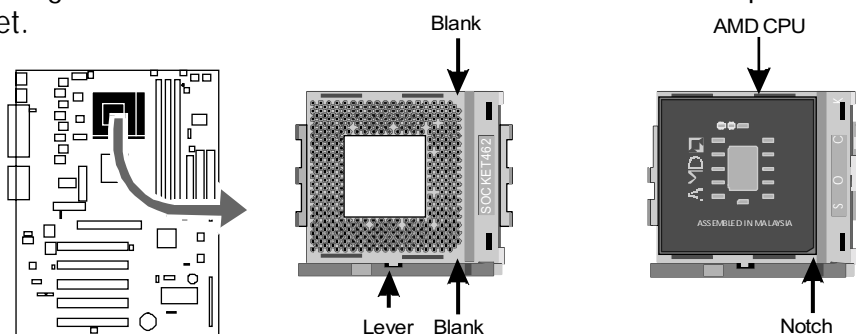


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## Step 1

### Install the CPU:

1. Locate the CPU socket on the upper-right sector of your mainboard (between the back panel connectors and the DIMM memory banks).
2. Pull the CPU socket lever slightly sideways away from the socket to unlock the lever, and then bring it to an upwardly vertical position.
3. Place your AMD 462 processor in the socket A. Note that the CPU's edges have been purposely designed non-symmetrically to prevent from inserting the processor in the wrong direction. And the CPU will only fit in the orientation as shown. The following diagram demonstrates the correct placement of the CPU in socket A. You can see that the two blunt-edged corners should be oriented toward the blank space on the socket.



4. Slightly push the AMD 462 processor into the socket without applying excessive force while making sure there is no gap between CPU and socket. Then lower the socket-lever all the way down to the horizontal position and lock it to secure the CPU in place.
5. The AMD 462 processor requires a set of heatsink/fan to ensure proper cooling of the processor. If the heatsink/fan have not been mounted on your CPU, you must purchase the heatsink/fan separately and have it installed. Plug the cable through the heatsink/fan in the CPU fan power connector located nearby. Note that there are several types of CPU fan connectors. Normally, if your mainboard supports the hardware monitoring function, a 3-pin fan power connector should allow your system to detect the CPU fan's speed. The CPU fan can also run with a 2-pin fan power connector, however, detection of CPU fan's speed is not supported. Another type of CPU fan may feature a large 4-pin fan power connector, which does not support CPU fan's speed detection and must be directly connected to the system's power supply unit.

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## **Step 2.**

### **Set Jumpers**

The default jumper settings have been set for the common usage standard of this mainboard. Therefore, you do not need to reset jumpers unless you require special adjustments as any of following cases:

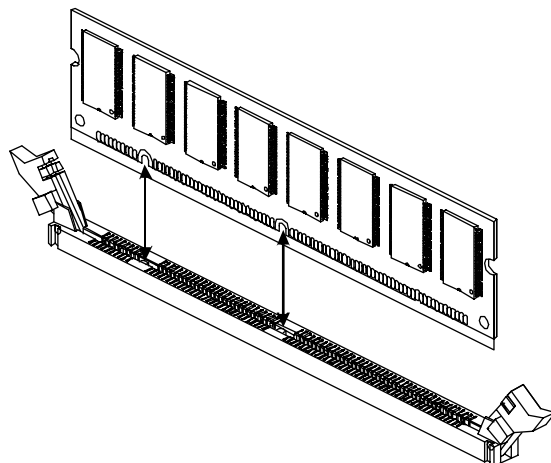
1. Clear CMOS
2. Enable wake-up function of USB ports
3. The read-only status of BIOS
4. Onboard CODEC mode
5. Codec select
6. FSB speed select

For first-time DIY system builders, we recommend that you should not change the default jumper settings if you are not totally familiar with mainboard configuration procedures. The factory-set default settings are tuned for optimum system performance. For the advanced users who wish to customize their system, section **3.2 Jumper Settings** will provide the detailed information on how to configure your mainboard manually.

## **Step 3**

### **Install SDRAM System Memory**

To install memory, insert SDRAM or VCM SDRAM memory module(s) in any one, two or three DIMM banks. Note that SDRAM modules are directional and will not go in the DIMM slots unless they are properly oriented. After the module is fully inserted into the DIMM socket, lift the clips of both sides of the DIMM bank to lock the module in place.



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## **Step 4**

### **Install Internal Peripherals in System Case**

Before you install and connect the mainboard into your system case, we recommend that you first assemble all the internal peripheral devices into the computer housing, including but not limited to the hard disk drive (IDE/HDD), floppy disk drive (FDD), CD-ROM drive, and ATX power supply unit. This will greatly facilitate in making the connection to the mainboard described below.

To install IDE & FDD drives, follow this procedure:

1. Set the required jumpers on each device according to the instructions provided by the manufacturer. (IDE devices, HDD and CD-ROM, must have jumpers on Master or Slave mode depending on your willing to install more than one device for each kind.
2. Connect IDE cable and FDD cable to the back panel of the internal peripheral devices. Note that the cable should be oriented with its colored stripe (usually in red or magenta) connected to pin#1 both on the mainboard IDE or FDD connector and on the device as well.
3. Connect an available power cable through your system power supply unit to the back panel of each peripheral device. Note that the power cable is directional and cannot fit in if not properly positioned.

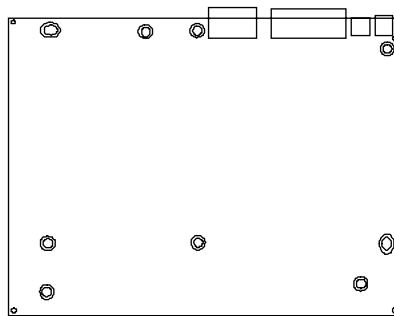


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## Step 5

### Mount the Mainboard on the Computer Chassis

1. You may find that there are a lot of different mounting hole positions both on your computer chassis and on the mainboard. To choose a correct mounting hole, the key point is to keep the back panel of the mainboard in a close fit with your system case, as shown below.



2. After deciding the proper mounting holes, position the studs between the frame of chassis and the mainboard. The studs are used to fix the mainboard and to keep a certain distance between the system chassis and the mainboard, in order to avoid any electrical short between the board and the metal frame of chassis. (If your computer case is already equipped with mounting studs, you will need to tighten screws to attach the mainboard.)

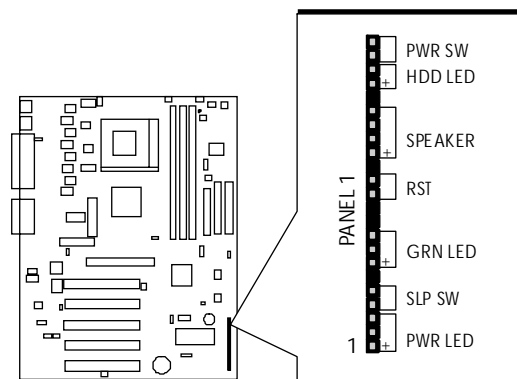
**Note:** In most computer housings, you will be able to find 4 or more attachment points to install mounting studs and fix the mainboard. If there aren't enough matching holes, then make sure to install at least 4 mounting studs to ensure proper attachment of the mainboard.

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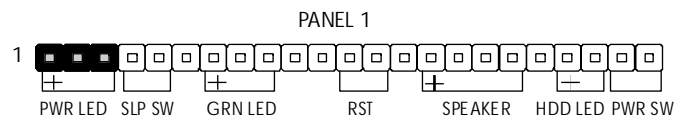
## Step 6

### Connect Front Panel Switches/LEDs/Speaker

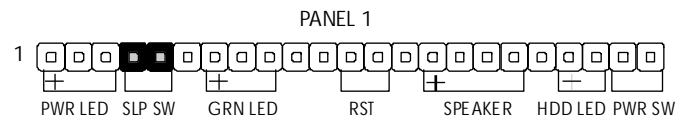
You can find there are several different cables already existing in the system case and originating from the computer's front panel devices (HDD LED, Power LED, Reset Switch, PC Speaker, etc.) These cables serve to connect the front panel switches and LEDs to the mainboard's front panel connectors group, as shown below :



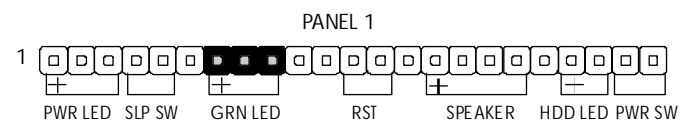
#### 1. Power LED (PWR LED)



#### 2. Sleep switch (SLP SW)

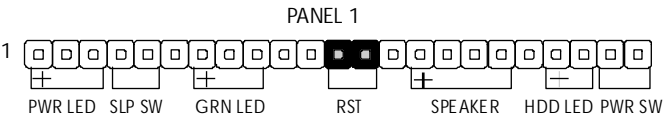


#### 3. Green LED (GRN LED)

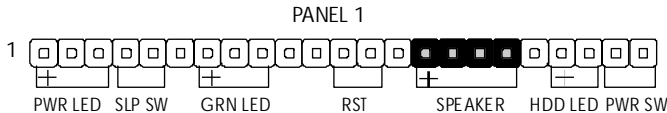


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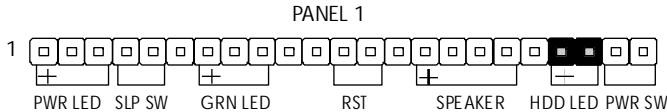
4. Hardware reset switch (RST)



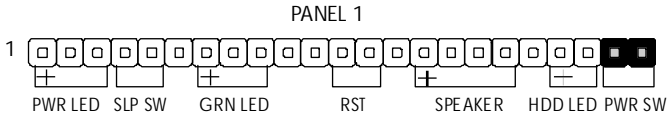
5. PC speaker (SPEAKER)



6. HDD LED (HDD LED)



7. ATX soft power on/off (PWR SW)

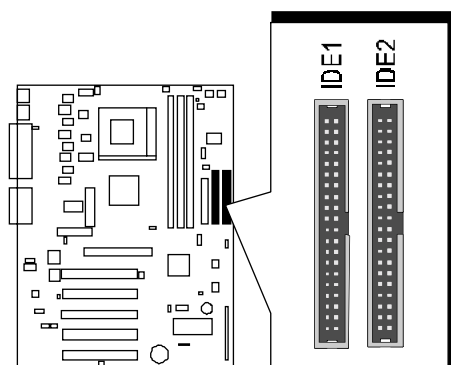


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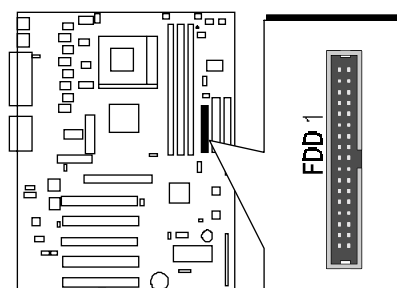
## Step 7

### Connect IDE & Floppy Disk Drives

1. IDE cable connector



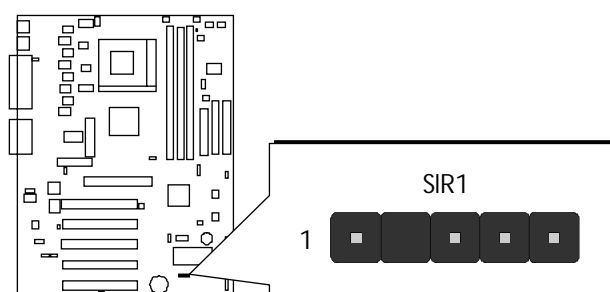
2. Floppy cable connector



## Step 8

### Connect Other Internal Peripherals

1. IR connector



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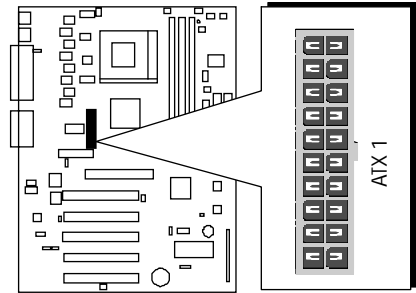
## Step 9

### Connect the Power Supply

1. System power connector

#### Warning:

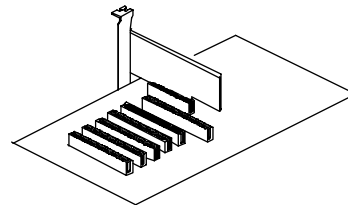
Once power cord is plugged in mainboard, LED1 lights up. Please take reference to page 40 for location of LED 1. You are not allowed to install or uninstall memory modules while LED 1 lights up.



