

AB48/AB48N

**Pentium 4/Celeron, 478-pin Processor
Based MAIN BOARD**

Shuttle® AB48/AB48N

Pentium 4/Celeron , 478-pin processor based Mainboard Manual Version 1.0

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About This Manual

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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 AB48/AB48N mainboard.

Experienced DIY User

Congratulate on your purchase of the Shuttle AB48/AB48N mainboard. You will find that installing your new Shuttle AB48/AB48N mainboard is just easy. Bundled with an array of onboard functions, the highly-integrated AB48/AB48N 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 AB48/AB48N to construct your system. Shuttle AB48/AB48N incorporates all the state-of-the-art technology of the Brookdale chipset from Intel. It integrates the most advanced functions you can find to date in a compact ATX board.

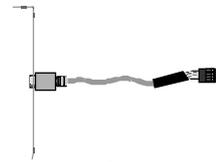
1.2 Item Checklist:

Check all items with you AB48/AB48N mainboard to make sure nothing is missing. The complete package should include:

- * One piece of Shuttle AB48/AB48N Mainboard



- * One piece of Audio Cable (Central/Bass Channel)



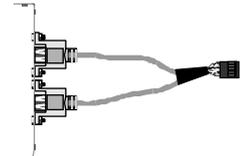
- * One piece of ATA **100/66** Ribbon Cable



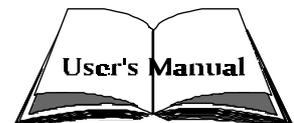
- * One piece of Floppy Ribbon Cable



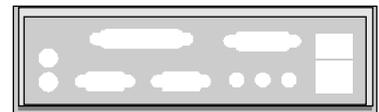
- * One piece of twin ports USB Cable (**optional**)



- * AB48/AB48N User's Manual



- * I/O Shielding (AB48N Only)



- * One piece of Bundled CD-ROM with containing:
 - AB48/AB48N user's manual saved in PDF format
 - Intel Chipset Driver
 - Realtek Audio driver
 - Realtek LAN driver
 - Intel IDE driver
 - Award Flashing Utility



2 FEATURES

AB48/AB48N 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 400/533 MHz FSB.

* Chipset

Features Intel 845PE N.B. and ICH4 S.B..

* CPU FSB Configuration

Soft-configuration FSB (The FSB speed is software configurable from 100MHz to 166MHz *by 1MHz step* in the Frequency/Voltage Control of BIOS setup program.)

* On Board 6 Channel AC'97 Audio

Compliant with AC'97 2.2 specifications.

6 channel slot selectable DAC output for multi-channel applications.

* Versatile Memory Support

Two **184-pin DIMM** slots to support max 2GB of PC2100 or PC2700 compliant unbuffered with or without ECC **DDR** SDRAM module.

* PCI Expansion Slots

Provides five 32-bit PCI slots.

* AGP Expansion Slots

Provides one 32-bit AGP slot which supports up to 4X AGP devices.

* 6 USB 2.0 Interface Onboard

2 * 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* Floppy interface for 3.5-inch FDD with 720KB, 1.44MB, or 2.88MB format or for 5.25-inch FDD with 360K or 1.2MB format.
- 1* PS/2 mouse connector.

-
- 1* PS/2 keyboard connector.
 - 2* Serial Ports.
 - 1* Infrared communication port.
(Serial port COM2 can also be redirected to an external IrDA Adapter for wireless connection.)
 - 1* DB25 Parallel port supports Standard Parallel Port and Bi-directional (SPP), Enhanced Parallel Port (EPP), and Extended Capabilities Port (ECP) data transmission schemes.
 - 1* LAN Port.(AB48N Only)
 - 1* Line-Out port.
 - 1* Line-In port, shared with rear speaker output when multi-channel audio is enabled.
 - 1* Mic-In port.
 - 1* MIDI/GAME port.

*** PCI Bus Master IDE Controller Onboard**

Two Ultra DMA **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 **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 connected to the onboard 20-pin Pentium 4 standard ATX power connectors, supporting Suspend and Soft-On/Off by dual-function power button.

The Pentium 4 ATX power include two connectors.

*** Advanced Configuration and Power Interface**

Features four power saving modes: S1 (Snoop), S3 (Suspend to RAM), 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 Award BIOS V6.0 PG on Intel Firmware Hub 2Mb Flash core 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 and automatic clock shut-off of unused PCI/DDR-SDRAMS slots to reduce EMI.
- **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 Soft-Off mode.
- **Modem Ring Power-On** - The system can be powered on automatically by the activation of modem ringing.
- **CPU Clock Setting** - This item allows users to adjust CPU Host Clock in BIOS.
- **CPU Multiplier Setting** - This item allows users to adjust CPU Multiplier in BIOS.

* Intelligent Features

- **Voltage Monitoring** - Monitoring various voltages of key elements, such as the CPU, and other critical system voltage levels to ensure stable current passing through mainboard components. System voltages include CPU Vcore, VDD, +3.3v, +5V, +12V, -12V, 2.5V, +5VSB, Voltage Battery on system etc.
- **Fan Status Monitoring** - To prevent CPU from overheating, 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 runs in a suitable temperature.

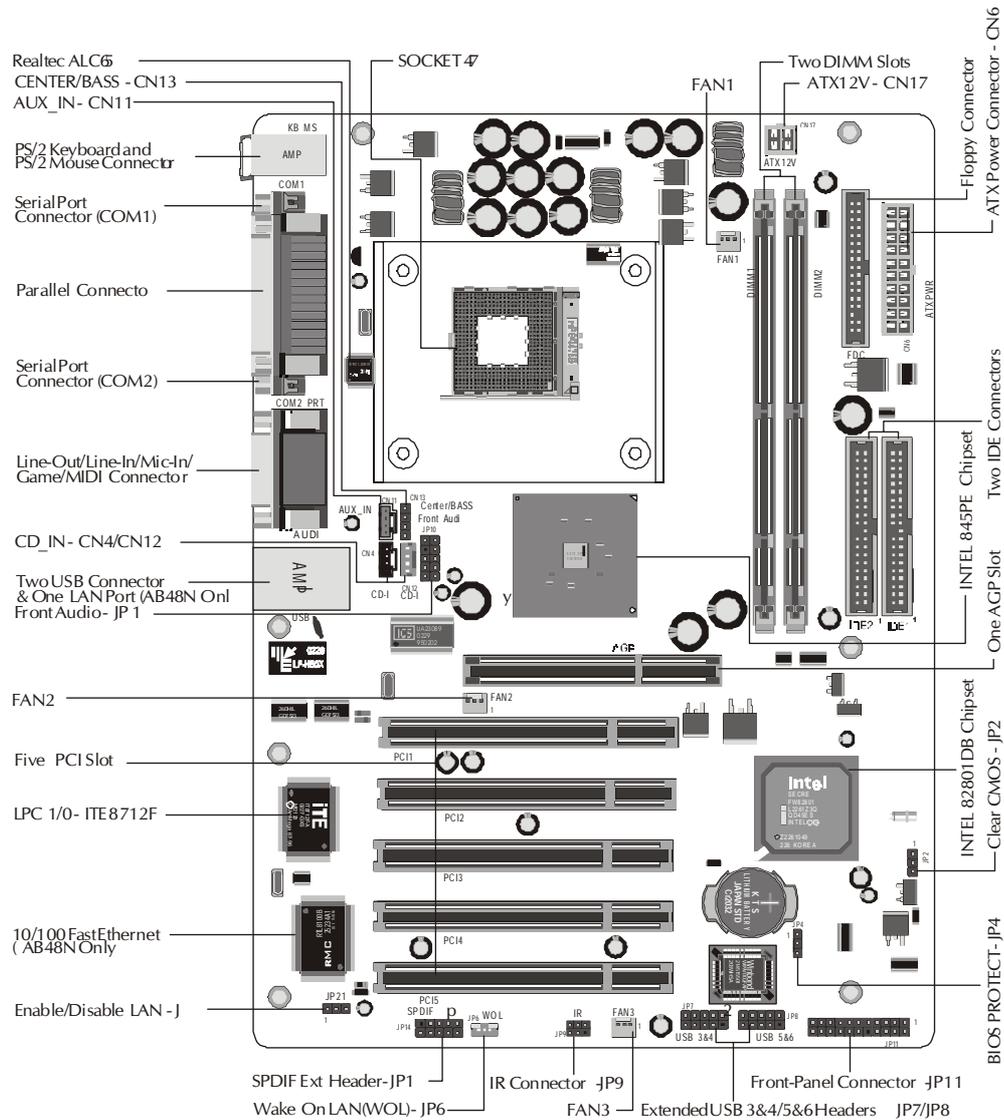
3 HARDWARE INSTALLATION

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 mainboard. Refer to the following mainboard layout to help you to 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 AB48/AB48N

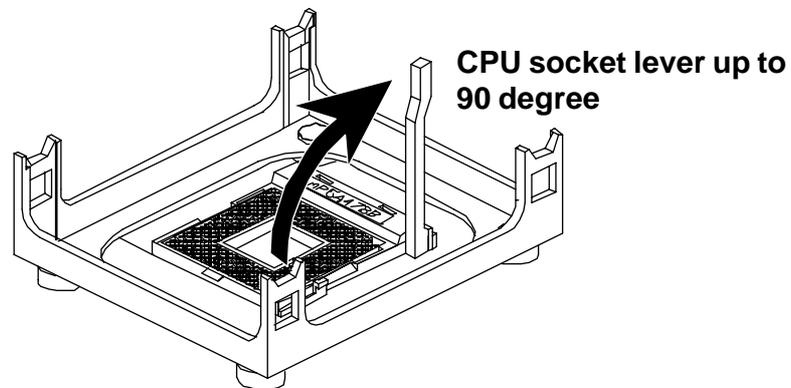


Step 1

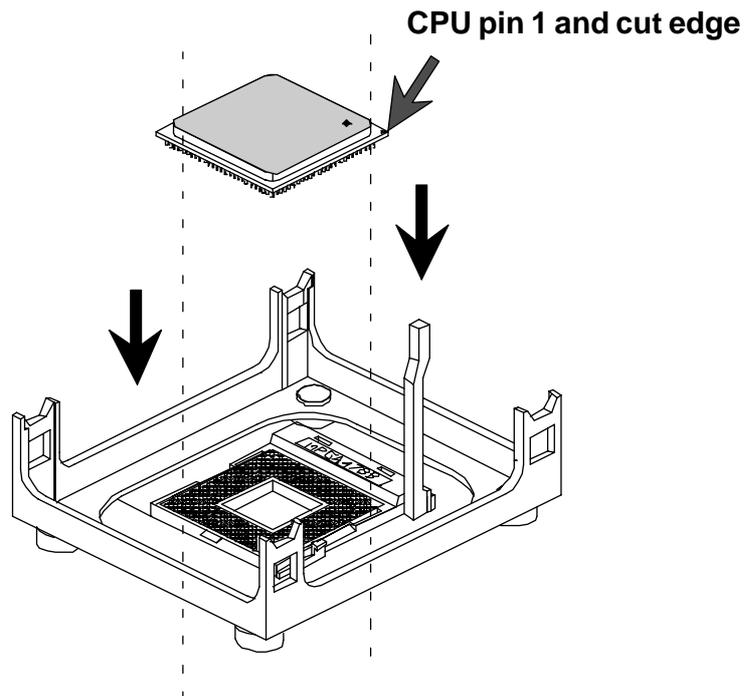
CPU Installation:

This mainboard supports Intel Pentium 4/Celeron , Socket 478 series CPU. Please follow the step as below to finish CPU installation. Be careful of CPU orientation when you plug it into CPU socket.

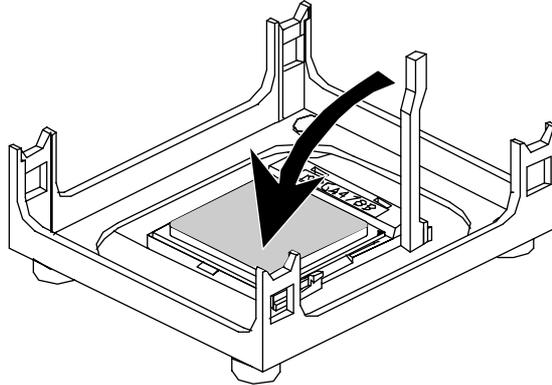
1. Pull up the CPU socket lever and up to 90-degree angle.



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, then insert the CPU into the socket.



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



Note: If you do not match the CPU socket Pin 1 and CPU cut edge well, it may damage the CPU.

4. The Intel Pentium 4 /Celeron processor requires a set of heatsink/fan to ensure proper cooling of the processor. If heatsink/fan have not been already bundled with 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.

Step 2.

