

AV49P & AV49PN
Intel Pentium 4/Celeron
478-pin Processor
with 400/533/800 MHz FSB
Based DDR MAINBOARD

User's Manual

Shuttle® AV49P & AV49PN

**Intel Pentium 4/Celeron
478-pin Processor
with 400/533/800 MHz FSB
Based DDR Mainboard
Manual Version 1.0**

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Statement of Shuttle Mainboard via the EMI Test

Shuttle mainboards have been via the EMI test in terms of series of regulations: EN55022/ CISPR22/AS/NZS3548 Class B, EN55024 (1998/AS/NZS), EN4252.1 (1994), EN61000, ANSI C63.4 (1992), CFR47 Part 15 Subpart B, and CNS13438 (1997). The items tested are illustrated as follows:

(A) Voltage: AC 110V/60HZ & AC 230V/50HZ

(B) Tested Product Information:

Product Name: PC Mainboard

Status: Sample

Model Name: AV49P/AV49PN

S/N: N/A

CPU:

External Frequency: 100 MHz

Intel Pentium IV 1.6/1.8/2.0/2.2/2.4/2.6 GHz

External Frequency: 133 MHz

Intel Pentium IV 2.26/2.40/2.53/2.66/2.80/3.06 GHz

External Frequency: 200 MHz

Intel Pentium IV 2.80/3.0/3.2 GHz

Mouse Port: one port with 6 pins

Keyboard Port: one port with 6 pins

Parallel Port: one port with 25 pins

Serial Port: one port with 9 pins

Line-Out & Line-In & Microphone Ports: one port for each

LAN Port: one port with 8 pins (10Mbps/100Mbps)(AV49PN only)

USB Port: four ports with 4 pins respectively

DDR Memory: 400, 256 MB*2

Power Cable: Detachable and Shielded (with a GND pin)

Maximum Resolution: 1280 X 1024 V:60Hz

All CPUs have completely been tested, and values offered by the worst EMI combination of CPU external frequency are listed as follows:

Test Mode	External Frequency	CPU	Open/Close
1	200MHz	P4 3.2 GHz	Close
2	200MHz	P4 3.2 GHz	Open
3	133MHz	P4 3.06 GHz	Close
4	133MHz	P4 3.06 GHz	Open

(C) Remedy for the Tested Product & Its EMI Interference:

Remedy: N/A

EMI Interference:

Crystal: 24.576 MHz(X4)/ 24.576 MHz(X6)/25.00 MHz(X7)/32.768 KHz(X2)

Clock Generator: CLK1

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1 INTRODUCTION

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 3.1 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 Shuttle AV49P/AV49PN mainboard.

Experienced DIY User

Congratulate on your purchase of the Shuttle AV49P/AV49PN mainboard. You will find that installing your new Shuttle AV49P/AV49PN mainboard is just easy. Bundled with an array of onboard functions, the highly-integrated AV49P/AV49PN 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 Drivers/Software Utilities 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

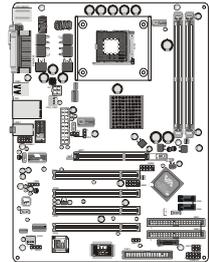
You have wisely chosen Shuttle AV49P/AV49PN to construct your system. Shuttle AV49P/AV49PN incorporates all the state-of-the-art technology of the VIA PT800 chipset from VIA. It integrates the most advanced functions you can find to date in a compact ATX board.

This manual is all-purpose for two kinds of mainboards: AV49P and AV49PN. The main difference between them is that AV49PN is equipped with an onboard LAN. In the manual, if there are some standards, characteristics, equipment, or software adopted only by AV49PN, it will be highlighted in brackets.

1.2 Item Checklist:

Check all items with your AV49P/AV49PN mainboard to make sure nothing is missing. The complete package should include:

- ✦ One piece of Shuttle AV49P/AV49PN Mainboard



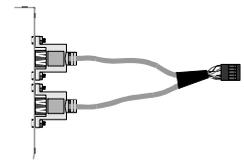
- ✦ One piece of ATA 133/100/66/33 Ribbon Cable



- ✦ One piece of Floppy Ribbon Cable



- ✦ One piece of twin ports USB Cable (optional)



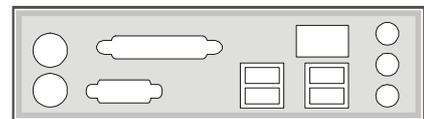
- ✦ One piece of Serial ATA Cable



- ✦ AV49P/AV49PN User's Manual



- ✦ I/O Shielding



- ✦ One piece of Bundled CD-ROM with containing:

- AV49P/AV49PN user's manual saved in PDF format
- RAID manual saved in PDF format
- VIA 4in1 Driver
- VIA LAN Driver (AV49PN Only)
- VIA Audio Driver
- VIA USB2.0 Driver
- VIA RAID Drivers
- AMI Flashing Utility



2 FEATURES

AV49P/AV49PN 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**

Intel Pentium 4/Celeron, 478-pin processors with 800/533/400 MHz FSB.

* **Chipset**

Features VIA PT800 N.B. and VIA VT8237 S.B..

* **Hyper-Threading Technology**

The latest Intel application defines a high-speed calculating ability to optimize your system by two CPUs supported (one virtual, one physical) in a multi-task environment.

* **Onboard 10/100Mb/s LAN (AV49PN Only)**

The VIA VT6103 incorporated provides the mainboard with integrated 10/100 Mbps Fast Ethernet capabilities.

* **AC'97 Link for Audio and Telephony CODEC**

AC'97 2.2 compliant.

Spread independent PCI functions for Audio and Modem.

* **Versatile Memory Support**

Two 184-pin DIMM slots to support max 2GB of PC1600/PC2100/PC2700/PC3200 compliant with DDR SDRAM module.

* **PCI Expansion Slots**

Provides four 32-bit PCI slots.

* **AGP Expansion Slot**

Provides one AGP 3.0 compliant slot which supports 4X/8X AGP devices.

* **8 USB 2.0 Interface Onboard**

4 * USB connectors on back panel and 2 sets of dual USB ports headers on mid-board.

★ I/O Interface

Provides a variety of I/O interfaces:

- 1* PS/2 mouse connector.
- 1* PS/2 keyboard connector.
- 1* DB25 parallel port.
- 1* serial port.
- 4* USB 2.0 ports.
- 1* LAN port. (AV49PN only)
- 1* Line-In port.
- 1* Line-Out port.
- 1* Microphone port.

★ PCI Bus Master IDE Controller Onboard

Two Ultra DMA 133/100/66/33 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 data transfer speeds of up to 133/100/66/33 MB/sec and also supports Enhanced PIO Modes. 80-pin Cable Backward Compatible Legacy ATAPI Devices, ATAPI IDE CD-ROM, CD-R, CD-RW, and LS-120 Supports.

★ ATX Power Supply Connector

ATX power supply unit can be connected to the onboard 20-pin ATX power connector, and 4-pin ATX power connector. The unit supports Suspend and Soft-On/Off modes by the dual-function power button.

★ Advanced Configuration and Power Interface

Features three power saving modes: S1 (Snoop), S4 (Suspend to DISK), and S5 (Soft-Off). ACPI provides more efficient Energy Saving Features controlled by your operating system that supports OS Direct Power Management (OSPM) functionality.

★ System BIOS

Provides licensed AMI BIOS and supports Green PC, Desktop Management Interface (DMI).

★ ATX Form Factor

System board conforms to ATX specification.

Board dimension: 305 mm * 190 mm.

* Advanced Features

- Low EMI - Built in spread spectrum. Unused PCI/SDRAM slots are shut off by the automatic clock for reducing EMI.
- Dual Function Power Button - The system can be in any of the 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 will enter Soft-Off mode.
- CPU Multiplier Setting - This item allows users to adjust CPU Multiplier in BIOS.
- CPU Clock Setting - This item allows users to adjust CPU Clock by BIOS and jumper JP2/JP3.

* Intelligent Features

- Voltage Monitoring - Monitors various voltages of key elements, such as the CPU, and other critical system voltage levels to ensure a stable current passing through mainboard components.
- Fan Status Monitoring - To prevent the CPU from overheating, the CPU fan is monitored by RPM, with which the cooling fan is required.
- Temperature Monitoring - This item allows users to make sure whether the CPU or system runs under a suitable temperature.

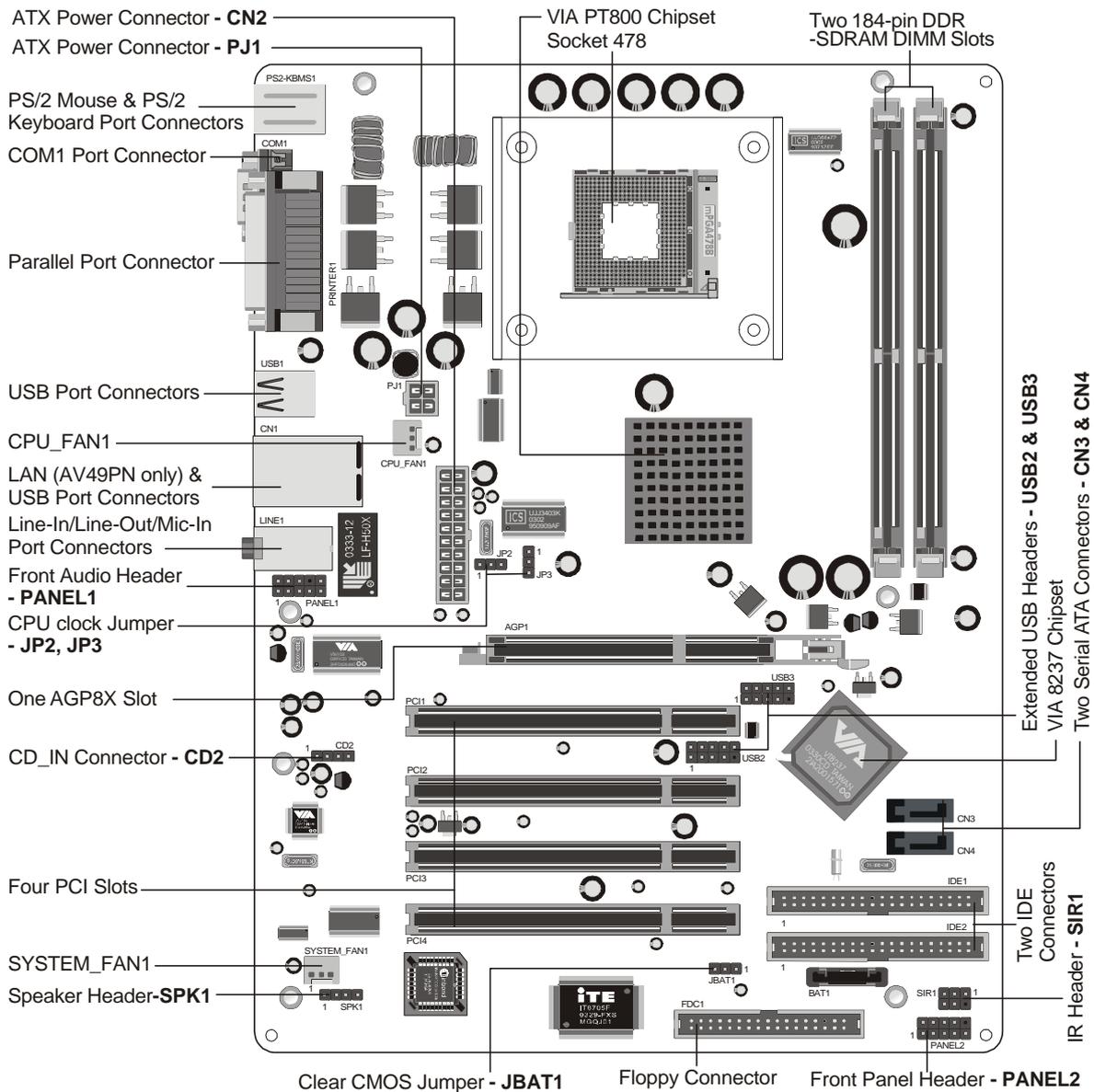
3 HARDWARE INSTALLATION

Before removing/installing any of these devices: CPU, DIMMs, Add-On Cards, and Cables, please unplug the onboard power connector.