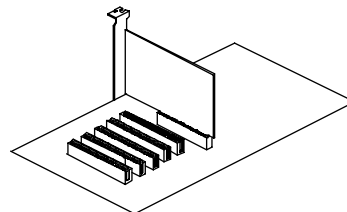
## Step 10

### Install Add-on Cards in Expansion Slots

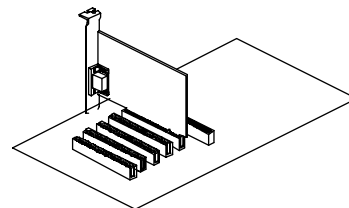
1. AMR Card



2. Accelerated Graphics Port (AGP) Card



3. PCI Card

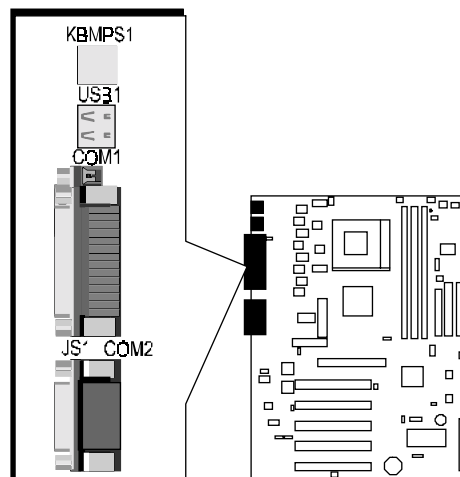


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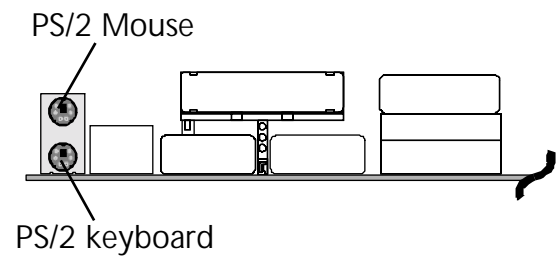
## Step 11

### Connect External Peripherals to Back Panel

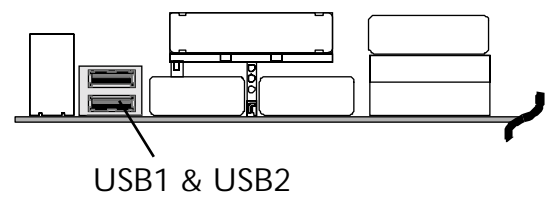
You are now ready to put the computer case back together and get on to the external peripherals connections to your system's back panel.



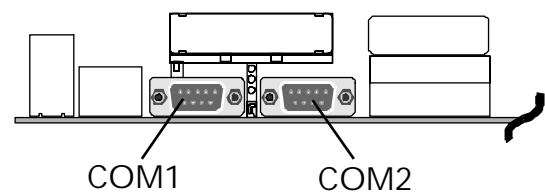
#### 1. PS/2 Mouse and PS/2 Keyboard



#### 2. USB Devices

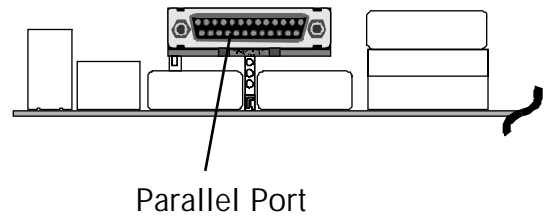


#### 3. COM Ports

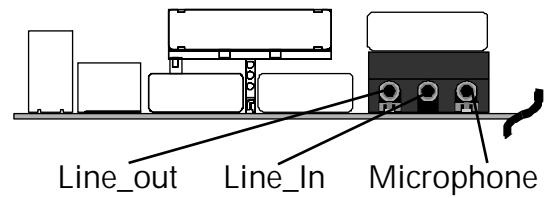


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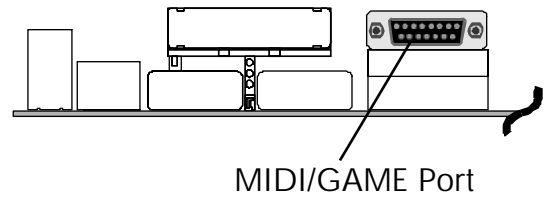
#### 4. Parallel Port



#### 5. Line\_out / Line\_In / Microphone Ports



#### 6. MIDI/Game Port



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## Step 12

### First Time System Boot-Up

To assure the completeness and correctness of your system installation, you may check the above installation steps once again before you boot up your system for the first time.

1. Insert a bootable system floppy disk (DOS 6.2x, Windows 95/98/NT, or others) which contains FDISK and FORMAT utilities into the FDD.
2. Turn on the system power.
3. First, you must use the FDISK utility to create a primary partition of the hard disk. You can also add an extended partition if your primary partition does not use all of the available hard disk space. If you choose to add an extended partition, you will have to create one or more logical partitions to occupy all the space available in the extended partition. The FDISK utility will assign a drive letter (i.e., C:, D:, E:,...) to each partition which will be shown in the FDISK program. After FDISK procedure, reboot your system by using the same system floppy disk.

**Note:** DOS 6.2x and Windows 95A can only support up to 2.1GB of HDD partition. If you use the FDISK utility with one of the operating systems mentioned above, you can only install your HDD into partitions no larger than 2.1GB each.

4. Now, use the FORMAT utility to format all the partitions you've created. When formatting the primary partition (C:), make sure to use the FORMAT C: /S command.

**Note:** FORMAT C: /S can transfer all the necessary system files into the primary partition of your hard disk. Then, your HDD will become a bootable drive.

5. Install all the necessary drivers for CD-ROM, Mouse, etc.
6. Set up the complete operating system according to your OS installation guide.

**Note:** This mainboard supports ACPI. Consequently, NumLock on keyboard is still on whenever you turn off system.



---

## **Step 13**

### **Install Drivers & Software Components**

Please note that all the system utilities and drivers are designed for Win 9x\2000\ME\NT 4.0 operating systems. Make sure your operating system is already installed before running the driver installation CD-ROM programs.

1. Insert the AK12 bundled CD-ROM into your CD-ROM drive. The auto-run program will display the driver main installation window on screen .
2. Choose " Install Mainboard Software" and complete the installation.
3. Return to the SHUTTLE MAINBOARD SOFTWARE SETUP screen.
4. Choose "Install Audio Device Software" and complete the installation.
5. Return to the main installation window and exit from the auto-run drivers installation program.

---

## 3.2 Jumper Settings

Several hardware settings are made through the use of mini jumpers to connect jumper pins to the mainboard. Pin #1 is located at any corner of each jumper; you just find a location with pin #1 marked on the board. There are several types of pin1# shown as below:

3-pin and multi-pin (> 3) jumpers are shown as follows:

Pin #1 to the left:



Pin #1 on the top:





Pin #1 to the right:



Pin #1 on the bottom:



Jumpers with two pins are shown as  for Close [On] or  for Open [Off]. To Short jumper pins, simply place a plastic mini jumper over the desired pair of pins.

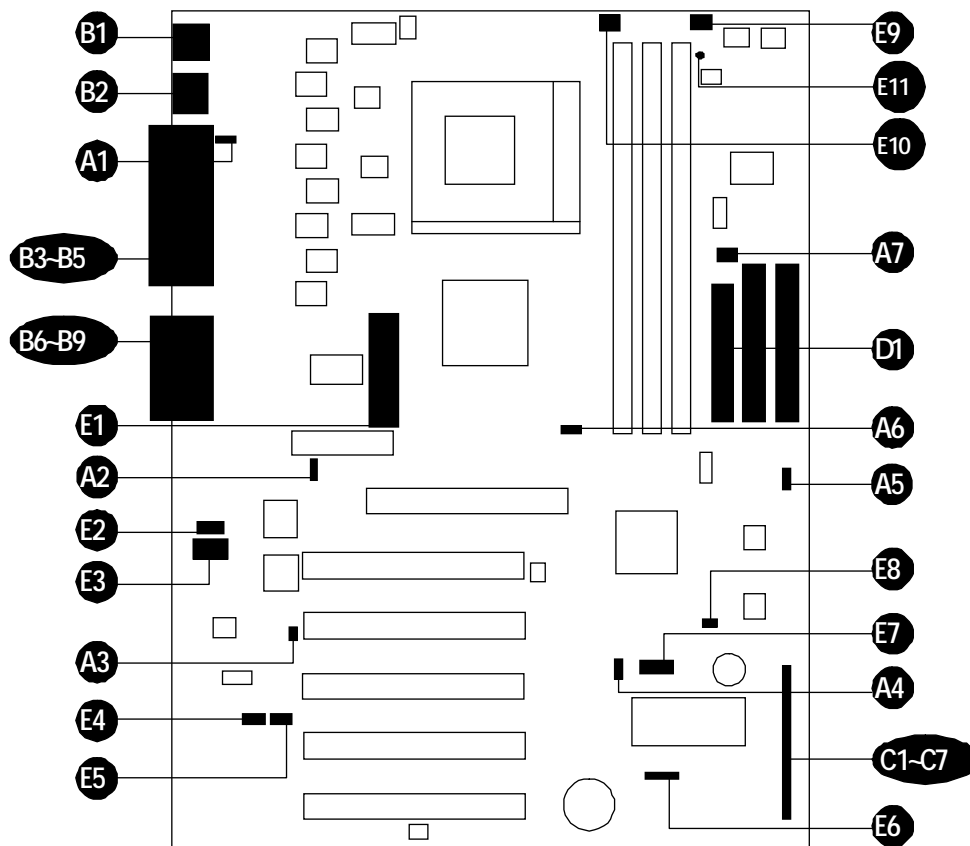
### **Caution!**

1. Do not remove the mainboard from its antistatic protective packaging until you are ready to install it.
2. Carefully hold the mainboard by its edges and avoid touching its components. When putting the mainboard down, place it on the top of its original packaging film, and on an even surface, and components side up.
3. Wear an antistatic wrist strap or take other suitable measures to prevent electrostatic discharge (ESD) whenever handling this equipment.

---

## Jumpers & Connectors Guide

Use the mainboard layout on page 10 to locate CPU socket, memory banks, expansion slots, jumpers and connectors on the mainboard during the installation. The following list will help you to identify jumpers, slots, and connectors along with their assigned functions:



### **CPU/Memory/Expansion Slots**

Socket 462 : CPU Socket for socket A AMD processors.

DIMM 1/2/3 : Three DIMM sockets for 32,64,128,256,512MB 3.3V SDRAM and VCM SDRAM.

AMR : One AMR expansion slot for audio/modem riser cards

AGP : One AGP (Accelerated Graphics Port) slot

PCI : Five 32-bit PCI expansion slots

---

### ***Jumpers***

- A1** JP2 : USB port 1 ~ 2 wake-up setting.
- A2** JP4 : Codec select setting.
- A3** JP7 : Onboard codec mode.
- A4** JP6 : USB port 3 ~ 4 wake-up setting.
- A5** JP5 : BIOS write protect setting.
- A6** JP1 : Clear CMOS setting.
- A7** JP9, JP10 : FSB speed setting.

### ***Back Panel Connectors***

- B1** KB : PS/2 Keyboard.
- B1** MPS1 : PS/2 Mouse.
- B2** USB 1 : 2 × USB (Universal Serial Bus).
- B3** COM1 : Serial Port 1 (DB9 male).
- B4** PRINTER : Parallel Port (DB25 female).
- B5** COM2 : Serial Port 2 (DB9 male).
- B6** Line\_out : Line\_out port.
- B7** Line\_in : Line\_in port.
- B8** Microphone : Microphone port.
- B9** GAME/MIDI : GAME/MIDI port.

### ***Front Panel Connectors***

- C1** PWR LED : System Power LED.
- C2** SLP SW : Hardware system management interface momentary type switch.
- C3** GRN LED : Green LED
- C4** RST : Hardware reset switch.
- C5** SPEAKER : Speaker in housing.
- C6** HDD LED : IDE drive active LED.
- C7** PWR SW : ATX Power On/Off Momentary Type Switch.

### ***Internal Peripherals Connectors***

- D1** FDD 1 : Floppy Disk Drive Interface
  - D1** IDE 1 : IDE Primary Interface (Dual-channel)
  - D1** IDE 2 : IDE Secondary Interface (Dual-channel)
-

---

**Other Connectors:**

- Ⓔ<sup>1</sup> ATX 1 : ATX power connector (20-pin header).
- Ⓔ<sup>2</sup> CD1 : Audio\_in connector.
- Ⓔ<sup>3</sup> CD2 : Audio\_in connector.
- Ⓔ<sup>4</sup> WOL 1 : Wake on lan connector.
- Ⓔ<sup>5</sup> WOM 1 : Wake on modem connector.
- Ⓔ<sup>6</sup> SIR 1 : IR connector.
- Ⓔ<sup>7</sup> USB 2 : USB3 and USB4 ports header.
- Ⓔ<sup>8</sup> J4 : Dual color LED header.
- Ⓔ<sup>9</sup> PWR FAN 1 : System cooling fan power connector.
- Ⓔ<sup>10</sup> CPU FAN 1 : CPU cooling fan power connector.
- Ⓔ<sup>11</sup> LED 1 : 3VSB LED for SDRAM.

