Installation Procedures

The PA-2010+ has several user-adjustable jumpers on the board that allow you to configure your system to suit your requirements. This chapter contains information on the various jumper settings on your mainboard.

To set up your computer, you should follow these installation steps:

■   Step 1 -
    Set system jumpers

■   Step 2 -
     Install System RAM modules

■   Step 3 -
    Install the CPU

■   Step 4 -
    Install expansion cards

■   Step 5 -
    Connect cables and power supply

■   Step 6 -
    Set up BIOS feature (Please read Chapter Three.)

Mainboard Layout

# 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:

Jumper cap is shown as above

stands for pin 1

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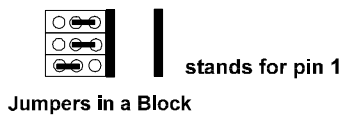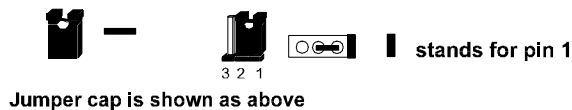
NOTE : Users are not encouraged to change the jumper settings not listed in this manual. Changing the jumper settings improperly may adversely affect system performance.
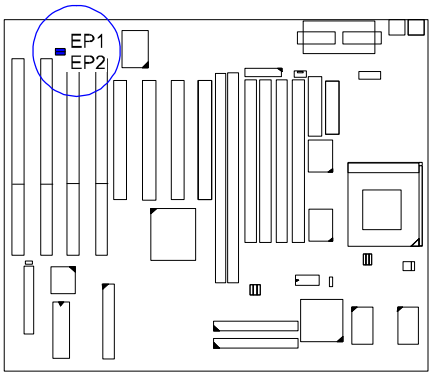

Clear Password: CPW

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.



Enable

Disable
(Default)
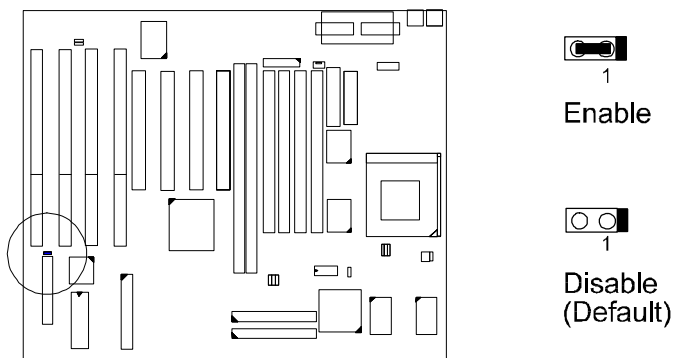
Flash EPROM Type Selection: EP1, EP2

13

These two jumpers allow you to configure the Flash EPROM chip

1M F-ROM	EP1	EP2
Intel 28F001	▣ 1	Normal Default ▣ 1 Program Bootblk ▣ 1
SST 29EE010	▣ 1	▣ 1

2M F-ROM	EP1	EP2
AMD AM29F002T	▣ 1	▣ 1
SST 29EE020	▣ 1	▣ 1
ATMEL AT29C020	▣ 1	▣ 1
MXIC MX28F2000P	▣ 1	▣ 1

CPU to SRAM Data Transacting Mode Selection: SRAM

This jumper allows you to select the CPU-to-SRAM data read/write mode.
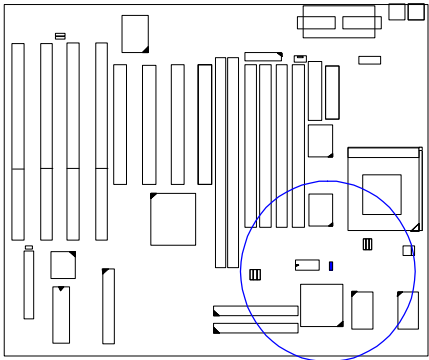
Intel Burst
(Default)
For
Intel Pentium CPUs,
AMD CPUs,
Cyrix CPUs,
IBM CPUs

Linear Burst

For
Cyrix CPUs,
IBM CPUs

2). Install System RAM Modules

DRAM and SDRAM

The working space of the computer is the Random Access Memory (RAM). The system cannot act upon data unless it is loaded into RAM. When more memory is added, the working memory of the computer is larger, thereby increasing total performance.