This section outlines how to install and configure your mainboard. Referring to the following mainboard layout helps you identify various jumpers, connectors, slots, and ports. Steps described herein will lead you to a quick and correct installation of your system.

3.1 Step-by-Step Installation

Accessories Of AV49P/AV49PN



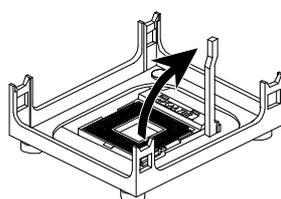
Step 1

CPU Installation:

This mainboard supports Intel Pentium 4/Celeron Socket 478 series CPU. Please follow the steps as follows to finish CPU installation.

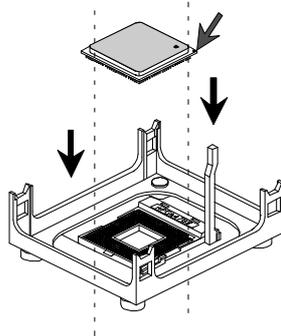
Note the CPU orientation when you plug it into CPU socket.

1. Pull up the CPU socket lever to 90-degree angle.



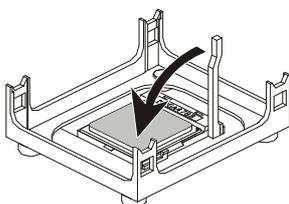
CPU socket lever up to 90-degree angle

2. Locate Pin 1 in the socket and look for a black dot or cut edge on the CPU upper interface. Match Pin 1 and cut edge, and insert the CPU into the socket.



CPU Pin 1 and cut edge

3. Press down the CPU socket lever and finish CPU installation.



Note: The CPU might be damaged if you do not match the CPU socket Pin 1 and cut edge well.

4. Intel Pentium 4/Celeron processors require a set of heatsink and fan to cool down the processor. You need to purchase a heatsink and fan if they are not bundled with your CPU. Required is that install the set and plug its cable in the CPU fan power connector. Note that there are kinds of CPU fan connectors. Normally, if your mainboard supports a hardware monitoring function, a 3-pin fan power connector can have your system detect the CPU fan's speed. A CPU fan with a 2-pin or 4-pin fan power connector does not support the detection of the CPU fan's speed, and must directly be connected to the system's power supply unit.

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 the jumpers unless you require special adjustments as any of the following cases:

1. Clear CMOS
2. CPU Clock

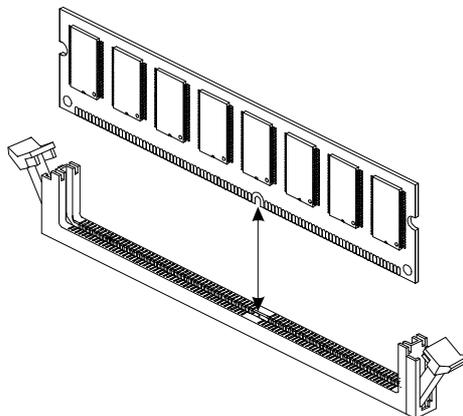
For first-time DIY system builders, we recommend that you do not change the default jumper settings if you are not totally familiar with the mainboard configuration procedures. The factory-set default settings are tuned for optimum system performance. For the advanced users who wish to customize their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

Step 3

Install DDR SDRAM System Memory

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

DDR SDRAM



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 connections to the mainboard described below.

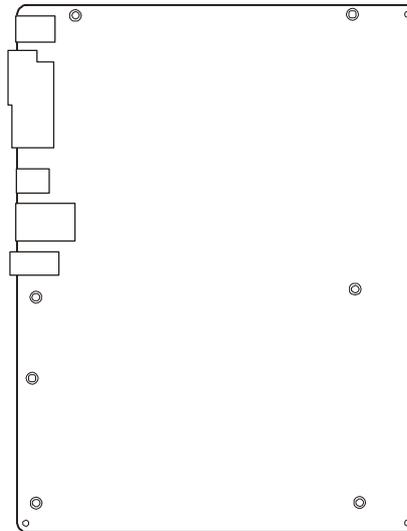
To install IDE & FDD drives, follow this procedure:

1. Set the required jumpers on each device according to the instructions provided by the manufacturer. (IDE devices, HDD, and CD-ROM, have to set jumpers to Master or Slave mode depending on whether you install more than one device of each kind.)
2. Connect IDE cable and FDD cable on the back panel of the internal peripheral devices to the corresponding headers on board. Note that the cable should be oriented with its colored stripe (usually 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 from 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.

Step 5

Mount the Mainboard on the Computer Chassis

1. You may find there are a lot of mounting holes on your computer chassis and mainboard. To match the holes on both properly, the key point is to make the back panel of the mainboard in a close fit with your system case, as shown below.



2. Position the studs between the chassis and the mainboard. The studs are used to fix the mainboard and to keep a certain distance between the them, for avoiding any electrical shorts in-between.
(If your computer case is already equipped with mounting studs, you need to tighten the screws to attach the mainboard.)

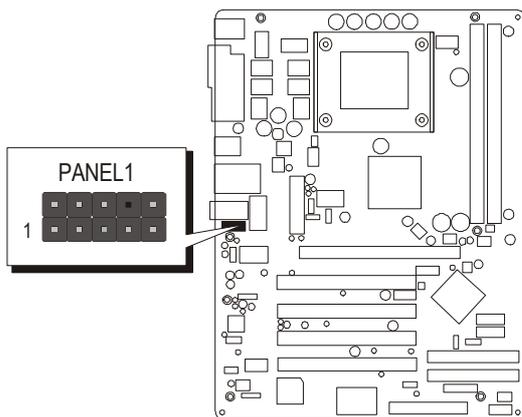
Note: In most computer housings, you can find 4 or more holes to place studs for fixing the mainboard. If there aren't enough matching holes, screw at least 4 studs to ensure the proper attachment of the mainboard.

Step 6

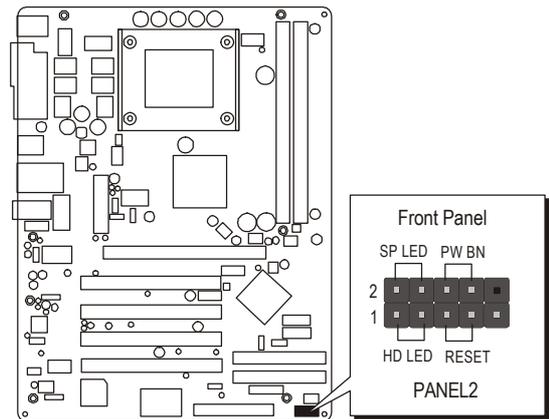
Connect Front Panel Switches/LEDs/Speaker/USBs

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, or USB devices etc.) These cables serve to connect the front-panel switches, LEDs, and USB connectors to the mainboard front-panel connectors group (USB2/USB3 and PANEL1, PANEL2, SPK1), as shown below.

