

## Installation Procedures

The motherboard has several user-adjustable jumpers on the board that allow you to configure your system to suit your requirements. To set up your computer, you should follow these installation steps: 1). set system jumpers; 2). install RAM modules; 3). install the CPU; 4). install expansion cards; 5). connect devices; 6). set up BIOS feature. 7). set up supporting software tools.

**CAUTION:** If you use an electric drill to install this motherboard on your chassis, please wear a static wrist strap. The recommended electric drill torque is from 5.0 to 8.0 kg/cm to avoid damaging the chips' pins.

### 1). Set System Jumpers

#### Jumpers

Jumpers are used to select the operation modes for your system. To **set** a jumper, a black cap containing metal contacts is placed over the jumper pins 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



Jumper cap is shown as above



Jumpers in a Block

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.

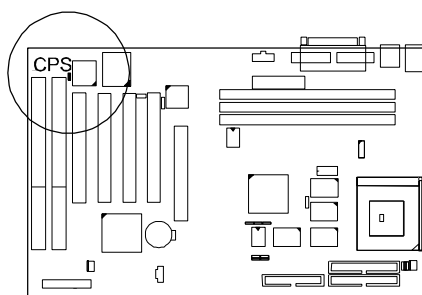
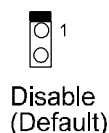


Onboard Mark	Meaning	Page
CPS	Clear Password	10
EP1, 2	Flash ROM Type Selection	10
SRAM	CPU to SRAM Data Transacting Mode Selection	11
CLK4, SDRAM	DIMM Frequency Selection	13
NBCLK1,NBCLK2	System Frequency Selection	13
CLK1, 2, 3	CPU External (Bus) Frequency Selection	16
FREQ1, 2, 3	CPU to Bus Frequency Ratio Selection	16
VR	CPU Voltage Selection	18
DIMM1, 2, 3	Memory Module Socket	11
CPU ZIF Socket 7	ZIF Socket7 for Processor	15
AGP	Accelerated Graphic Port Slot	19
PCI1, 2, 3, 4	PCI Bus Expansion Slot (32-bit)	19
ISA1, 2	ISA Bus Expansion Slot (16-bit)	19
FLOPPY	Floppy Diskette Drive Connector	20
PRIMARY, SECONDARY	IDE Device Connector	20
POWER	ATX Power Connector	20
FAN1	CPU Fan Connector	21
RWU	Wake-On-LAN Connector	21
F_PNL*	Connectors for LEDs & Switches on Front Panel	22
FAN2	System Case Fan Connector	24
CHASSIS1	Chassis Open Alarm Connector	24
KB	PS/2 Keyboard Connector	25
MS	PS/2 Mouse Connector	25
LPT	Parallel Port	25
USB0, USB1, F_USB	Universal Serial Bus Connector	25
COM1, COM2	Serial Port	26
IR	Infrared Connector	26

\* includes PWR\_LED, KB\_LOCK, TB\_LED, SP\_SW, SPK, SP\_LED, IDE\_LED, RPW\_SW, and RST connectors.

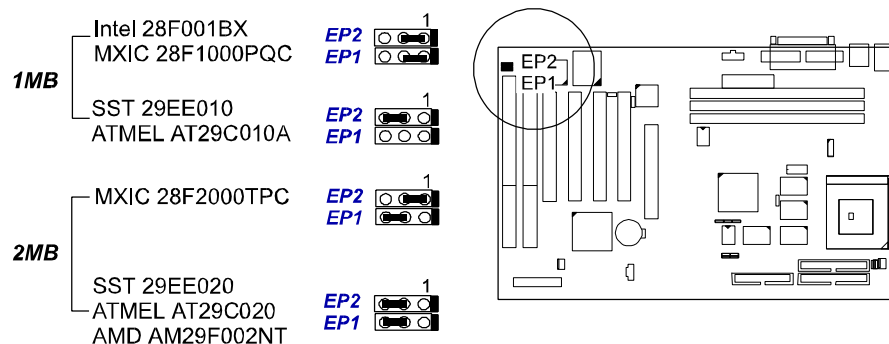
### ***Clear Password: CPS***

This jumper allows you to enable or to disable the password configuration. You may need to enable this jumper by shorting it with a jumper cap if you forget your password. To clear the password setting: 1. Turn off your computer, (2). Short this jumper by placing a jumper cap on it, (3) Turn on your computer, (4), Hold down the Delete key during bootup and enter BIOS Setup to re-enter user preferences, (5) Turn off your computer, (6) Remove the jumper cap, (7) Turn on your computer for the new settings to take effect.



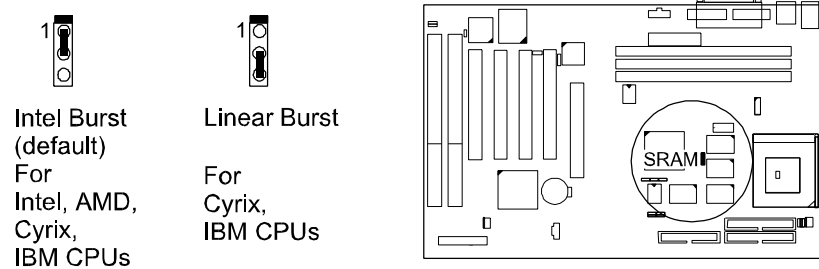
### ***Flash ROM Type Selection: EP1, EP2***

These two jumpers allow you to configure the type of flash ROM chip. This jumper setting is correct by manufactory default. If you want to know the flash ROM type installed on this motherboard, remove the sticker from the chip to see its type.



