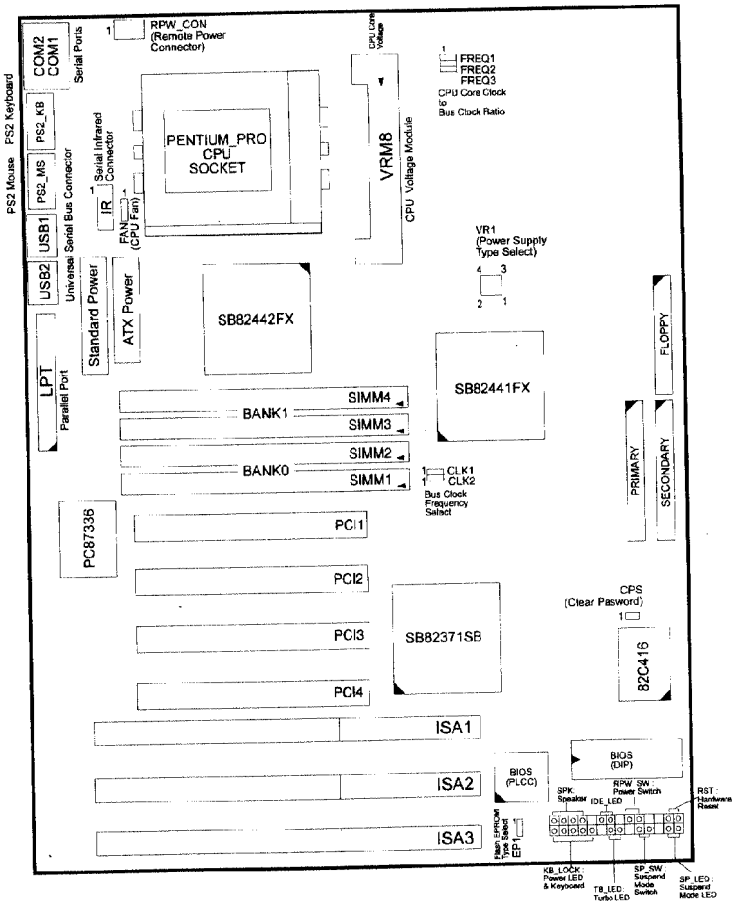
Mainboard Layout



JUMPERS

CPS	P2-5	2-pin male	To clear password
CLK1, 2	P2-11	3-pin male	To set the external frequency of the CPU
EP1	P2-5	3-pin male	To select the flash EPROM voltage and size
FREQ1, 2, 3	P2-11	3-pin male	To set the internal frequency of the CPU
VR1	P2-12	4-pin male	To select types of the power supply

SLOTS

ISA	P2-13	A 16-bit ISA Bus expansion slot
PCI	P2-13	A 32-bit PCI Bus expansion slot
SIMM	P2-8	DRAM memory expansion slot

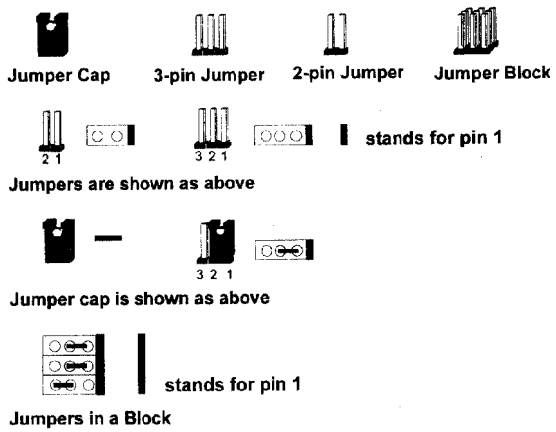
CONNECTORS

COM1, 2	P2-15	10-pin male	To be connected with the serial port device
FAN	P2-15	3-pin male	To supply 12V for the CPU fan power
FLOPPY	P2-16	34-pin block	To be connected with the floppy disk drive
F_PNL	P2-16	22-pin block	Includes PW_LED, KB_LOCK, TB_LED, SP_SW, SPK, SP_LED, IDE_LED, RST, RPW_SW connectors
IR	P2-17	10-pin male	To allow the SIR data communication
LPT	P2-19	26-pin block	To be connected with the printer
POWER	P2-18	(two options)	To be connected with the power supply
PRIMARY, SECONDARY	P2-19	40-pin block	To be connected with the IDE HDD
PS2_KB	P2-20	6-pin female	To be connected with the PS/2 keyboard
PS2_MS	P2-20	6-pin female	To be connected with the PS/2 mouse
RPW_CON	P2-21	3-pin block	To be connected with a remote power supply
USB1, 2	P2-21	4-pin male	To provide a port that allows you to attach a USB hub