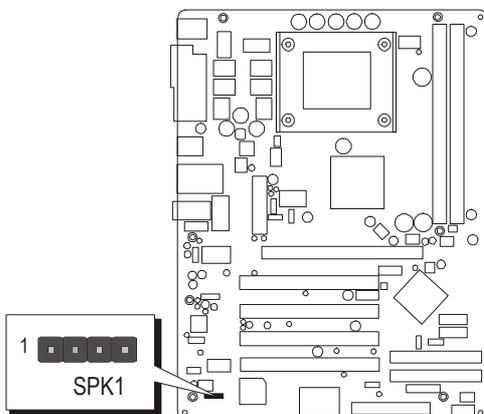
1. PANEL1



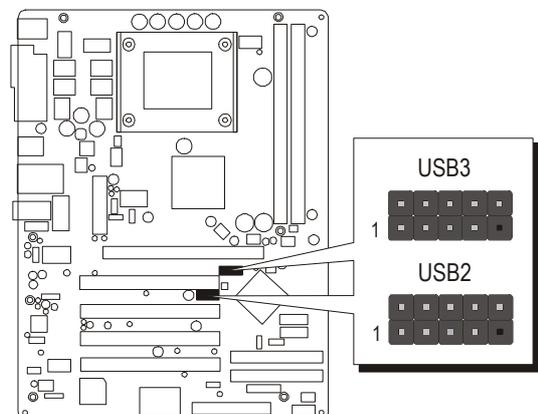
2. PANEL2



3. SPK1



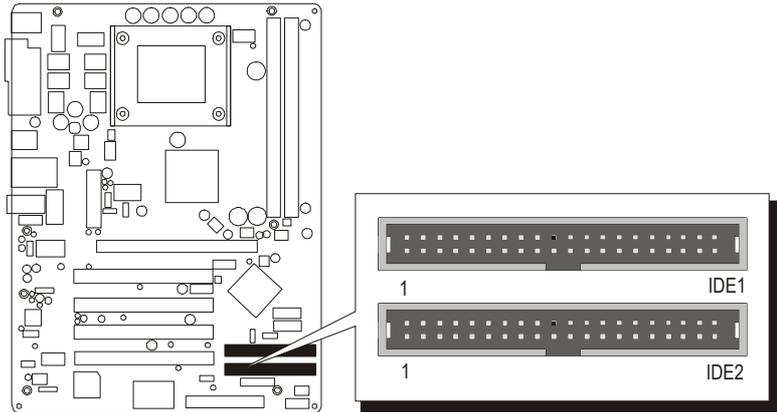
4. USB2/USB3



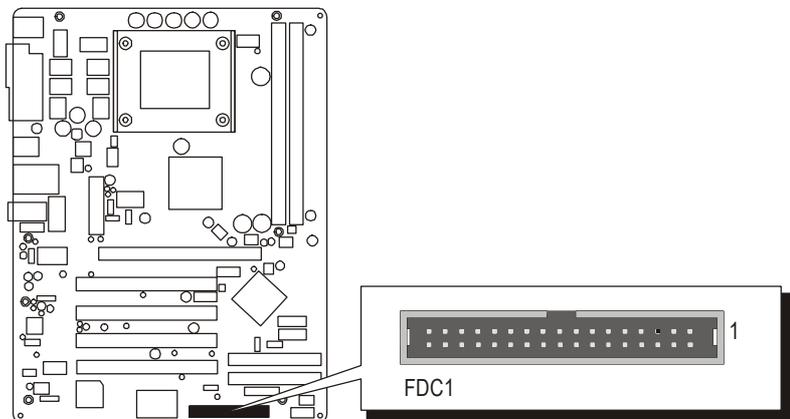
Step 7

Connect IDE , Floppy and Serial ATA Disk Drives

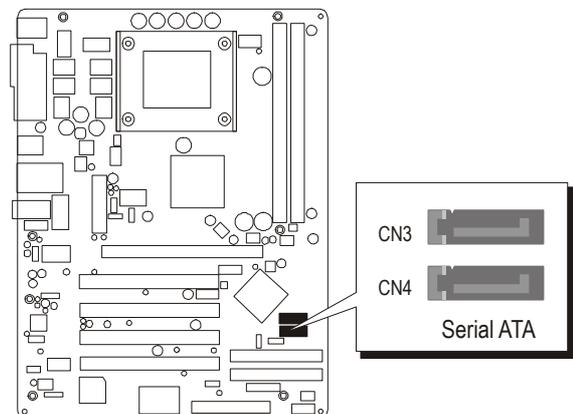
1. IDE cable connectors



2. Floppy cable connector



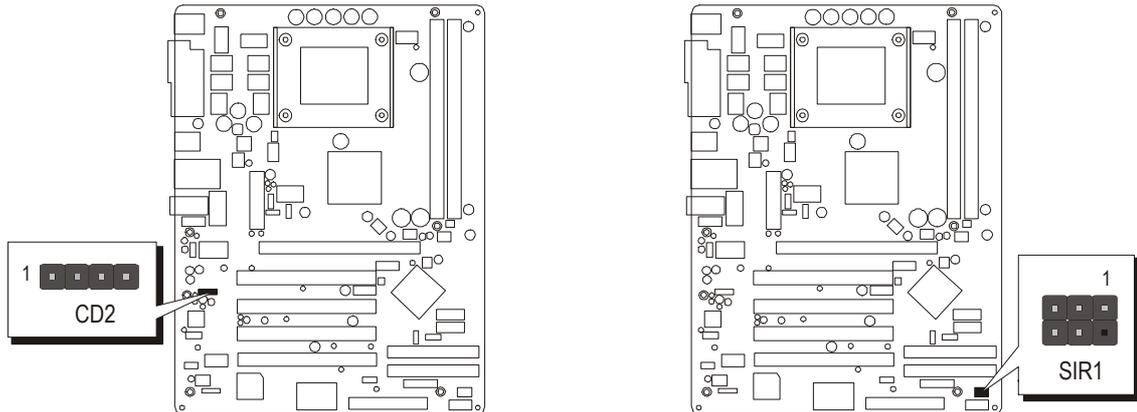
3. Serial ATA connector



Step 8

Connect Other Internal Peripherals

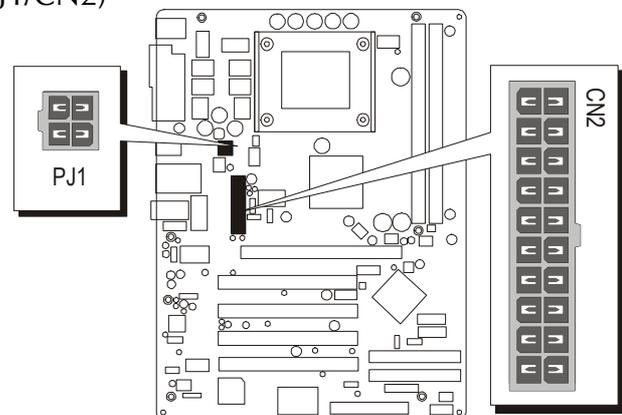
1. Audio CD_IN connector (CD2)
2. IR Header (SIR1)



Step 9

Connect the Power Supplies

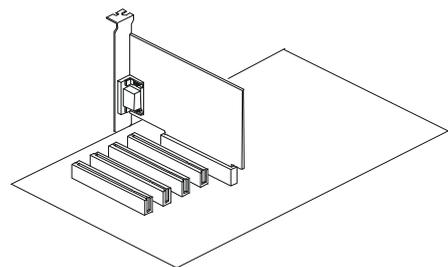
1. System power connectors (PJ1/CN2)



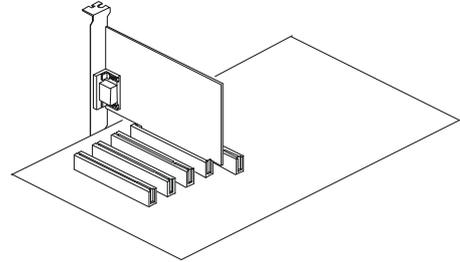
Step 10

Install Add-On Cards in Expansion Slots

1. Accelerated Graphics Port (AGP) Card



2. PCI Card

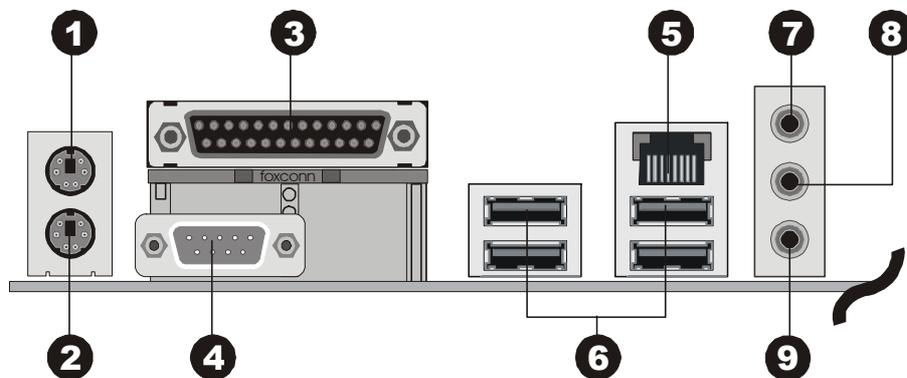
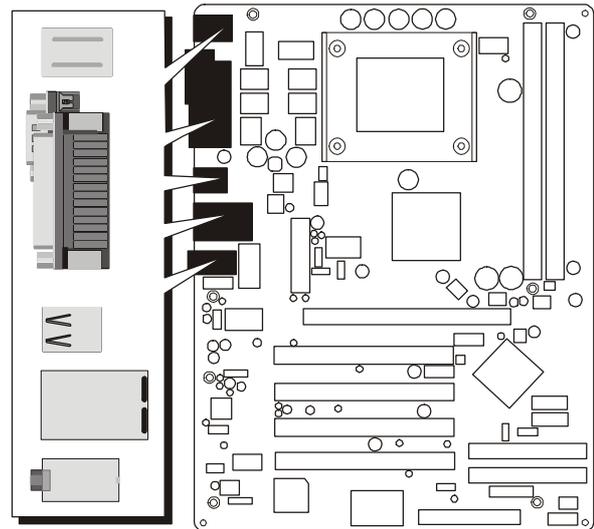


Step 11

Connect External Peripherals to Back Panel

You are now ready to connect the external peripherals to your system's back panel.

1. PS/2 Mouse Port
2. PS/2 Keyboard Port
3. Parallel Port
4. COM1 Port
5. LAN Port (AV49PN Only)
6. USB 0/1 Ports
7. Audio Line-In Port
8. Audio Line-Out Port
9. Audio Microphone Port



Step 12

Install Drivers & Software Components

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

1. Insert the AV49P/AV49PN bundled CD-ROM into your CD-ROM drive. The auto-run program will display the driver's main installation window on screen.
2. Choose "Install Mainboard AV49P Software," or "Install Mainboard AV49PN Software."
3. Choose "Install VIA 4in1 Driver" and complete it.
4. Choose "Install VIA LAN Driver" and complete it. (AV49PN only)
5. Choose "Install VIA Audio Driver" and complete it.
6. Choose "Install VIA USB2.0 Driver" and complete it.
7. Choose "Install VIA RAID Driver" and complete it.
8. Quit (from the auto-run installation program).

3.2 Jumper Settings

Several hardware settings are made through the use of mini jumpers to connect jumper pins on the mainboard. Pin #1 could be located at any corner of each jumper, you just find the location with a white right angle which stands for pin #1. There are several types of pin #1 shown as below:

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

Pin #1 to the left:



Pin #1 on the top:



Pin #1 to the right:



Pin #1 on the bottom:



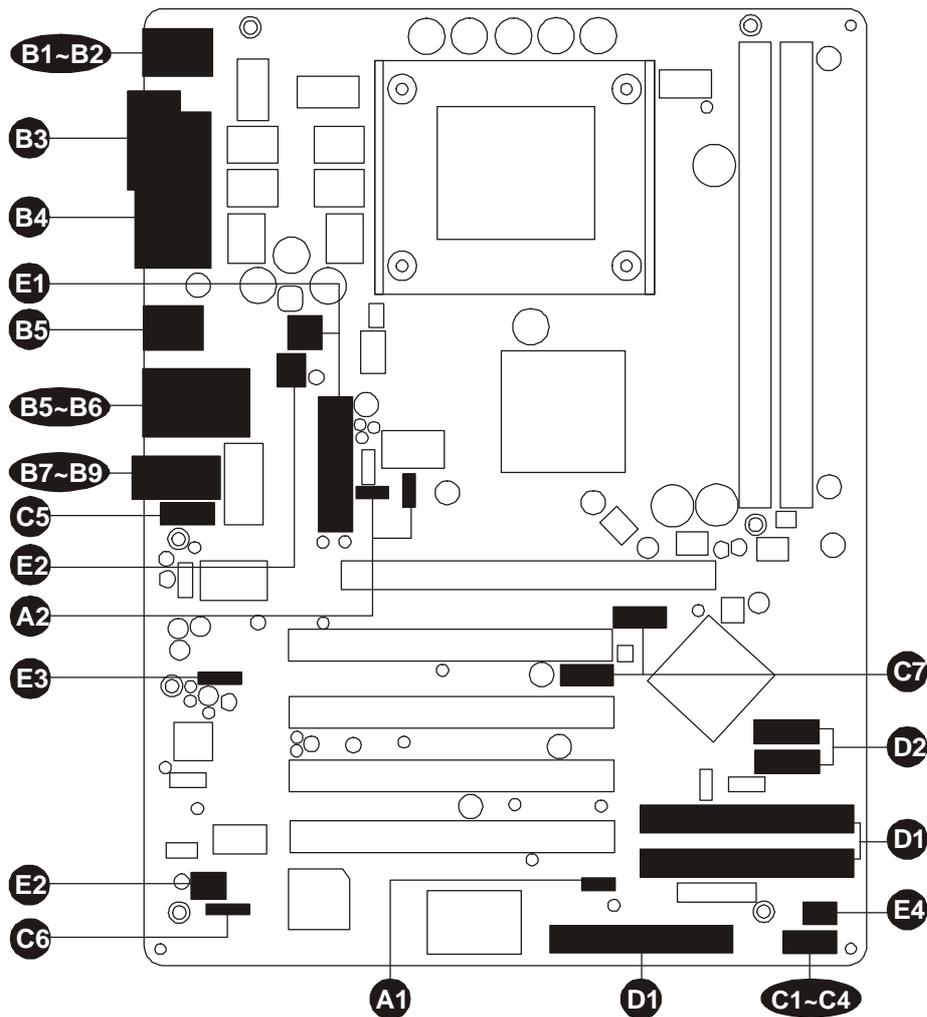
Jumpers with two pins are shown as  for Close [On] or  for Open [Off]. To short jumper pins, simply place a plastic mini jumpers over the desired pair of pins.

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 top of its original packaging film, 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 11 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 478 : CPU Socket for Pentium 4/Celeron, 478-pin processors
- DIMM1/2 : Two DIMM Slots for 128, 256, 512 MB, and 1GB of 2.5V DDR SDRAM.
(The total installed memory does not exceed 2GB.)
- AGP : One 4X/8X AGP (Accelerated Graphics Port) Slot
- PCI : Four 32-bit PCI Expansion Slots

Jumpers

- A1** JBAT1 : Clear CMOS setting
- A2** JP2, JP3 : CPU Clock setting

Back Panel Connectors

- B1** MS : PS/2 mouse port
- B2** KB : PS/2 keyboard port
- B3** COM1 : Serial port (DB9 male)
- B4** PRINTER1 : Parallel port (DB25 female)
- B5** USB : USB ports 0/1
- B6** LAN : 10/100 base-T LAN Port (AV49PN only)
- B7** LINE_IN : Line-In port
- B8** LINE_OUT : Line-Out port
- B9** MIC_IN : Microphone port

Front Panel Connectors

- C1** HD LED : IDE drive active LED
- C2** RESET : Hardware reset switch
- C3** SP LED : Green LED
- C4** PW BN : ATX power on/off momentary type switch
- C5** PANEL1 : Front panel audio header
- C6** SPK1 : Speaker header
- C7** USB2/USB3 : Extended USB headers

Internal Peripheral Connectors

- D1** IDE1 : IDE primary interface (dual-channel)
- D1** IDE2 : IDE secondary interface (dual-channel)
- D1** FDC1 : Floppy disk drive interface
- D2** CN3/CN4 : Serial ATA Connectors

Other Connectors

- E1** PJ1/CN2 : ATX power connectors
- E2** CPU_FAN1 : CPU fan connector
- E2** SYSTEM_FAN1 : System fan connector
- E3** CD2 : Audio CD_IN connector
- E4** SIR1 : IR header

Jumpers

A1 Clear CMOS Setting (JBAT1)

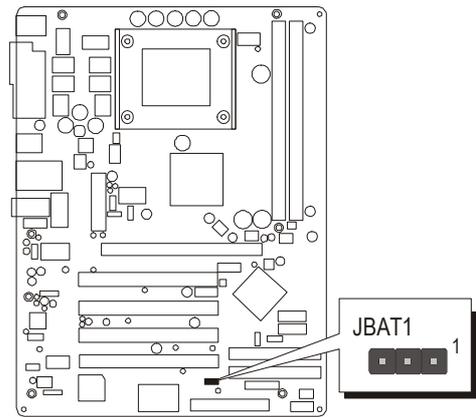
JBAT1 is used to clear CMOS data. Clearing CMOS will result in the permanently erasing previous system configuration settings and the restoring original (factory-set) system settings.



