



Professional

MANUAL

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Notices

Federal communications Commission Statement

This device complies with FCC Rules part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the Party responsible for compliance could void the user's authority to Operate this equipment

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If Possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

specification summary*

CPU	Socket 478 for Intel Pentium 4 Northwood/Willamette processor Intel Hyper-Threading technology ready New power design for next generation Intel Prescott CPU
Chipset	SiS661 FX SiS963L
Front Side Bus (FSB)	800/533/400 MHz
Memory	2 x 184-pin DDR DIMM sockets for up to 2GB memory Supports PC3200/2700/2100 unbuffered non-ECC DDR DIMMs.
Expansion slots	1 x AGP 8x/4x (1.5V only) 3 x PCI
VGA	SiS Real 256E integrated graphics
Storage	2 x Ultra ATA 133, PLO Mode 0~4
Audio	ADI AD1888 6-channel audio CODEC
LAN	Integrated MAC with VIA 6103L 10/100 LAN PHY
Hardware monitoring	Super I/O integrated monitoring of CPU/chassis fan rotation and MB/CPU temperature
Special features	Power loss restart Digital audio via an S/SDIF out interface
Rear panel I/O	1 x Parallel port 1 x Serial port 1 x Video port 1 x PS/2 keyboard port 1 x PS/2 mouse port 1 x RJ-45 port 4 x USB 2.0/USB 1.1 ports Line In/Line Out/Microphone ports
Internal I/O	1 x USB 2.0 connector for additional two USB ports CPU and chassis fan connectors 20-pin/4-pin ATX 12V power connectors CD/AUX audio connectors S/PDIF out connector Front panel audio connector Panel connector Speaker out connector GAME/MIDI connector Power LED connector**

(Continued on the next page.)

* Specifications are subject to change without notice.

** Present only on PGB versions 1.03 or later.

specification summary

BIOS features	2Mb Flash EEPROM, DMI, features, SM BIOS 2.3, WfM 2.0, ASUS CrashFree BIOS, ASUS EZ Flash, and ASUS C.P.U. (CPU Parameter Recall)
Industry standard	PCI 2.2, USB 2.0/1.1
Manageability	WOL/WOR by PME, Wake on USB KB/Mouse
Form Factor	Micro-ATX form factor: 9.6 in x 9.6 in (24.5 cm x 24.5 cm)
Support CD contents	Device drivers PC Probe LiveUpdate Screensaver Adobe Acrobat Reader Trend Micro™ PC-cillin 2002 anti-virus software Microsoft DirectX 8.1

About this guide

Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this guide.



WARNING: Information to prevent injury to yourself when trying to complete a task.



CAUTION: Information to prevent damage to the components when trying to complete a task.



IMPORTANT: Information that you MUST follow to complete a task.

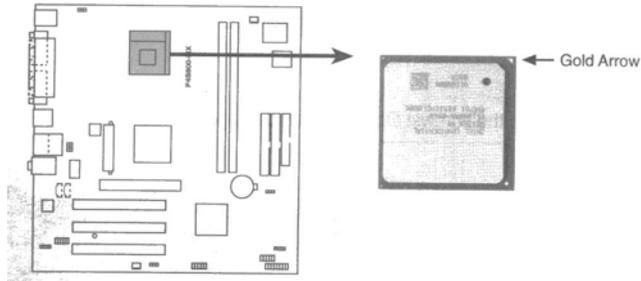


NOTE: Tips and additional information to aid in completing a task.

1.1 Central Processing Unit (CPU)

1.1.1 Overview

The Intel Pentium 4 processor has a gold triangular mark on one corner. This Mark indicates the processor Pin 1 that should match a specific corner of the CPU socket



Incorrect installation of the CPU into the socket may bend the pins and severely damage the CPU!