1). Set System Jumpers

Jumpers

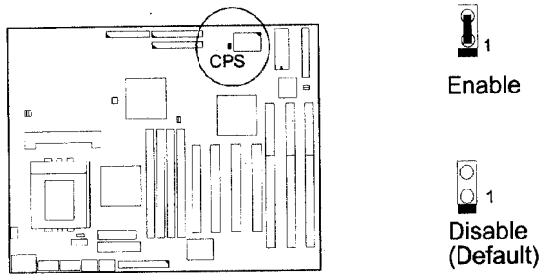
Jumpers are used to select the operation modes for your system. Some jumpers on the board have three metal pins with each pin representing a different function. To "set" a jumper, a black cap containing metal contacts is placed over the jumper pin/s according to the required configuration. A jumper is said to be "shorted" when the black cap has been placed on one or two of its pins. The types of jumpers used in this manual are shown below:



→ **NOTE : Users are not encouraged to change the jumper settings not listed in this manual. Changing the jumper settings improperly may adversely affect system performance.**

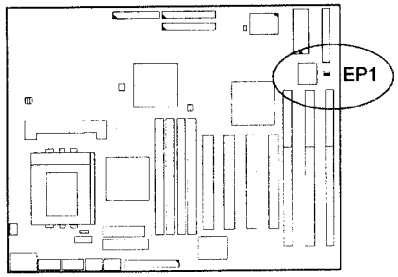
Clear Password: CPW

This jumper allows you to set the password configuration to "Enabled" or "Disabled". You may need to enable this jumper if you forget your password.



Flash EPROM: EP1

These two jumpers allow you to select the flash EPROM voltage and size.



	12V	5V
EP1		(Default)

2). Install DRAM Modules

DRAM Memory

The working space of the computer is the Random Access Memory. The system cannot act upon data unless it is loaded into RAM. A system RAM is comprised of industry-standard 72-pin Single In-line Memory Modules (SIMMs).

Occasionally the system must break apart data files because the entire file can not be fitted into the RAM area. Consequently, when the system needs data that is not in RAM, it must access the disk where the balance of the data is stored.

EDO memory is the latest DRAM chip designs that perform a lot better than the fast page mode DRAM type. With EDO memory, CPU access to memory is 10 to 15% faster.

When more RAM is added, the working area of the computer is larger, thereby increasing total performance. You should verify the type and speed of the RAM currently installed from your dealer. Mixtures of RAM types, other than those described in this manual, will have unpredictable results.

The PN-6010 is able to support standard FPM (Fast Page Mode) or EDO (Extended Data Out) DRAM; and can accommodate onboard memory from 8 to 512MB using SIMMs (Single-In-Line Memory Modules). The mainboard has two memory banks — Bank 0 and Bank 1. Each bank has two SIMM sockets which can accept either a pair of 4MB, 8MB, 16MB, 32MB, 64MB or 128 MB SIMM in each socket.

Banks 0 and 1 can use different types of SIMMs (e.g., 4 or 16MB). However, you must populate each memory band width the same type of SIMM.

DRAM Configuration

DRAM modules can be installed in a variety of configurations, as shown below. Since all possible combinations of installation are numerous; it is not necessary to list them all. The installation of any SIMM on Bank 0 or Bank 1 are mutually exchangeable.

TOTAL MEMORY	BANK 0 (72-PIN x 2)	BANK 1 (72-PIN x 2)
8MB	4MB & 4MB	
16MB	8MB & 8MB	
	4MB & 4MB	4MB & 4MB
24MB	8MB & 8MB	4MB & 4MB
32MB	8MB & 8MB	8MB & 8MB
	16MB & 16MB	
40MB	16MB & 16MB	4MB & 4MB
48MB	16MB & 16MB	8MB & 8MB
64MB	16MB & 16MB	16MB & 16MB
	32MB & 32MB	
72MB	32MB & 32MB	4MB & 4MB
80MB	32MB & 32MB	8MB & 8MB
96MB	32MB & 32MB	16MB & 16MB
128MB	32MB & 32MB	32MB & 32MB
	64MB & 64MB	
256MB	64MB & 64MB	64MB & 64MB
512MB	128MB & 128MB*	128MB & 128MB*

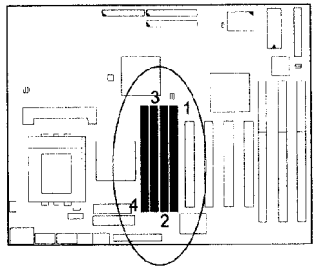
→ **NOTE :**
1. All memory banks use 72-pin memory modules.
2. * A SIMM of this size was not available yet for testing when this book was printed.