Pin 1-2 (Normal)(Default)



Pin 2-3 (Clear CMOS)

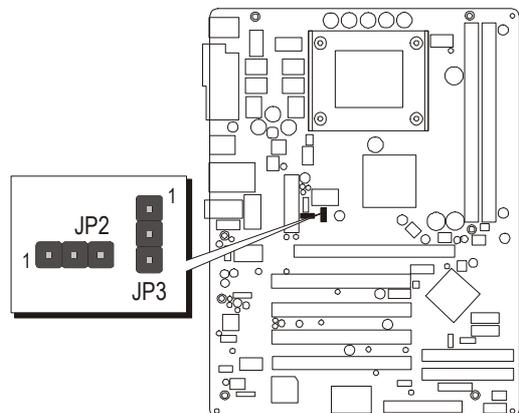


- Step 1. Turn off the system power (PC-> Off).
- Step 2. Remove ATX Power cable from ATX Power connector.
- Step 3. Remove jumper cap from pins 1-2.
- Step 4. Place the jumper cap on pins 2-3 for a few seconds.
- Step 5. Return the jumper cap to pins 1-2.
- Step 6. Plug ATX Power cable into ATX Power connector.
- Step 7. Turn on the system power (PC-> On).

A2 CPU Clock Setting (JP2, JP3)

Use this jumper to enable the selection of the CPU frequency.

CPU Clock	JP2	JP3
100M	Short Pins 2-3	Short Pins 2-3
133M	Short Pins 1-2	Short Pins 2-3
200M	Short Pins 2-3	Short Pins 1-2

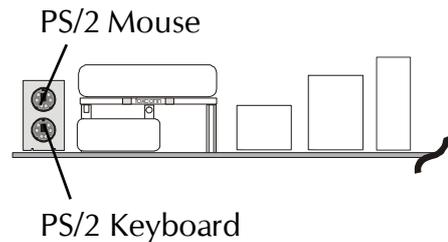


☞ **Back Panel Connectors**

B1 PS/2 Mouse & PS/2 Keyboard

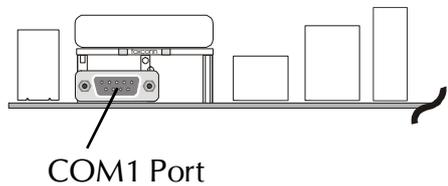
B2 Port Connectors

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



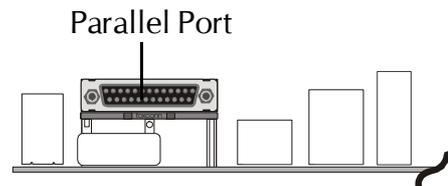
B3 COM1 Port Connector

Attach a serial device cable to the DB9 male serial port COM1 at the back panel of your computer.



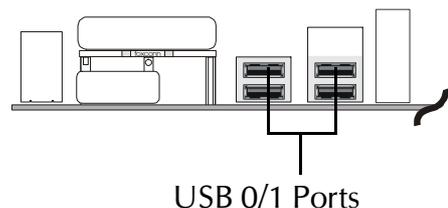
B4 Parallel Port Connector

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.



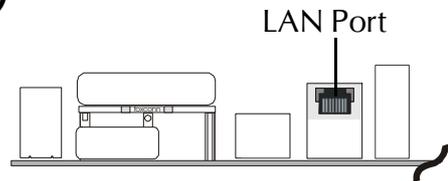
B5 USB Port Connectors

This mainboard offers 2 USB ports on back panel. Plug each USB device jack into an available USB0/USB1 connector.



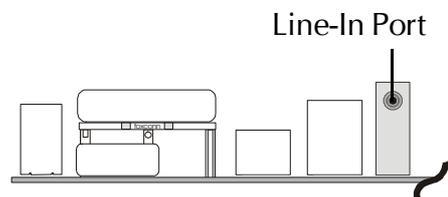
B6 LAN Port Connector (AV49PN Only)

This mainboard can accommodate one device on LAN. Attach RJ-45 cable to this port connector to your PC to the LAN.



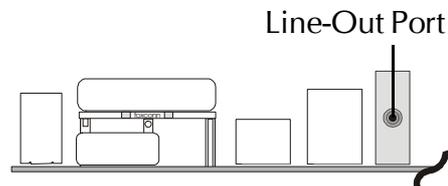
B7 Line-Out Port Connector

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.



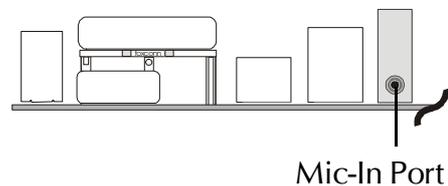
B8 Line-In Port Connector

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.



B9 Mic-In Port Connector

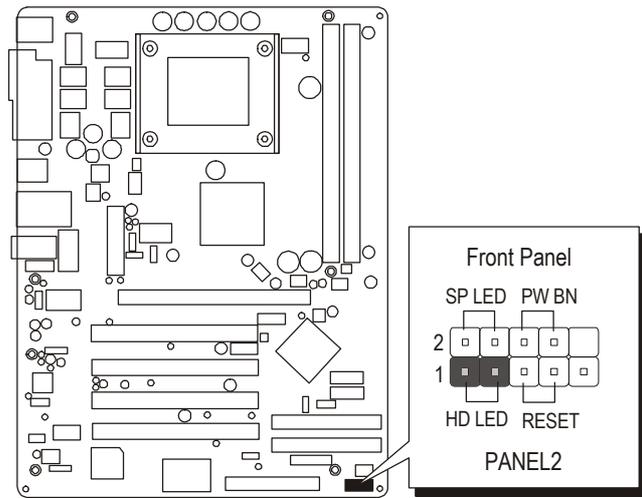
Mic-In is a 1/8-inch jack that provides a mono input. It can use a dynamic mono or stereo microphone with a resistance of not more than 600 Ohms.



☞ **Front Panel Connectors**

④ **HDD LED Connector (HD LED)**

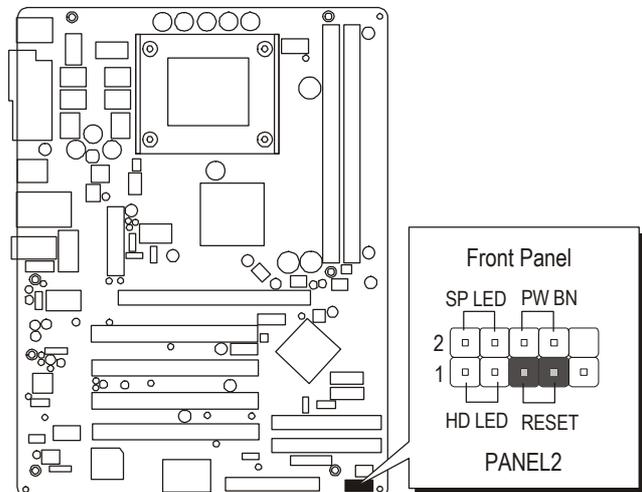
Attach a connector cable from the IDE device LED to the 2-pin (HD LED) header. The HDD LED lights up whenever an IDE device is active.



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

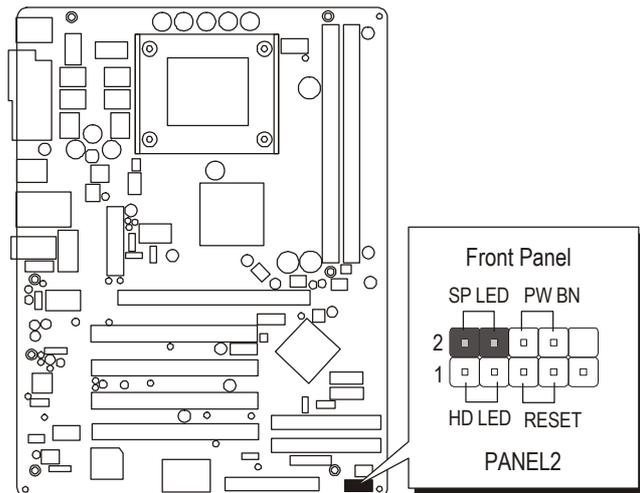
⑤ **Hardware Reset Connector (RESET)**

Attach a cable to the 2-pin (RESET) header. Pressing the reset switch causes the system to restart.



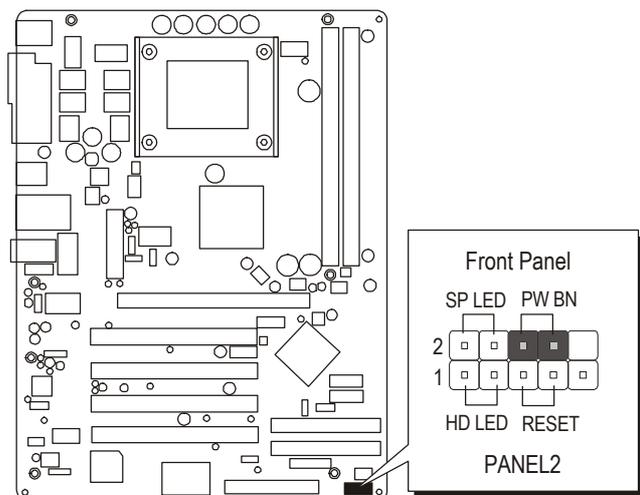
③ Green LED Connector (SP LED)

Connecting pins 2 and 4 to a single- or dual-color, front panel mounted LED provides power on/off, sleep, and message waiting indication.



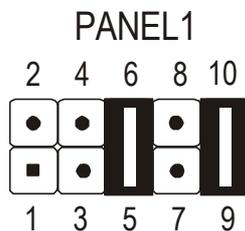
④ ATX Power On/Off Switch Connector (PW BN)

The Power On/Off Switch is a momentary type switch used for turning on or off the ATX power supply. Attach a connector cable to the 2-pin (PW BN) header on the mainboard.