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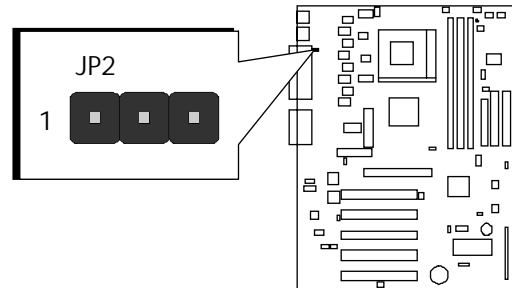
### **A1 USB port 1~2 wake-up setting (JP2)**

This motherboard offers JP2 to resume system from S1 mode (suspend to RAM) by USB keyboard connected to USB port 1 ~ 2.

Pin 1-2 (Default- disable wake-up function)



Pin 2-3 (Enable wake-up function)



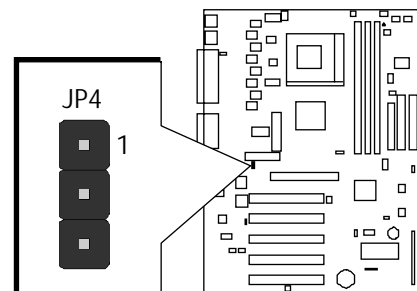
### **A2 Codec select setting (JP4)**

This motherboard offers JP4 jumper to select the onboard AC 97 audio codec or Audio Modem Riser (AMR) slot.

Pin 1-2 (Default- use onboard codec)



Pin 2-3 (Use AMR slot codec )



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### **A3 Onboard codec mode setting (JP7)**

This motherboard offers JP7 jumper to define onboard codec mode as Master or Slave.

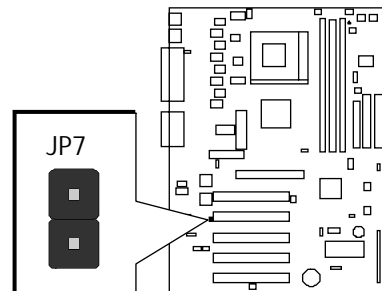
Open pin 1-2

(Default- master)



Short Pin 1-2

(Slave mode)



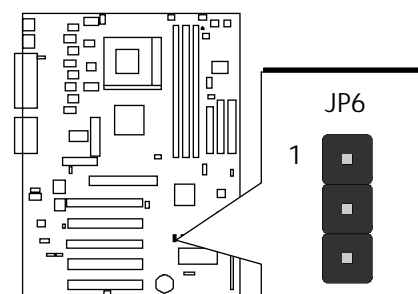
### **A4 USB port 3~4 wake-up setting (JP6)**

This motherboard offers JP6 to resume system from S1 mode (suspend to RAM) by USB keyboard connected to USB port 3 ~ 4.

Pin 1-2 (Default- disable wake-up function)



Pin2-3 (Enable wake-up function)



---

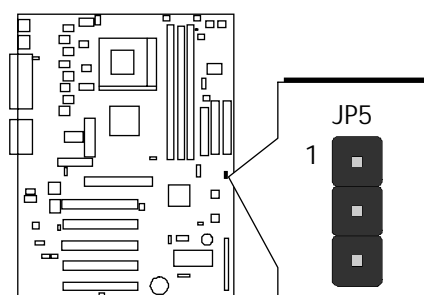
### **A5 BIOS write protect setting (JP5)**

This motherboard offers JP5 jumper to make BIOS read-only.

Pin 1-2 (Default- disable the function)



Pin 2-3 (Enable the function)



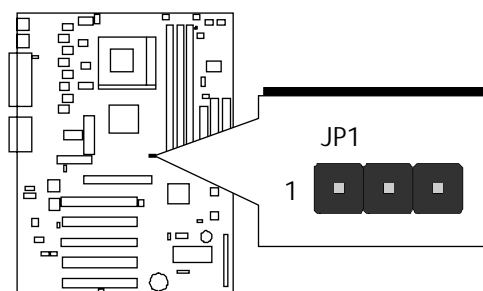
### **A6 Clear CMOS setting (JP1)**

You can clear CMOS to restore system default setting. Please follow below procedures to clear CMOS.

Pin 1-2 (Default, Normal)



Pin 2-3 (Clear CMOS)







- Step 1.** Turn off system and unplug AC power.
- Step 2.** Remove ATX power cable from onboard power connector.
- Step 3.** Locate JP1 and short pins 2-3 for a few seconds.
- Step 4.** Return JP1 to its normal setting by shorting pins 1-2.
- Step 5.** Connect ATX power cable back to onboard power connector.

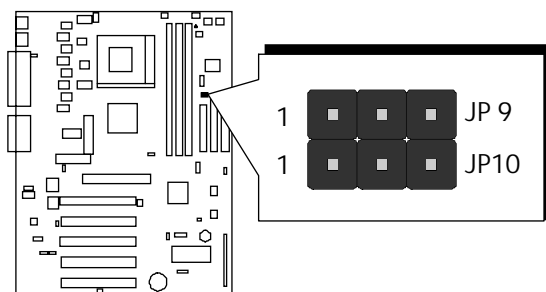


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### **Ⓐ FSB speed setting (JP9, JP10)**

This motherboard provides JP9 and JP10 to set FSB (front side bus) as 100Mhz or 133Mhz automatically. Please insert mini jumper on JP9 and JP10 as below indication.

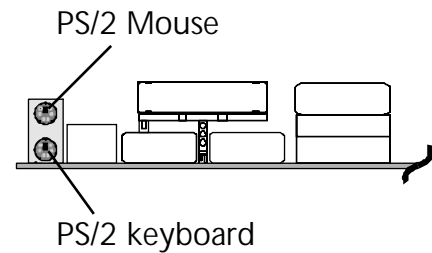
Function	Jumper Setting
100 MHz FSB	1  JP 9 1  JP 10
133 MHz FSB	1  JP 9 1  JP 10



---

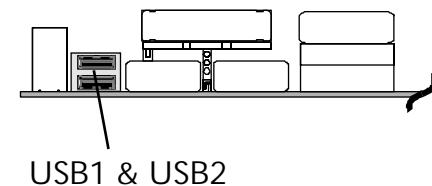
## **B1 PS/2 Keyboard & PS/2 Mouse Connectors**

Two 6-pin female PS/2 keyboard & Mouse connectors are located at the rear panel of the mainboard. Depending on the computer housing you use (desktop or minitower), the PS/2 Mouse connector is situated at the top of the PS/2 Keyboard connector when the mainboard is laid into a desktop, as opposite to a minitower where the PS/2 Mouse connector is located at the right of the PS/2 Keyboard's. Plug the PS/2 keyboard and mouse jacks into their corresponding connectors.



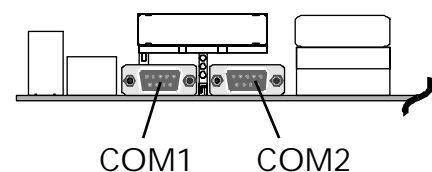
## **B2 USB1/USB2 Port Connectors**

Two female connectors USB1/USB2 share the same USB (Universal Serial Bus) bracket at the rear panel of your mainboard. Plug each USB device jack into an available USB1/USB2 connector.



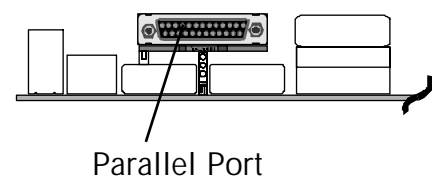
## **B3 COM1/COM2 Connectors**

This mainboard can accommodate one serial device on COM1/COM2. Attach a serial device cable to the DB9 serial port COM1/COM2 at the back panel of your computer.



## **B4 Parallel Port Connector**

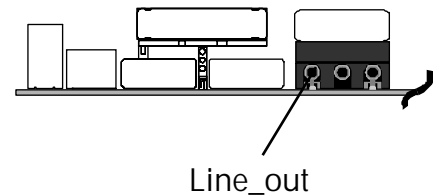
One DB25 female parallel connector is located at the rear panel of the mainboard. Plug the connection cable from your parallel device (printer, scanner, etc.) into this connector.



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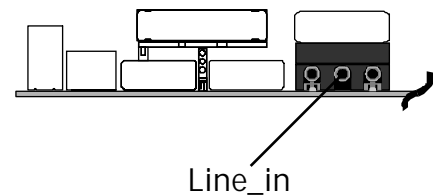
### **B5 Line\_out**

Line\_Out is a stereo output port through which the combined signal of all internal and external audio sources on the board is output. It can be connected to 1/8-inch TRS stereo headphones or to amplified speakers.



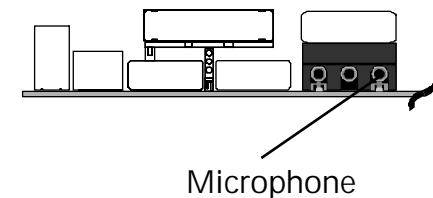
### **B6 Line\_in**

Line\_in is a stereo line-level input port that accepts a 1/8-inch TRS stereo plug. It can be used as a source for digital sound recording, a source to be mixed with the output, or both.



### **B7 Microphone**

Microphone is a 1/8-inch jack that provides a mono input. It can use a dynamic mono or stereo microphone with a resistance of not more than 600 Ohms.

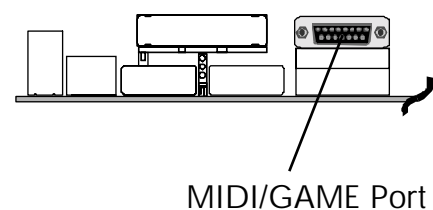


### **B8 MIDI/GAME Port**

The MIDI/GAME port is a 15-pin female connector. This port can be connected to any IBM PC compatible game with a 15-pin D-sub connector.

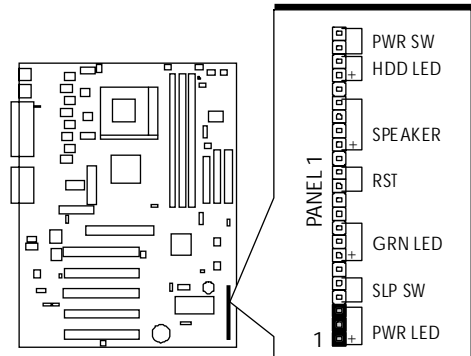
#### **MIDI Instrument Connection**

You will need a MIDI adapter to connect a MIDI compatible instrument to the sound card. The MIDI adapter can in turn be connected to the Joystick/MIDI port. You will also need the MIDI sequencing software to run MIDI instruments with your computer.



## **C1 POWER LED (PWR LED)**

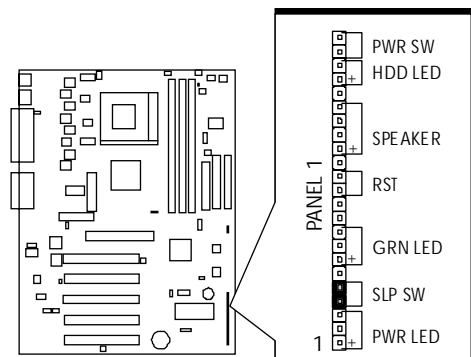
If you get a 3-pin LED in dual color connector, attach the cable from housing's front panel to the PWR LED header on board. The LED stays light while the system is running ; and it turns to another color while the system is operating from normal mode to ACPI mode.



**Note :** Please notice all LED connectors are directional. If your chassis's LED does not light up during running, please simply change to the opposite direction.

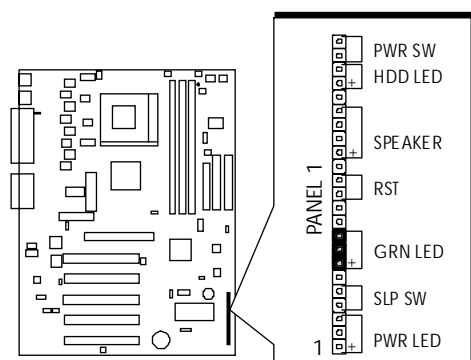
## **C2 Sleep Switch (SLP SW)**

SLP SW header may attach to a 2-pin momentary switch. Press the SLP SW switch to force the system into power saving mode; press it again to resume to normal operation.