Set Jumpers

This mainboard is jumperless! 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:

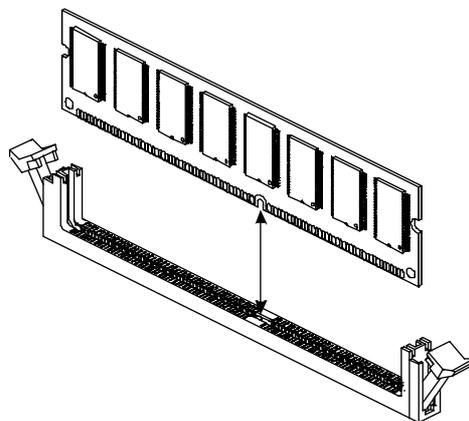
1. Clear CMOS
2. Boot ROM protection
3. Enable/Disable LAN

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.



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.

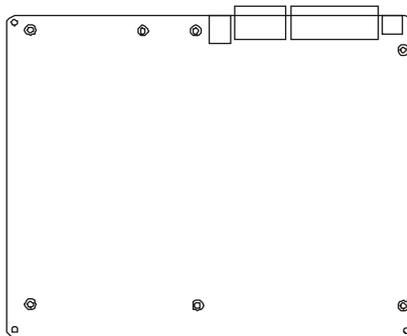
To install IDE & FDD drives, follow this procedure:

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



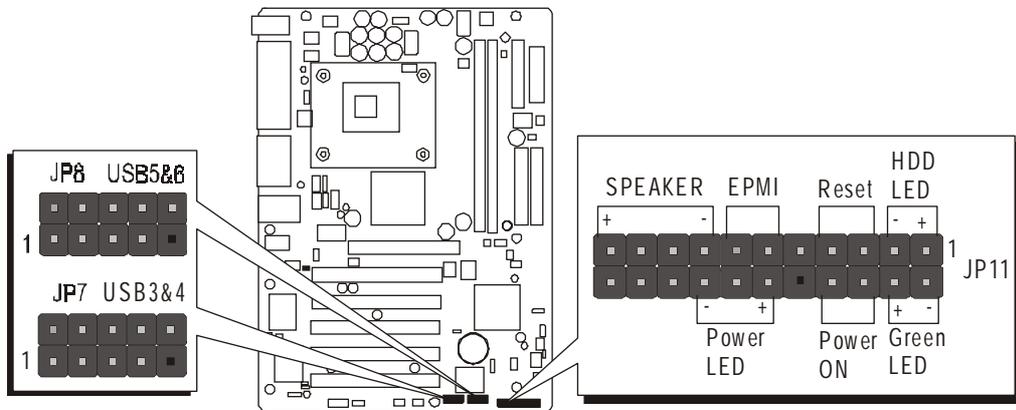
2. After deciding on the proper mounting holes, position the studs between the frame of the chassis and the mainboard. The studs are used to fix the mainboard and to keep a certain distance between the system chassis and the mainboard, in order to avoid any electrical shorts between the board and the metal frame of the 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 then 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.

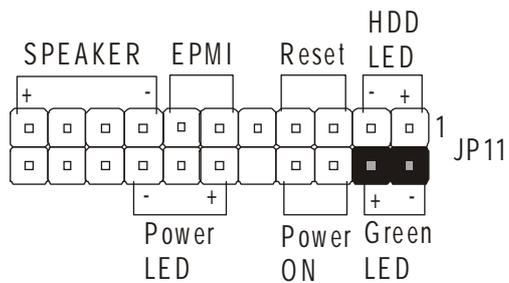
Step 6

Connect Front Panel Switches/LEDs/Speaker/USB

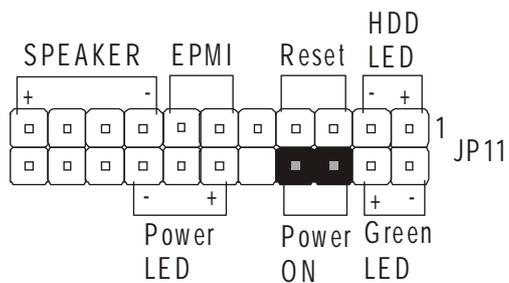
You can find there are several different cables already existing in the system case and originating from the computer's front-panel devices (HDD LED, Power LED, Reset Switch, PC Speaker, or USB devices etc.) These cables serve to connect the front-panel switches, LEDs, and USB connectors to the mainboard's front-panel connectors group (JP11), as shown below.



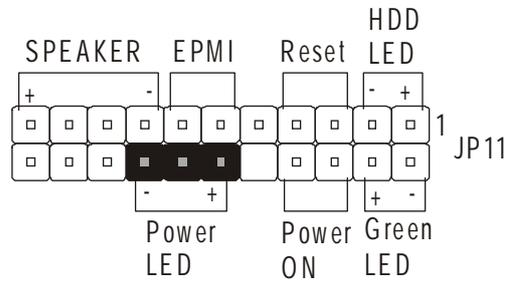
1. Green-LED (Green LED)



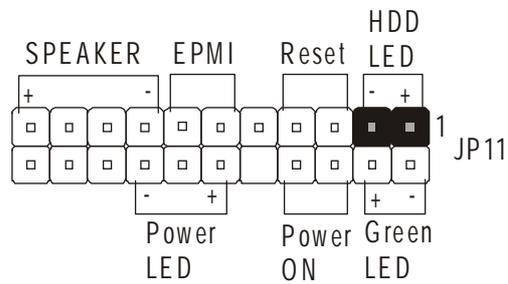
2. ATX Soft Power On/Off (Power ON)



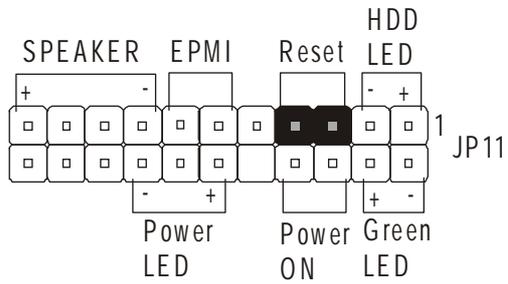
3. Power LED (PLED)



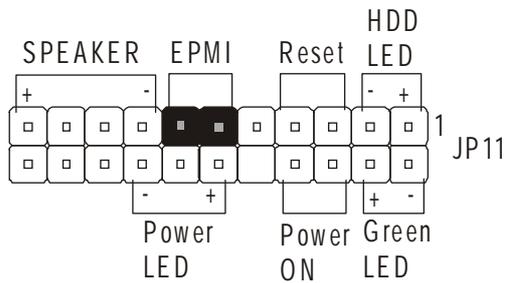
4. HDD-LED (HLED)



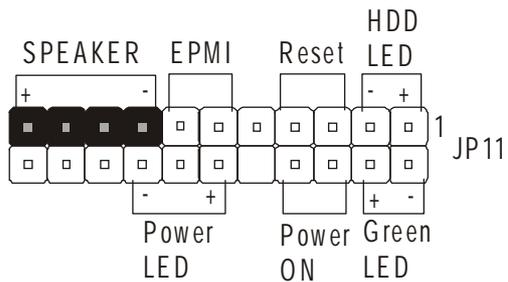
5. Hardware Reset Switch Button (RST)



6. System Management Interface Button (EPMI)

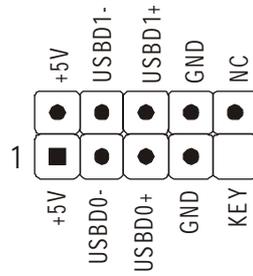


7. PC Speaker (SPEAKER)



9. Extended USB Header

USB port 5&6

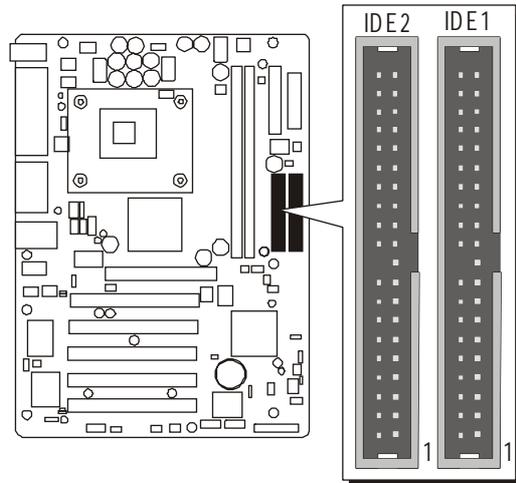


USB port 3&4

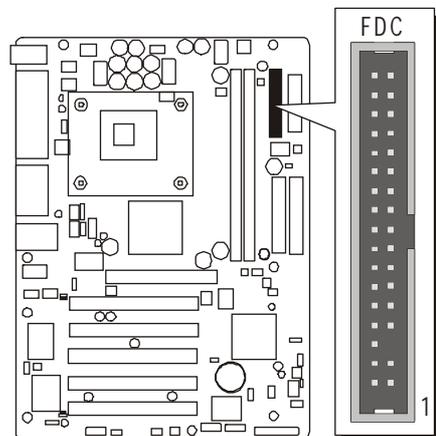
Step 7

Connect IDE and Floppy Disk Drives

- 1. IDE cable connector



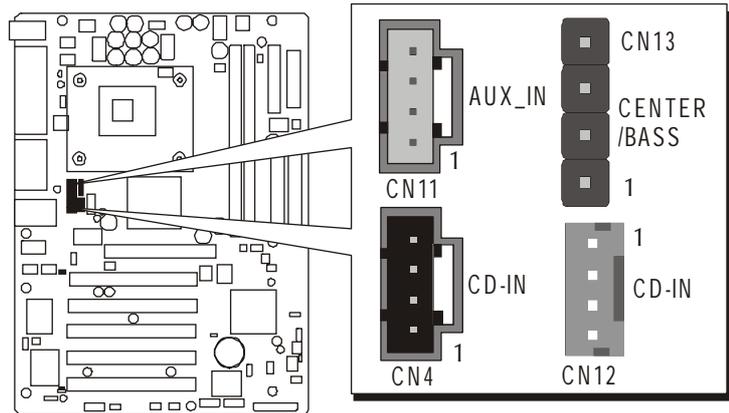
- 2. Floppy cable connector



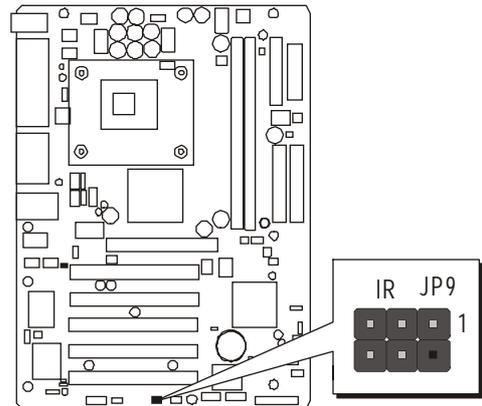
Step 8

Connect Other Internal Peripherals

1. CD-IN , Auxiliary-IN, Bass/Center-Out connectors



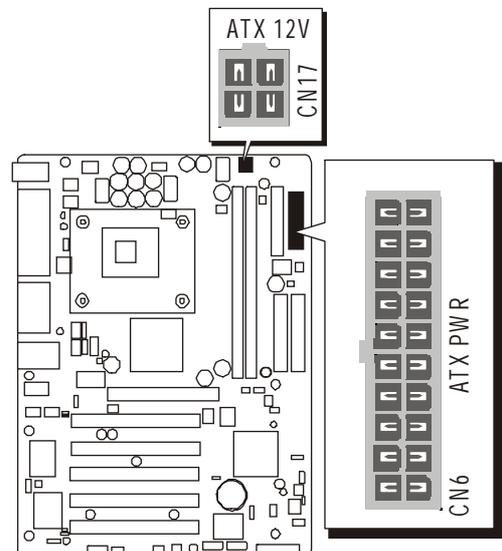
2. IR header



Step 9

Connect the Power Supply

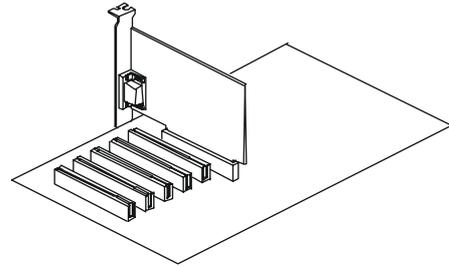
1. System power connector



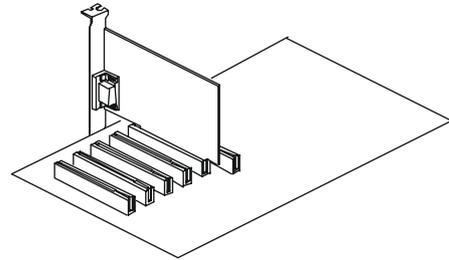
Step 10

Install Add-on Cards in Expansion Slots

1. Accelerated Graphics Port (AGP) Card



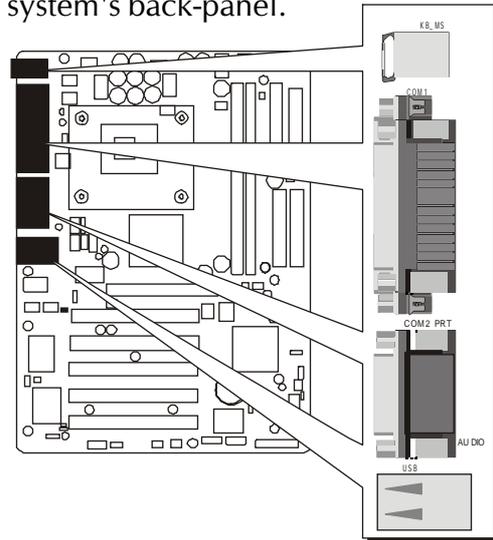
2. PCI Card



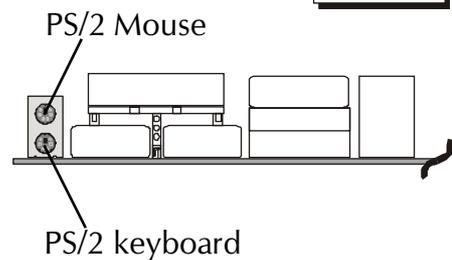
Step 11

Connect External Peripherals to Back-Panel

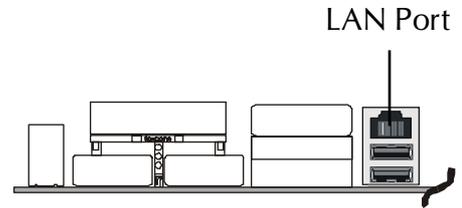
You are now ready to put the computer case back together and get on to the external peripherals connections to your system's back-panel.