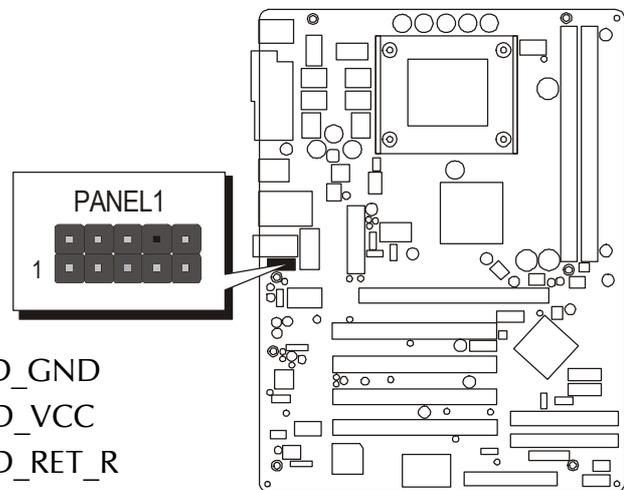
⑤ Front Panel Audio Header (PANEL1)

This header allows users to install an auxiliary Front-Oriented Microphone and Line-Out port for easier access. Either the Line-Out port connector on back-panel or PANEL1 header is available at the same time. If you would like to use this header on front-panel, please remove all jumpers from this header and install your special extra microphone and line-out cable instead. Two mini jumpers must be setted on pins 5-6 and pins 9-10, when this header is not used.



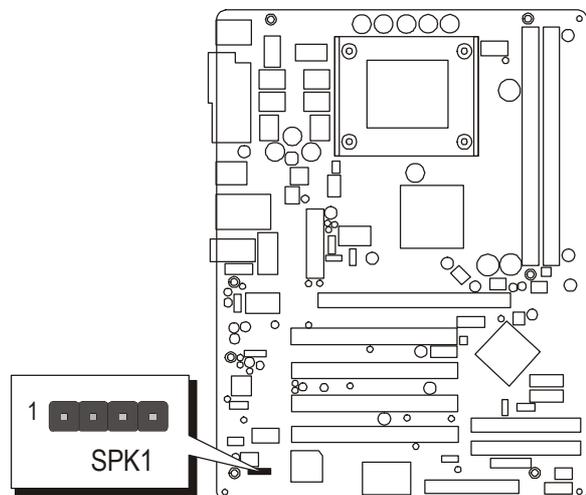
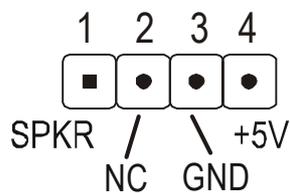
Pin Assignments:

1 = AUD_MIC	2 = AUD_GND
3 = AUD_MIC_BIAS	4 = AUD_VCC
5 = AUD_FPOUT_R	6 = AUD_RET_R
7 = HP_ON	8 = KEY
9 = AUD_FPOUT_L	10 = AUD_RET_L



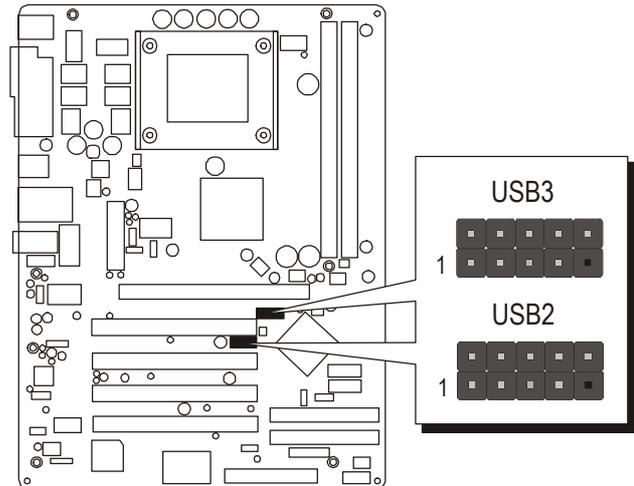
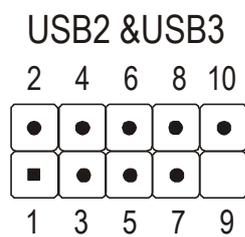
⑥ Speaker Header (SPK1)

Attach the PC speaker cable from the case to the 4-pin speaker connector (SPK1).



67 Extended USB Headers (USB2 & USB3)

The headers are used to connect the cables attached to USB connectors which are mounted on front panel or back panel. But the USB cable is optional at the time of purchase.



Pin Assignments:

1 = VREG_FP_USBPWR0

3 = USB_FP_P0-

5 = USB_FP_P0+

7 = GROUND

9 = KEY

2 = VREG_FP_USBPWR0

4 = USB_FP_P1-

6 = USB_FP_P1+

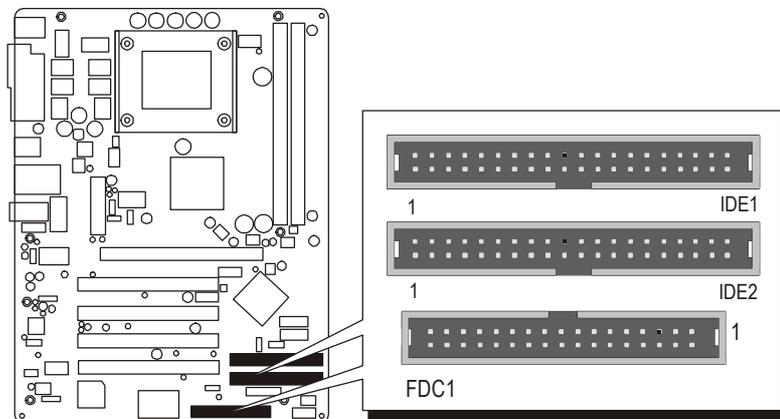
8 = GROUND

10 = USB_FP_OC0

☞ **Internal Peripherals Connectors**

D1 Enhanced IDE and Floppy Connectors

The mainboard features two 40-pin dual-channel IDE device connectors (IDE1/IDE2) providing support for 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 (FDC) to accommodate the Floppy Disk Drive (FDD). Moreover, this mainboard comes with one 80-pin ATA 133/100/66/33 ribbon cable to connect to IDE H.D.D. and one 34-pin ribbon cable for F.D.D. connection.

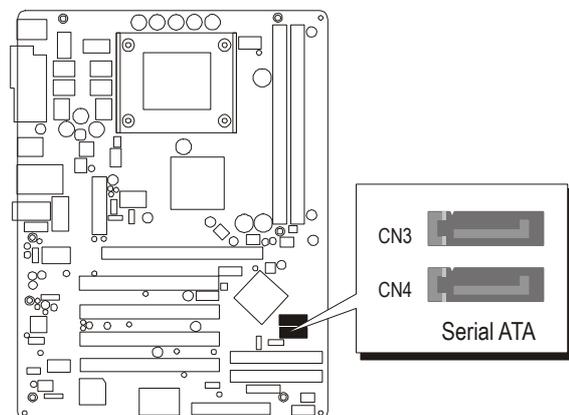


Important : Ribbon cables are directional, therefore, make sure to always connect with the red cable stripe on the same side as pin #1 of the IDE1/IDE2 or FDC connector on the mainboard.

D2 Serial ATA Connectors (CN3, CN4)

The Serial ATA is an evolutionary replacement for the Parallel ATA physical storage interface. Serial ATA is scalable and will allow future enhancements to the computing platform.

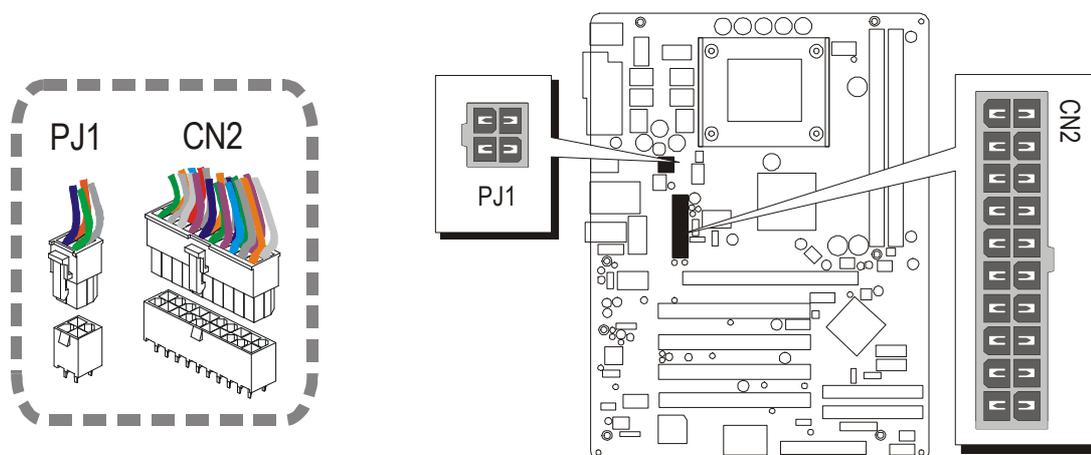
The Serial ATA supports all ATA and ATAPI device, including CDs, DVDs, tape devices, high capacity removable devices, zip drivers, and CDRWs. The Serial ATA interface supports data transfer rates up to 150MB/s.



Other Connectors

ATX Power Supply Connectors (PJ1/CN2)

This motherboard uses 20-pin ATX power header (CN2), and comes with the other one header (PJ1). Please make sure you plug each in the right direction. It is essential to have these two power supply connectors plugged or your system won't boot up.

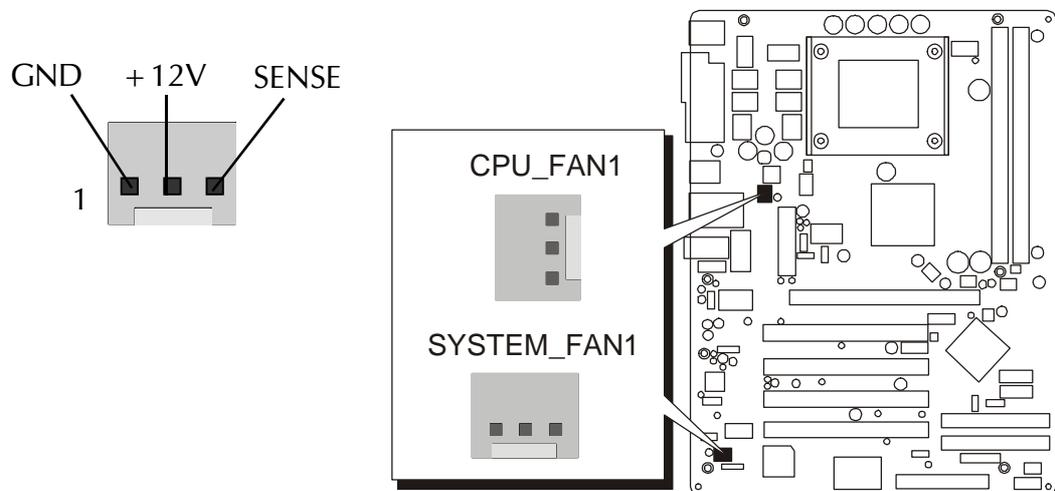


A traditional ATX system remains in the power-off stage when AC power resumes from power failure. However, it is inconvenient for a network server or workstation if there is not an UPS to execute power-on. Thus, this motherboard supports an AC Power Auto Recovery function to solve this problem. You may enable the function, "Restore on AC power loss" in the sub-menu of "Power Management Setup" within the BIOS setup program.

- Note 1: The ATX power connector is directional and will not go in unless the guides match perfectly, making 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 enough power for higher speed processor installed.