The PA-2010+'s RAM is comprised of four industry standard 72-pin Single In-line Memory Modules (SIMMs) and two 168-pin Dual In-line Memory Modules (DIMMs). Each SIMM socket supports from 4 to 128MB FPM (Fast Page Mode) and high-speed EDO (Extended Data Out) DRAM. Each DIMM socket is able to support up to 64MB EDO DRAM and lightning-fast SDRAM (Synchronous DRAM).

SDRAM is an advanced new memory technology that boosts overall system performance with its ability to synchronize all operations with the processor clock signal. This makes the implementation of control interfaces easier, and speeds up column access time. SDRAM features an on-chip burst counter that can be utilized to increment column addresses for very fast burst access, which means that SDRAM allows new memory access to be initiated before the preceding access has been finished.

Before making DRAM upgrades you should verify the type and speed of the RAM currently installed from your dealer. Installing mixtures of RAM types other than those described in this manual, will have unpredictable results.

RAM Module Configuration

SIMMs and DIMMs in Bank 0 and Bank 1 can be installed in many combinations. Some of them are listed in the following table.

(Unit : MB)

TOTAL MEMORY	SIMM 1 & 2 (Bank 0)	SIMM 3 & 4 (Bank 1)	DIM1 (Bank 0)	DIM2 (Bank 1)
8	4 & 4			
			8	
16	8 & 8			
			16	
32	16 & 16			
			32	
64	32 & 32			
			64*	
128	64 & 64			
			64*	64*
256	64 & 64	64 & 64		
512	128* & 128*	128* & 128*		

NOTE :
1. * A RAM module of this size was not available for testing at press time.
2. DIM1 and DIM2 only support 3.3V (unbuffered) EDO and SDRAM modules.
3. It is recommended that SIMMs and DIMMs are not installed at the same time on this mainboard to avoid unexpected failure.
4. DIM2 and SIMM 1&2 are shared. That is, It is not allowed to install RAM modules on DIM2 and SIMM 1 &2 at the same time.

Install SIMMs

Complete the following procedures to install SIMMs:

CAUTION : Always turn the system power off before installing or removing any device; and see "Handling Precautions" at the start of this manual.

---

1. Locate the SIMM slots on the mainboard. (See figure below.)
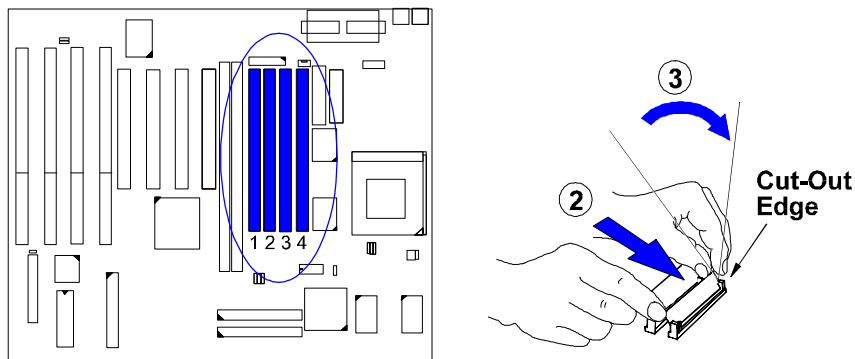
NOTE : SIMMs in each bank must be of the same type; and the BIOS automatically configures the memory size.

---

2. Carefully fit a SIMM at a 45 degree angle into each empty socket to be populated. All the SIMMs must face 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, as shown above.
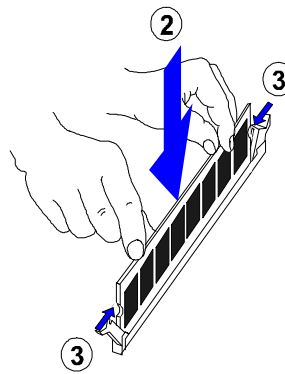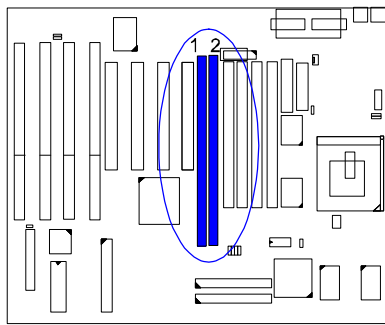
Remove SIMMs

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

Install DIMMs

Complete the following procedures to install DIMMs:

1. Locate the DIMM slots on the mainboard.

2. Install the DIMM straight down into the DIMM slot with both hands.

3. The clips of the slot will close up to hold the DIMM in place when the DIMM touches the slot's bottom.

Remove DIMMs

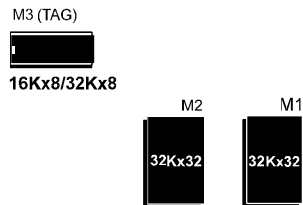Press the clips with both hands to remove the DIMM.