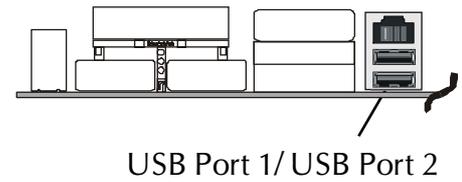
1. PS/2 Mouse and PS/2 Keyboard



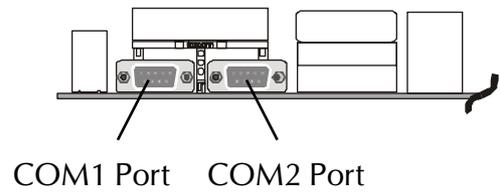
2. LAN Port (AB48N Only)



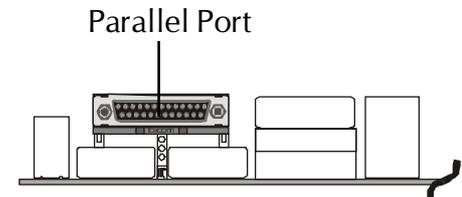
3. USB Ports



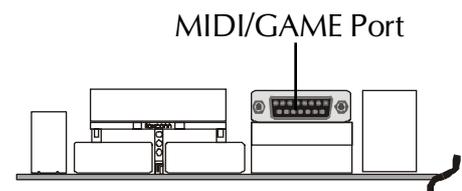
4. COM Ports



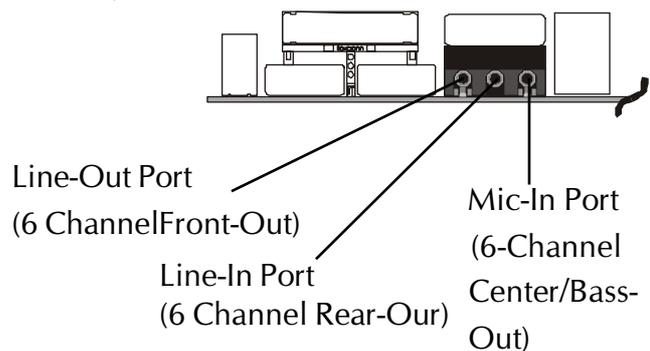
5. Parallel Port



6. MIDI/GAME Port



7. Audio Line-Out (6-Channel Front-Out) /Line-In (6-Channel Rear-Out) /
Mic-In(6-Channel Center/Bass-Out) Ports



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 AB48/AB48N bundled CD-ROM into your CD-ROM drive. The auto-run program will display the drivers main installation window on screen.
2. Choose "Install Chipset System Driver" and complete it.
3. Choose "Install Intel Ultra ATA Driver" and complete it.
4. Choose "Install Audio Driver" and complete it.
5. Choose "Install LAN Driver" and complete it. (AB48N Only)
6. 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 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:



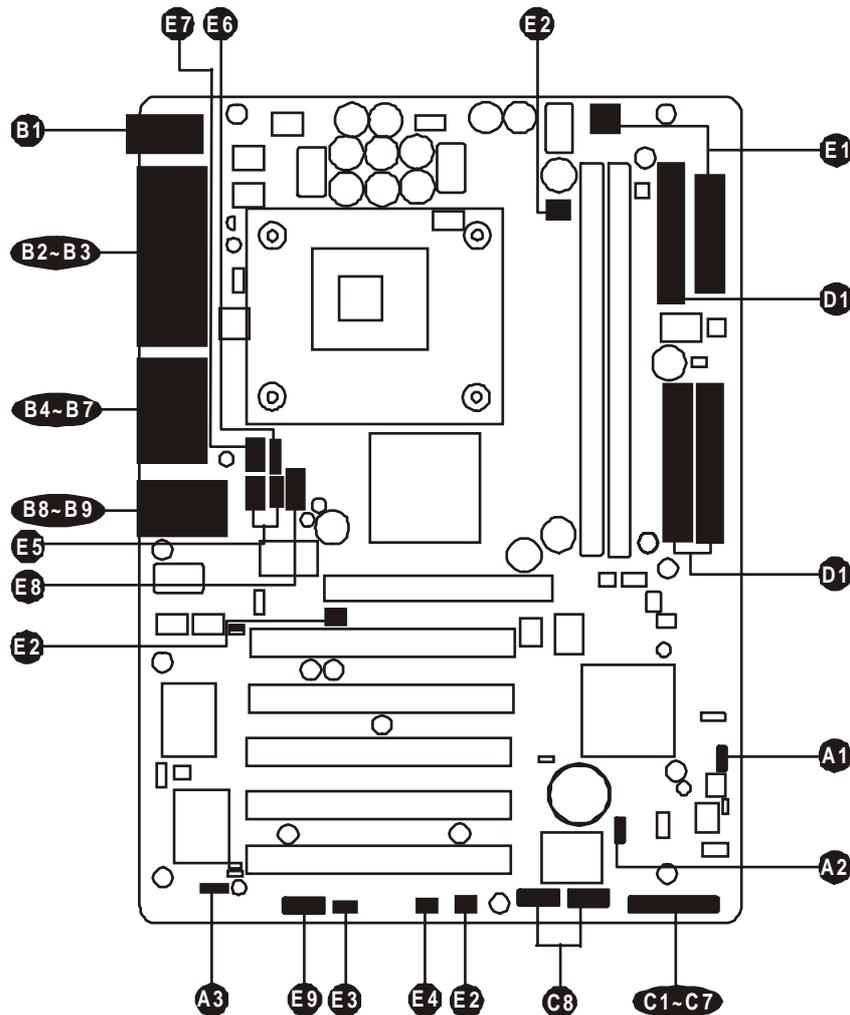
Jumpers with two pins are shown as  for Close [On] or  for Open [Off]. To Short jumper pins, simply place a plastic mini jumpers over the desired pair of pins.

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

- Socket478 : CPU Socket for Pentium 4/Celeron, 478-pin processors
- DIMM1/2 : Two DIMM Slots for 64, 128, 256, 512 MB, and 1GB of 2.5V DDR SDRAM
(The total installed memory does not exceed 2GB)
- AGP : One 4 X AGP (Accelerated Graphics Port) Slot
- PCI : Five 32-bit PCI Expansion Slots

Jumpers

- A1** JP2 : Clear CMOS setting
- A2** JP4 : BIOS protect
- A3** JP21 : Onboard LAN Enabled/Disabled setting

Back Panel Connectors

- B1** KB : PS/2 keyboard port
- B1** MS : PS/2 mouse port
- B2** PRINTER : Parallel port (DB25 female)
- B3** COM1/2 : Serial ports 1/2 (DB9 male)
- B4** LINE_OUT : Line-Out (6-Channel Front-Out) port
- B5** LINE_IN : Line-In (6-Channel Rear-Out) port
- B6** MIC_IN : Mic-In port (6-Channel Center/Bass-Out)
- B7** GAME/MIDI : GAME/MIDI Port
- B8** USB : 2 USB (Universal Serial Bus) ports
- B9** LAN : 1 LAN ports (AB48N Only)

Front Panel Connectors

- C1** Green LED : Green LED
- C2** HDD LED : IDE drive active LED
- C3** Power On : ATX power on/off momentary type switch
- C4** Reset : Hardware reset switch
- C5** Power LED : System power LED
- C6** EPMI : System Management Interface
- C7** SPEAKER : Internal speaker in housing
- C8** JP7/8 : Extended USB header

Internal Peripherals Connectors

- D1** FDC : Floppy disk drive interface
- D1** IDE1 : IDE primary interface (Dual-channel)
- D1** IDE2 : IDE secondary interface (Dual-channel)

Other Connectors

- E1** CN6/CN17 : ATX power connector
- E2** FAN1 : CPU fan connector

Ⓔ	FAN2	: AGP fan connector
Ⓔ	FAN3	: Chassis fan connector
Ⓕ	JP6	: Wake-On-LAN connector
Ⓖ	JP9	: IR header
Ⓗ	CN4/CN12	: CD_IN connector
Ⓘ	CN13	: Bass/Center_Out header
Ⓛ	CN11	: Auxiliary_IN connector
Ⓜ	JP10	: Front-Panel Microphone and Line-Out Connector
Ⓝ	JP14	: SPDIF Ext connector

Jumpers

A1 Clear CMOS Setting (JP2)

JP2 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.



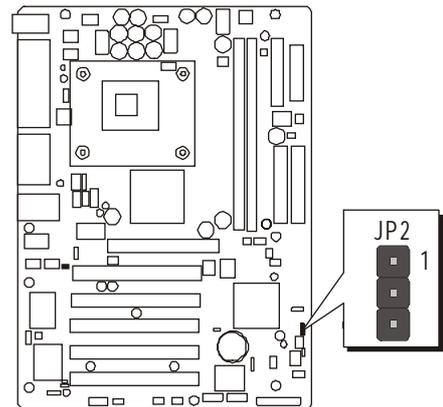
1

Pin 1-2 (Default)



1

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 JP1 pins 1-2.

Step 4. Place the jumper cap on JP1 pin 2-3 for a few seconds.

Step 5. Return the jumper cap to pin 1-2.

Step 6. Plug ATX Power cable into ATX Power connector.

Step 7. Turn on the system power (PC-> On).

A2 BIOS flash protection Setting (JP4)

JP4 is used to protect the BIOS from being unintentionally flashed. Enable this jumper for protection and disable this jumper when you want to flash the BIOS.



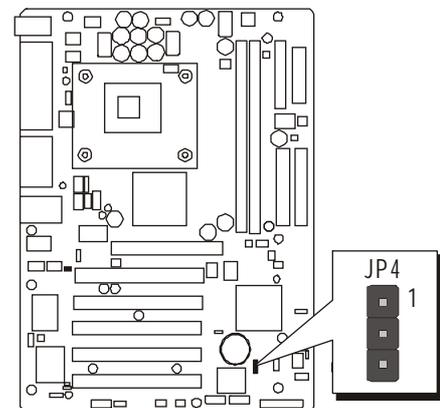
1

Pin 1-2 (Unprotected)



1

Pin 2-3 (Protected)

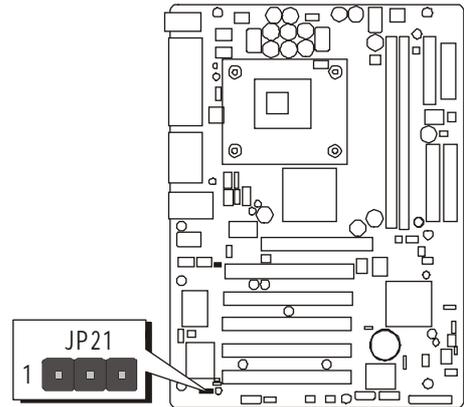


A3 LAN Select on Board Setting (JP21)

JP21 is used to enable or disable built-in LAN adapter.

1  Pin 1-2 (Enable)

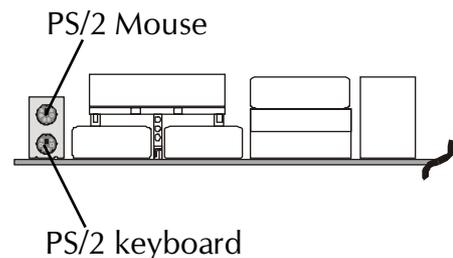
1  Pin 2-3 (Disable)



☛ Back-Panel Connectors

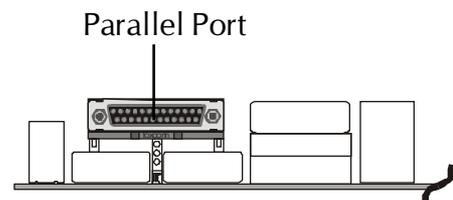
B1 PS/2 Keyboard & PS/2 Mouse Connectors

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 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 keyboard and mouse jacks into their corresponding connectors.