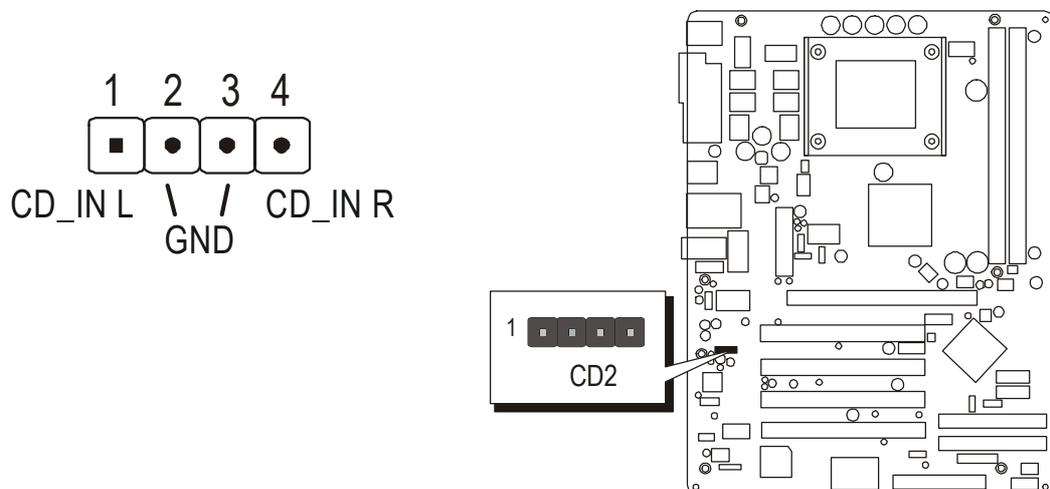
② CPU and SYSTEM Fan Connectors (CPU_FAN1/SYSTEM_FAN1)

The mainboard provides two onboard 12V cooling fan power connectors to support CPU (CPU_FAN1) and System (SYSTEM_FAN1) cooling fans. Note that both cable wiring and type of plug may vary, which depend on the fan maker. Keep in mind that the red wire should always be connected to the +12V header and the black wire to the ground (GND) header.



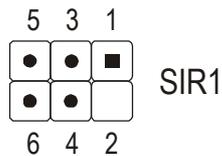
③ Audio CD_IN Connector (CD2)

Port CD2 is used to attach the audio connector cable from the CD-ROM/DVD-ROM drive.



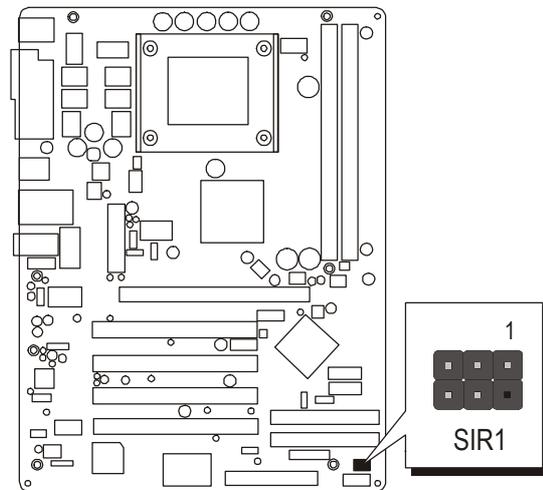
E4 IR Header (SIR1)

If you have an Infrared device, this mainboard can implement IR transfer function. This mainboard supports Normal or IrDA transfer mode. To enable this function, attach a 6-pin infrared device cable to the IR (SIR1) header, and refer to the diagram below for the IR pin assignments.



Pin Assignments:

1 = NC	2 = KEY
3 = +5V	4 = GND
5 = IRTX	6 = IRRX



Note : Before connect your IR device to the IR (IR1) header, please note that every pin is properly allocated. If not, your IR device may be damaged.

3.3 System Memory Configuration

The AV49P/AV49PN mainboard has three 184-pin DIMM banks that allow you to install from 128MB up to 3GB of system memory. Each 184-pin DIMM (Dual In-line Memory Module) bank can accommodate 128MB, 256MB, 512MB, and 1GB of PC1600/ PC2100/ PC2700/ PC3200 compliant 2.5V single or double side 64-bit wide data path DDR SDRAM modules.

1. Install Memory:

Install memory in any or all of the banks. The combination shown as follows.

DIMM Socket	Memory Modules	Module Quantity
DIMM 1	128MB, 256MB, 512MB, and 1GB 184-pin 2.5V DDR SDRAM DIMM	x 1
DIMM 2	128MB, 256MB, 512MB, and 1GB 184-pin 2.5V DDR SDRAM DIMM	x 1

Note: The total installed memory does not exceed 2GB.

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.

2. Upgrade Memory:

You can easily upgrade the system memory by inserting additional DDR 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 in the field "Standard CMOS Setup" of BIOS setup program.

4 SOFTWARE UTILITY

4.1 Mainboard CD Overview

Note : The CD contents attached in AV49P/AV49PN mainboard are subject to change without notice.

To start your mainboard CD disc, 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 AV49P Software - Installing VIA 4in1, VIA Audio, VIA USB2.0, VIA RAID Drivers.
- ☞ Install Mainboard AV49PN Software - Installing VIA 4in1, VIA LAN, VIA Audio, VIA USB2.0, VIA RAID Drivers.
- ☞ Install Utility - Installing Acrobat Reader
- ☞ Manual - AV49P/AV49PN user's manual, RAID manual in 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.



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) on the "Install Mainboard AV49P Software" bar to run into sub-menu. The software includes:

- [4.2.A] Install VIA 4in1 Driver
- [4.2.B] Install VIA Audio Driver
- [4.2.C] Install VIA USB2.0 Driver
- [4.2.D] Install USB2.0 Driver
- [4.2.E] Install RAID Driver



AV49P

Or use your pointing device (e.g. mouse) on the "Install Mainboard AV49PN Software" bar to run into sub-menu. The software includes:

- [4.2.A] Install VIA 4in1 Driver
- [4.2.B] Install VIA LAN Driver
- [4.2.C] Install Audio Driver
- [4.2.D] Install USB2.0 Driver
- [4.2.E] Install RAID Driver



AV49PN

4.2.A Install VIA 4in1 Driver

Select using your pointing device (e.g. mouse) on the "Install VIA 4in1 Driver" bar to install the chipset driver.



AV49P



AV49PN

Once you made your selection, a Setup window run the installation automatically. When the copying files is done, make sure you reboot the system to take the installation effect.

4.2.B Install Realtek LAN Driver (AV49PN only)

Select using your pointing device (e.g. mouse) on the "Install Realtek LAN Driver" bar to install the LAN driver.

AV49PN



Once you made your selection, a Setup window run the installation automatically. When the copying files is done, make sure you reboot the system to take the installation effect.

4.2.C Install VIA Audio Driver

Select using your pointing device (e.g. mouse) on the "Install VIA Audio Driver" bar to install the Audio driver.



AV49P

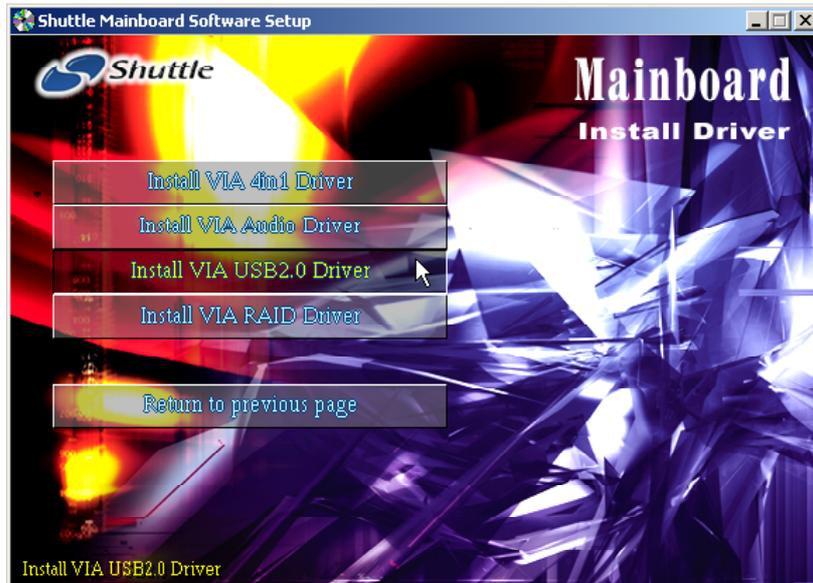


AV49PN

Once you made your selection, a Setup window run the installation automatically. When the copying files is done, make sure you reboot the system to take the installation effect.

4.2.D Install VIA USB2.0 Driver

Select using your pointing device (e.g. mouse) on the "Install VIA USB2.0 Driver" bar to install the USB2.0 driver.



AV49P



AV49PN

Once you made your selection, a Setup window run the installation automatically. When the copying files is done, make sure you reboot the system to take the installation effect.

4.2.E Install VIA RAID Driver

Select using your pointing device (e.g. mouse) on the "Install VIA RAID Driver" bar to install SATA RAID Driver.



Once you made your selection, a Setup window run the installation automatically. When the copying files is done, make sure you reboot the system to take the installation effect.

4.3 View the User's Manual

Select using your pointing device (e.g. mouse) on the "Manual" bar.

1. Click on the "Install Acrobat Reader" bar if you need to install it.
2. Click on "Manual" bar to view AV49P/AV49PN user's manual.
3. Click on "RAID manual" bar to view SATA RAID manual.



5 BIOS SETUP

AV49P/AV49PN 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 key immediately, or at the following message: Press DEL to enter SETUP, or simultaneously press <Ctrl>, <Alt>, <Esc> keys

Note1. If you miss trains of words mentioned in step2 (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>, keys simultaneously.

Note2. 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:

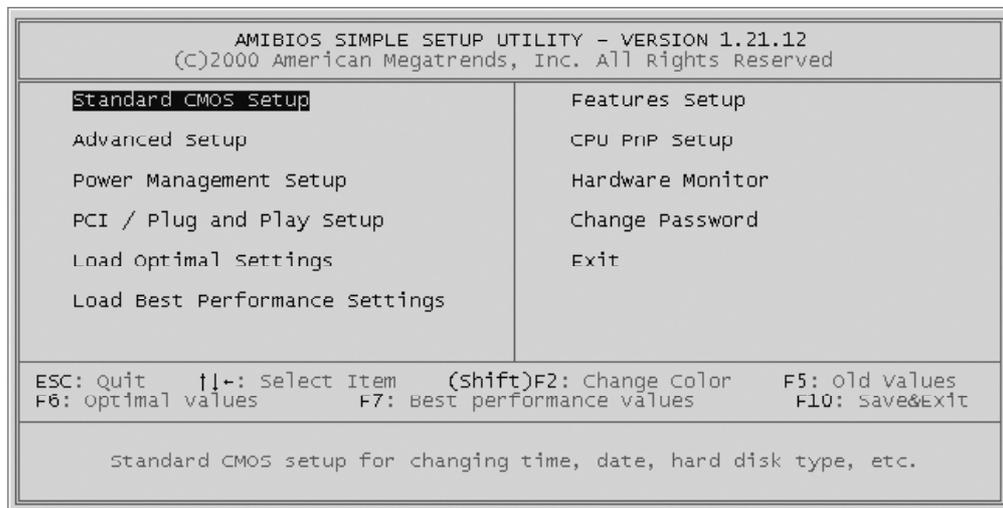
"Press F1 to Continue, DEL to Enter Setup"

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

Note : The content of this manual is subject to any change without notice in advance.

5.2 The Main Menu

Once you enter the AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and 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.

Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

Standard CMOS Setup

Use this menu for basic system configuration.

Advanced Setup

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

Power Management Setup

Use this menu to specify your settings for power management.

PCI / Plug and Play Setup

Use this menu to sets some of parameters for devices installed on the PCI bus and devices that use the system plug and play capability.

Load Optimal Settings

If you select this item and press Enter a dialog box apperars. If you press Y, and then Enter, the Setup Utility loads a set of fail-safe default values. These default values are not very demanding and they should allow your system to function with most kinds of hardware and memory chips.

Load Best Performance Settings

If you select this item and press Enter a dialog box apperars. If you press Y, and then Enter, the Setup Utility loads a set of best-performance default values. These default values are quite demanding and your system might not function properly if you are using slower chips or other low-performance components.

Features Setup

Use this menu to sets some of the parameters for peripheral devices connected to the system.

CPU PnP Setup

Use this menu to lets you manually configure the mainboard for thw CPU.

Hardware Mointor

Use this menu to sets some of the parameters for the hardware monitoring function of this mainboard.