Install SIMMs

Complete the following procedures to install SIMMs:

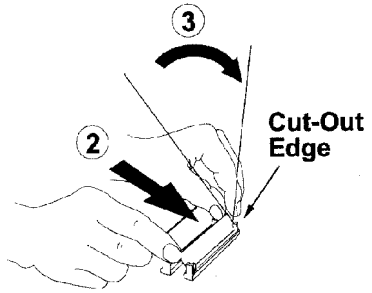
> **CAUTION :**
> **1. Always turn the system power off before installing or removing any device.**
> **2. Always observe static electricity precautions. See "Handling Precautions" at the start of this manual.**

1. Locate the SIMM banks on the mainboard. (See figure below.)



> **NOTE :**
> **1. SIMMs in each bank must be of the same type.**
> **2. The BIOS automatically configures the memory size.**

2. Carefully fit a SIMM at a 45 degree angle into each of the empty sockets. All the SIMMs should be facing the same direction.
3. Swing each SIMM into its upright, locked position. When locking a SIMM in place, push on each end of the SIMM - do not push in the middle.



Remove SIMMs

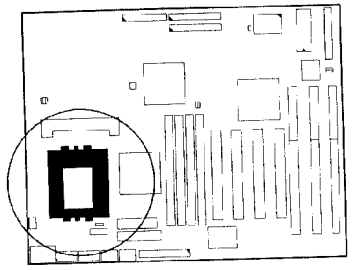
To remove the SIMMs, pull the retaining latch on both ends of the socket and reverse the procedure above.

Cache Memory

The PN-6010 utilizes the built-in Level 2 cache RAM of 256KB/512KB in the Pentium Pro processor. Every time the CPU wants to write data to the external memory, if the location in RAM is a "**hit**", it writes this data to the cache RAM directly, not to the DRAM, thereby enhancing system performance.

3). Install the CPU

The CPU module resides in a Zero Insertion Force (ZIF) socket on the mainboard.



CAUTION :
1. **Always turn the system power off before installing or removing any device.**
2. **Always observe static electricity precautions. See "Handling Precautions" at the start of this manual.**
3. **Inserting the CPU chip incorrectly may damage the chip.**

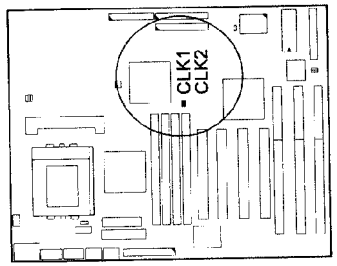
To install the CPU, do the following:

1. Lift the lever on the side of the CPU socket.
2. Handle the chip by its edges and try not to touch any of the pins.
3. Place the CPU in the socket. The chip has a notch to correctly orientate the chip. Align the notch with pin one of the socket. Pin one is located next to the blank triangular area.
   Do not force the chip. The CPU should slide easily into the socket.
4. Swing the lever to the down position to lock the CPU in place.
5. See the following sections for information on the CPU jumper settings.

Select Frequency and Voltage

CPU External Clock (BUS) Frequency: CLK1 and CLK2

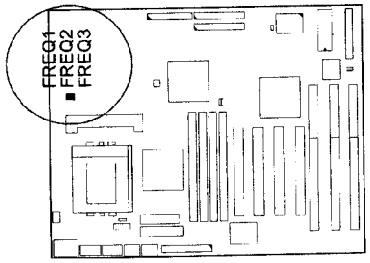
The table below shows the jumper settings for the different CPU speed configurations. Set the corresponding external clock and CPU clock rate jumpers according to the CPU speed of the system by following the table below. The External and Internal Clock multiple column values are for your reference.



External (CPU/CLK)	CLK1	CLK2
66 MHz		
60 MHz		

CPU to Bus Frequency Ratio: FREQ1, FREQ2, and FREQ3

These two jumpers, in combination, are used to decide the ratio of the internal frequency of the CPU to the bus clock.