## **C3 Green LED (GRN LED)**

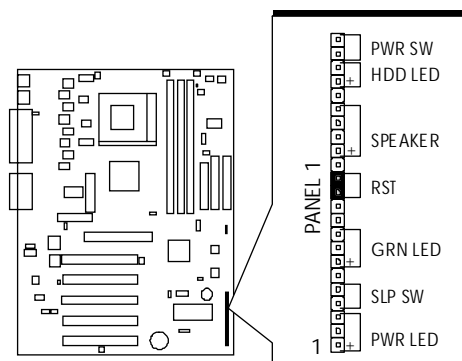
The green LED (GRN LED) indicates that the system is currently in one of the power saving mode (Doze/Standby/Suspend). When the system resumes to normal operation mode, the green LED will go off. Attach a 2-pin green LED cable to GRN LED header.



---

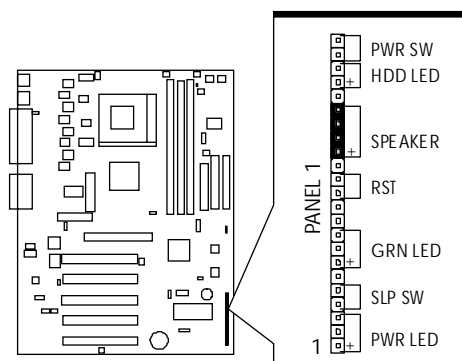
#### **④ Hardware reset connector (RST)**

Attach the 2-pin hardware reset switch cable to the RST header. Pressing the reset switch causes the system to restart.



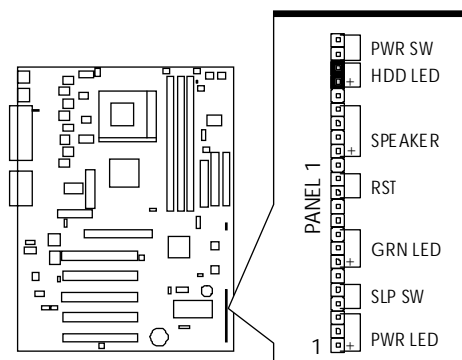
#### **⑤ Speaker Connector (SPEAKER)**

Attach the PC speaker cable from the case to the 4-pin speaker connector (SPEAKER).



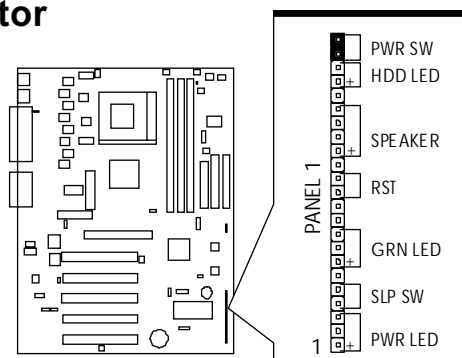
#### **⑥ HDD LED Connector (HDD LED)**

Attach the connector cable from the IDE device LED to the 2-pin HDD LED header. The HDD LED lights up whenever an IDE device is active.



#### **⑦ ATX Power On/Off Switch Connector (PWR SW)**

The Power On/Off Switch is a momentary type switch used for turning on or off the system's ATX power supply. Attach the connector cable from the Power Switch to the 2-pin PWR SW header on the mainboard.



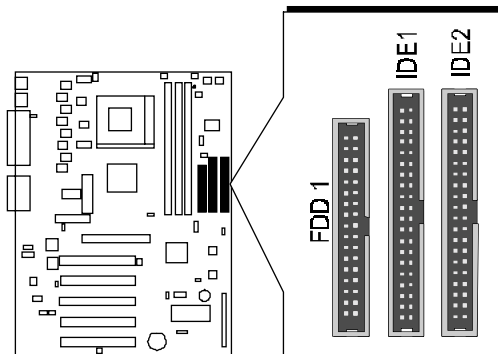
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## **① Enhanced IDE and Floppy Connectors**

The AK12 mainboard features two 40-pin dual-channel IDE device connectors (IDE1/IDE2) providing the support to up to four IDE devices, such as CD-ROM and Hard Disk Drives (H.D.D.). This mainboard also includes one 34-pin floppy disk controller (FDD) to accommodate the Floppy Disk Drive (F.D.D.). Moreover, this mainboard comes with one 40pin ribbon cable to connect to IDE H.D.D. and one 34-pin ribbon cable for F.D.D. connection.

**Note :** Please connect your system H.D.D. to IDE 1.

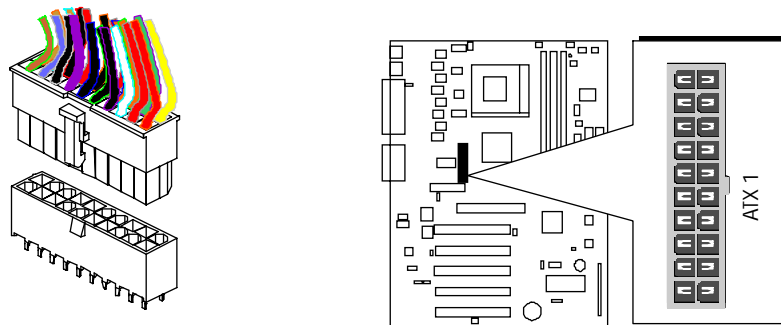
**Important:** Ribbon cables are directional, therefore, make sure to always connect with the red cable stripe on the same side as pin #1 of the IDE1/IDE2 or FDC connector on the mainboard.



---

### **E1 ATX Power Connector (ATX 1)**

Locate the 20-pin male header ATX power connector (ATX 1) on your mainboard. Plug the power cable from the ATX power supply unit directly into ATX 1 power supply connector.



**Note 1 :** The ATX power connector is directional and will not go in unless the guides match perfectly. Make sure that pin#1 is properly positioned.

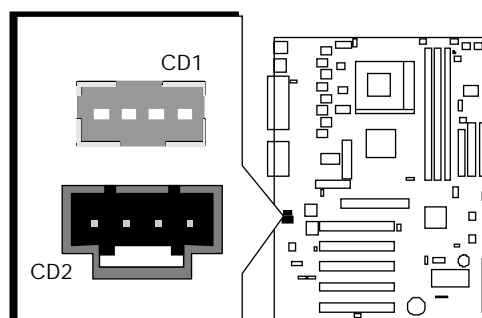
**Note 2:** Make sure the latch of the ATX power connector clicks into place to ensure a solid attachment.

**Note 3:** Your ATX power supply must be supplied to ACPI +5V standby power and at least 720mA compatible.

**Note 4:** Make sure your power supply have adequate power for higher speed processor installed.

### **E2~E3 Audio\_in header (CD1 and CD 2)**

Use the audio cable provided with CD-ROM/DVD ROM drive to join audio connector on rear edge of CD-ROM/DVD ROM drive with one of the two audio-in connectors CD1 and CD2 on the mainboard.

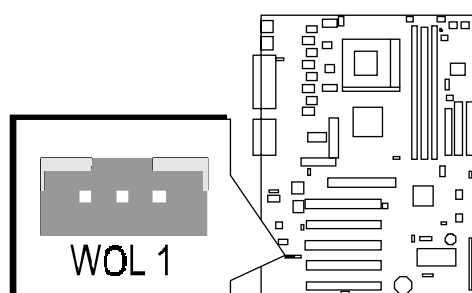


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#### **E4 Wake-on lan connector (WOL 1)**

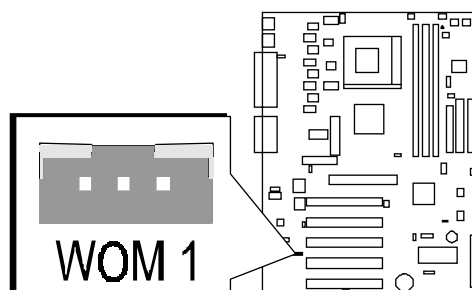
If a lan card installed, please connect the cable into WOL1 header on mainboard. While your system is in power-saving mode, any lan signal resumes system automatically. And you also need to enable the function through "Power Management" of BIOS setup program.

P.S.: Lan card supports wake-on-lan feature is necessary.



#### **E5 Wake-on modem connector (WOM 1)**

If PCI modem card installed that supports WOM function, please connect the cable into WOM1 header on mainboard. When your system is in power-saving mode, any modem signal resumes system automatically. And you also need to enable the function through "Power Management" of BIOS setup program.

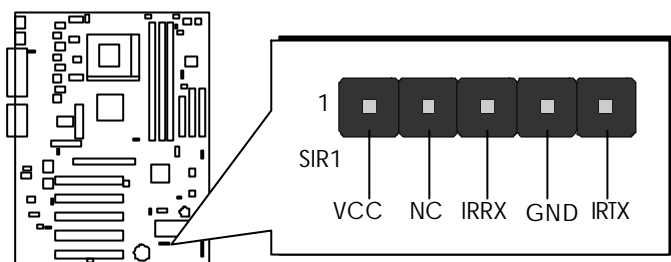




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## IR connector (SIR 1)

If you have an Infrared device, this mainboard can implement IR transfer function. Please follow below procedure to enable IR transfer function.



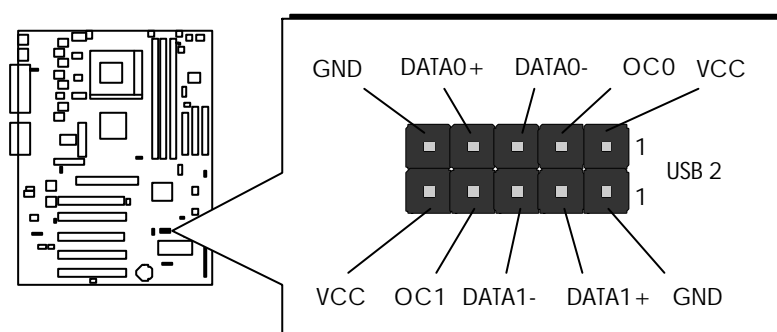
Step 1. Attach the 5-pin infrared device cable to SIR1 connector.  
(Refer to above diagram for IR pin assignment.)

Step 2. Configure the Infrared transfer mode through the option "UART 2 Mode" in field "Integrated peripheral" of BIOS setup program. This mainboard supports Standard, HPSIR, ASKIR transfer modes.

## USB ports 3~4 connector (USB2)

This header is used to connect the cable attached to USB connectors mounted on front panel.

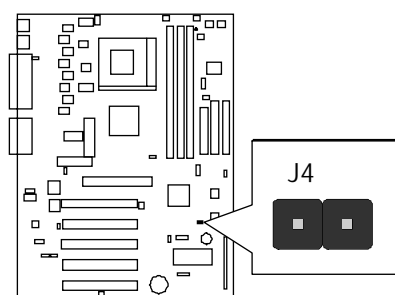
Pin assignment:



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### **E8 Dual color LED header (J4)**

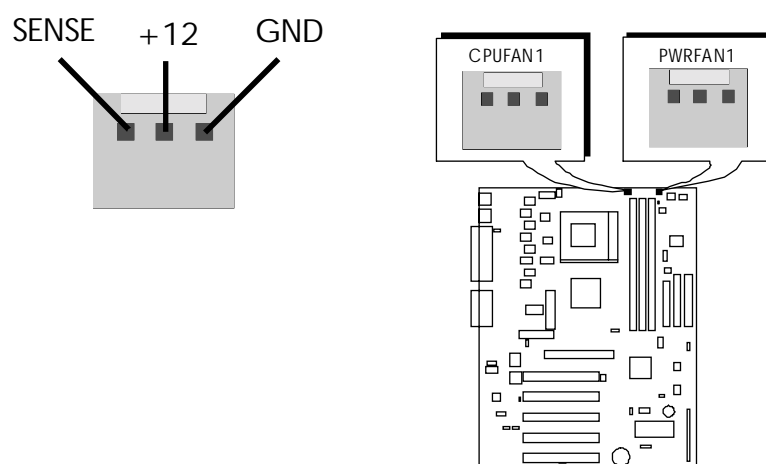
The dual color LED indicates that the system is currently in one of the modes (suspend to ram- STR / normal). Usually, when the system resumes to normal operation mode, the LED will turn green and the LED turns red while system is in STR mode.



### **E9~E10 CPU Fan and Housing Fan Connectors (CPUFAN1 , PWRFAN1)**

This mainboard provides two onboard 12V cooling fan power connectors to support CPU (CPUFAN1), Housing (PWRFAN1) cooling fans.