Cache Memory

The mainboard comes with onboard 256KB (512KB is optional) synchronous 3V Pipeline Burst SRAMs. Cache memory access is very fast compared to main memory access. The cache holds data for imminent use. Since cache memory is from five to more than ten times faster than main memory, the CPU's access time is reduced, giving you better system performance.

Pentium mainboards may implement various types of L2 cache SRAMs. Pipeline Burst SRAM is one of them, delivering the best price performance ratio. They perform much better than asynchronous SRAMs.
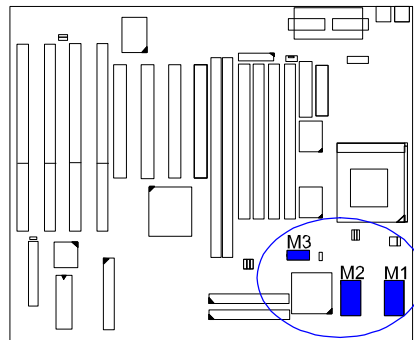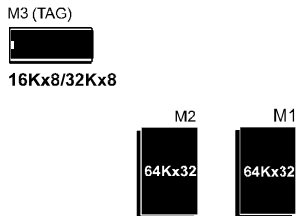
NOTE: The cache memory can not be upgraded by end users.

Onboard Cache RAM (256KB/512KB)

256KB

M3 (TAG)

16Kx8/32Kx8

M2   M1

32Kx32   32Kx32

512KB

M3 (TAG)

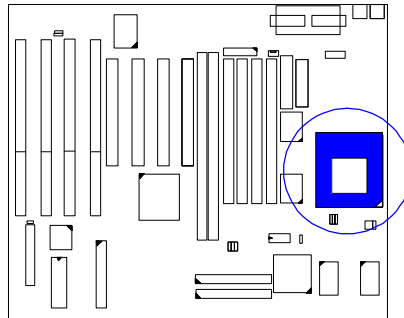16Kx8/32Kx8

M2   M1

64Kx32   64Kx32

3). Install the CPU

The CPU module resides in the 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 in 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 jumpers settings.

CPU External Clock (BUS) Frequency: CLK1, CLK2, CLK3

The table below shows the jumper settings for the different CPU speed configurations.
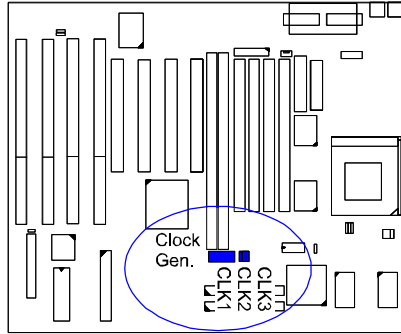
For IMI Clock Generator

External (CPU/CLK)	CLK1	CLK2	CLK3
75 MHz			
66 MHz			
60 MHz			
55 MHz			

NOTE : There is one of three different types of clock generators onboard, either IMI, ICW, or PhaseLink, for CPU clock jumper settings. Please check your onboard clock generator before you set the CPU jumpers. The settings of ICW and PhaseLink are listed in Appendix B.

CPU to Bus Frequency Ratio: FREQ1, FREQ2, FREQ3

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

FREQ1	FREQ2	FREQ3	Ratio			
			P54C	P55C/ M2/K6	K5	M1
			3 x	3 x	2 x	4 x
			2.5 x	2.5 x	1.75 x	1 x
			2 x	2 x	---	2 x
			1.5 x	3.5 x	1.5 x	3 x
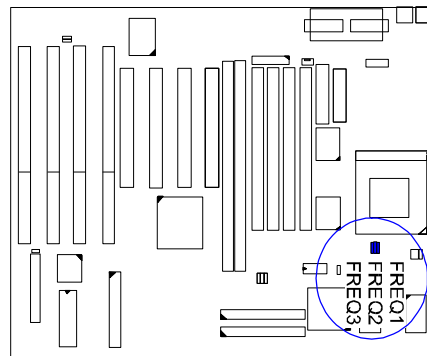
Intel Pentium CPUs