Note on Intel Hyper-Threading Technology

1. Hyper-Threading Technology is supported under **Windows XP** and **Linux 2.4.x (kernel)** and later versions only. Under Linux, use the Hyper-Threading compiler to compile the code. If you are using any other operating systems, disable the Hyper-Threading Technology item in BIOS to ensure system stability and performance.
2. It is recommended that you install WinXP Service Pack 1.
3. Make sure to enable the Hyper-Threading Technology item in BIOS before installing a supported operating system.
4. For more information on Hyper-Threading Technology, visit www.intel.com/info/hyperthreading.

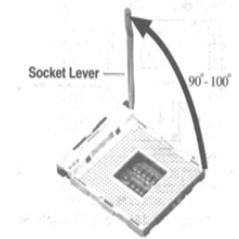
1.1.2 Installing the CPU

Follow these steps to install a CPU.

1. Locate the 478-pin ZIF socket on the motherboard.
2. Unlock the socket by pressing the lever sideways, then lift it up to a 90°-100° angle.



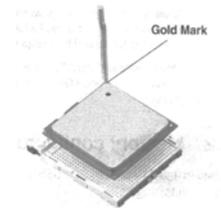
Make sure that socket lever is lifted up to 90°-100° angle, otherwise the CPU does not fit in completely.



3. Position the CPU above the socket such that its marked corner matches the base of the socket lever.
4. Carefully insert the CPU into the socket until it fits in place.



The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!



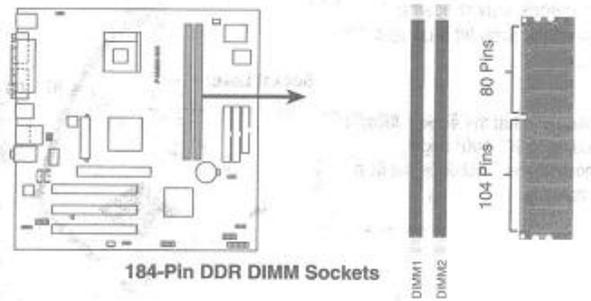
5. When the CPU is in place, push down the socket level to secure the CPU. The level clicks on the side tab to indicate that it is locked.
6. Install a CPU heatsink and fan following the instructions that came with the heatsink package.
7. Connect the CPU fan cable to the CPU_Fan1 connector on the Motherboard.



1.2 System memory

1.2.1 DIMM sockets location

The following figure illustrates the location of the DDR DIMM sockets.



Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

When installing long AGP cards, it is recommended to install the memory modules first. Long AGP cards, when installed, may interfere with the memory sockets.

1.2.2 Memory configurations

You may install 64MB, 128MB, 256MB, 512MB, and 1 GB DDR DIMMs into the DIMM sockets.



Obtain DDR DIMMs only from qualified vendors. Refer to the Qualified DDR400 vendors list next page. Visit for the Latest DDR Qualified Vendors List.

Table 1 Qualified DDR400 vendors list

This table lists the memory modules that have been tested and qualified for use with this motherboard.

Size	Vendor	Part Number	Chip Brand	Side/s*	Chip Number
512MB	MICRON	MT16VDDT16464AG-40B4	MICRON	DS	MT146V32M8TG-5BC
512MB	CENTURY	DXV2S8SSCCE3K27E	SAMSUNG	DS	K4H560838E-TCCC
256MB	CENTURY	DXV6S8MC5BC3U27E	MICRON	SS	MT146V32M8TG-5BC
256MB	BRAIN POWER	B6U808-256M-SAM-400	SAMSUNG	SS	K4H560838D-TCC4
256MB	A Transcend	TS32MLD64V4F3	MOSEL	SS	V58C2256804SA15
256MB	Apacer	77.10636.465	SAMSUNG	SS	K4H560838D-TCC4
256MB	ATP	AG32L64T8SOC4S	SAMSUNG	SS	K4H560868D-TCC4
256MB	NANYA	NT256D64S88B1G-5T	NANYA	SS	NT5DS32M8BT-5T
256MB	MICRON	MT18VDDT3264AG-40BC4	MICRON	SS	MT146V32M8TG-5BC
512MB	elixir	M2U25664DS8HB3G-5T	elixir	DS	N2DS25680BT-5T