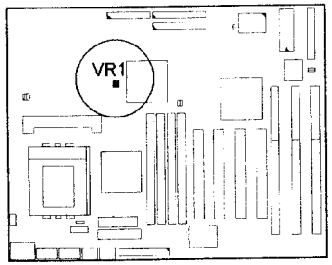
Internal	CPU Clock Rate		
	FREQ1	FREQ2	FREQ3
4 x Ext.			
3.5 x Ext.			
3 x Ext.			
2.5 x Ext.			

Intel Pentium Pro CPUs

CPU Speed	External (CPU/CLK)	CLK1	CLK2	Internal	CPU Clock Rate		
					FREQ1	FREQ2	FREQ3
200 MHz	66 MHz			3 x Ext.			
180 MHz	60 MHz			3 x Ext.			
166 MHz	66 MHz			2.5 x Ext.			
150 MHz	60 MHz			2.5 x Ext.			

Power Supply Type Select: VR1

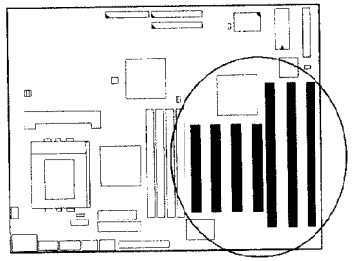
This jumper allows you to select the type of the power supply.



	ATX Power Supply (Default)	Standard Power
VR1	3 1 4 2	3 1 4 2

4). Install Expansion Cards

Your PN-6010 features three 16-bit ISA Bus and four 32-bit PCI Bus expansion slots. (See figure below.) This section describes how to connect an expansion card to one of your system's expansion slots. Expansion cards are printed circuit boards that, when connected to the mainboard, increase the capabilities of your system. For example, expansion cards can provide video and sound capabilities.

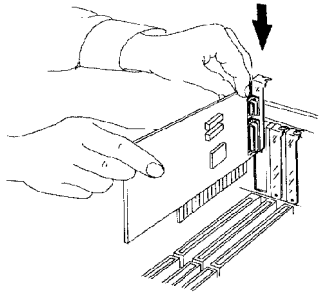


→ **CAUTION :**
1. **Always turn the system power off before installing or removing any device.**
2. **Always observe static electricity precautions. See "Handling Precautions" at the start of this manual.**

To install an expansion card, do the following:

1. Remove the chassis cover and select an empty expansion slot.
2. Remove the corresponding slot cover from the chassis. Unscrew the mounting screw that secures the slot cover and pull the slot cover out from the chassis, as shown in the following figure. Keep the slot cover mounting screw nearby.

3. Holding the edge of the peripheral card, carefully align the edge connector with the expansion slot. (See figure below.)



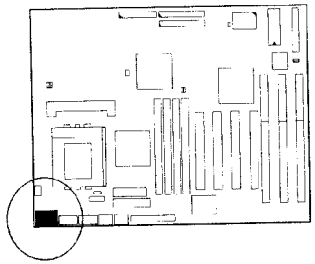
4. Push the card firmly into the slot. Push down on one end of the expansion card, then the other. Use this "rocking" motion until the add-in card is firmly seated inside the slot.
5. Secure the board with the mounting screw removed in Step 2. Make sure that the card has been placed evenly and completely into the expansion slot.

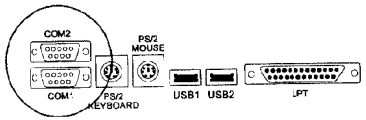
5). Connect Cables and Power Supply

Connectors allow the mainboard to link electronically with other parts of the system. Some malfunction problems encountered may be caused by loose or improper connections. Ensure that all connections are in place and firmly attached.

Serial Port Connectors: COM1 and COM2

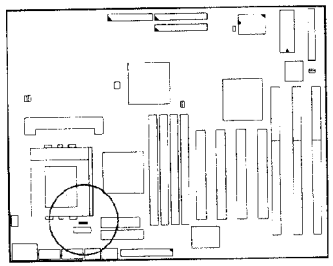
These two 10-pin male connectors allow you to connect your devices that use serial ports, such as a serial mouse or a modem. The COM2 Port on the mainboard can also be used as another IR Port. Usually, your serial mouse is attached to COM1. Your modem is linked to COM2. When you do not use the modem, you can set the BIOS to let COM2 be an IR port to save a dedicated SIR port.

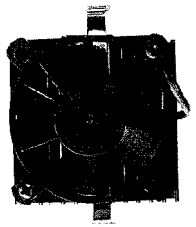


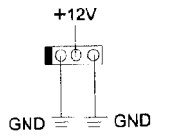


CPU Fan Connector: FAN

This 3-pin male connector is linked to the CPU fan.