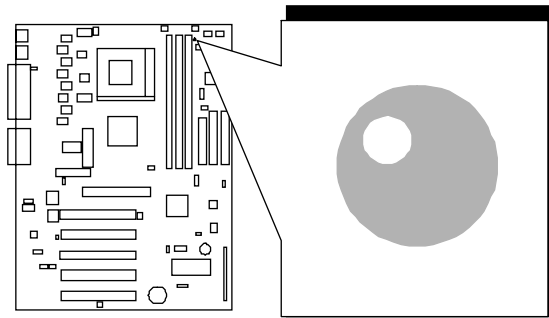
**Note:** Both cable wiring and type of plug may vary , which depends on fan maker. Please keep in mind that red wire should always be connected to 12V header and black wire should be connected to ground (GND) header.



---

**E11 Red 3VSB LED for SDRAM (LED 1)**

The red LED turns on if your power cord is still plugged in, which means 3V standby voltage is supplied to mainboard. You can not install or uninstall memory modules while LED 1 is on.



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### 3.3 System Memory Configuration

The AK12 mainboard has three 168-pin DIMM sockets that allow you to install from 32MB up to 1.5GB of system memory with PC 100/133 SDRAM (Synchronous DRAM) and VCM (Virtual Channel Memory) SDRAM. Each DIMM (Dual In-line Memory Module) socket can accommodate 32MB, 64MB, 128MB, 256MB and 512MB 3.3V single or double side 64 bit wide data path SDRAM and VCM SDRAM modules.

#### Install Memory:

Install memory in any or all of the banks and in any combination, shown as follows :

DIMM Socket	Memory Modules	Module Quantity
DIMM 1	32MB, 64MB, 128MB, 256MB and 512MB 168-pin 3.3V SDRAM and VCM SDRAM DIMM	x 1
DIMM 2	32MB, 64MB, 128MB, 256MB and 512MB 168-pin 3.3V SDRAM and VCM SDRAM DIMM	x 1
DIMM 3	32MB, 64MB, 128MB, 256MB and 512MB 168-pin 3.3V SDRAM and VCM SDRAM DIMM	x 1

**Note:** You do not need to set any jumper to configure memory since the BIOS utility can detect the system memory automatically. You can check the total system memory value in the BIOS Standard CMOS Setup menu.

#### Upgrade Memory:

You can easily upgrade the system memory by inserting additional SDRAM and VCM SDRAM modules in available DIMM banks. The total system memory is calculated by simply adding up the memory in all DIMM banks. After upgrade, the new system memory value will automatically be computed and displayed by the BIOS Standard CMOS Setup menu.

# 4 SOFTWARE UTILITY

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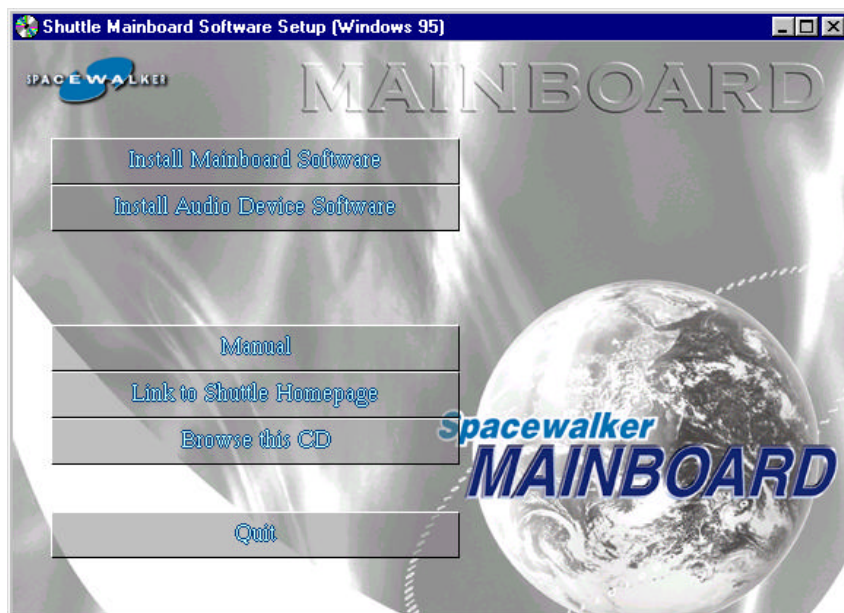
## 4.1 AK12 Mainboard CD Overview

**Note:** The cd contents attached in the AK12 mainboard are subject to change without notice.

To start your mainboard CD, just insert it into your CD-ROM drive, and the CD AutoRun screen should appear. If the AutoRun screen does not appear, double click or run D:\Autorun.exe (assuming that your CD-ROM drive is drive D:)

### Navigation Bar Description:

- ☞ **Install Mainboard Software** - Installing Mainboard Drivers for Windows
- ☞ **Install Audio Device Software** - Installing Audio Driver.
- ☞ **Manual** - AK12 mainboard user's manual by PDF format.
- ☞ **Link to Shuttle Homepage** - Link to shuttle website homepage.
- ☞ **Browse this CD** - Allows you to see contents of this CD.
- ☞ **Quit** - Close this CD.

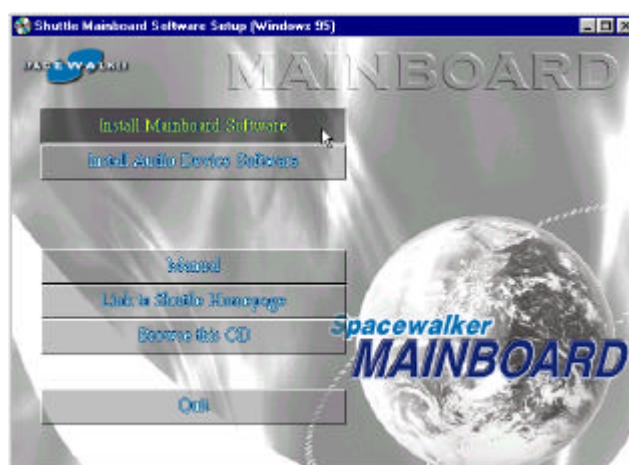


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## 4.2 Install Mainboard Software

Insert the attached CD into your CD-ROM drive, and the CD AutoRun screen should appear. If the AutoRun screen does not appear, double click on Autorun icon in **My Computer** to bring up **Shuttle Mainboard Software Setup** screen.

Use your pointing device (e.g. mouse) to select the “**Install Mainboard Software**” bar.



Once you made the selection, a Setup window runs the installation automatically.

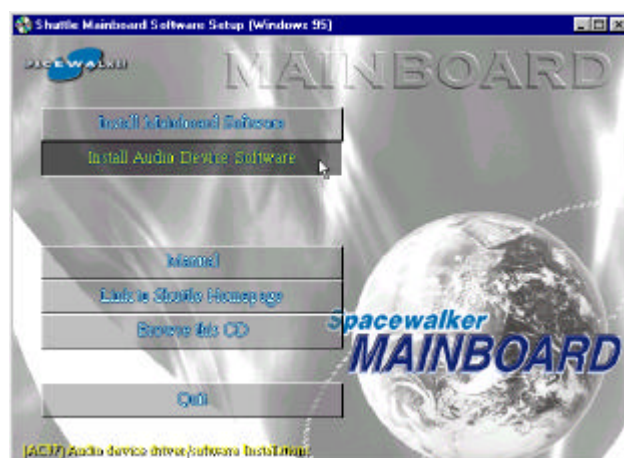
When the copying files is done, make sure you **reboot** system to take the installation effect.

---

### 4.3 Install Audio Device Software

Insert the attached CD into your CD-ROM drive, and the CD AutoRun screen should appear. If the AutoRun screen does not appear, double click on Autorun icon in **My Computer** to bring up **Shuttle Mainboard Software Setup** screen.

Use your pointing device (e.g. mouse) to select the “**Install Audio Device Software**” bar.



Once you made the selection, a Setup window runs the installation automatically.

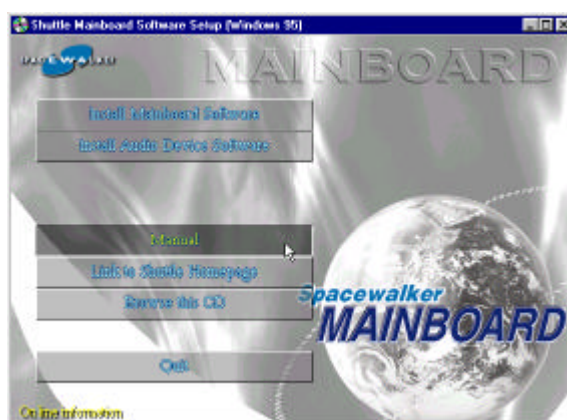
When the copying files is done, make sure you **reboot** system to take the installation effect.

---

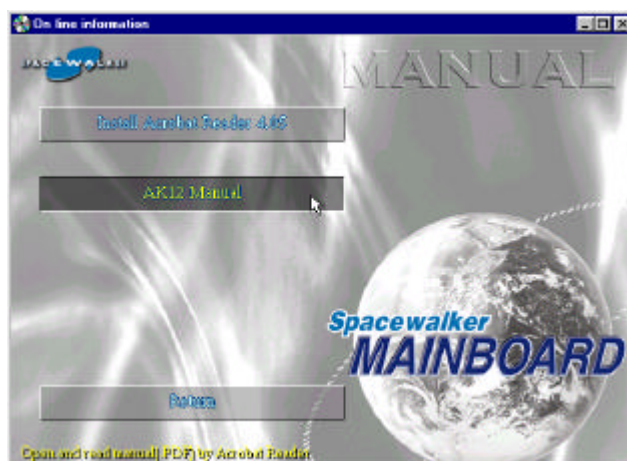
## 4.4 View the User's Manual

Insert the attached CD into your CD-ROM drive and the CD AutoRun screen should appear. If the AutoRun screen does not appear, double click on Autorun icon in **My Computer** to bring up **Shuttle Mainboard Software Setup** screen.

Use your pointing device (e.g. mouse) to select the “**Manual**” bar.



Then **On line information** windows will appear on screen. Click on the “**Install Acrobat Reader 4.05**” bar if you need to install acrobe reader.



Then click on “**AK12 Manual**” bar to view AK12 user's manual.

---



# 5 BIOS SETUP

---

AK12 BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in battery-backed RAM so that it retains the Setup information even if the system power is turned off.

The system BIOS is managing and executing a variety of hardware related functions in the system, including:

System date and time

Hardware execution sequence

Power management functions

Allocation of system resources

## 5.1 Enter the BIOS

To enter the BIOS (Basic Input / Output System) utility, follow these steps:

- Step 1.** Power on the computer, and the system will perform its POST (Power-On Self Test) routine checks.
- Step 2.** Press < Del > key immediately, or at the following message: "Press DEL to enter SETUP" ,or simultaneously press < Ctrl > , < Alt > , < Esc > keys

**Note 1.** If you miss trains of words mentioned in step 2 (the message disappears before you can respond) and you still wish to enter BIOS Setup, restart the system and try again by turning the computer OFF and ON again or by pressing the < RESET > switch located at the computer's front panel. You may also reboot by simultaneously pressing the < Ctrl > , < Alt > , < Del > keys.

**Note 2.** If you do not press the keys in time and system does not boot, the screen will prompt an error message, and you will be given the following options:

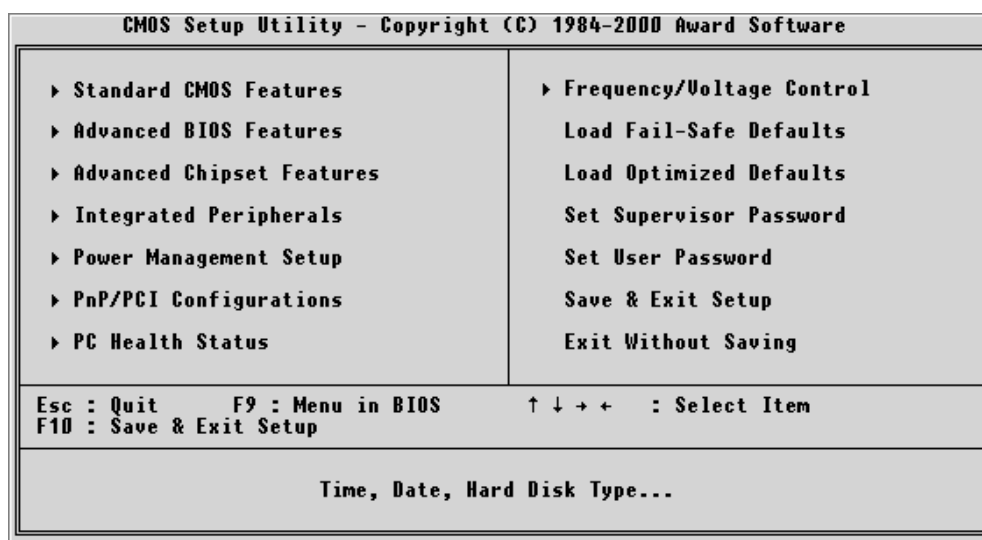
**"Press F1 to Continue, DEL to Enter Setup"**

- Step 3.** As you enter the BIOS program, the CMOS Setup Utility will prompt you the Main Menu, as shown in the next section.