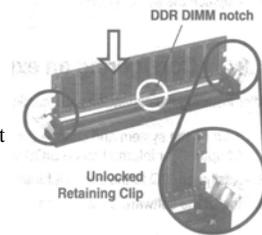
* Side/s:

DS-Double-sided
SS-Single-Sided

1.2.3 Installing a DIMM

Follow these steps to install a DIMM.

1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.

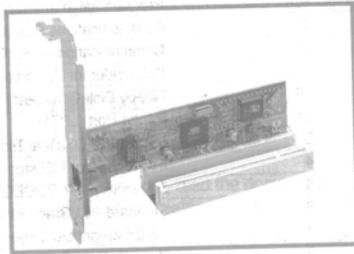


A DDR DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

1.3 Expansion slots

1.3 PCI slots

The PCI slots support PCI cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications.



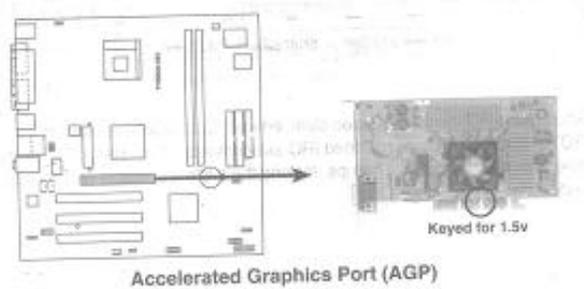
1.3.1 AGP slot

The Accelerated Graphics Port (AGP) slot that supports AGP 8X/4X (+1.5V) cards. When you buy an AGP card, make sure that you ask for one with +1.5V

Note the notches on the card golden fingers to ensure that they fit the AGP slot on the motherboard.



This motherboard does not support 3.3V AGP cards. Install only +1.5V AGP cards



1.4 Jumpers

1. Clear RTC RAM (CLRTC1)

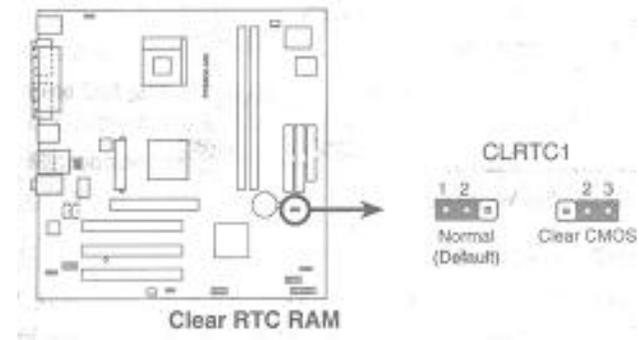
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The RAM data in CMOS, that include system setup information such as system passwords, is powered by the onboard button cell battery.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5–10 seconds, then move the cap back to pins 1-2.
3. Plug the power cord and turn ON the computer.
4. Hold down the key during the boot process and enter BIOS setup to re-enter data.



Except when clearing the RTC RAM, never remove the cap on CLRTC1 jumper Default position. Removing the cap will cause system boot failure!



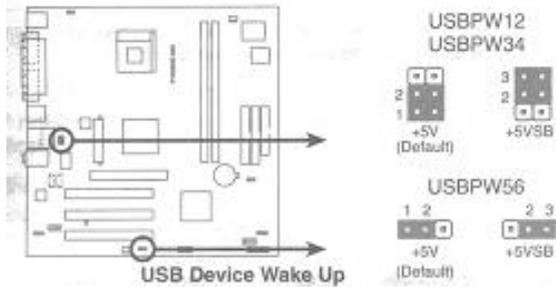
2. USB device wake-up (3-pin USBPW12, USBPW34, USBPW56)

Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to from S3 sleep mode (no power to CPU, DRAM in slow refresh, power supply in reduced power mode). Both jumpers are set to pins 1-2 (+5V) by default because not all computers have the appropriate power supply to support this feature.