Frequency

CPU Speed (MHz)	External (CPU/CLK) (MHz)	CLK1	CLK2	CLK3	Internal	CPU Clock Rate		
						FREQ1	FREQ2	FREQ3
P55C								
233	66				3.5 x			
200	66				3 x			
166	66				2.5 x			
P54C								
200	66				3 x			
166	66				2.5 x			
150	60				2.5 x			
133	66				2 x			
120	60				2 x			
100	66				1.5 x			
90	60				1.5 x			
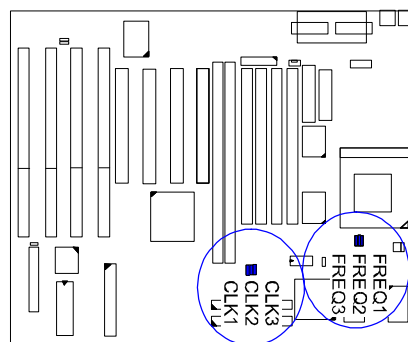
Voltage

VR
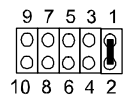
Core : 3.5V
IO   : Same
P54C VRE
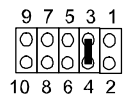
Core : 3.3V
IO   : Same
P54C STD
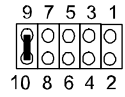
Core : 2.8V
IO   : 3.3V
P55C

Intel Pentium CPU
Bottom Side Marking

xxxxxxxxxx
xxxxxxxxxx
BP80502-SSS
SXXXX/RSS
XXX
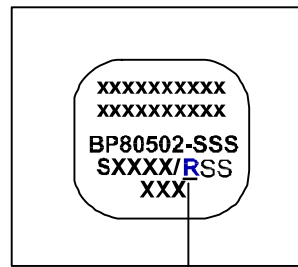
R (Identifier for Voltage Range) :

V for VRE Voltage Range
    or
S for Standard Voltage Range
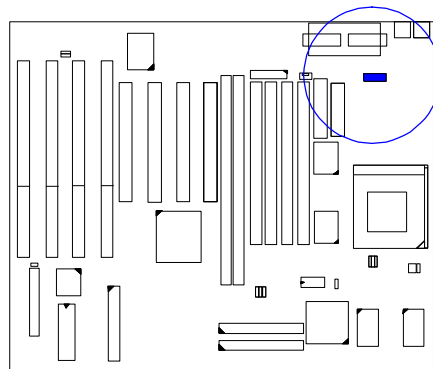
AMD-K5/K6 CPUs

Frequency

Model	CPU Speed (MHz)	External (CPU/CLK) (MHz)	IMI Clock Generator			CPU Clock Rate			
			CLK1	CLK2	CLK3	Internal	FREQ1	FREQ2	FREQ3
K6-233	233	66				3.5 x			
K6-200	200	66				3 x			
K6-166	166	66				2.5 x			
K5-PR200	133	66				2 x			
K5-PR166	116	66				1.75 x			
K5-PR150	105	60				1.75 x			
K5-PR133	100	66				1.5 x			
K5-PR120	90	60				1.5 x			
K5-PR100	100	66				1.5 x			
K5-PR90	90	60				1.5 x			

Voltage

VR

```
9 7 5 3 1
O O O O ▮
O O O O ▮
10 8 6 4 2
```

Core : 3.5V
IO   : Same
AMD-K5 - B

```
9 7 5 3 1
O O ▮ O O
O O ▮ O O
10 8 6 4 2
```

Core : 3.2V
IO   : 3.3V
AMD-K6 (233 MHz)

```
9 7 5 3 1
O ▮ O O O
O ▮ O O O
10 8 6 4 2
```
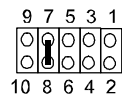
Core : 2.9V
IO   : 3.3V
AMD-K6 (166, 200 MHz)

AMD-K5 CPU
Top Side Marking

AMD-K5
AMD-K5-PRXXXA**B**Q

V (Identifier for Operation Voltage)

AMD-K6 CPU
Top Side Marking

AMD-K6
AMD-K6-XXXA**V**Q
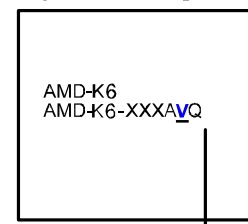
V (Identifier for Operation Voltage) :
   N   3.1-3.3V Core/3.135-3.6V I/O
   L   2.755-3.045V Core/3.135-3.6V I/O

Cyrix 6x86 CPUs

Frequency

Model	CPU Speed (MHz)	External (CPU/CLK) (MHz)	IMI Clock Generator			Internal	CPU Clock Rate		
			CLK1	CLK2	CLK3		FREQ1	FREQ2	FREQ3
M2*	233	66				3.5 x			
M2*	225	75				3 x			
M2*	200	66				3 x			
M2*	187	75				2.5 x			
M2*	166	66				2.5 x			
M2*	150	60				2.5 x			
6x86-PR200+ 6X86L-PR200+	150	75				2 x			
6x86-PR166+ 6x86L-PR166+	133	66				2 x			
6x86-PR150+ 6x86L-PR150+	120	60				2 x			
6x86-PR133+ 6x86L-PR133+	110	55				2 x			

NOTE : * This CPU had not been tested when this manual was printed.