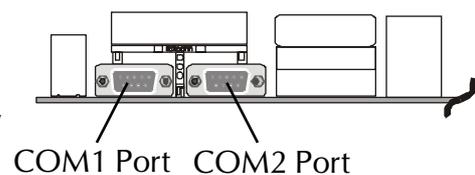
B2 Parallel Port Connector

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.



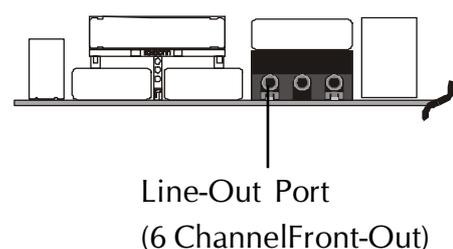
B3 COM1/2 Port Connectors

This mainboard can accommodate two serial devices on COM1/2. Attach a serial device cable to the DB9 serial port COM1/2 at the back panel of your computer.



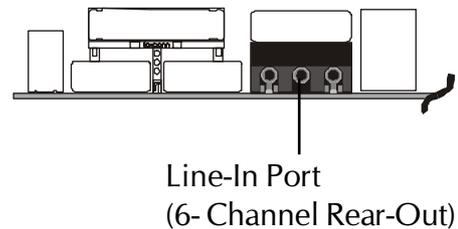
B4 Line-Out (6-Channel Front-Out) Port Connector

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.



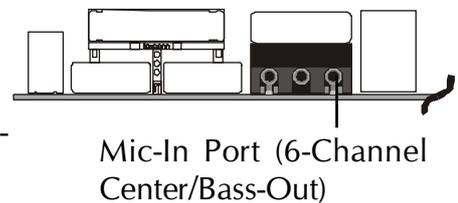
B5 Line-In (6-Channel Rear-Out) Port Connector

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, a source to be mixed with the output, or both.



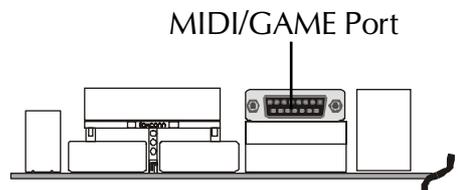
B6 Mic-In (6-Channel Center/Bass-Out)Port Connector

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 or mixed with Center/Bass output.



B7 MIDI/GAME Port Connector

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.

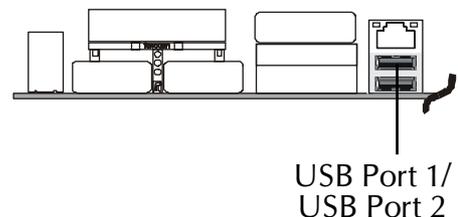


MIDI Instrument Connection

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 etc. into this connector.

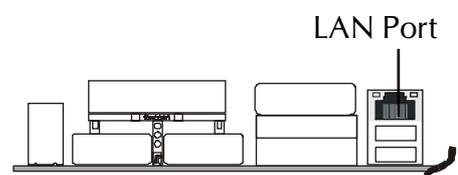
B8 USB1/USB2 Port Connectors

This mainboard offers 2USB ports on back panel. Plug each USB device jack into an available USB1/USB2 connector.



B9 LAN Port Connector (AB48N Only)

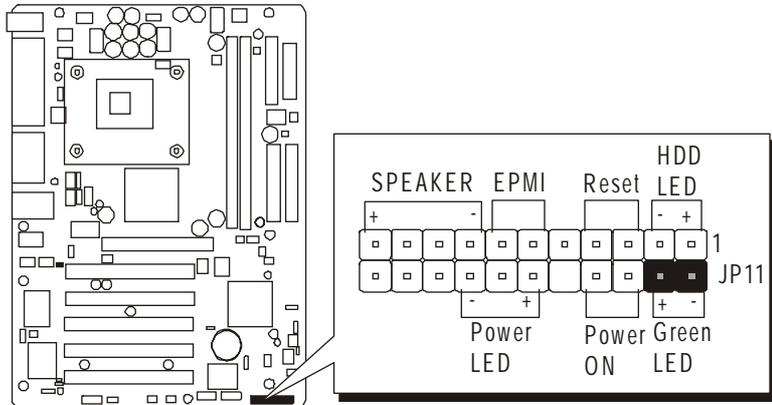
This mainboard can accommodate one device on LAN. Attach RJ-45 cable to this port connector to your PC to the LAN.



☞ **Front-Panel Connectors**

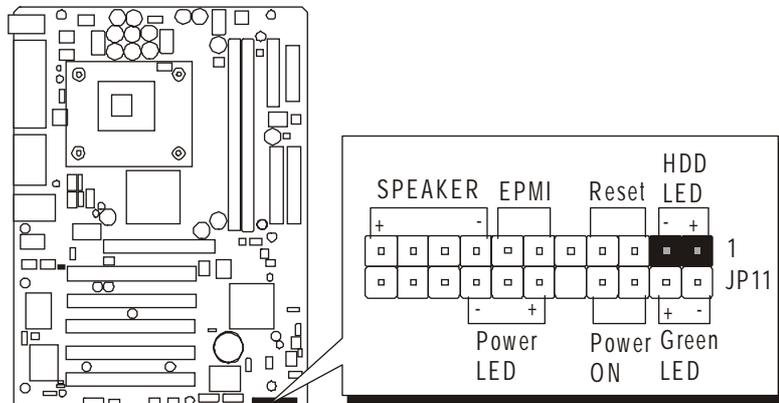
① **Green LED Connector (Green LED)**

The Green LED (Green 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 Green LED header.



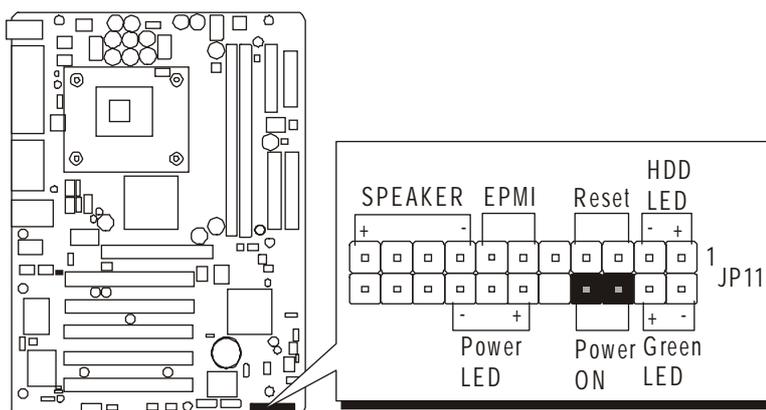
② **HDD LED Connector (HLED)**

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



③ ATX Power On/Off Switch Connector (Power ON)

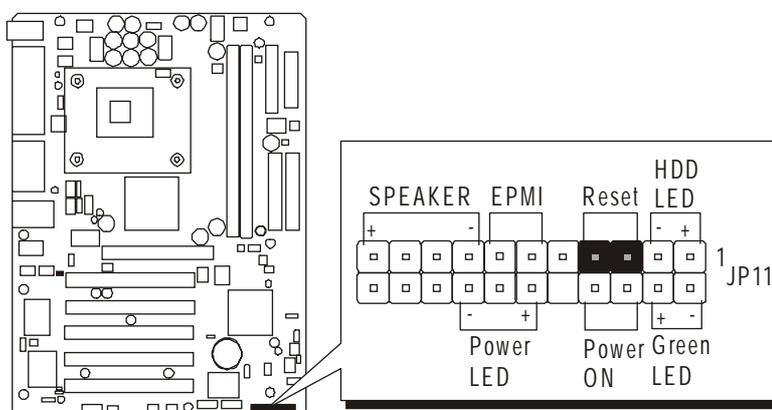
The Power On/Off Switch is a momentary type switch used for turning on or off the system ATX power supply. Attach the connector cable from the Power Switch to the 2-pin (PWON) header on the mainboard.



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

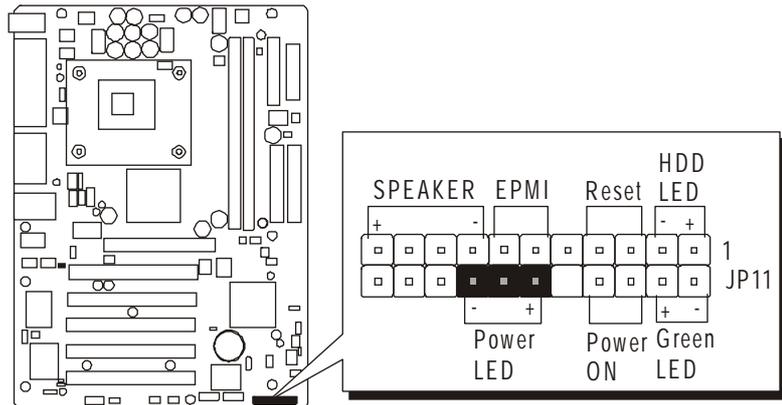
④ Hardware Reset Connector (Rreset)

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



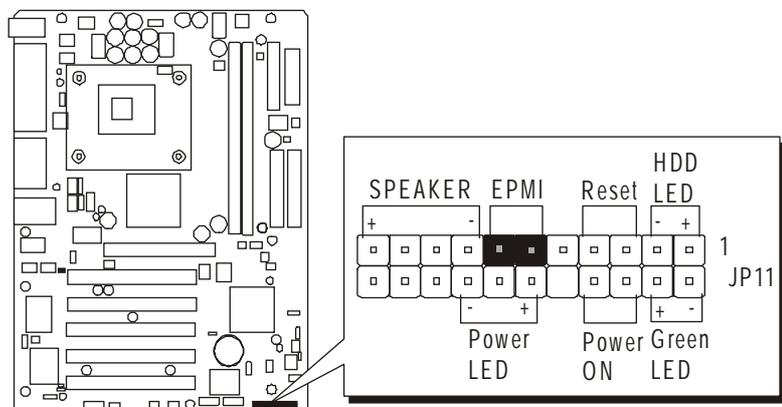
⑤ Power LED Connector (Power LED)

Attach the 3-pin Power LED connector cable from the housing front panel to the (Power LED) header on the mainboard. The power LED stays light while the system is on.



⑥ EPMI Connector (EPMI)

Hardware System Management Interface (EPMI) header may attach to 2-pin momentary switch. Press the switch to force system into power saving mode; press it again to resume back the normal operation situation.

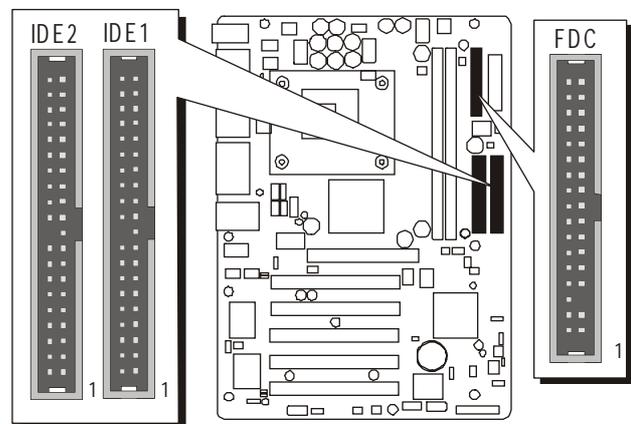


☞ **Internal Peripherals Connectors**

① **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).



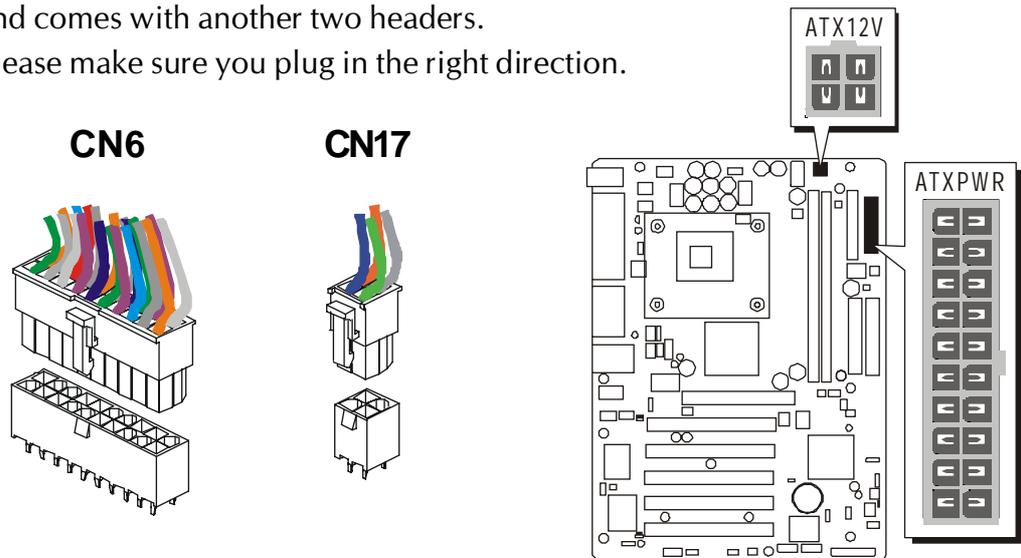
Important: Ribbon cables are directional, therefore, make sure to always connect with the red cable.