The USBPW_12 and USBPW_34 jumpers are for the rear USB ports. The USBPW_56 jumper is for the internal USB header that you can connect to the Front USB ports.

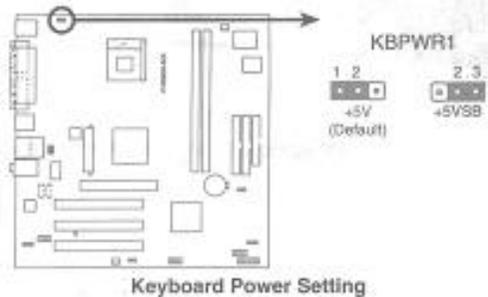


1. This feature requires a power supply that can provide at least 1 A on the +5VSB lead when these jumpers are set to +5VSB. Otherwise, the system would not power up.
2. The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.



3. Keyboard power (3-pin KBPWR1)

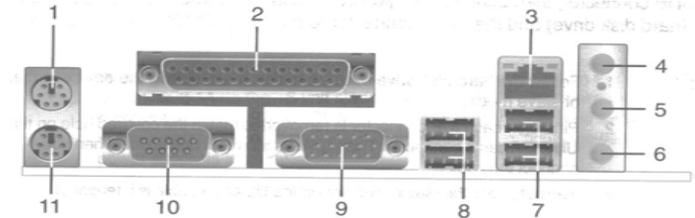
This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) if you wish to wake up the computer when you press a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS (see 2.5.5 “APM Configuration”).



1.5 Connectors

This section describes and illustrates the motherboard rear panel and internal connectors.

1.5.1 Rear panel connectors



1. **PS/2 Mouse port.** This green 6-pin connector is for a PS/2 mouse.
2. **Parallel port.** This 25-pin port connects a parallel printer, scanner, or other devices.
3. **RJ-45 port.** This port allows connection to a Local Area Network (LAN) through a network hub.
4. **Line In jack.** This Line In (light blue) jack connects a tape player or other audio sources. In 6-channel mode, the function of this jack becomes Bass/Center
5. **Line Out jack.** This Line Out (lime) jack connects a headphone or a speaker. In 6-channel mode, the function of this jack becomes Front Speaker Out.
6. **Microphone jack.** This Mic (pink) jack connects a microphone. In 6-channel Mode, the function of this jack becomes Rear Speaker Out.



The functions of the Line Out, Line In, and Microphone jacks change when you Select the 6-channel audio configuration as shown in the following table.

Audio 2,4 or 6-channel configuration

	Headphone/2-Speaker	4-Speaker	6-Speaker
Light Blue	Line In	Line In	Bass/Center
Lime	Line Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Rear Speaker Out	Rear Speaker Out

Windows 98SE only supports 2-channel speaker configuration.



7. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are Available for connecting USB 2.0 devices.
8. **USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports are Available for connecting USB 2.0 devices.
9. **VGA port.** This port connects a VGA compatible monitor.
10. **Serial port.** This 9-pin COM port is for pointing devices or other serial devices.
11. **PS/2 keyboard port.** This purple connector is for a PS/2 keyboard.

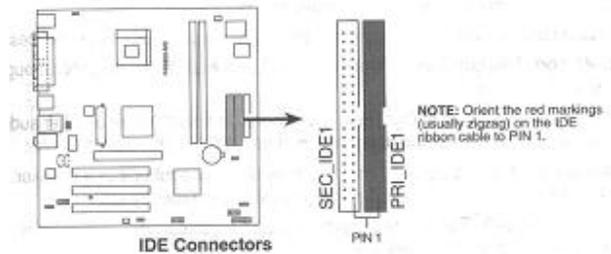
1.5.2 Internal connectors

1. IDE connectors (40-pin PRI_IDE1, SEC_IDE1)

This connector supports the provided Ultra ATA 133 IDE hard disk ribbon cable. Connect the cable's blue connector to the primary (recommended) or secondary IDE connector, then connect the gray connector to the UltraATA 133 slave device (hard disk drive) and the black connector to the UltraATA 133 master device.