Voltage

VR

Cyrix 6x86 CPU
Top Side Marking

```
 9  7  5  3  1
┌──┬──┬──┬──┬──┐
│○ │○ │○ │○ │▮ │
│○ │○ │○ │○ │  │
└──┴──┴──┴──┴──┘
10  8  6  4  2
```

Core : 3.5V
IO   : Same
Cryix 6x86-028

```
 9  7  5  3  1
┌──┬──┬──┬──┬──┐
│▮ │○ │○ │○ │  │
│  │○ │○ │○ │○ │
└──┴──┴──┴──┴──┘
10  8  6  4  2
```

Core : 2.8V
IO   : 3.3V
Cyrix 6x86L

6x86-PR166$^+$GP
133 MHz
3.52V **(028)**

.

IBM 6x86 CPUs

Frequency

Model	CPU Speed (MHz)	External (CPU/CLK) (MHz)	IMI Clock Generator			Internal	CPU Clock Rate		
			CLK1	CLK2	CLK3		FREQ1	FREQ2	FREQ3
M2*	233	66				3.5 x			
M2*	225	75				3 x			
M2*	200	66				3 x			
M2*	187	75				2.5 x			
M2*	166	66				2.5 x			
M2*	150	60				2.5 x			
6x86-PR200+ 6X86L-PR200+	150	75				2 x			
6x86-PR166+ 6x86L-PR166+	133	66				2 x			
6x86-PR150+ 6x86L-PR150+	120	60				2 x			
6x86-PR133+ 6x86L-PR133+	110	55				2 x			

NOTE : * This CPU had not been tested when this manual was printed.

Voltage

VR

IBM 6x86 CPU
Top Side Marking

9 7 5 3 1
10 8 6 4 2

Core : 3.5V
IO : Same
IBM 6x86-028
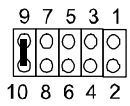
6x86-PR166$^+$GP
133 MHz
3.52V **(028)**

9 7 5 3 1
10 8 6 4 2

Core : 2.8V
IO : 3.3V
IBM 6x86L
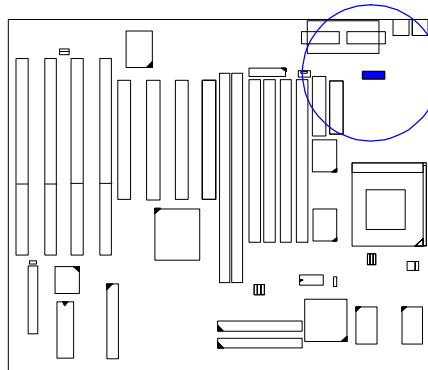
4). Install Expansion Cards

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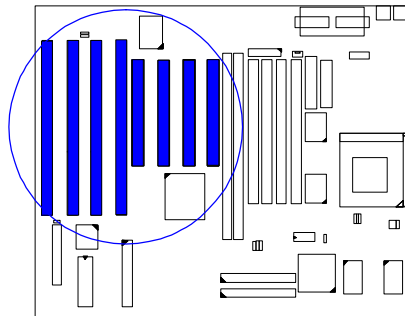
This section describes how to connect an expansion card to one of your system's expansion slots. Expansion cards are printed circuit boards that, when connected to the mainboard, increase the capabilities of your system. For example, expansion cards can provide video and sound capabilities.