☛ Other Connectors

Ⓜ ATX Power Supply Connector (CN6/CN17)

This motherboard uses 20-pin Pentium 4 standard ATX power header, CN6 and comes with another two headers.

Please make sure you plug in the right direction.



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.

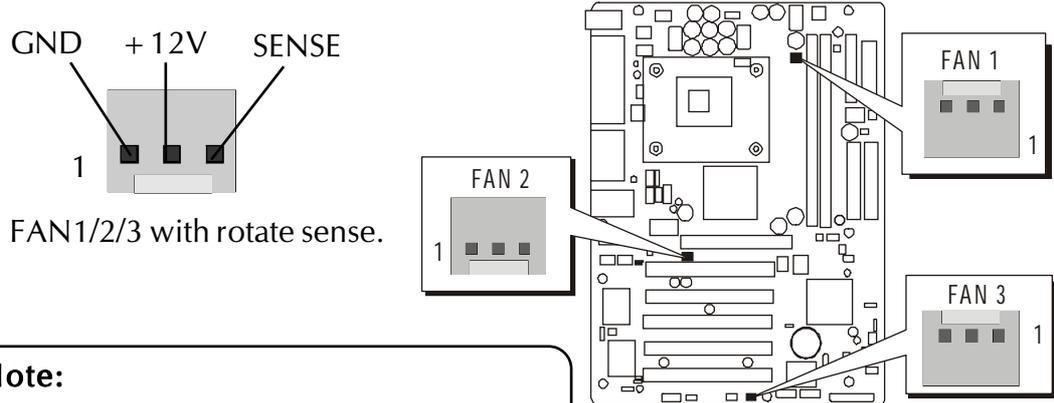
Note 2: Make sure the latch of the ATX power connector clicks into place to ensure a solid attachment.

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.

CPU, AGP, Chipset and Chassis Fan connectors - FAN1/2/3

The mainboard provides three onboard 12V cooling fan power connectors to support CPU (FAN1), AGP (FAN2), Chassis (FAN3) cooling fans.

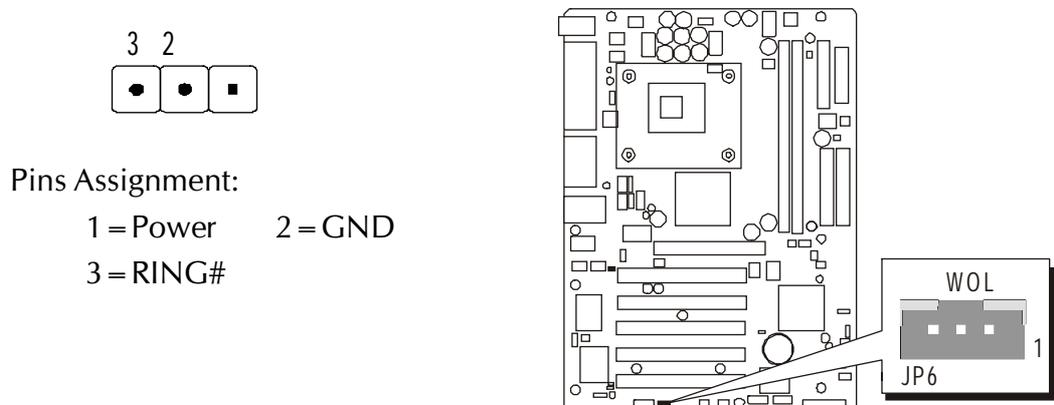


Note:

Both cable wiring and type of plug may vary, which depends 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.

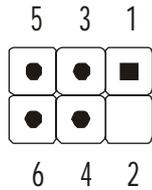
Wake-On-LAN Connector (JP6)

Attach a 3-pin connector through the LAN card which supports the Wake-On-LAN (JP6) function. This function lets users wake up the connected system through the LAN card.



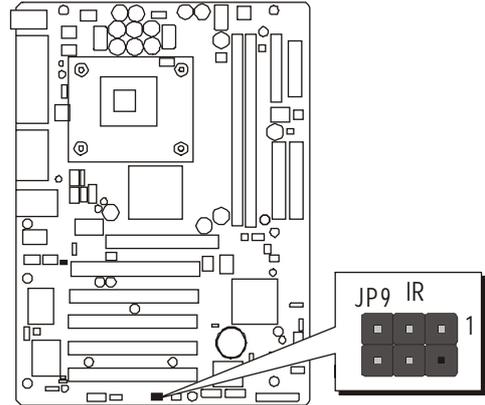
E4 IR Header (JP9)

If you have an Infrared device, this mainboard can implement IR transfer function. To enable the IR transfer function, follow these steps:



Pins Assignment:

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



Note: Before connect your IR device, please be sure each IR on board pin allocation is matchable with the pin of the IR device. Other wise, incorrect IR connection may do damage to your IR device.

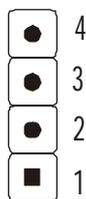
Step 1. Attach the 6-pin infrared device cable to JP9.
(Refer to the above diagram for IR pin assignment.)

Step 2. This mainboard support IrDA, or Normal transfer modes.

E5 Audio CD_IN Connector (CN4/CN12) (Black/Write)

Port CN4/CN12 is used to attach an audio connector cable from the CD-ROM drive.

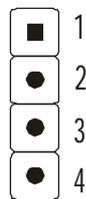
CN4



Pin Assignments:

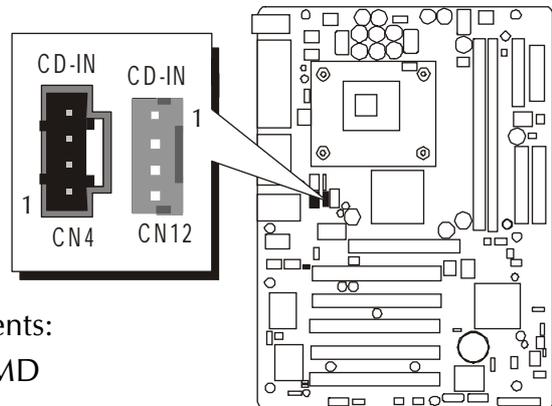
1 = CD-L
2 = CD-GND
3 = CD-GND
4 = CD-R

CN12



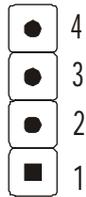
Pin Assignments:

1 = CD-GMD
2 = CD-R
3 = CD-GND
4 = CD-L



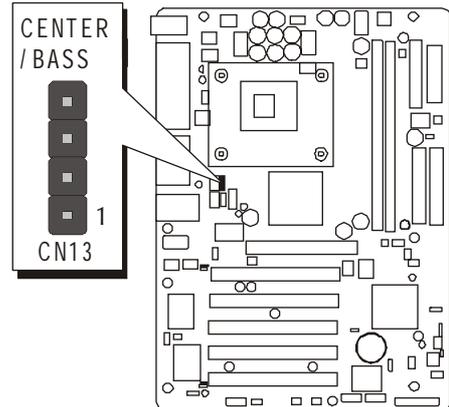
Ⓔ Audio Bass/Center_Out Header (CN13)

CN13 header can be used to connect the cable which attached to bass/center amplified speakers.



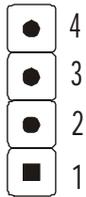
Pin Assignments:

1 = CENTER	2 = GND
3 = GND	4 = BASS



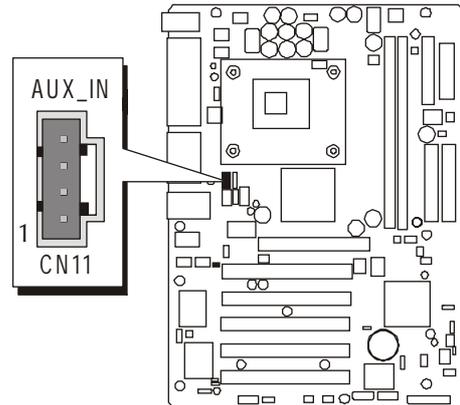
Ⓕ Audio AUXILIARY_IN Connector (CN11) (White)

Port CN11 can be used to connect a stereo audio input from CD-ROM, TV-tuner or MPEG card.



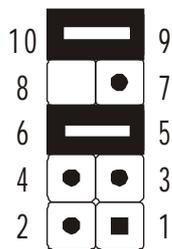
Pin Assignments:

1 = AUXL	2 = AGND
3 = AGND	4 = AUXR

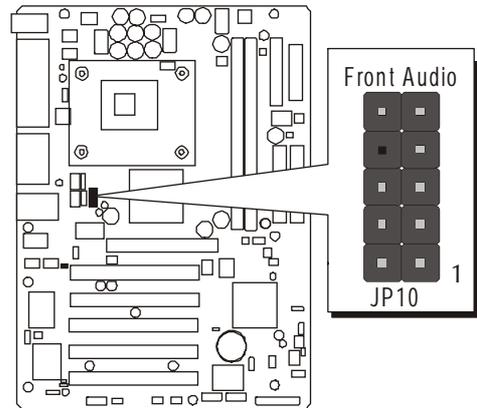


Ⓔ8 Front-Panel Microphone and Line_out Header (JP10)

This header allows users to install auxiliary front-oriented microphone and line-out ports for easier access. Either the Mic and Line_out connector on back-panel or JP10 header are available at the same time. If you would like to use this JP10 header on front-panel, please remove all jumpers from JP10 and install your special Extra Mic / Line_out cable instead.



Two mini jumpers must be setted on pin 5-6 and pin 9-10, when this header is not used.

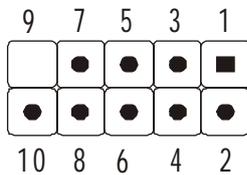


Pins Assignment:

1 = AUD_MIC	2 = AUD_GND
3 = AUD_MIC_VCC	4 = AUD_RESERVE
5 = AUD_FRONT_R	6 = AUD_RET_R
7 = HP_ON	8 = KEY
9 = AUD_FRONT_L	10 = AUD_RET_L

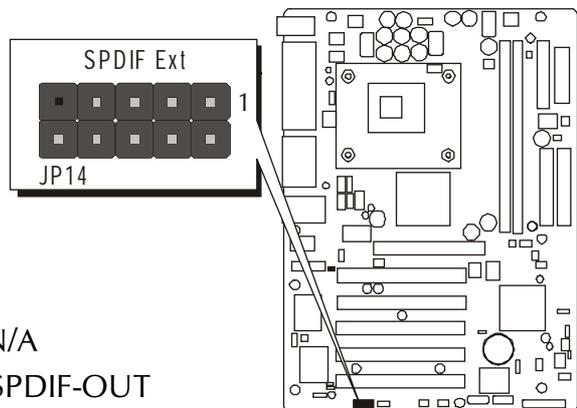
Ⓔ9 SPDIF Ext Connector (JP14)

Port JP14 can be used to connect special device.



Pin Assignments:

1 = +12V	2 = N/A
3 = N/A	4 = SPDIF-OUT
5 = SPDIF-IN 1	6 = GND
7 = SPDIF-IN 2 (optional)	8 = SPGPIO
9 = KEY	10 = GND



3.3 System Memory Configuration

The AB48/AB48N mainboard has two 184-pin DIMM banks that allow you to install from 128MB up to 1GB of system memory.

Each **184-pin** DIMM (Dual In-line Memory Module) bank can accommodate 128MB, 256MB, 512MB, and 1GB of PC2100/PC2700 compliant 2.5V single or double side unbuffered with or without ECC Registered DDR SDRAM modules. DIMM slots are arranged in two banks, each memory bank made of one bank and providing a 64-bit wide data path.