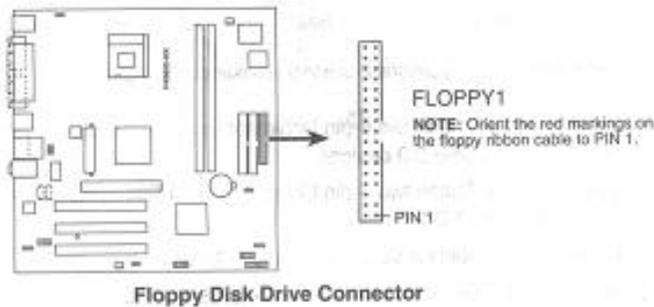


1. Follow the hard disk drive documentation when setting the device in master or slave mode.
2. Pin 20 on each IDE connector is removed to match the covered hole on the Ultra ATA cable connector. This prevents incorrect orientation when you connect the cables.
3. The hole near the blue connector on the Ultra ATA cable is intentional.



2. Floppy disk drive connector (34-pin FLOPPY1)

This connector supports the provided floppy drive ribbon cable. After connecting one end to the motherboard, connect the other end to the floppy drive. (Pin 5 is removed to prevent incorrect insertion when using ribbon cables with pin 5 plug).

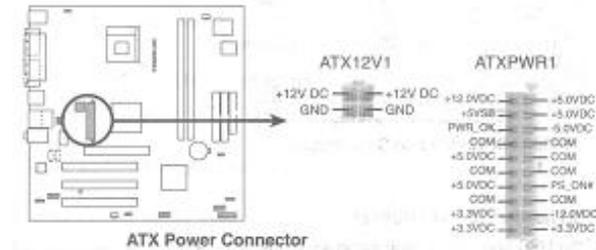


3. ATX power connectors (20-pin ATXPWR1, 4-pin ATX12V1)

These connectors connect to an ATX 12V power supply. The plugs from the power supply are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit. In addition to the 20-pin ATXPWR connector, this motherboard requires that you connect the 4-pin ATX +12V power plug to provide sufficient power to the CPU.

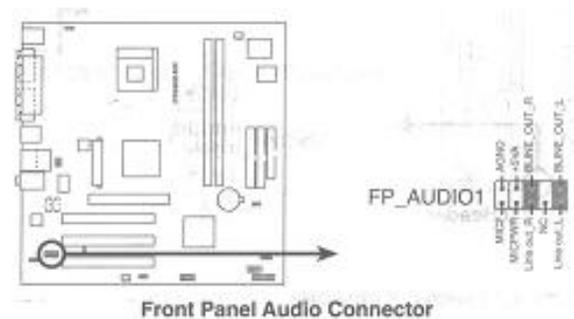


Make sure that your ATX 12V power supply can provide 8A on the +12V lead and at least 1A on the +5-volt standby lead (+5VSB). The Minimum recommended wattage is 230W, or 300W, or 300W for a fully configured system. The system may become unstable and may experience difficulty powering up if the power supply is inadequate.



4. Front panel audio connector (10-pin FP_AUDIO 1)

This is an interface for the front panel cable that allows convenient connection and control of audio devices. By default, the pins labeled LINE_OUT_R/BLINE_OUT_R and the LINE_OUT_L/BLINE_OUT_L are shorted with jumper caps. Remove the caps Only when you are connecting the front panel audio cable.