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. 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.)
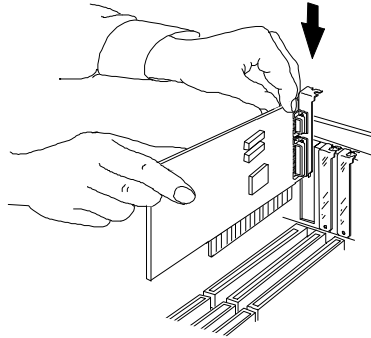

4. Push the card firmly into the slot. Push down on one end of the expansion card, then the other. Use this "rocking" motion until the add-in card is firmly seated inside the slot.
5. Secure the board with the mounting screw removed in Step 2. Make sure that the card has been placed evenly and completely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

5). Connector Cables and Power Supply

Serial Port Connectors: COM1, COM2

These two connectors allow you to connect with your devices that take serial ports, such as a serial mouse or a modem. Usually, it is recommended to connect your serial mouse to COM1 and your fax/modem to COM2. Because COM2 and IR utilizes the same IRQ, COM2 will not work if an IR device is connected to the IR connector. Please read page 50 of this manual for more information.
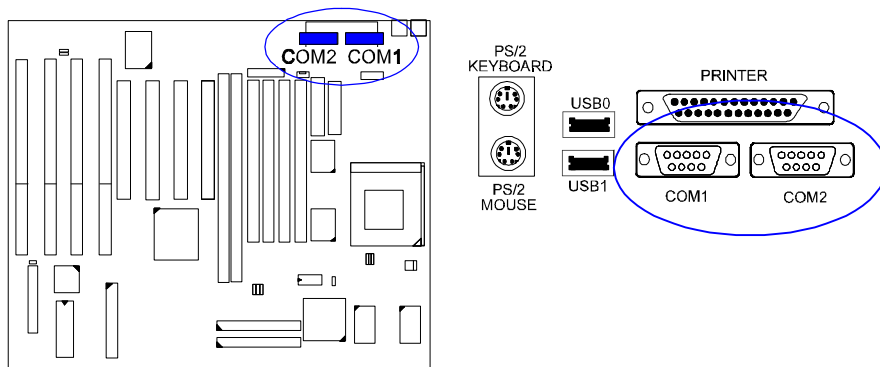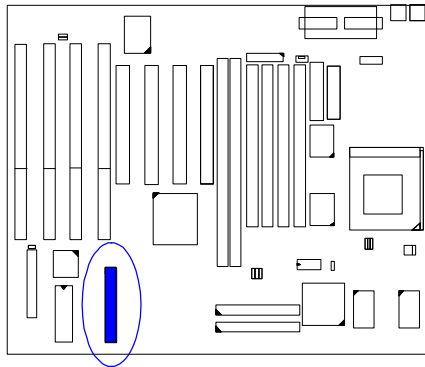

CPU Fan Connector: FAN

This connector is linked to the CPU fan.
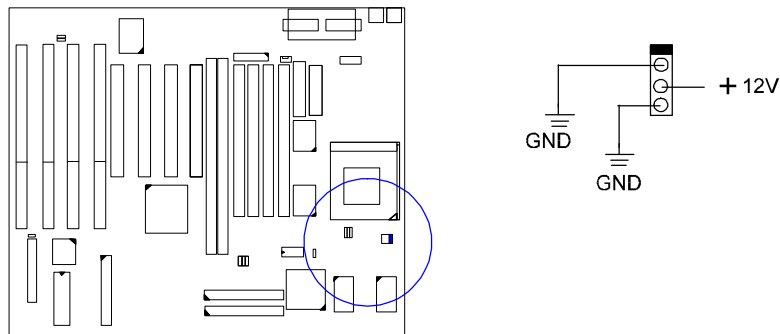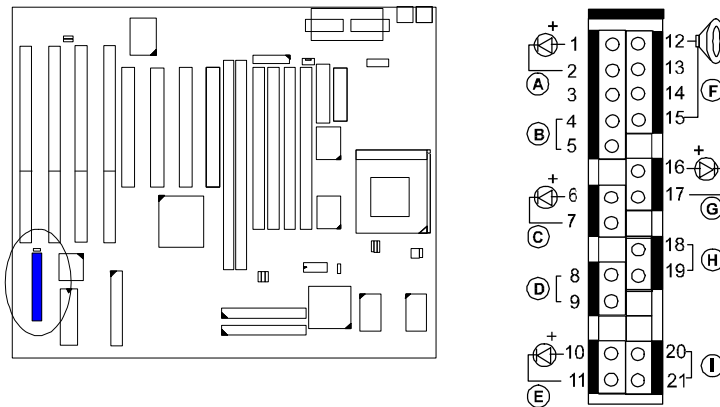
Floppy Diskette Drive Connector: FLOPPY