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	64MB, 128MB, 256MB, 512MB, and 1GB, 184-pin 2.5V DDR SDRAM DIMM	x 1
DIMM 2	64MB, 128MB, 256MB, 512MB, and 1GB, 184-pin 2.5V DDR SDRAM DIMM	x 1

Maximum installed memory is 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

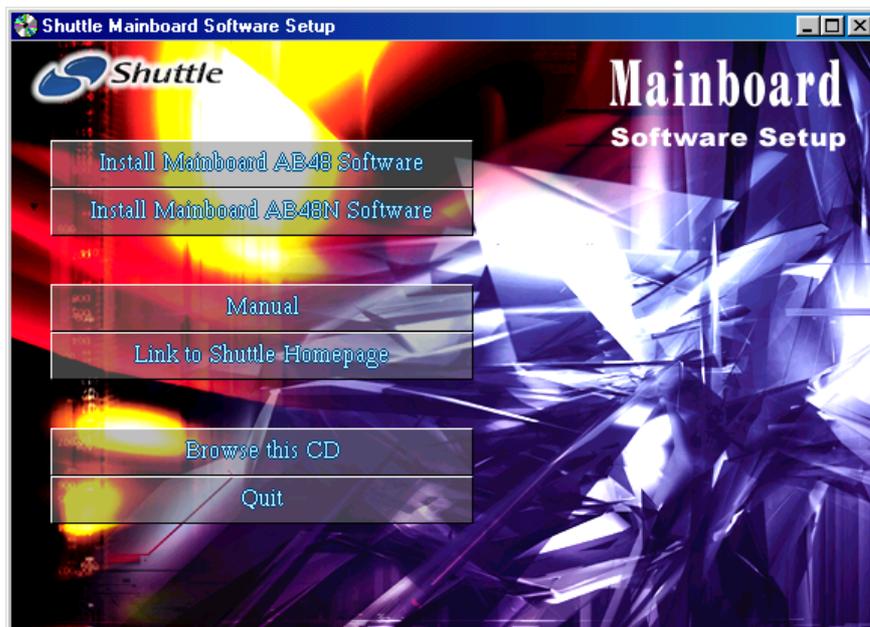
4.1 Mainboard CD Overview

Note: The CD contents attached in AB48/AB48N 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 AB48 Software** - Installing Intel Chipset, Intel Ultra ATA, Audio drivers.
- ☞ **Install Mainboard AB48N Software** - Installing Intel Chipset, Intel Ultra ATA, Audio, LAN drivers.
- ☞ **Manual** - AB48/AB48N Series mainboard user's 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.



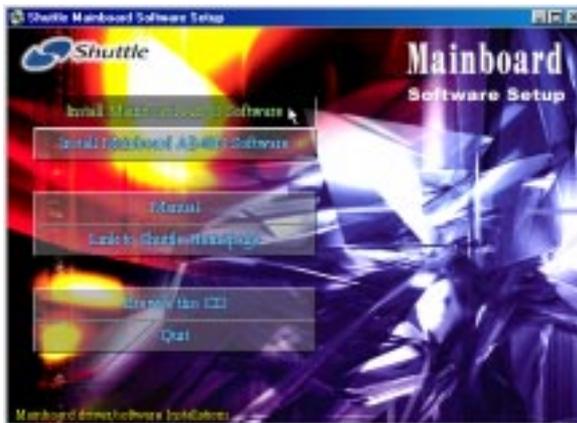
4.2 Install Mainboard Software

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 AB48 Software**" bar or "**Install Mainboard AB48N Software**" to run into sub-menu.

The **Mainboard AB48 Software** include:

- [4.2.A] Install Intel Chipset Driver
- [4.2.B] Install Intel Ultra ATA Driver
- [4.2.C] Install Audio Driver



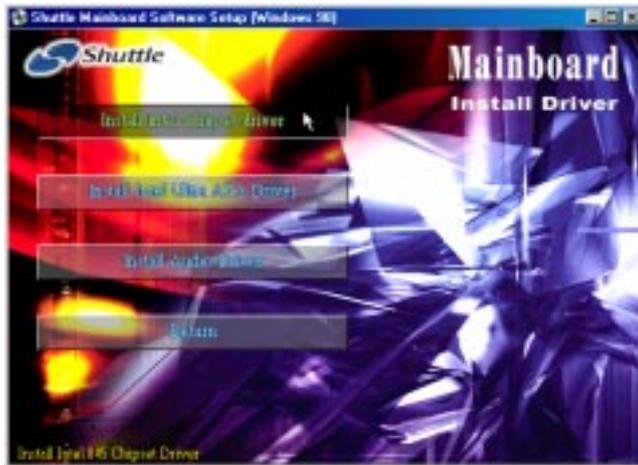
The **Mainboard AB48N Software** include:

- [4.2.A] Install Intel Chipset Driver
- [4.2.B] Install Intel Ultra ATA Driver
- [4.2.C] Install Audio Driver
- [4.2.D] Install LAN Driver



4.2.A Install Intel Chipset Driver

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



AB48

AB48N



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

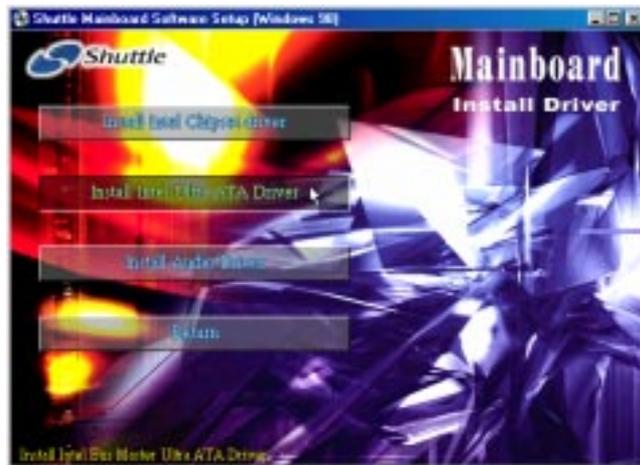
When the copying files is done, make sure you **reboot** the system to take the installation effect.

4.2.B Install IDE Driver

This driver may do bad effect on some model or brand of IDE HDD devices. Hereby, we won't suggest users to install it cause it might crash your HDD data. However, if you are very sure that the driver matches your IDE HDD, please follow below indication to complete setup.

Select using your pointing device (e.g. mouse) on the "Install Intel Ultra ATA Driver" bar to install Ultra ATA IDE driver.

P.S.: Before doing this IDE Driver installation, setup Chipset System Driver is necessary.



AB48

AB48N



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 Audio Driver

Select using your pointing device (e.g. mouse) on the “**Install Audio Driver**” bar to install audio driver.



AB48

AB48N



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 LAN Driver (AB48N Only)

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

Note:

When Install LAN driver, please confirm your OS and correctly install driver. If your OS is Win9X/NT, please take the following next page for reference. The other OS such as Win 2000/XP/ME can be automatical installed.

Install Win98 LAN driver

The LAN Device Driver can't be set up automatically, you need double click on **My Computer** -> **Control Pnael** -> **System** icon to bring up **System Properties** screen.

Select tab "**Device Manager**".

You will find a yellow "?" mark at **PCI Ethernet Controller**, that means the driver is not recognize.

Double click on the **Ethernet Controller**.



Then **PCI Ethernet Controller Properties** windows will appear on your screen.

Click on the "**Reinstall Driver**" bar to install driver.



The **Update Device Driver Wizard** windows will appear on your screen.

Click on "**Next**" bar to continue.



Please choose "**Display a list of the drivers in a specific location, so you can select the driver you want**" to the manual install driver, and click on "**Next**" bar to continue.



Select "**Network adapters**" bar for LAN device and click on "**Next**" bar to continue.



Insert the support CD by the mainboard manufacturer and choose "**Have Disk**" bar to continue next step.



Indicate the driver's location as "**D:\lan\WIN98\NETRTS5.INF**" (In this location CD drive is supposed to be "**D**" letter.)



Select "**Realtek RTL8139 [A/B/C/8130] PCI Fast Ethernet NIC**" to install, and then click on "**OK**".



Make sure "**Realtek RTL8139 [A/B/C/8130] PCI Fast Ethernet NIC**" driver, and click on "**Next**". Then the system will do the setup procedure automatically.



Completing the upgrade device driver, and click on **"Finish"** to restart the system to take all the changes effect.



After restart, you may check Network adapters under the location mentioned at right figure.

The Network adapters shows correctly.



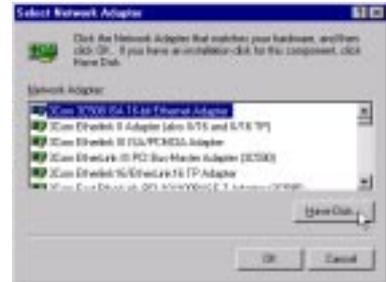
Install WinNT4.0 LAN drivers

The LAN Device Driver can't be set up automatically, you need double click on Desktop **Network** icon to bring up **Network Setup Wizard** screen.

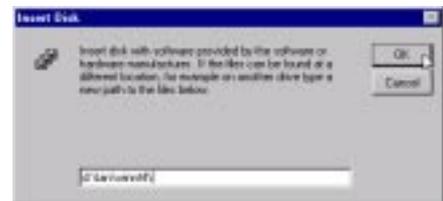
Select tab **"Adapters"** and **"Add"** bar to install driver.



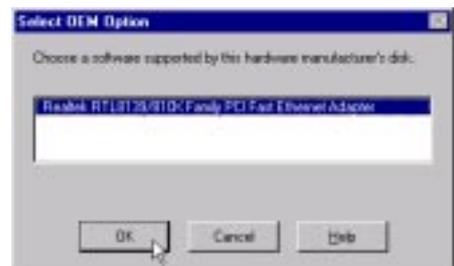
Insert the support CD by the mainboard manufacturer and choose **"Have Disk"** bar to continue next step.



Key in the driver's location as **"D:\lan\WINNT4"** (In this location CD disk drive is supposed to be **"D"** letter.) and click on **"OK"**.



Select **"Realtek RTL8139 [A/B/C/8130] PCI Fast Ethernet Adapter"** to install then click on **"OK"**.



Choose the proper Duplex Mode, and click on **"OK"**.



Make sure **"Realtek RTL8139 [A/B/C/8130] PCI Fast Ethernet Adapter"** driver, and click on **"Close"**.

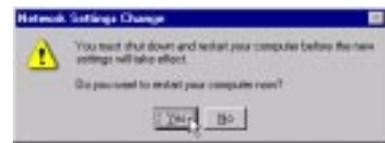


Setting yourself network.

Then the system will do the setup procedure automatically.

Completing the upgrade device driver, and click on **"Yes"** to restart the system to take all the changes effect.

After restart, you may check Network adapters under the location mentioned at right figure. The Network adapters shows correctly.



4.3 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.

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



Then **Online Information** windows will appear on your screen. Click on the **"Install Acrobat Reader"** bar if you need to install acrobe reader.



Then click on **"AB48/AB48N Manual"** bar to view user's manual.

5 BIOS SETUP

AB48/AB48N 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

Note 1. If you miss trains of words meationed 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.

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.

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

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

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory-set for optimal performance system operation. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet users' needs.

Supervisor / User 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.

Save & Exit Setup

Save CMOS value changes in CMOS and exit from setup.

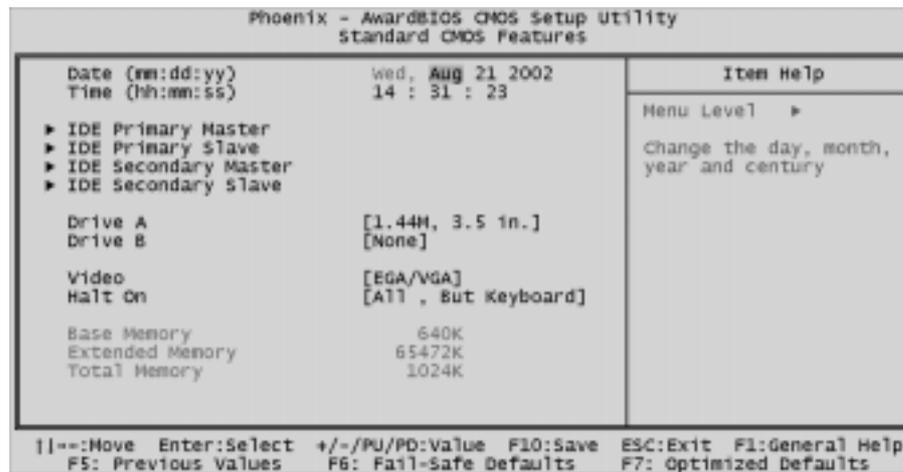
Exit Without Saving

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.



Date

<Month> <DD> <YYYY>

Set the system date. Note that the 'Day' automatically changes when you set the date.

Time

<HH:MM:SS>

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

IDE Primary Master

Options are in its sub-menu.

Press <Enter> to enter the sub-menu of detailed options.

IDE Primary Slave

Options are in its sub-menu.

Press <Enter> to enter the sub-menu of detailed options.

IDE Secondary Master

Options are in its sub-menu.

Press <Enter> to enter the sub-menu of detailed options.

IDE Secondary Slave

Options are in its sub menu.

Press <Enter> to enter the sub-menu of detailed options.

Drive A /Drive B

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

- The choice: None, 360K, 5.25 in, 1.2M, 5.25 in, 720K, 3.5 in, 1.44M, 3.5 in, or 2.88M, 3.5 in.

Video

Select the default video device.

- The choice: EGA/VGA, CGA 40, CGA 80, or MONO.

Halt On

Select the situation in which you want the BIOS to stop the POST process and notify you.

- The choice: All Errors, No Errors, All, But Keyboard, All, But Diskette, or All, But Disk/Key.

Base Memory

Displays the amount of conventional memory detected during boot up.

- The choice: 640K.

Extended Memory

Displays the amount of extended memory detected during boot up.

- The choice: 65472K.

Total Memory

Displays the total memory available in the system.

- The choice: 1024K.

IDE Adapters

The IDE adapters control the hard disk driver. Use a separate sub-menu to configure each hard disk driver.