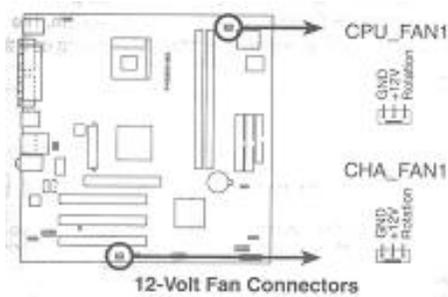


5. CPU and chassis fan connectors (3-pin CPU_FAN1, CHA_FAN1)

The fan connectors support cooling fans of 350mA~740mA (8.88W max.) or a total of 1A~2.22A (26.64W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.

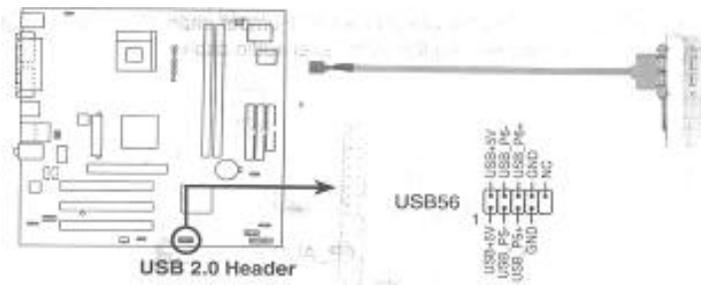


Do not forget to connect the fan cables to the fan connectors. Lack of sufficient Air flow within the system may damage the motherboard components. These Are not jumpers! DO NOT place jumper caps on the fan connectors!



6. USB header (10-1 pin USB 56)

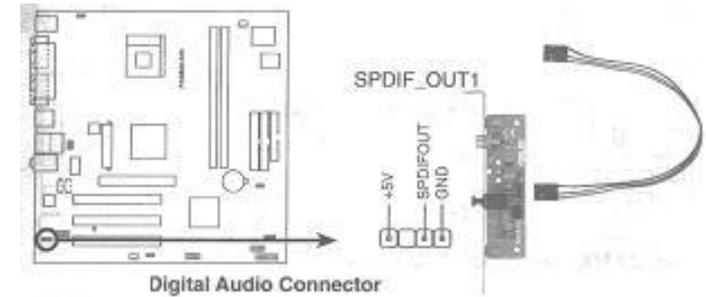
If the USB port on the rear panel are inadequate, a USB header is available for additional USB ports. Connect the USB cable of an optional USB 2.0 module to this header. You may install the USB module in the chassis front panel. The module has two USB 2.0 ports for connecting next generation USB peripherals such as high resolution cameras, scanners, and printers.



The USB module is purchased separately.

7. Digital audio connector (4-1 pin SPDIF_OUT1)

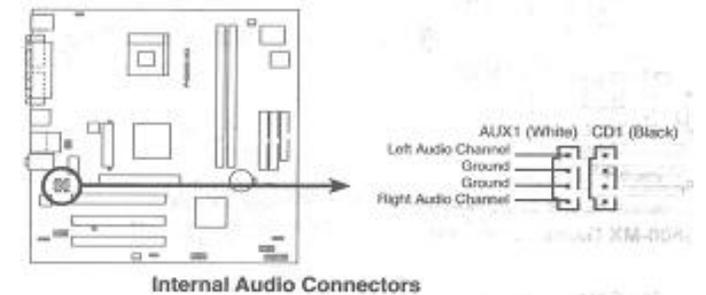
In addition to the S/PDIF Out port on the rear panel, an S/PDIF Out connector is available for an S/PDIF audio module. Connect one end of the S/PDIF audio cable to this connector and the other end to the S/PDIF module.



The S/PDIF module is purchased separately.