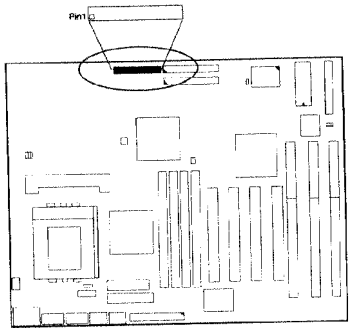






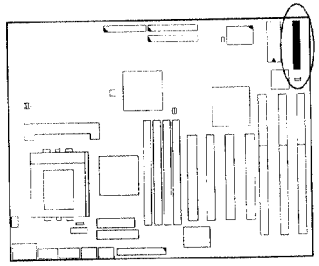
Floppy Disk Drive Connector: FLOPPY

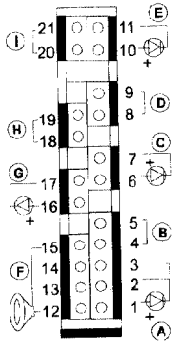
This 34-pin block connector connects to your floppy disk drive (FDD) using the cable that is provided with this mainboard.



Block Connector: F_PNL

This block connector concludes : PW_LED, KB_LOCK, TB_LED, SP_SW, SPK, SP_LED, IDE_LED, RPW_SW, and RST connectors.

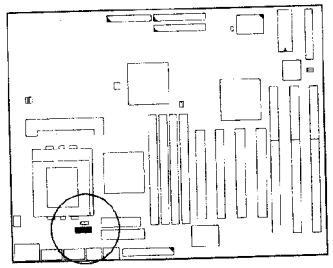




Item	Connector	PIN TYPE	Function
A	PW_LED	2-pin male	Power LED, indicates the system power on/off status. LED lit : power on
B	KB_LOCK	2-pin male	Keyboard Lock, allows the keyboard to access the system.
C	TB_LED	2-pin male	Turbo Speed LED, indicates the system speed is in normal or turbo speed. LED lit : turbo speed
D	SP_SW	2-pins male	Suspend Mode Switch
E	SP_LED	2-pins male	Suspend LED, indicates the system into suspend mode when LED lit.
F	SPK	4-pins male	Speaker, connects to the speaker.
G	IDE_LED	2-pin male	IDE HDD LED, indicates the IDE HDD I/O access. LED lit : IDE HDD read / write
H	RPW_SW	2-pin male	Remote Power Switch
I	RST	2-pin male	Hardware Reset Switch, to reset the system.

Infrared Connector: IR

This 10-pin male connector is used for connecting to the infrared (SIR) port and allows transmission of data to another system which also supports the SIR feature.

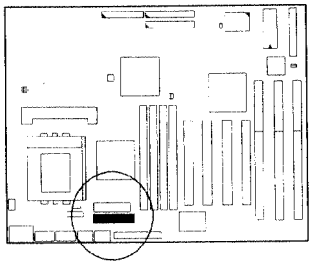


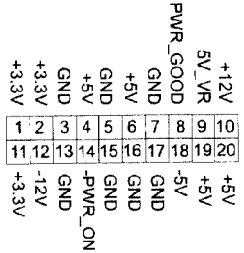
Power Block Connector: POWER

This mainboard allows you to use either ATX power supply (default) or standard power supply.

ATX Power Supply Connector

The former one is a 20-pin male block connector used for connecting to your ATX 12V power supply.

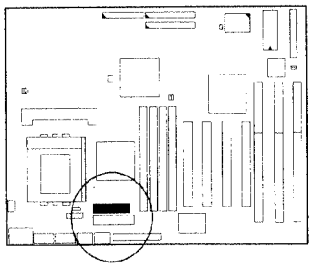


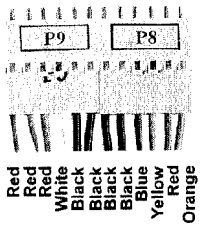


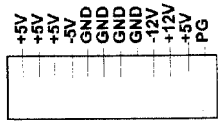
Power Connector

Standard Power Supply

This 12-pin block connector is used for connecting to your standard 5V power supply. In the picture below, notice that, in most cases, there are two marks "P8" and "P9" on the surface of the connector. You have to insert the "P8"plug into the "P8" section of the connector, and so forth for "P9". Two black wires must be in the middle.