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

Front Panel 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	Feature
A	PW_LED	2-pin male	indicates the system power status
B	KB_LOCK	2-pin male	allows the keyboard to access the system
C	TB_LED	2-pin male	indicates the system speed is in normal or turbo speed
D	SP_SW	2-pin male	Suspend Mode switch
E	SP_LED	2-pin male	indicates the system into Suspend Mode when LED lit
F	SPK	4-pin male	connects to speaker
G	IDE_LED	2-pin male	indicates the IDE HDD I/O access LED lit
H	RPW_SW	2-pin male	Remote Power switch
I	RST	2-pin male	allows you 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.
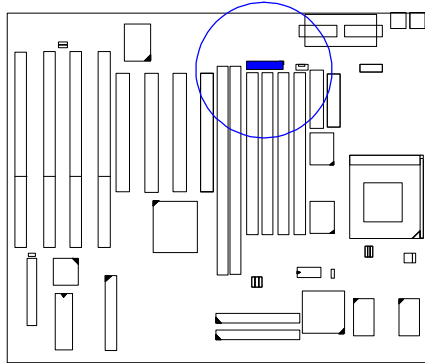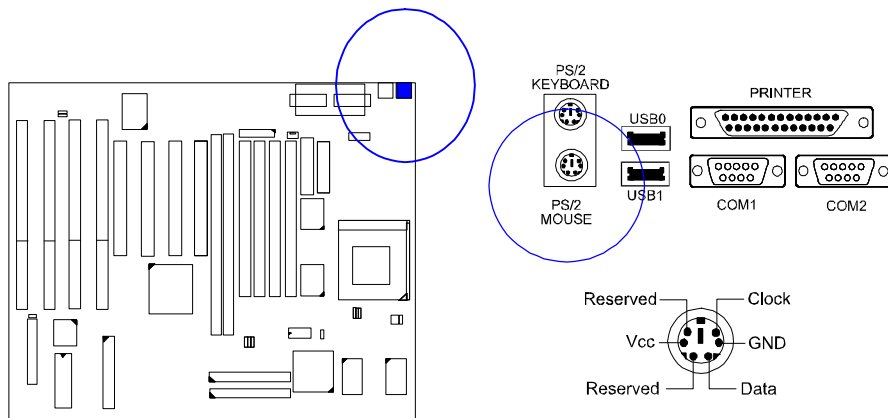
PS/2 Keyboard Connector: PS2_KB

This 6-pin female connector is used for your PS/2 keyboard.
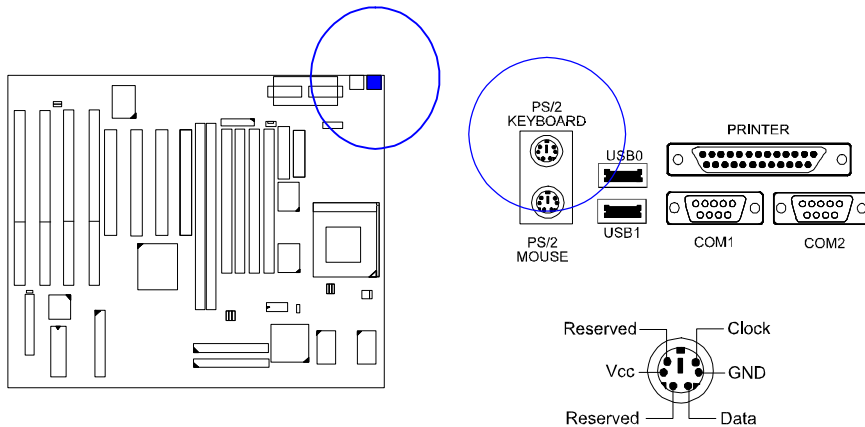
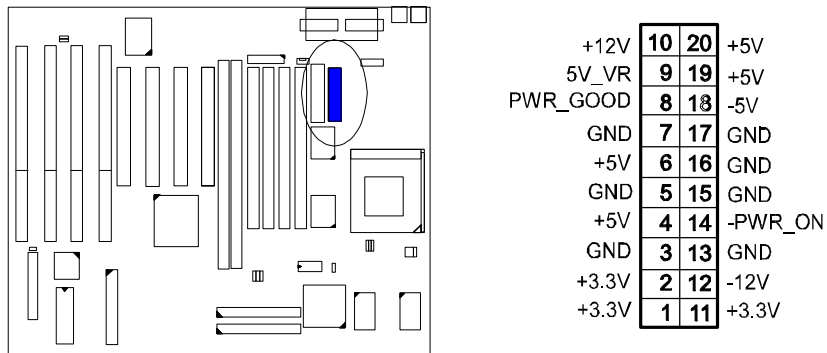## PS/2 Mouse Connector: PS2_MS

This connector is connected to the PS/2 mouse.