---

## 5.2 The Main Menu

Once you enter the Award BIOS (tm) CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.



Note that a brief description of each highlighted selection appears at the bottom of the screen.

### ***Standard CMOS Features***

This setup page includes all items in a standard BIOS compatible.

### ***Advanced BIOS Features***

This setup page includes all items of Award special enhanced features.

### ***Advanced Chipset Features***

This setup page includes all items of chipset features.

### ***Integrated Peripherals***

This setup page includes all items of peripherals features.

### ***Power Management Setup***

This setup page includes all items of Power Management features.

### ***PnP/PCI Configurations***

This item specifies the value (in units of PCI bus blocks) of the latency timer for the PCI bus master and the IRQ level for PCI device.

---

---

### ***PC Health Status***

This entry shows the current system temperature, voltage and Fan speed.

### ***Frequency/Voltage Control***

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

### ***Load Fail-Safe Defaults***

Setup defaults load the optimized settings for optimum system performance. However, you can change the parameter through each Setup Menu.

### ***Load Optimized Defaults***

To load the Turbo defaults is required by the power users who want to push the limitation of system performance by overclocking. **Before you use this function, make sure you fully understand the items in Chipset Setup menu and the components (CPU, DRAM, HDD, etc.) of your system are good enough for optimized setting.**

### ***Set Supervisor Password***

Change, set, or disable supervisor password. It allows you to limit access to the system and Setup, or only to Setup.

### ***Set User Password***

Change, set, or disable user password. It allows you to limit access to the system and Setup, or only to Setup.

### ***Save & Exit Setup***

Save CMOS value change to CMOS and exit from setup.

### ***Exit Without Saving***

Abandon all CMOS value changes and exit from setup.

---

## **Standard CMOS Features**

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

CMOS Setup Utility - Copyright (C) 1984-2000 Award Software Standard CMOS Features		
Date (mm:dd:yy)	Thu, Mar 8 2001	Item Help Menu Level ▶ Change the day, month, year and century
Time (hh:mm:ss)	5 : 33 : 31	
▶ IDE Primary Master		
▶ IDE Primary Slave		
▶ IDE Secondary Master		
▶ IDE Secondary Slave		
Drive A 1.44M, 3.5 in.		
Drive B None		
Floppy 3 Mode Support Disabled		
Video EGA/VGA		
Halt On All Errors		
Base Memory 640K		
Extended Memory 64512K		
Total Memory 65536K		
↑↓←→:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults		

### **Date**

The date format is < month> < date> < year> .  
Press < F3> to show the calendar.

### **Time**

The time format is < hour> < minute> < second> . The time is converted based on the 24-hour military-time clock. For example. 5 p.m. is 17:00:00.

### **Hard Disks Type**

This item identify the types of hard disk drives that has been installed in the computer. There are 46 predefined types ,a user definable type and AUTO type.

Press PgUp or PgDn to select a numbered hard disk type, or type the number and press < Enter> . Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this item. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.

---

---

If select Type User, you may find related information in the following items. Enter the information directly from the keyboard and press < Enter > . Those information should be provided in the documentation from your hard disk vendor or the system manufacturer.

The user may also set those items in AUTO to automatically configure the hard disk drives parameter when the system power on.

If a hard disk drive has not been installed, select NONE and press < Enter > .

### ***Drive A type/Drive B type***

This item specifies the types of floppy disk drive A or drive B that has been installed in the system.

### ***Floppy 3 Mode Support***

Floppy 3 mode refers to a 3.5-inch diskette with a capacity of 1.2 MB. Floppy 3 mode is sometimes used in Japan.

### ***Video***

This item selects the type of adapter used for the primary system monitor that must matches your video display card and monitor. Although secondary monitors are supported, you do not have to select the type in Setup.

### ***Halt On***

This item determines if the system will stop when an error is detected during power-up.

### ***Memory***

This item is only for display. It is automatically detected by POST (Power On Self Test) of the BIOS.

#### ***Base Memory***

The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 640K for systems with 640K memory installed on the mainboard.

#### ***Extended Memory***

The BIOS determines how much extended memory is present during the POST. This is the amount of memory located above 1MB in the CPU's memory address map.

## **Advanced BIOS Features**

CMOS Setup Utility - Copyright (C) 1984-2000 Award Software Advanced BIOS Features		
Virus Warning	Disabled	Item Help Menu Level ▶  Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
Y2K Monitor	Disabled	
H/W Reset Function	Enabled	
CPU Internal Cache	Enabled	
External Cache	Enabled	
CPU L2 Cache ECC Checking	Enabled	
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	
Second Boot Device	HDD-0	
Third Boot Device	LS120	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Enabled	
Boot Up NumLock Status	On	
Gate A20 Option	Normal	
Typematic Rate Setting	Disabled	
x Typematic Rate (Chars/Sec)	6	
x Typematic Delay (Msec)	250	
Security Option	Setup	
OS Select For DRAM > 64MB	Non-OS2	
HDD S.M.A.R.T. Capability	Disabled	
Report No FDD For WIN 95	Yes	
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults		

### **Virus Warning**

When this item is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive for any attempt at modification. If an attempt is made, the BIOS will halt the system and the following error message will appear. Afterwards, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

!WARNING!  
Disk boot sector is to be modified  
Type "Y" to accept write or "N" to abort write  
Award Software, Inc.

- The choice: Enabled, Disabled.

### **Y2K Monitor**

If you enable this item, the system will monitor for errors generated by year 2000 bug.

- The choice: Enabled, Disabled.

---

### ***H/W Reset Function***

Enables or disables the computer's hardware reset button.

- The choice: Enabled, Disabled.

### ***CPU Internal Cache***

All the processors that can be installed in this mainboard use internal (level 1) cache memory to improve performance. Leave this item *Enabled* for better performance.

- The choice: Enabled, Disabled.

### ***External Cache***

Most processors that can be installed in this system use external (L2) cache memory to improve performance. The exceptions are older SEPP Celeron CPUs running at 266 or 300 MHz. Enable this item for all but these two processors.

- The choice: Enabled, Disabled.

### ***CPU L2 Cache ECC Checking***

This item enables or disables ECC (Error Checking and Correction) error checking on CPU L2 cache memory. We recommend that you leave this item at the default value.

- The choice: Enabled, Disabled.

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

You can enable this item to shorten power on testing (POST) and have make system to start up a little faster. You might like to enable this item after you are confident that your system hardware is operating smoothly.

- The choice: Enabled, Disabled.

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

Use these three items to select the priority and order of the devices that your system searches for an operating system at start-up time.

- The choice: Floppy, HDD-0, HDD-1, HDD-2, HDD-3, SCSI, CDROM, ZIP-100, USB-FDD, USB-ZIP, LAN, Disabled.

### ***Boot Other Device***

System at start up time will search all other possible locations for an operating system if it fails to find one in the devices specified under the first, second, and third boot devices.

- The choice: Enabled, Disabled.

---

### ***Swap Floppy Drive***

If you have two floppy diskette drives in your system, this item allows you to swap the assigned drive letters so that drive A becomes drive B, and drive B becomes drive A.

- The choice: Enabled, Disabled.

### ***Boot Up Floppy Seek***

If this item is enabled, it checks the geometry of the floppy disk drives at start-up time. You don't need to enable this item unless you have an old diskette drive with 360K capacity.

- The choice: Enabled, Disabled.

### ***Boot Up NumLock Status***

This item defines if the keyboard Num Lock key is active when system starts.

- The choice: On, Off.

### ***Gate A20 Option***

This item defines how the system handles legacy software that was written for an earlier generation of processors. Leave this item at the default value.

- The choice: Normal, Fast.

### ***Typematic Rate Setting***

If this item is enabled, you can use following two items to set typematic rate and typematic delay settings for keyboard.

- The choice: Enabled, Disabled.

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

If the item Typematic Rate Setting is enabled, you can use this item to define how many characters per second are generated by a held-down key.

- The choice: 6,8,10,12,15,20,24,30.

### ***Typematic Delay (Msec)***

If the item Typematic Rate Setting is enabled, you can use this item to define how many milliseconds must elapse before a held-down key begins generating repeat characters.

- The choice: 250, 500, 750, 1000.



---

### ***Security Option***

If you have installed password protection, this item defines if the password is required at system start up, or if it is only required when a user tries to enter the Setup Utility.

- The choice: Setup, System.

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

This item is only required if you have installed more than 64 MB of memory and you are running the OS/2 operating system. Otherwise, leave this item at the default Non-OS2.

- The choice: OS2, Non-OS2.

### ***HDD S.M.A.R.T. Capability***

The S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) system is a diagnostics technology that monitors and predicts device performance. S.M.A.R.T. software resides on both the disk drive and host computer. The disk drive software monitors the internal performance of the motors, media, heads, and electronics of the drive. The host software monitors overall reliability status of the drive. If a device failure is predicted, the host software, through the Client WORKS S.M.A.R.T. applet, warns user of the impending condition and advises appropriate action to protect data.

- The choice: Enabled, Disabled.

### ***Report No FDD for WIN95***

If you are running a system without floppy drive installed and using the Windows 95 OS, select Yes for this item to ensure compatibility with the Windows 95 logo certification.

- The choice: Yes, No.

## Advanced Chipset Features

CMOS Setup Utility - Copyright (C) 1984-2000 Award Software Advanced Chipset Features		
Bank 0/1 DRAM Timing Bank 2/3 DRAM Timing Bank 4/5 DRAM Timing SDRAM Cycle Length DRAM Clock Memory Hole PCI Master Pipeline Req P2C/C2P Concurrency Fast R-W Turn Around System BIOS Cacheable Video RAM Cacheable AGP Aperture Size AGP-4X Mode AGP Driving Control x AGP Driving Value K7 CLK_CTL Select OnChip USB OnChip USB 2 USB Keyboard Support USB Mouse Support OnChip Sound CPU to PCI Write Buffer PCI Dynamic Bursting PCI Master 0 WS Write PCI Delay Transaction PCI#2 Access #1 Retry AGP Master 1 WS Write AGP Master 1 WS Read Memory Parity/ECC Check		Item Help
		Menu Level ▶
↑↓←→:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults		

Warning: Make sure you fully understand the items contained in this menu before you try to change anything. You may change the parameter settings to improve system performance. However, it may cause your system to be unstable if the setting is not correct for your system configuration.

### **Bank 0/1 2/3 4/5 DRAM Timing**

This item allows you to select timing for DRAM slots, depending on whether the mainboard has paged SDRAMs.

- The choice: SDRAM 8/10ns, Medium, Fast, Turbo.

### **SDRAM Cycle Length**

This field enables you to set CAS latency time in HCLKs of 2/2 or 3/3. The mainboard designer should have set the values in this field, depending on DRAM installed. Do not change the values in this field unless you change specifications of installed DRAM or installed CPU.

- The choice: 2, 3.

### **DRAM Clock**

Enables users to select DRAM Clock. ➤ The choice: PC100, PC133.

---

### ***Memory Hole***

If this feature is enabled when the system memory size is equal to or greater than 16 MB, the physical memory address from 15 MB to 16 MB will be passed to PCI or ISA and there will be a 1 MB hole in your system memory. This option is designed for some OS with special add-in cards which need 15-16 MB memory space.

➤ The choice: Disabled, 15M-16M.

### ***PCI Master Pipeline Req***

Enable this item to allow better data transfer between the PCI Master bus and the CPU for better performance. You may want to disable this item if your system becomes unstable.

➤ The choice: Enabled, Disabled.

### ***P2C/C2P Concurrency***

When this item is disabled, the CPU bus is occupied during the entire PCI operation period.

➤ The choice: Enabled, Disabled.

### ***Fast R-W Turn Around***

When this is enabled, the chipset will insert one extra clock to the turn-around of back-to-back DRAM cycles.

➤ The choice: Enabled, Disabled.

### ***System BIOS Cacheable***

When this is enabled, system BIOS will be cached for faster execution.