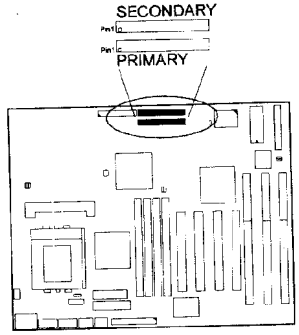
Power Plugs of Power Supply

Power Connector

Please refer to page 2-12, VR1, if you install this type of power supply.

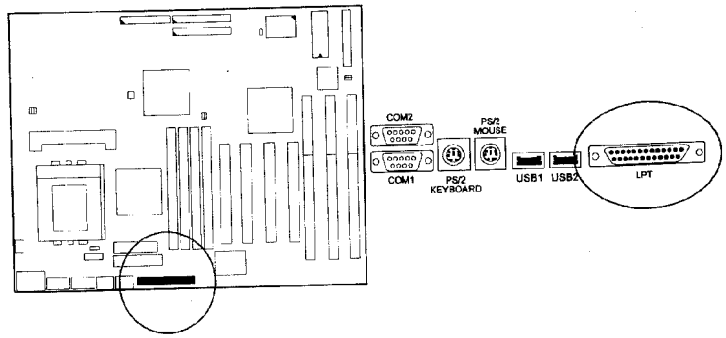
IDE HDD Device Connectors: PRIMARY and SECONDARY

This two 40-pin block connectors are used for your IDE hard disks. It you have one IDE hard disk, connect it to the PRIMARY connector using the IDE HDD flat cable provided with the mainboard. The BIOS auto detection sets it to be a "Primary Master" disk. If you want to install another IDE hard disk or CD-ROM, please use the SECONDARY connector. If two hard disks are connected to the PRIMARY connector using the same cable, one of them is the master drive, the other one is the slave drive. You may need to set jumpers for the slave drive; please refer to the HDD manual for details.



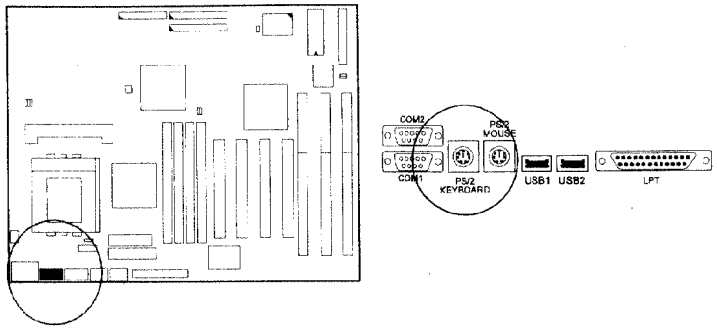
Printer Block Connector: LPT

This 26-pin D-Sub female connector is connected to your printer.



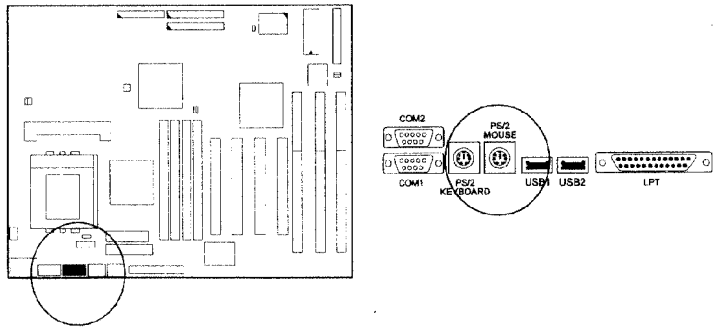
PS/2 Keyboard Connector: PS2_KB

This 5-pin female connector is used for your PS/2 keyboard.



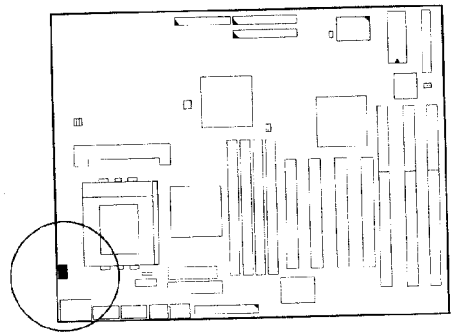
PS/2 Mouse Connector: PS2_MS

This 5-pin female connector is used for your PS/2 mouse.



Remote Power Connector: RPW_CON

This 3-pin male connector allows you to enable or disable the system power if the RPW_SW is on or off. (This allows you to adapt the remote power switch feature. Please contact your dealer for further information.)



Universal Serial Bus Connector: USB1 and USB2

This connects to the port that allows you to attach a USB hub. The USB1 and USB2 connectors are built-in for future upgrade of devices or peripherals that support Universal Serial Bus features.