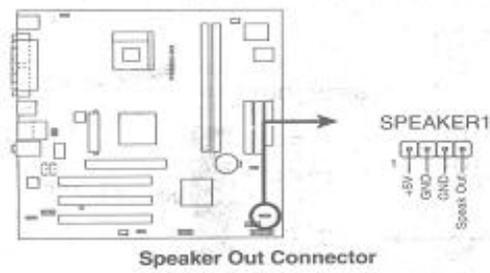
8. Internal audio connectors (4-pin AUX1, CD1)

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



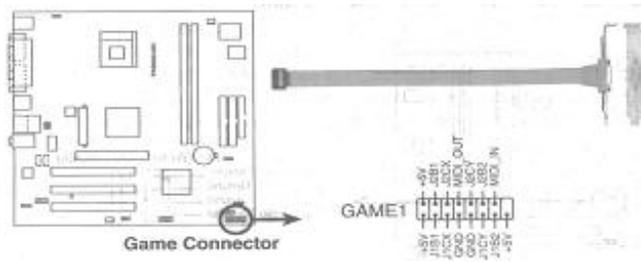
9. Speaker out connector (4-pin SPEAK1)

This connector connects to the case-mounted speaker and allows you to hear system beeps and warnings.



10. GAME/MIDI connector (16-pin GAME1)

This connector supports a GAME/MIDI module. Connect the GAME/MIDI cable with yellow connector to the yellow header onboard. The GAME/MIDI port on the module connects a joystick or a game pad for playing games, and MIDI devices for playing or editing audio files.



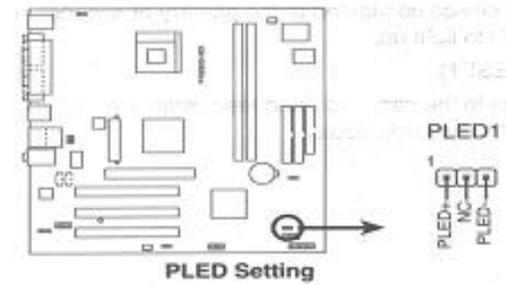
The GAME module is purchased separately.

11. Power LED Lead (3-1 pin LED1)

This 3-1 pin connector is for the system power LED. Connect the 3-pin power LED cable from the system chassis to this connector. The LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

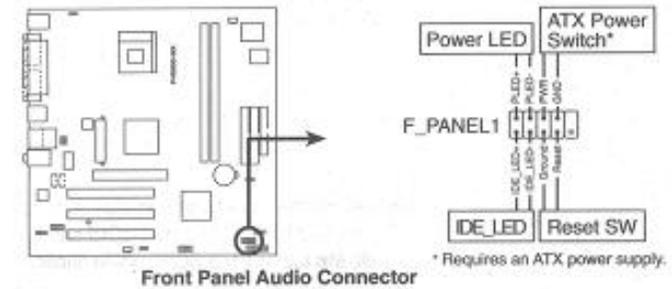


The power LED lead (PLED1) is present only on PCB versions 1.03 or later.



12. System panel connector (10-1 pin F_PANEL1)

This connector accommodates several system front panel functions.



* Requires an ATX power supply.

Power LED Lead (2-pin PWR_LED)

This 2-pin connector connects to the system power LED. The LED lights up when you turn on the system power, and blinks when the system is in sleep mode. If your motherboard package comes with a 2-pin to 3-pin power LED converter, Connect the 2-pin plug to this connector, and the other end to the 3-pin power LED plug from the system chassis.

- **Power Switch / Soft-Off Switch Lead (2-pin PWR_BTN)**
This connector connects a switch that controls the system power. Pressing the power switch turns the system between ON and SLEEP, or ON and SOFT OFF, depending on the BIOS or OS settings. Pressing the power switch while in the ON mode for more than 4 seconds turns the system OFF.
- **IDE LED Lead (2-pin IDE_LED)**
This 2-pin connector supplies power to the hard disk drive activity LED. The read or write activities of any device connected to the primary or secondary IDE connector cause this LED to light up.
- **Reset Switch Lead (2-pin RESET)**
This 2-pin connector connects to the case-mounted reset switch for rebooting the system without turning off the system power.