IDE Primary Master

Selecting 'manual' lets you set the remaining fields on this screen and select the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc., Note: PRECOMP = 65535 means NONE !

- The choice: None, Auto, or Manual.

Access Mode

Choose the access mode for this hard disk.

- The choice: CHS, LBA, Large, or Auto.

Capacity

Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.

- Auto-Display your disk drive size.

The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'

Cylinder

Set the number of cylinders for this hard disk.

- 0 MB

Head

Set the number of read/write heads.

- 0

Precomp

Warning: Setting a value of 65535 means no hard disk.

- 0

Landing zone

Set the Landing zone size.

- 0

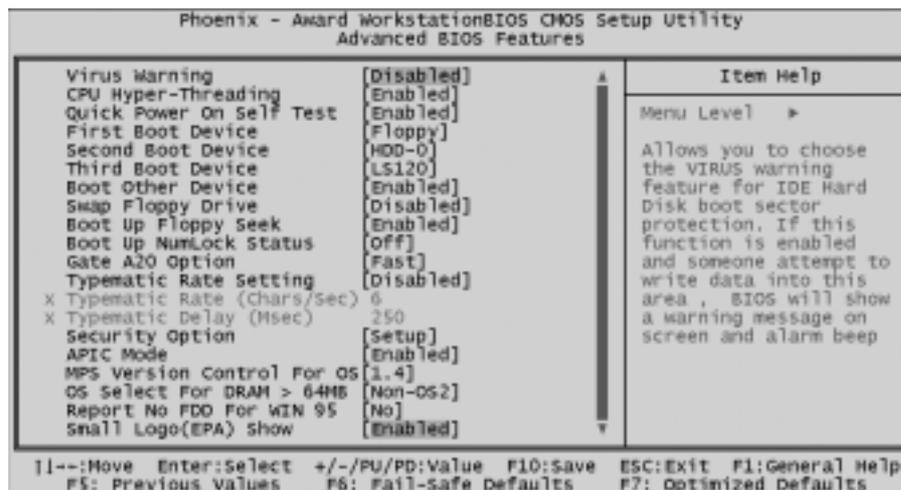
Sector

Number of sector per track.

- 0

Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing, and security.



Virus Warning

Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempts to write data into this area, BIOS will show a warning message on screen, and an alarm beep.

Enabled Activates automatically when the system boots up, causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Disabled No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

- The choice: Enabled or Disabled.

CPU Hyper-Threading

This item allows you to enable/disable CPU Hyper-Threading function. If it is set to enabled, the CPU performance will be better.

- The choice: Enabled, or Disabled.

Quick Power On Self Test

This item speeds up Power-On Self Test (POST) after you power on the computer. If it is set to enabled, BIOS will shorten or skip some check items during POST.

- The choice: Enabled, or Disabled.

First/Second/Third Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

- The Choice: Floppy, LS120, HDD-0, SCSI, Hard Disk, CDROM, HDD-1, HDD-2, HDD-3, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, or Disabled.

Boot Other Device

Select Your Boot Device Priority.

- The choice: Enabled or Disabled.

Swap Floppy Drive

If the system has two floppy drives, you can swap the logical drive name assignment.

- The choice: Enabled or Disabled.

Boot Up Floppy Seek

Seeks disk drives during boot-Up. Disabling speed boots up.

- The choice: Enabled or Disabled.

Boot Up NumLock Status

Selects power-on state for NumLock.

- The choice: Off or On.

Gate A20 Option

This entry allows you to select how the gate A20 is handled. The gate A20 is a device used for above 1MByte of address memory. Initially, the gate A20 was handled via a pin on the keyboard. Today, while a keyboard still provides this support, it is more common and much faster in setting to Fast for the system chipset to provide support for gate A20.

- The choice: Normal, or Fast.

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller. When this controller enabled, the typematic rate and typematic delay can be selected.

- The choice: Enabled or Disabled.

Typematic Rate (Chars/Sec)

This item sets how many times the keystroke will be repeated in a second when you hold the key down.

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

Typematic Delay (Msec)

Sets the delay time after the key is held down before it begins to repeat the keystroke.

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

Security Option

Select whether the password is required every time the system boots or only when you enter setup.

System The system will not boot and access to Setup will be denied if the correct password is not entered promptly.

Setup The system will boot, but access to Setup will be denied if the correct password is not entered promptly.

- The choice: System or Setup.

Note:

To disabled security, select PASSWORD SETTING at Main Menu, and then you will be asked to enter password. Do not type anything and just press <Enter>; it will disable security. Once the security is disabled, the system will boot, and you can enter Setup freely.

APIC Mode

Selects enable/disable IO APIC function

- The choice: Enabled or Disabled.

MPS Version Control For OS

Selects the operating system multiprocessor support version.

- The choice: 1.1 or 1.4

OS Select For DRAM > 64MB

Selects the operating system that is running with greater than 64MB of RAM in the system.

- The choice: Non-OS2 or OS2.

Report No FDD For Win 95

Whether report no FDD runs for Win 95 or not.

- The choice: Yes or No.

Small Logo (EPA) Show

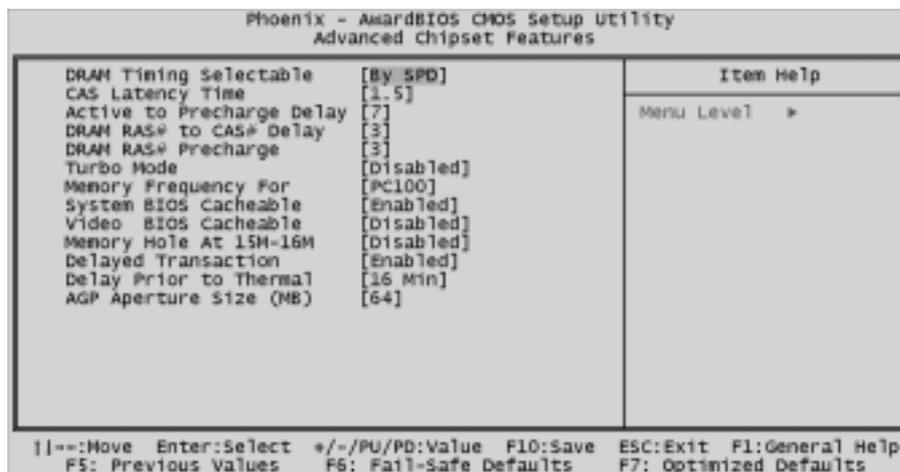
This item allows you to enable/disable the EPA Logo.

- The choice: Enabled or Disabled.



Advanced Chipset Features

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It states that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. If you discovered that data was being lost while using your system, you might consider making any changes.



DRAM Timing Selectable

This item select the DRAM Timing by SPD (Serial Presence Data) or by manual selection.

- The Choice: Manual or By SPD.

In some DDR SDRAM module , there is no SPD on it, select by SPD will cause system can not boot.

CAS Latency Time

This item select DDR SDRAM CAS latency. (1.5T, 2T, or 2.5T)

- The Choice: 1.5, 2, 2.5, or 3.

Active to Precharge Delay

This item select the SDRAM Active to Precharge Delay. (7T, 6T, or 5T)

- The Choice: 7, 6, or 5.

DRAM RAS# to CAS# Delay

This field lets you insert a timing delay between the CAS and RAS strobe signals, and you can use it when DRAM is written to, read from, or refreshed. Faster performance is gained in high speed, more stable performance, in low speed. This field is applied only when synchronous DRAM is installed in the system.

- The Choice: 3 or 2.

DRAM RAS# Precharge

If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be-incompleted, and the DRAM may fail to retain data. Fast gives faster performance; and Slow gives more stable performance. This field is applied only when synchronous DRAM is installed in the system.

- The Choice: 3 or 2.

Turbo Mode

This items allows you to enable/disable the Turbo Mode .

- The Choice: Enabled or Disabled.

Memory Frequency For

This item select DDR SDRAM Frequency.

- The Choice: PC100, PC133, or Auto.

System BIOS Cacheable

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program is written to this memory area, a system error may result.

- The choice: Enabled or Disabled.

Video BIOS Cacheable

Selecting Enabled allows caching of the video BIOS , resulting in better system performance. However, if any program is written to this memory area, a system error may result.

- The Choice: Enabled or Disabled.

Memory Hole At 15M-16M

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

- The Choice: Enabled or Disabled.

Delayed Transaction

The chipset has an embedded 32-bit posted write buffer to support delayed transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

- The Choice: Enabled or Disabled.

Delay Prior to Thermal

This item select the Delay time before thermal controller activate from temperature too high.

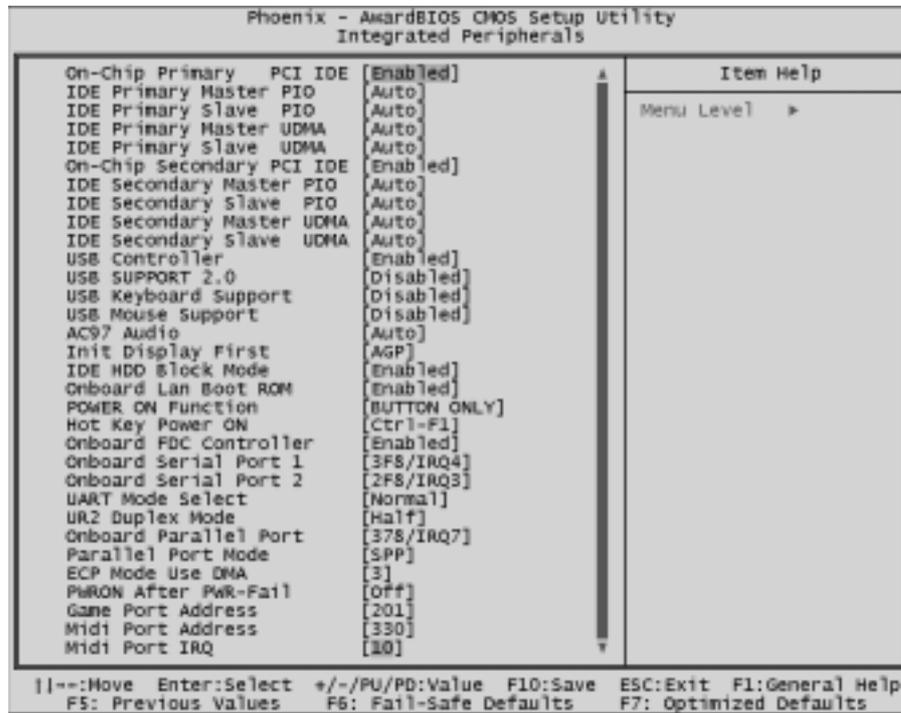
- The Choice: 4 Min, 8 Min, 16 Min, or 32 Min.

AGP Aperture Size (MB)

Select the size of Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation.

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

Integrated Peripherals



On-Chip Primary PCI IDE

The integrated peripherals controller contains an IDE interface with support to two IDE channels. Select Enabled to activate each channel separately.

- The choice: Enabled or Disabled.

IDE Primary Master/Slave PIO

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

- The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, or Mode 4.

IDE Primary Master/Slave UDMA

Ultra DMA33/66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If both of your hard drive and your system software support Ultra DMA33/66/100, select Auto to enable BIOS support.

- The Choice: Auto or Disabled.

On-Chip Secondary PCI IDE

The integrated peripherals controller contains an IDE interface with support to two IDE channels. Select Enabled to activate each channel separately.

- The choice: Enabled or Disabled.

IDE Secondary Master/Slave PIO

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

- The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, or Mode 4.

IDE Secondary Master/Slave UDMA

Ultra DMA33/66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If both of your hard drive and your system software support Ultra DMA33/66/100, select Auto to enable BIOS support.

- The Choice: Auto or Disabled.

USB Controller

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.

- The choice: Enabled or Disabled.

USB Support 2.0

Select Enabled if your system contains a Universal Serial Bus (USB)2.0 controller and you have USB peripherals.

- The choice: Enabled or Disabled.

USB Keyboard Support

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

- The choice: Enabled or Disabled.

USB Mouse Support

Enabled this item if you plan to use a keyboard connected through the USB port in a legacy operating system (such as DOS) that does not support Plug and Play.

- The choice: Enabled or Disabled.

AC97 Audio

This item allows you to select AC97 CODEC audio chip to support Audio.

- The choice: Auto or Disabled.

Init Display First

This item allows you to decide to activate whether PCI Slot or AGP Slot first.

- The choice: PCI Slot or AGP/Slot .

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

- The choice: Enabled, or Disabled.

Onboard LAN Boot ROM

This item allows you to connect the server directly and as a device to boot up.

- The choice: Enable, or Disable.

POWER ON Function

This item is used to defined Keyboard & PS/2 mouse power-on function enabled or disabled.

- The choice:Hot-KEY, Mouse Click, Any KEY, Button only, Keyboard 98.

Note: USB Keyboard, USB Mouse and Serial Mouse are not supported to this function.

Hot Key Power ON

Power-on by soft-on/off button and keyboard are available.

- The choice: <Ctrl - F1 > to <Ctrl - F12 > .