ATX Power Connector: PWR1

This 20-pin male block connector is connected to the ATX power supply.

|		
+12V	10 20	+5V
5V_VR	9 19	+5V
PWR_GOOD	8 18	-5V
GND	7 17	GND
+5V	6 16	GND
GND	5 15	GND
+5V	4 14	-PWR_ON
GND	3 13	GND
+3.3V	2 12	-12V
+3.3V	1 11	+3.3V

Standard Power Connector: PWR2

This 12-pin block connector is used for connecting to the 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**
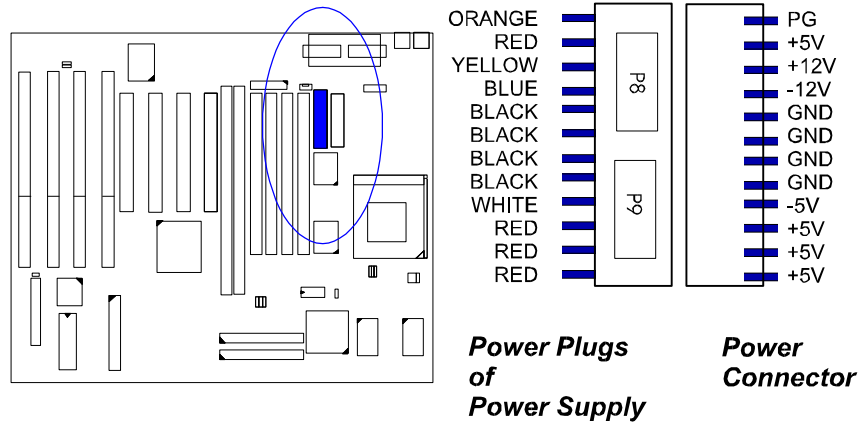
IDE HDD Device Connector: PRIMARY and SECONDARY

These two 40-pin block connectors are used for your IDE hard disks. If 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.
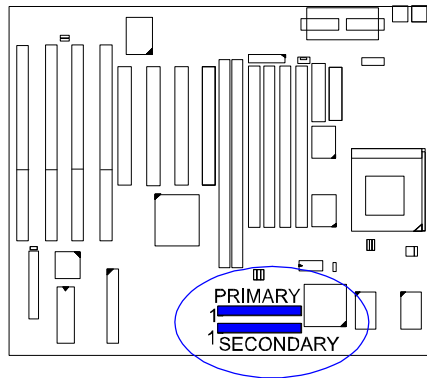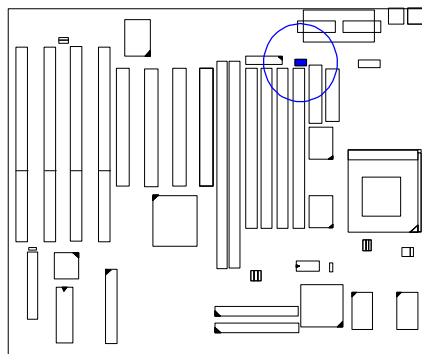
Printer Connector: PRINTER

This 25-pin D-Sub female connector is attached to your printer.
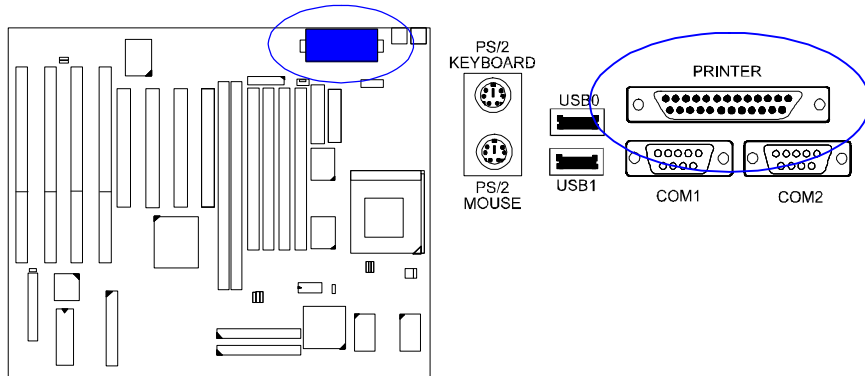
Remote Power Supply Connector: RPW_CON

This 3-pin male connector allows you to enable (or disable) the system power if the RPW_SW is on (or off).

Universal Serial Bus Connectors: USB0, USB1

These two connectors are featured to link with the USB peripheral devices.