➤ The choice: Enabled, Disabled.

### ***Video RAM Cacheable***

When this is enabled, graphics card's local memory will be cached for faster execution. However, if any program writes to this memory area, a system error may occur.

➤ The choice: Enabled, Disabled.

### ***AGP Aperture Size***

This option determines the effective size of AGP Graphic *Aperture*, where memory-mapped graphic data structures are located.

➤ The choice: 4M, 8M, 16M, 32M, 64M, 128M.

### ***AGP-4X Mode***

This item allows you to enable or disable the caching of display data for video memory of processor. Enabling can greatly improve speed of display. If your graphics display card does not support this feature, you need to disable this item.

➤ The choice: Enabled, Disabled.

---

### ***AGP Driving Control***

This item can be used to signal driving current on AGP cards to auto or Manual. Some AGP cards need stronger driving current in order to operate. We recommend that you set this item to Auto.

- The choice: Auto, Manual

### ***AGP Driving Value***

When the previous item AGP Driving Control is set to Manual, you can use this item to set the AGP current driving value.

- The choice: Min:0000 ~ Max:00FF.

### ***K7 CLK\_CTL Select***

This item adjusts CPU clock to match internal clock.

- The choice: Default, Optimal.

### ***On Chip USB***

This should be enabled if your system has a USB installed on mainboard and you wish to use it.

- The choice: Enabled, Disabled.

### ***On Chip USB2***

This should be enabled if your system has front panel USB ports installed on the mainboard and you wish to use them.

- The choice: Enabled, Disabled.

### ***USB Keyboard Support***

Enable the function when the USB keyboard is being used. Disabled it when an AT keyboard is used.

- The choice: Enabled, Disabled.

### ***USB Mouse Support***

Enable the function when USB mouse is being used.

- The choice: Enabled, Disabled.

### ***OnChip Sound***

Disabling this function turns off onboard audio chip.

- The choice: Auto, Disabled.

---

### ***CPU to PCI Write Buffer***

When enable this, up to four words of data can be written to PCI bus without interrupting CPU. When disabled this, a write buffer is not used and the CPU read cycle will not be completed until PCI bus signals that it is ready to receive the data.

➤ The choice: Enabled, Disabled.

### ***PCI Dynamic Bursting***

When enable this, up to four words of data can be written to PCI bus without interrupting CPU. When disabled this, a write buffer is not used and the CPU read cycle will not be completed until PCI bus signals that it is ready to receive the data.

➤ The choice: Enabled, Disabled.

### ***PCI Master 0 WS Write***

When enable this, writes to PCI bus are executed with zero wait state.

➤ The choice: Enabled, Disabled.

### ***PCI Delay Transaction***

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Enable it to support compliance with PCI specification version 2.1.

➤ The choice: Enabled, Disabled.

### ***PCI #2 Access #1 Retry***

When enable it, AGP Bus (PCI#1) access to PCI Bus (PCI#2) is executed with error retry feature.

➤ The choice: Enabled, Disabled.

### ***AGP Master 1 WS Write***

This implements a single delay when writing to AGP Bus. Usually, two-wait states is used by system, which is default setting for greater stability.

➤ The choice: Enabled, Disabled.

### ***AGP Master 1 WS Read***

This implements a single delay when reading to AGP Bus. By default, two-wait states are used by the system, allowing for greater stability.

➤ The choice: Enabled, Disabled.

### ***Memory Parity ECC Check***

This item allows users to enable memory error correcting code (ECC) function. Meanwhile, SDRAM modules with ECC installed is necessary.

➤ The choice: Auto, Disabled.

---

---

## **Integrated Peripherals**

CMOS Setup Utility - Copyright (C) 1984-2000 Award Software Integrated Peripherals		
OnChip IDE Channel0	Enabled	Item Help Menu Level ▶
OnChip IDE Channel1	Enabled	
IDE Prefetch Mode	Enabled	
Primary Master PIO	Auto	
Primary Slave PIO	Auto	
Secondary Master PIO	Auto	
Secondary Slave PIO	Auto	
Primary Master UDMA	Auto	
Primary Slave UDMA	Auto	
Secondary Master UDMA	Auto	
Secondary Slave UDMA	Auto	
Init Display First	PCI Slot	
IDE HDD Block Mode	Enabled	
Onboard FDD Controller	Enabled	
Onboard Serial Port 1	Auto	
Onboard Serial Port 2	Auto	
UART 2 Mode	Standard	
x IR Function Duplex	Half	
x TX,RX inverting enable	No, Yes	
Onboard Parallel Port	378/IRQ7	
Onboard Parallel Mode	ECP	
ECP Mode Use DMA	3	
Parallel Port EPP Type	EPP1.7	
Onboard Legacy Audio	Enabled	
Sound Blaster	Disabled	
SB I/O Base Address	220H	
SB IRQ Select	IRQ 5	
SB DMA Select	DMA 1	
MPU-401	Enabled	
MPU-401 I/O Address	330-333H	
Game Port (200-207H)	Enabled	
↑↓←→:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults		

### **OnChip IDE Channel0,1**

Use these items to enable or disable PCI IDE channels that are integrated on the mainboard.

- The choice: Enabled, Disabled.

### **IDE Prefetch Mode**

Enable prefetch mode for IDE drive interfaces that support its faster drive accesses. If you are getting disk drive errors, change the setting to omit drive interface where the errors occur. Depending on the configuration of your IDE subsystem, this field may not appear, and it does not appear when the Internal PCI/IDE field above is Disabled.

- The choice: Enabled, Disabled.

### **Primary/Secondary Master/Slave PIO**

Each channel supports a master device and a slave device. These four items let you assign which kind of PIO (Programmed Input/Output) is used by IDE devices. You can choose Auto, to let the system auto detect which PIO mode is best, or you can install a PIO mode from 0-4.

- The choice: Auto, Mode 0~4.
-

---

### ***Primary/Secondary Master / Slave UDMA***

Each channel supports a master device and a slave device. This motherboard supports UltraDMA. UltraDMA technology provides faster access to IDE devices.

If you install a device that supports UltraDMA, change the appropriate item on this list to Auto. You have to install UltraDMA driver supplied by this motherboard in order to use an UltraDMA device.

- The choice: Auto, Disable.

### ***Init Display First***

If install both PCI and AGP display card , use this item to define one as primary display adapter.

- The choice: AGP, PCI Slot.

### ***IDE HDD Block Mode***

Block mode transfers can improve access to IDE devices. Enable this item if your IDE devices support block mode transfer.

- The choice: Enabled, Disabled.

### ***Onboard FDD Controller***

This option enables onboard floppy disk drive controller.

- The choice: Enabled, Disabled.

### ***Onboard Serial Port 1,2***

This option is used to assign I/O address for onboard serial ports.

- The choice: 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto, Disabled.

### ***UART 2 Mode***

This field is available if onboard serial port 2 field is set to any option but Disabled. UART 2 Mode enables you to select the infrared communication protocol—Standard , HPSIR, or ASKIR. HPSIR is Hewlett Packard's infrared communication protocol with a maximum baud rate up to 115.2 Kbps. ASKIR is Sharp's infrared communication protocol with a maximum baud rate up to 57.6 Kbps.

- The choice: Standard, HPSIR, ASKIR

---

### ***IR Function Duplex***

This field is available when UART 2 Mode is set to either ASKIR or HPSIR. This item enables you to determine the infrared (IR) function of onboard infrared chip. Full-duplex means that you can transmit and send information simultaneously. Half-duplex is the transmission of data in both directions, but only one direction at a time.

➤ The choice: Half, Full.

### ***TX, RX inverting enable***

Defines voltage level for Infrared module RxD (receive) mode and TxD (transmit) mode. This setting has to match the requirements of infrared module used in system.

➤ The choice: No, No / No, Yes / Yes, No / Yes, Yes.

### ***Onboard Parallel Port***

This option is used to assign I/O address for onboard parallel port.

➤ The choice: Disable, 3BC/IRQ7, 378/IRQ7, 278/IRQ5.

### ***Onboard Parallel Mode***

This feature enables you to set data transfer protocol for parallel port. Normal allows data output only. Extended Capabilities Port (ECP) and Enhanced Parallel Port (EPP) are bi-directional modes, and they allow both data input and output. ECP and EPP modes are only supported with EPP and ECP aware peripherals.

➤ The choice: Normal, EPP, ECP, ECP/EPP.

### ***ECP Mode Use DMA***

When onboard parallel port is set to ECP mode, the parallel port has the option to use DMA 3 or DMA 1.

➤ The choice: 1, 3

### ***Parallel Port EPP Type***

This option offers users to specify Enhanced Parallel Port (EPP) specification.

➤ The choice: EPP 1.7, 1.9.



---

***These items from "Onboard Legacy Audio" to "Game Port" control the onboard legacy audio and are defined as follows:***

***Onboard Legacy Audio***

This option enables onboard legacy audio function. When this is enabled, following items become available.

- The choice: Enable, Disable.

***Sound Blaster***

This feature is used to enable or disable a sound blaster card if it's installed.

- The choice: Enable, Disable.

***SB I/O Base Address***

This item lets you set I/O base address for sound blaster card.

- The choice: 220H, 240H, 260H, 280H.

***SB IRQ Select***

This item lets you set interrupt request (IRQ) for sound blaster card.

- The choice: IRQ 5,7,9,10.

***SB DMA Select***

This item lets you select direct memory access (DMA) for sound blaster card.

- The choice: DMA 0,1,2,3.

***MPU-401***

Use this item to enable MPU-401 function for game port.

- The choice: Enable, Disable.

***MPU-401 I/O Address***

Use this item to set I/O address for game port.

- The choice: 300-303H, 310-313H, 320-323H, 330-333H.

***Game Port (200-207H)***

This item shows I/O address for game port.

- The choice: Enable, Disable.

---

## **Power Management Setup**

CMOS Setup Utility - Copyright (C) 1984-2000 Award Software		
Power Management Setup		
ACPI function	Enabled	Item Help
▶ Power Management	Press Enter	
ACPI Suspend Type	S1(POS)	Menu Level ▶
PM Control by APM	Yes	
Video Off Option	Suspend -> Off	
Video Off Method	DPMS Support	
MODEM Use IRQ	3	
Soft-Off by PWRBTN	Instant-Off	
AC Resume Function	Always Off	
▶ Wake Up Events	Press Enter	

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

The Power Management Setup allows you to configure motherboard green features.

### **ACPI Function**

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

- The choice: Enabled, Disabled.

**Select "Power Management" to press "enter" key ,and then you may run into the sub-menu. The sub-menu contains three items listed as follows:**

### **Power Management**

This function allows you to set the default parameters of power-saving modes. You may set "User Define" to choose your own parameters.

- The choice: User Define, Min Saving, Max Saving.

### **HDD Power Down**

IDE hard drive will spin down if it is not accessed within a specified length of time.

- The choice: Disable, 1Min, ....., 15Min.

---

### ***Doze Mode***

system speed will change from turbo to slow if no Power Management events occur for a specified length of time. Full power function will return when a Power Management event is detected.

- The choice: 1Min, 2Min, 4Min, 6Min, 8Min, 10Min, 20Min, 30Min, 40Min, 1Hour.

### ***Suspend Mode***

CPU clock will be stopped and the video signal will be suspended if no Power Management events occur for a specified length of time. Full power function will return when a Power Management event is detected. Options are from 1 Min to 1 Hour and Disable.

- The choice: 1Min, 2Min, 4Min, 6Min, 8Min, 10Min, 20Min, 30Min, 40Min, 1Hour, Disable.

***Press "Esc" key to go back to the previous sub-menu.***

### ***ACPI Suspend Type***

Use this item to define how your system suspends. In the default, S1 (POS), the suspend mode is equivalent to a software power down. If you select S3 (STR), the suspend mode is a suspend to RAM – system shuts down with the exception of a refresh current to system memory.

- The choice: S1(POS), S3(STR)

### ***PM Control by APM***

If this item is set to No, system BIOS will be ignored and APM calls power to manage system.

If this item is set to Yes, system BIOS will wait for APM's prompt before it enters any power management mode, example DOZE, STANDBY or SUSPEND.

- The choice: Yes, No.

### ***Video Off Option***

This option defines if the video is powered down when the system is put into suspend mode.

- The choice: Always on, Suspend -> off, All modes -> off.

---

### ***Video Off Method***

This determines the manner in which the monitor is blanked.

#### **V/H SYNC + Blank**

This selection will cause system to turn off vertical and horizontal synchronization ports and write blanks to video buffer.

#### **Blank Screen**

This option only writes blanks to video buffer

#### **DPMS Support**

Initial power management signal of display.