Onboard FDC Controller

This item specifies onboard floppy disk drive controller. This setting allows you to connect your floppy disk drives to the onboard floppy connector. Choose the "Disabled" settings if you have a separate control card.

- The choice: Enabled Disabled.

Onboard Serial Port1/Port2

Select an address and corresponding interrupt for the first and second serial ports.

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

UART Mode Select

The main board support IrDA infrared through COM 2 port.

- The choice: Normal, IrDA, ASKIR or SCR.

UR2 Duplex Mode

This item specifies onboard infrared transfer mode to full-duplex.

- The choice: Full, or Half.

Onboard Parallel Port

This item allows you to determine onboard parallel port controller I/O address setting.

- The choice:: 378/IRQ7, 278/IRQ5, 3BC/IRQ7, or Disabled.

Parallel Port Mode

Select an operating mode for the onboard parallel (printer) port. Select Normal, Compatible, or SPP unless you are certain your hardware and software both support one of the other available modes.

- The choice: SPP, EPP, ECP, or ECP + EPP.

ECP Mode Use DMA

Select a DMA channel for the parallel port for use during ECP mode.

- The choice: 1 or 3.

PWRON After PWR-Fail

This item select power on function when power fail.

- The choice: Off, On, or Former-Sts.

Game Port Address

This item selects Game Port Address.

- The choice: Disabled, 201, or 209.

Midi Port Address

This item selects Midi Port Address.

- The choice: Disabled, 330, or 300.

Midi Port IRQ

This item selects Midi Port IRQ.

- The choice: 5 or 10.

Power Management Setup



The Power Management Setup allows you to configure your system to most effectively saving energy while operating in a manner consistent with your own style of computer use.

ACPI Suspend Type

This item allows you to select sleep state when suspend.

- The choice: S1(POS) , S3(STR) or S1&S3.

Power Management

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

Min Saving Minimum power management.

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

Max Saving Maximum power management.

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

User Define Allows you to set each mode individually.

When this item not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

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

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC + Blank This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.

Blank Screen This option only writes blanks to the video buffer.

DPMS Initial display power management signaling.

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

Video Off In Suspend

This item determines the manner in which the monitor is blanked.

- The choice: No or Yes.

Suspend Type

This item allows you to select the Suspend Type.

- The choice: Stop Grant or PwrOn suspend .

MODEM Use IRQ

This item determines the IRQ in which the MODEM can use.

- The choice: 3, 4, 5, 7, 9, 10, 11, or NA.

Suspend Mode

When this item enabled and after the set up time of system inactivity, all devices except the CPU will be shut off.

- The choice: Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, or 1 Hour.

HDD Power Down

When this item enabled and after the set up time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

- The choice: Disabled or 1 Min ~ 15 Min.

Soft-Off by PWR-BTTN

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has "hung."

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

Wake-Up by PCI card

This item Enabled/Disabled PCI card wakeup for PCI Spec 2.2.

- The choice: Enabled or Disabled.

Power On by Ring

This item determine the system will resume by activating of modem ring.

- The choice: Enabled or Disabled.

Wake Up On LAN

This item Enabled/Disabled LAN wakeup .

- The choice: Enabled or Disabled.

USB KB Wake-Up Fram S3

Set the item Enabled, users can awaken the system by USB keyboard. When ACPI Suspend Type item select is S1(POS), then this item can not show up.

- The choice: Disabled or Enabled.

Resume by Alarm

When this item enabled, you can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.

- The choice: Disabled or Enabled.

Data (of Month) Alarm

This item selects the alarm date.

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

Time (hh:mm:ss) Alarm

This item selects the alarm Time.

[hh]

- Key in a DEC number:Min = 0, Max = 23.[mm/ss]

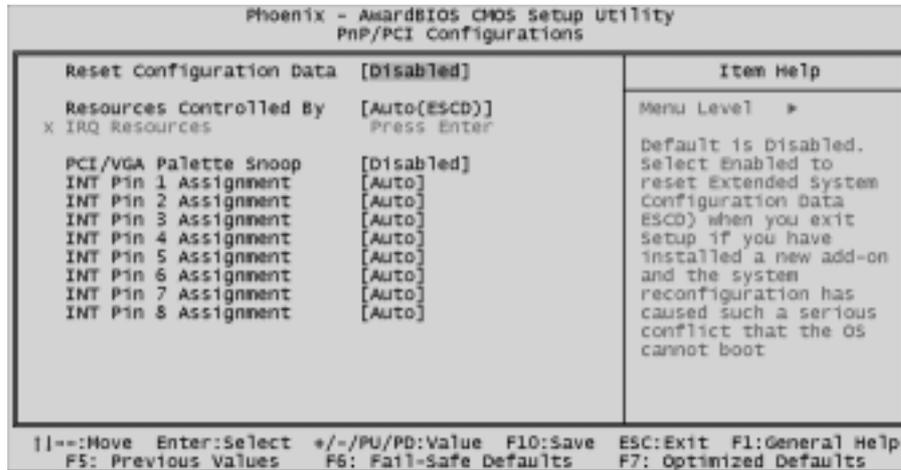
***** Reload Global Timer Events *****

If any of these items is set to Disabled, system will not monitor the activity event and reload global timer. If these items is set to Enabled, system will monitor the system activity event; if any of the events it monitored, it will cause system to reload global timer. These items include Primary IDE0/1, Secondary IDE 0/1, Floppy Disk, Serial Port, Parallel Port, and PCI PIRQ[A-D]#.

- The choice: Disabled or Enabled.



PnP/PCI Configurations



This section describes the configuration of PCI bus system. PCI or Personal Computer Interconnection is a system which allows I/O devices to operate at the speed CPU itself keeps when CPU communicating with its own special components. This section covers some very technical items, and it is strongly recommended that only experienced users should make any changes to the default settings.

Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit from Setup if you have installed a new device or software and the system reconfiguration has caused such a serious conflict that the operating system can not boot.

- The choice: Enabled or Disabled .

Resource controlled By

The Award Plug-and-Play BIOS has the capacity to automatically configure all of the boot and Plug-and-Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug-and-Play operating system such as Windows 95. If you set this field to "manual" , choose specific resources by going into each of the sub-menu that follows this field (a sub-menu is preceded by a ">").

- The choice: Auto(ESCD) or Manual.

IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

IRQ3/4/5/7/9/10/11/12/14/15 assigned

This item allows you to determine the IRQ assigned to the ISA bus and is not available to any PCI slot. Legacy ISA for devices is compliant with the original PC AT bus specification; PCI/ISA PnP for devices is compliant with the Plug-and-Play standard whether designed for PCI or ISA bus architecture.

- The choice: PCI Device or Reserved.

PCI/VGA Palette Snoop

Leave this field Disabled.

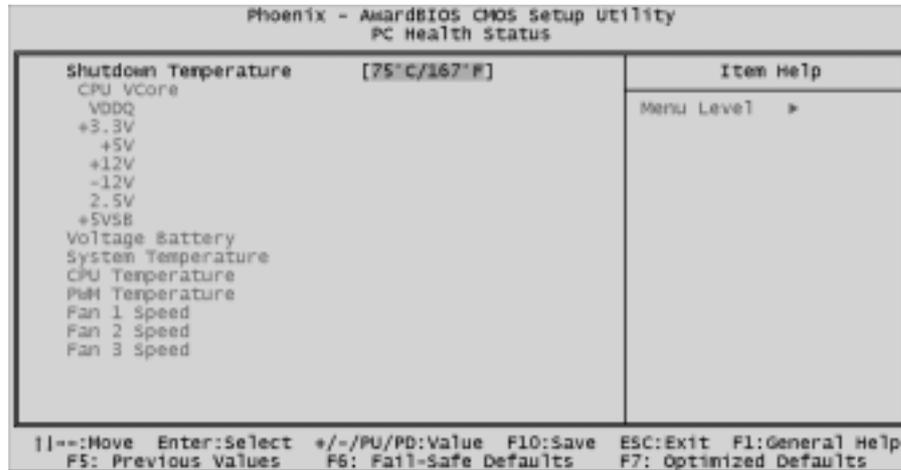
- The choice: Enabled or Disabled.

INT Pin 1/2/3/4/5/6/7/8 Assignment

Names the interrupt request (IRQ) line assigned to PCI 1 through PCI 8 on system. Activity of selected PCI slot awakens system.

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

PC Health Status



Shutdown Temperature

Enables you to set the maximum temperature the system can reach before powering down.

- The choice: 60°C/140°F, 65°C/149°F, 70°C/158°F, 75°C/167°F.

System Component Characteristics

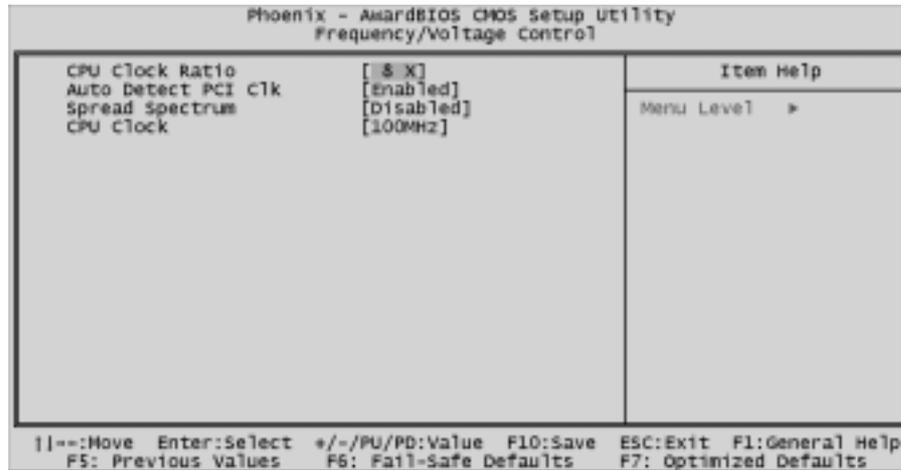
These fields provide you with information about the systems current operating status. You cannot make changes to these fields.

The fields include:

CPU Vcore	Fan 1 Speed
VDDQ	Fan 2 Speed
+3.3V	Fan 3 Speed
+5V	
+12V	
-12V	
2.5V	
+5VSB	
Voltage Battery	
System Temperature	
CPU Temperature	
PWM Temperature	



Frequency/Voltage Control



CPU Clock Ratio

This item allows you to adjust CPU Ratio.

Min: 8

Max: 50

- Key in a DEC number: (Between Min and Max.)

Auto Detect PCI Clk

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

- The choice: Enabled, or Disabled.

Spread Spectrum

This item allows you to enable/disable the spread spectrum modulation.

- The choice: Enabled, or Disabled.

CPU Clock

This item allows the user to adjust CPU Host Clock from 100 MHz to 166 MHz by 1 MHz step.

Min: 100 MHz

Max: 165 MHz

- Key in a DEC number: (Between Min and Max.)



Load Fail-Safe Defaults

When you press <Enter> on this item, you will get a confirmation dialog box with a message similar to:

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

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



Load Optimized Defaults

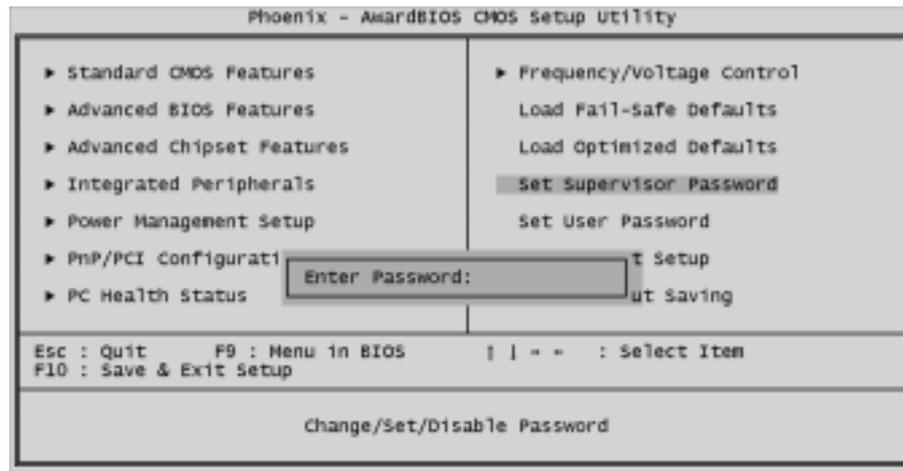
When you press <Enter> on this item, you will get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N) ? N

Pressing 'Y' loads the default values that are factory-set for optimal performance system operation.

Supervisor/User Password Setting

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



Supervisor Password and User Password

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 options, whereas User mode has restricted access to the options. By setting separate Supervisor and User password, a system supervisor can limit who can 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 in entering the password whenever the system is rebooted or 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, please refer to "Clear CMOS" on page 30.

 **Save & Exit Setup**

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 - a special section of memory that stays on after you turn your system off. The 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.

 **Exit Without Saving**

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit from Setup without storing in CMOS any change. The previous selections remain in effect. This exits from the Setup utility and restarts your computer.