Change Password

Use this menu to change, set, or disable supervisor/user password. It allows you to limit access to the system and Setup, or only to Setup.

Exit

Save CMOS value changes in CMOS and exit from setup.



Standard CMOS Setup

The items in Standard CMOS Setup are divided into 8 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.

```
AMIBIOS SETUP - STANDARD CMOS SETUP
(c)2000 American Megatrends, Inc. All Rights Reserved

Date (mm/dd/yyyy): Sun Feb 16, 2003
Time (hh/mm/ss) : 10:10:54

                                LBA  B1k  PIO  32Bit
                                Mode Mode Mode Mode
Pri Master :Not Installed
Pri Slave  :Not Installed
Sec Master :Not Installed
Sec Slave  :Not Installed

Floppy Drive A: Not Installed
Floppy Drive B: Not Installed

Month: Jan - Dec
Day: 01 - 31
Year: 1980 - 2099

ESC : Exit
↑↓ : select item
PU/PD/+/- : Modify
(shift)F2 : Color
F3 : Detect All HDD
```

Date (mm : dd : yyyy)

Set the system date. Note that if you are running a Windows OS, this items are automatically updated whenever you make changes to the Windows Date.

Time (hh : mm : ss)

Set the system time. The time is converted based on the 24-hour military-time clock. For example, 5:00:00 p.m. is 17:00:00.

Pri/Sec Master/Slave

This items configure devices connected to the Primary and Secondary IDE channels.

- The choice: Not Installed, 1 ~ 46, User, Auto, CD/DVD, or ARMD.

Floppy Drive A/DriveB

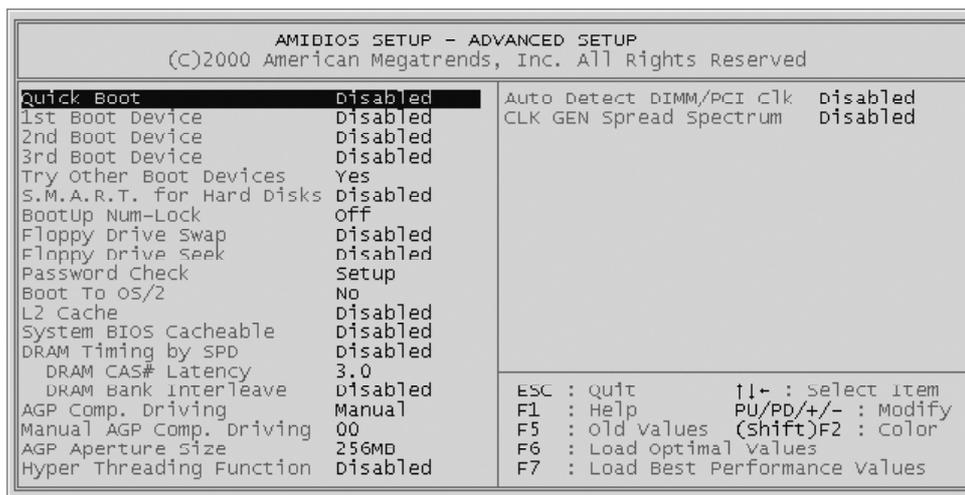
Select the type of floppy disk drive and installed in your system.

- The choice: Not Installed, 1.2MB, 5.25 in, 720KB, 3.5 in, 1.44MB, 3.5 in, or 2.88M, 3.5 in.



Advanced Setup

This section allows you to configure your system for basic operation.



Quick Boot.

This item enables/disables the system starts up more quickly/slowly by elimination some of the power on test routines.

- The choice: Enabled or Disabled.

1st/ 2nd/ 3rd 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: IDE 0 ~ 3, Floppy, ARMD-FDD/,ARMD-HDD, CD/DVD-0 ~ 3, SCSI, SCSI, Network, BBS-0 ~ 9, USB FDD, USB CDROM, USB HDD, USB RMD-FDD, USB RMD-HDD or Disabled.

Try Other Boot Device

If you enable this item, the system searches all other possible locations for and operating system if it fails to find one in the devices specified under the First, Second, and Third boot devices.

- The choice: Yes or No.

S.M.A.R.T. for Hard Disks

Enable this item if any IDE hard disks support the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) feature.

- The Choice: Enabled or Disabled.

BootUp Num-Lock

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

- The choice: Off or On.

Floppy Drive Swap

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 or Disabled.

Floppy Drive Seek

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

- The choice: Enabled or Disabled.

Password Check

If you have entered a password for the system, use this item to determine, if the password is required to enter the Setup Utility (Setup) or required both at start up and to enter the Setup Utility (Always).

- The choice: Setup or Always.

Boot to OS/2

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.

- The choice: Yes or No.

L2 Cache

Leave these items enabled since all the processors that can be installed on this board have internal L2 cache memory.

- The choice: Enabled or Disabled.

System BIOS Cacheable

If you enable this item, a segment of the system BIOS will be copied to main memory for faster execution.

- The choice: Enabled or Disabled.

DRAM Timing by SPD

This item enables or disables the SDRAM timing defined by the Serial Presence Detect electrical.

- The choice: Auto or Disabled.

DRAM CAS# Latency

This item determines the operation of SDRAM memory CAS (column address strobe). It is recommended that you leave this item at the default value.

- The choice: 1.5, 3.0, 2.5 or 2.

DRAM Bank Interleave

Enable this item to increase SDRAM memory speed. When enabled, separate memory banks are set of odd and even addresses, and upcoming byte of memory is accessible while refreshing the current byte.

- The choice: 2-way/ 4-way or Disabled.

AGP Comp. Driving

Use this item to signal driving current on AGP cards to auto or manual. Some AGP cards need stronger than normal driving current in order to operate.

- The choice: Manual or Auto.

Manual AGP Comp. Driving

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

- The choice: 00 ~ FF.

AGP Aperture Size

This item defines the size of the aperture if you use an AGP graphics adapter. The AGP aperture refers to section of the PCI memory address range used for graphics memory. We recommend that you leave this item at the default value.

- The choice: 4MB, 8MB, 16MB, 32MB, 64MB, 128MB or 256MB.

Hyper Threading Function

The latest Intel application defines a high-speed calculating ability to optimize your system by two CUPs supported (one virtual, one physical) in a multi-task environment.

- The choice: Enabled or Disabled.

Auto Detect DIMM/PCI Clock

When this item is enabled, BIOS will disable the clock signal of free DIMM/PCI slots.

➤ The choice: Enabled or Disabled.

CLK GEN Spread Spectrum

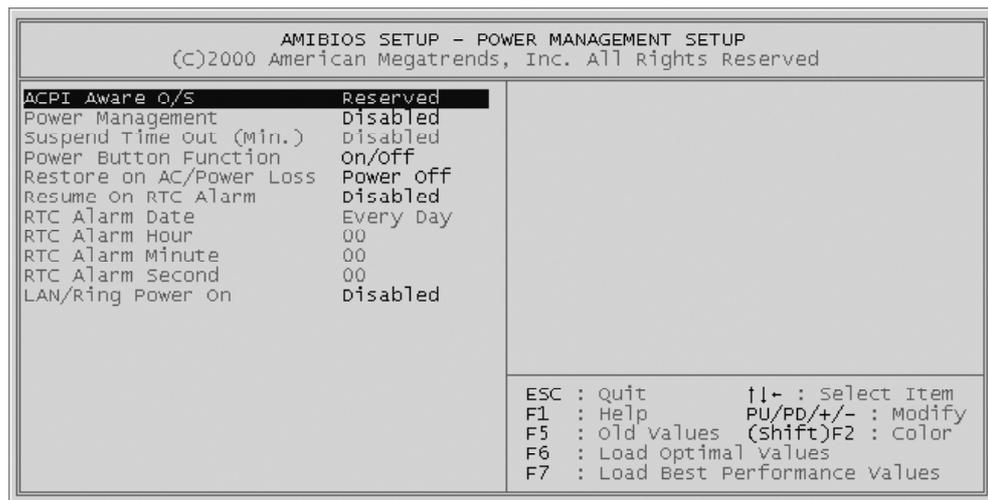
Use this item to set the system bus spread spectrum for the installed processor.

➤ The choice: Enabled or Disabled.



Power Management Setup

The Power Management Setup allows you to configure your system to most effectively saving energy.



ACPI Aware O/S

Enable this item if you are using an O/S that supports ACPI function such as Windows 98/ ME/ 2000.

- The choice: Reserved, Yes or No.

Power Management

This item acts like a master switch for the power-saving modes and hard disk timeouts. If this item is set to Max Saving, power-saving modes occur after a short timeout. If it is set to Min Saving, power-saving modes occur after a longer timeout. If it is set to User Define, you can insert your own timeouts for the power-saving modes.

- The choice: Enabled or Disabled.

Suspend Time Out (Min.)

When this item is not disabled and after the setup time of system inactivity, all devices except the CPU will be shut off.

- The choice: Disabled, 1 Min, 2 Min, 4 Min, 6 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min, or 60 Min.

Power Button Function

The item allows you to control the Power Button Function.

- The choice: On/Off or suspend.

Restore on AC/Power Loss

The item allows you to restore on AC/Power Loss.

- The choice: Power on, Last state or Power Off.

Resume On RTC Alarm Date/ Hour/ Minute/ Second

When Enabled, set the date and time of the RTC (Real-Time Clock) alarm will awaken the system from a suspend mode.

- The choice: Disabled or Enabled.

Date (of Month)

This item selects the alarm date.

- Key in a DEC number: Every Day, Min = 01, Max = 31.

Resume Time (hh:mm:ss)

This item selects the alarm time.

[hh] ➤ Key in a DEC number: Min = 00, Max = 23.

[mm] ➤ Key in a DEC number: Min = 00, Max = 59.

[ss] ➤ Key in a DEC number: Min = 00, Max = 59.

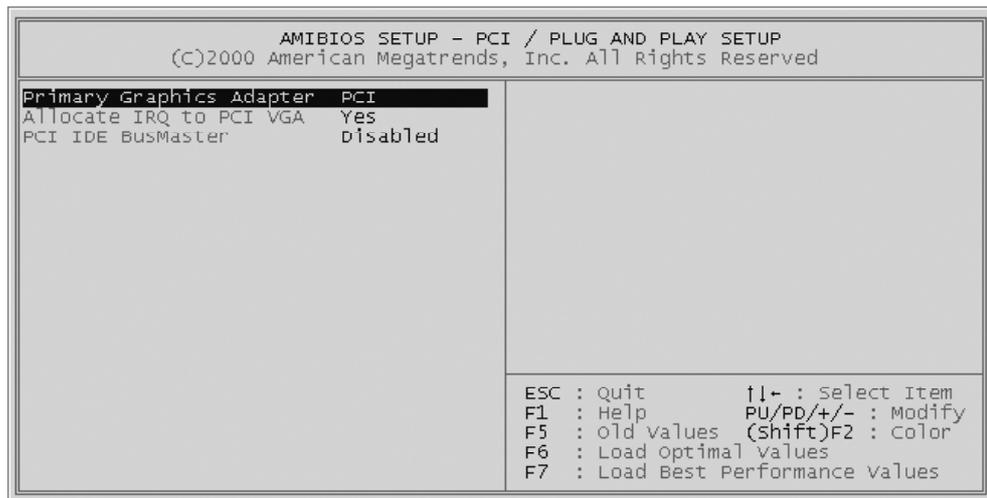
LAN/ Ring Power On

The system can be turned off with a software command. If you enable this item, the system can automatically resume if there is an incoming call on the Modem. You must use an ATX power supply in order to use this feature.

- The choice: Enabled or Disabled.

PCI/ Plug and Play Setup

These items set some of the parameters for devices installed on the PCI bus and devices that use the system plug and play capability.



Primary Graphics Adapter

This item indicates if the primary graphics adapter uses the PCI or the AGP bus. The default PCI setting still lets the onboard display work and allows the use of a second display card installed in a PCI slot.