- The choice: V/H SYNC + Blank, Blank Screen, DPMS Support.

### ***Modem Use IRQ***

If you want an incoming call on a modem to automatically resume system from a power-saving mode, use this item to specify interrupt request line (IRQ) that is used by modem. You might have to connect the fax/modem to Wake On Modem connector on the mainboard.

- The choice: 3, 4, 5, 7, 9, 10, 11, N/A

### ***Soft-Off by PWRBTN***

This is a specification of ACPI and supported by hardware. When **Delay 4 sec.** is selected, the soft power switch on the front panel can be used to control power On, Suspend and Off. If the switch is pressed less than 4 sec during power On, the system will go into Suspend mode. If the switch is pressed longer than 4 sec, the system will be turned Off. The default setting is **Install-Off**, soft power switch is only used to control On and Off, there is no need to press 4 sec, and there is no Suspend.

- The choice: Instant-Off, Delay 4 Sec.

### ***AC Resume Function***

This item lets user to determine the state that your PC returns to after a power failure. "Always on" means that PC will restart. "Always off" means not to boot and "Former-sts" means the state it is before the power interruption.

- The choice: Always on, Always off, Former-sts.

---

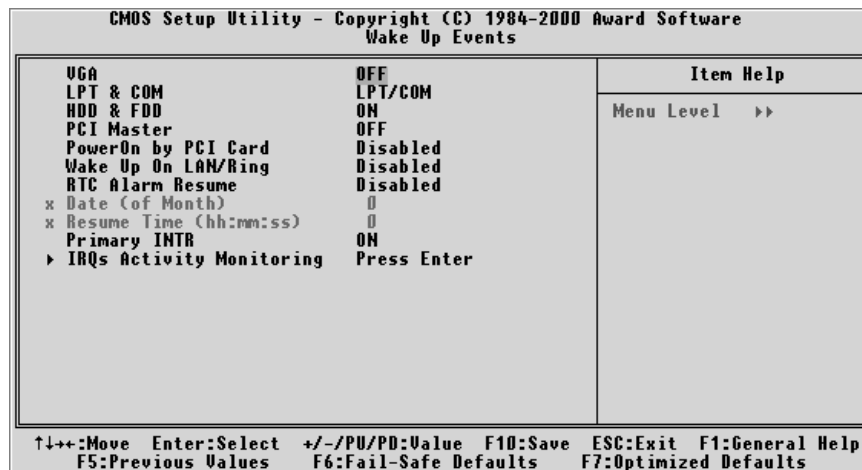
### \*\*\* **Wake Up Events** \*\*\*

Wake Up Events can prevent system from entering a power saving mode or can awaken system from such a mode. In effect, system remains alert for anything which occurs to a device that is configured as On or Enabled, even when system is in a power down mode.

#### **Wake Up Events**

This item allows user to determine wake up events.

- The choice: Press "Enter" key to run into the sub-menu.



#### **VGA**

Set the item ON, while you wake up system by LAN, and VGA is waken, too.

- The choice: ON, OFF.

#### **LPT & COM**

Set the item enabled then users can awaken system by any device connected to LPT/COM ports.

- The choice: NONE, LPT/COM, LPT, COM.

#### **HDD & FDD**

Set the item ON then users can awaken system by Hard Disk/Floppy disk.

- The choice: ON, OFF.

#### **PCI Master**

Set the item ON then users can awaken system by any PCI Card (Master mode).

- The choice: ON, OFF.
-

---

### ***Power On by PCI Card***

Set the item enabled then users can awaken system by PCI card.

- The choice: Enabled, Disabled.

### ***Wake Up On LAN/Ring***

When set the enabled, system power will be turned on if there is any LAN card or modem activity.

- The choice: Enabled, Disabled.

### ***RTC Alarm Resume***

Set the item Enabled, and then users may select alarm time in the next few items.

- The choice: Enabled, Disabled.

#### ***Date (of Month)***

This is for specifying the alarm Date on which system will awaken system from suspend mode.

- The choice: Key in a DEC number: Min=0, Max=31.

#### ***Resume Time (hh:mm:ss)***

This is to specify the alarm Hour/Minute/Second on which the system will awaken system from suspend mode.

- The choice: Key in a DEC number: Min=0, Max=23/59.

### ***Primary INTR***

Set the item Enabled then users can awaken system by any device with the IRQ designated by PCI Card.

- The choice: ON, OFF.

### ***IRQs Activity Monitoring***

Press "Enter" key to run into sub-menu. You may enable any device with listed IRQ to awaken system.

- The choice: IRQ 3 ~ IRQ15.

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## PnP/PCI Configurations

CMOS Setup Utility - Copyright (C) 1984-2000 Award Software PnP/PCI Configurations		
PNP OS Installed	No	<b>Item Help</b>  Menu Level   ►  Select Yes if you are using a Plug and Play capable operating system. Select No if you need the BIOS to configure non-boot devices.
Reset Configuration Data	Disabled	
Resources Controlled By	Auto(ESCD)	
x IRQ Resources	Press Enter	
x DMA Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	
Assign IRQ For VGA	Enabled	
Assign IRQ For USB	Enabled	
INT Pin 1 Assignment	Auto	
INT Pin 2 Assignment	Auto	
INT Pin 3 Assignment	Auto	
INT Pin 4 Assignment	Auto	

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

The PnP/PCI Configurations allows you to configure ISA and PCI devices installed.

### **PNP OS Installed**

Setting this option to Yes allows PnP OS (instead of BIOS) to assign system resources such as IRQ and I/O address to the ISA PnP device.

- The choice: Yes, No.

### **Reset Configuration Data**

If you enable this item and restart system, any PnP configuration data stored in the BIOS setup is cleared from memory. New updated data is created.

- The choice: Enabled, Disabled.

### **Resources Controlled By**

You should leave this item at default Auto (ESCD). Under this setting, system dynamically allocates resources to plug and play devices as they are required. If you cannot get a legacy ISA (Industry Standard Architecture) add-in card to work properly, you might be able to solve the problem by changing this item to Manual, and then opening up *IRQ Resources* and *DMA Resources* sub-menus.

- The choice: Auto, Manual.

---

In *IRQ Resources* sub-menu, if you change any of IRQ assignments to Legacy ISA, then that Interrupt Request Line is reserved for a legacy ISA add-in card. Press **Esc** to close the IRQ Resources sub-menu.

### ***PCI/VGA Palette Snoop***

This item is designed to overcome some problems that can be caused by some non-standard VGA cards. This board includes a built-in VGA system that does not require palette snooping so you must leave this item disabled.

➤ The choice: Disabled, Enabled.

### ***Assign IRQ for VGA***

Names the interrupt request (IRQ) line assigned to VGA (if any) on system. Activity of the selected IRQ always awakens the system.

➤ The choice: Enabled, Disabled.

### ***Assign IRQ for USB***

Names the interrupt request (IRQ) line assigned to USB (if any) on system. Activity of the selected IRQ always awakens system.

➤ The choice: Enabled, Disabled.

### ***INT Pin 1 ~ Pin 4 Assignment***

Names the interrupt request (IRQ) line assigned to PCI 1 through PCI 4 on system. Activity of selected PCI slot awakens system.

➤ The choice: Auto, 3,4,5,7,9,10,11,12,14,15.



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## **PC Health Status**

CMOS Setup Utility - Copyright (C) 1984-2000 Award Software		
PC Health Status		
Shutdown Temperature	Enabled	Item Help
Current CPU Temp.	XX°C/XX°F	Menu Level →
Current System Temp.	XX°C/XX°F	
CPU FAN Speed	XXXX RPM	
Power FAN Speed	XXXX RPM	
Vcore	X.XX V	
3.3V	X.XX V	
5V	X.XX V	
12V	X.XX V	
↑↓:Move Enter:Select +/-/PG/PD:Value F10:Save ESC:Exit F1:General Help		
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults		

### **Shutdown Temperature**

Select one range which includes the highest temperature of system. Once your computer's temperature is over the value, system shuts down.

### **Current CPU Temperature**

The mainboard supports CPU temperature monitoring and overheat alert. This item indicates the current Processor temperature.

### **Current System Temp**

The mainboard supports System Temperature monitoring and overheat alert. This item indicate the current main board temperature.

### **CPU FAN Speed**

The mainboard can detect fan's rotation speed for CPU cooler.

### **Power FAN Speed**

The mainboard can detect fans' rotation speed for Power cooler.

### **Vcore**

This mainboard supports CPU and mainboard voltages monitoring. The onboard hardware monitor is able to detect the CPU voltage (Vcore) and the voltage output from power supply.

### **3.3V, 5V, 12V**

The mainboard supports CPU and mainboard voltages monitoring. The onboard hardware monitor is able to detect the voltages output of the voltage regulators and power supply.

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## **Frequency/Voltage Control**

CMOS Setup Utility - Copyright (C) 1984-2000 Award Software Frequency/Voltage Control	
Auto Detect DIMM/PCI Clk    Enabled	Item Help
CPU Host/PCI/Spread Spec.    Default	Menu Level    ▶
↑↓→←:Move    Enter:Select    +/-:PU/PD:Value    F10:Save    ESC:Exit    F1:General Help F5:Previous Values    F6:Fail-Safe Defaults    F7:Optimized Defaults	

### **Auto Detect DIMM/PCI Clk**

This item allows you to enable/disable auto detection DIMM/PCI Clock.

- The choice: Enabled, Disabled.

### **CPU Host/PCI/Spread Spec.**

This is to set CPU host clock (100Mhz or 133Mhz) and PCI clock. And Spread Spec. typically reduces system electromagnetic interference.

---

### **Load Fail-Safe Defaults**

While pressing < Enter > , you will get a confirmation dialog box with a message similar to:

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

Press 'Y' loads the BIOS default values for the most stable, minimal-performance of system operations.

### **Load Optimized Defaults**

While pressing < Enter > , you will get a confirmation dialog box with a message similar to:

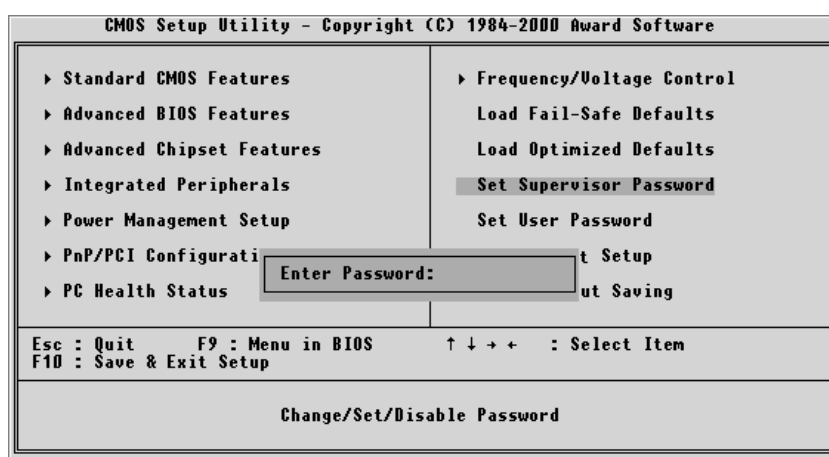
Load Optimized Defaults (Y/N) ? N

Press 'Y' loads the default values that are factory settings for optimal performance of system operations.

---

## User Password Setting

You can set either supervisor or user password or both of them. The differences between them are:



### Supervisor Password and User Setting

The options on the Password screen menu make it possible to restrict access to the Setup program by enabling you to set passwords for two different access modes: Supervisor mode and User mode.

In general, Supervisor mode has full access to the Setup option, whereas User mode has restricted access to the option. By setting separate Supervisor and User password, a system supervisor can limit who will change critical Setup values.

### Enter Password

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

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

---

### **Password Disable**

If you select System at Security Option of BIOS Features Setup Menu, you will be prompted the password whenever the system is rebooted or whenever you try to enter Setup. If you select Setup at Security Option of BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.

**Warning :** Retain a record of your password in a safe place. If you forget the password, the only way to access the system is to clear CMOS memory, please refer to "Clear CMOS" on page 29.

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### **Save & Exit Setup**

Press < Enter > on this item, and a similar dialog box shows up to ask you the following confirmation :

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

Pressing "Y" stores the selections made in the menus of CMOS - a special section of memory that stays on after you turn off system. When next time you restart computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values, system restarts again.

### **Exit Without Saving**

While pressing < Enter > , a similar dialog box shows up to ask you following confirmation :

Quit without saving (Y/N)? Y

This allows you to exit from Setup without storing any changes in CMOS. The previous selections remain in effect and it leads you to exit from the Setup utility and restart your computer.