- The Choice: PCI or AGP.

Allocate IRQ to PCI VGA

If this item is enabled, an IRQ will be assigned to the PCI VGA graphics system. You set this value to No to free up an IRQ.

- The choice: Yes or No.

PCI IDE BusMaster

This item enables or disables the DMA under DOS mode. We recommend you to leave this item at the default value

- The choice: Enabled or Disabled.

Load Optimal Settings

Pressing <Enter> on this item asks for confirmation:

Load Optimal Settings (Y/N) ? Y

Pressing 'Y' loads a set of fail-safe default values. These default values are not very demanding and they should allow your system to function with most kinds of hardware and memory chips.

Load Best Performance Settings

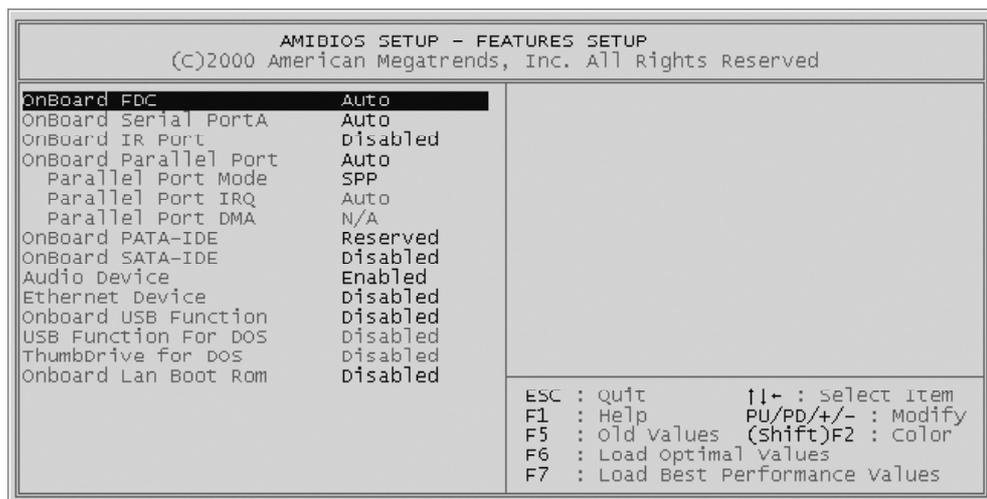
Pressing <Enter> on this item asks for confirmation:

Load Best Performance Settings (Y/N) ? Y

Pressing 'Y' loads a set of best-performance default values. These default values are quite demanding and your system might not function properly if you are using slower memory chips or other low-performance components.

Features Setup

These items set some of the parameters for peripheral devices connected to the system.



OnBoard FDC

Use this item to enable or disable the onboard floppy disk drive interface.

- The choice: Auto, Enabled or Disabled.

OnBoard Serial PortA

Use this item to enable or disable the onboard COM1 serial port, and to assign a port address.

- The choice: Auto, Disabled, 3F8h/COM1, 2F8h/COM2, 3E8h/COM3 or 2E8h/COM4.

OnBoard IR Port

Use this item to enable or disable the onboard infrared port, and to assign a port address.

- The choice: IrDA, ASKIR or Disabled.

OnBoard Parallel Port

Use this item to enable or disable the onboard LPT1 port mode, and to assign a port address.

- The choice: 378h, 278h, 3BCh, Auto or Disabled.

Parallel Port Mode

Use this item to set the onboard parallel port mode.

- The choice: SPP (Standard Parallel Port), EPP (Enhanced Parallel Port), ECP (Extended Capabilities Port) or ECP + EPP.

Parallel Port IRQ

Use this item to assign IRQ to the parallel port.

- The choice: 5 or 7.

Parallel Port DMA

Use this item to assign a DMA channel to the parallel port.

- The choice: 0, 1 or 3.

OnBoard PATA-IDE

Use this item to enable or disable the onboard PATA-IDE channel.

- The choice: Reserved, Enabled or Disabled.

OnBoard SATA-IDE

Use this item to enable or disable the onboard SATA-IDE channel.

- The choice: Enabled or Disabled.

Audio Device

Use this item to set the onboard AC'97 audio chip.

- The choice: Enabled or Disabled.

Ethernet Device

Use this item to set the onboard Ethernet LAN.

- The choice: Enabled or Disabled.

OnBoard USB Function

Enable this item if you plan to use the USB ports on this mainboard.

- The choice: Enabled or Disabled.

USB Function for DOS

Enable this item if you plan to use the USB ports on this mainboard in a DOS environment.

- The choice: Enabled or Disabled.

ThumbDriver for DOS

Enable this item to make a small portion of memory storage device for the USB ports.

- The choice: Enabled or Disabled.

Onboard Lan Boot Rom

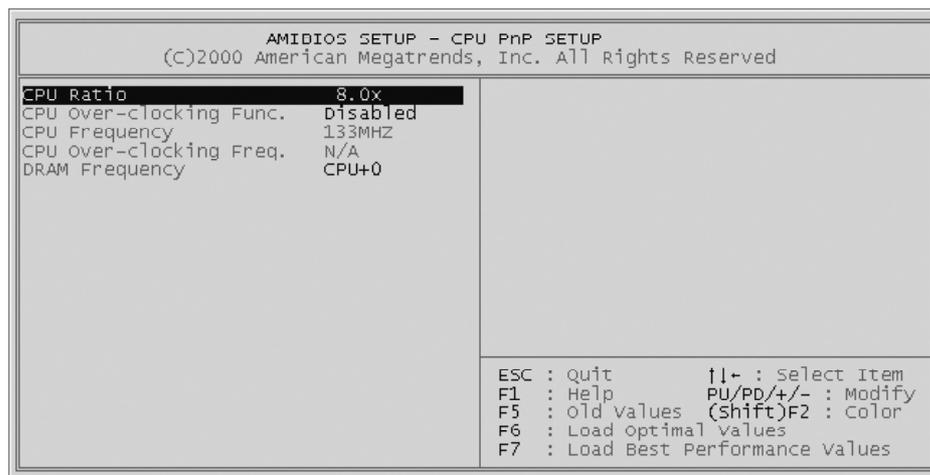
Decide whether to invoke the boot ROM of the onboard Lan chip.

- The choice: Enabled or Disabled.



CPU PnP Setup

Use this menu to let you manually configure the mainboard for the CPU. The system will automatically detect the kind of CPU that you have installed and make the appropriate adjustments to the items.



CPU Ratio

This item shows the ratio of the CPU installed in your system.

- The choice: 8.0x.

CPU Over-Clocking Func.

This item decides the CPU over-clocking function installed in your system. If the over-clocking fails, please turn off the system power. And then, hold the PageUp Key (similar to the Clear CMOS function) and turn on the power, the BIOS will recover the safe default.

- The choice: Enabled or Disabled.

CPU Frequency

This item shows the frequency of the CPU installed in your system.

- The choice: 134MHz ~ 165MHz.

CPU Over-Clocking Freq.

This item allows you to set the CPU over-clocking frequency.

- The choice: 134MHz ~ 165MHz.

DRAM Frequency

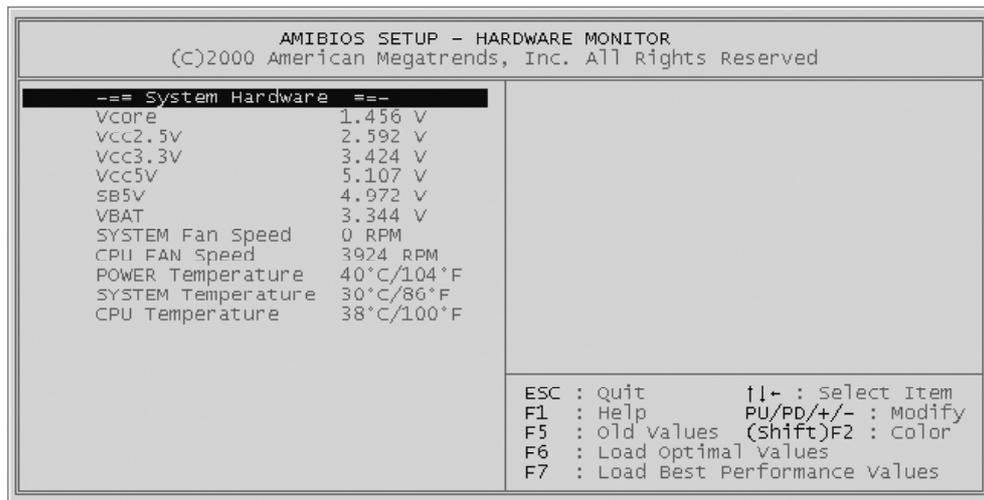
This item shows the frequency of the DRAM in your system.

- The choice: Auto, CPU + 0, CPU + 33 or CPU + 66.



Hardware Monitor

Use this menu to set some of the parameters for the hardware monitoring function of this mainboard.



CPU/System Temperature

This item displays CPU and system temperature measurement.

FANs & Voltage Measurements

These items indicate cooling fan speeds in RPM and the various system voltage measurements.

System Component Characteristics

These fields provide you with information about the system's current operating status. You cannot make changes to these fields.

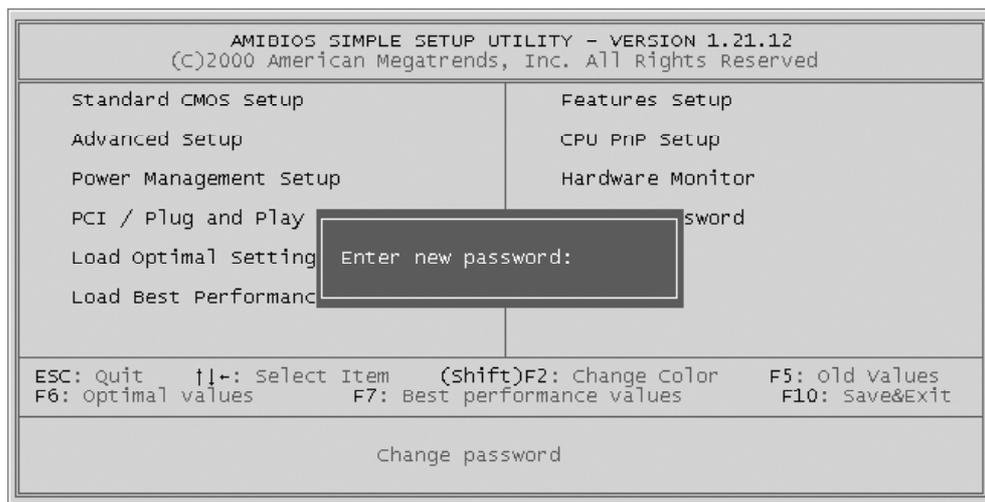
The fields include:

- Vcore
- Vcc 2.5V
- Vcc 3.3V
- Vcc 5V
- SB5V
- VBAT
- SYSTEM Fan Speed
- CPU Fan Speed
- Power Temperature
- SYSTEM Temperature
- CPU Temperature



Change Password

Use this menu to change, set, or disable supervisor/user password. It allows you to limit access to the system and Setup, or only to Setup.



Steps to set supervisor/user password are described as follows:

New Password Setting:

1. While pressing <Enter> to set a password, a dialog box appears to ask you enter a password.
2. Key in a new password that can not exceed eight characters.
3. System will request you to confirm the new password again.
4. When completed, new code takes effect.

No Password Setting:

If you want to disable the password, just press <Enter> as a password input is requested.

If You Forget Password:

If you forget the password, the only way to access the system is to clear the CMOS memory. Please refer to page 24 on clear CMOS setting.

 **Exit**

Pressing <Enter> on this item asks for confirmation:

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

Pressing 'Y' stores the selections made in the menus of CMOS.
Next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS.
After saving the values, the system is restarted again.