### ***CPU to SRAM Data Transacting Mode Selection: SRAM***

This jumper allows you to select the CPU to SRAM data read/write mode. If you install a Cyrix or IBM processor on this motherboard, please set at 2-3 pin pair. Please also read Linear Burst feature of BIOS Setup, Chapter 3 for more information.



## **2). Install System RAM Modules**

### **RAM Module Configuration**

This motherboard provides three onboard DIMM sockets for allowing 3.3V (unbuffered) EDO/SDRAM DIMM modules. Either 8, 16, 32, 64, 128MB, or 256\*MB DIMM can be installed on these three sockets. The maximum total memory supported is up to 768MB\*.

#### **NOTE:**

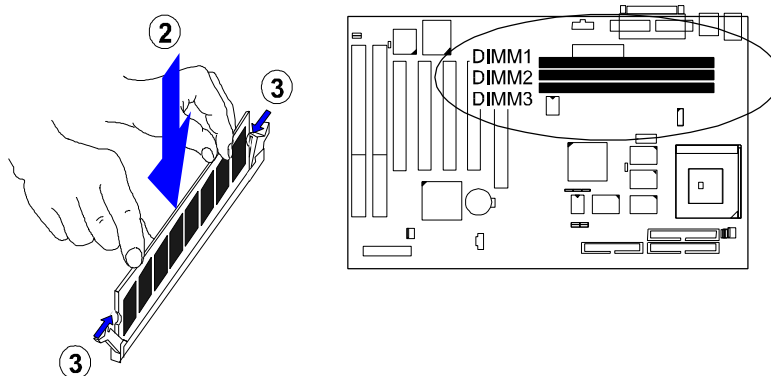
1. \* A RAM module of this size was not available for testing at time of printing.
2. This board only supports 3.3V (unbuffered) EDO/SDRAM modules.
3. This motherboard supports DIMMs with data access time of 15ns, 12ns, 10ns, 8ns or less. ECC memory and parity check is also supported. Please also refer to the feature of **Memory ECC Check** of Chapter 3 for more information.
4. If DIMM runs at the speed of 100MHz, it must meet the PC100 Specification.

## Install and Remove DIMMs

This motherboard supports 100MHz SDRAM DIMMs; that is, the system frequency of this motherboard runs in a higher speed rather than the speed of 66MHz.

Complete the following procedures to install DIMMs:

1. Locate the DIMM slots on the motherboard. (See figure below.)



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.

Press the clips with both hands to remove the DIMM.

## DIMM Frequency: CLK4, SDRAM

SDRAM Freq.  
= CPU External Freq.

CLK4 

SDRAM 

SDRAM Freq.  
= AGP Bus Freq.

CLK4 

SDRAM 

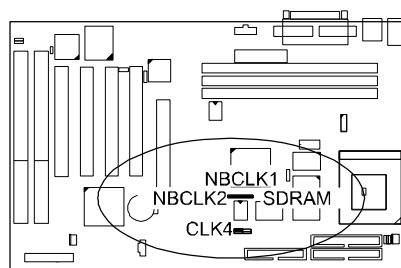
## System Frequency: NBCLK1, NBCLK2

100MHz  
83MHz

  
NBCLK2 NBCLK1

75MHz  
68MHz  
66MHz

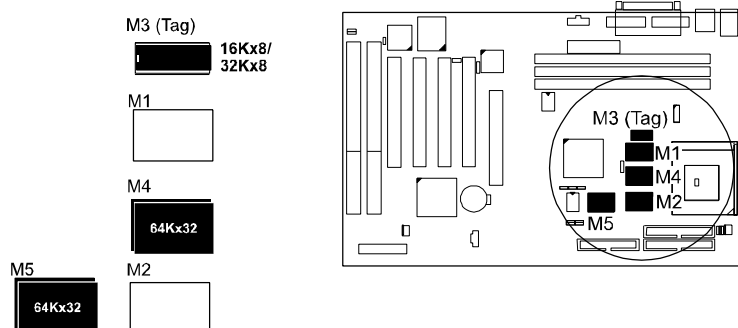
  
NBCLK2 NBCLK1



## Cache Memory

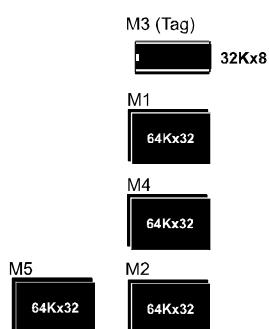
The PA-2013 comes with onboard **512KB (1MB is manufacturing optional) synchronous 3.3V Pipeline Burst SRAMs**. Cache memory access is very fast compared to main memory access. Since cache memory is from five to more than ten times faster than main memory, the system performance is better.

### 512KB



---

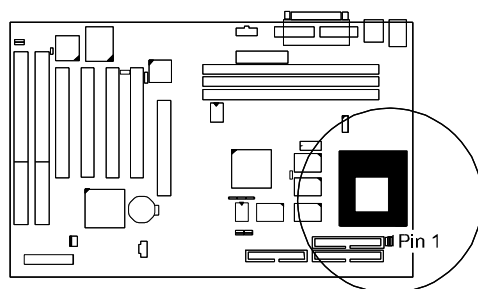
### 1MB





### 3). Install the CPU

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



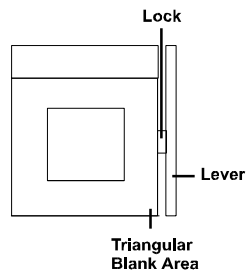
**CAUTION:**

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.

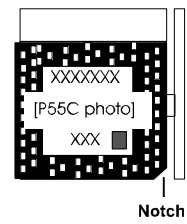
To install the CPU, do the following:

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 locate 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.

**Socket Without CPU**



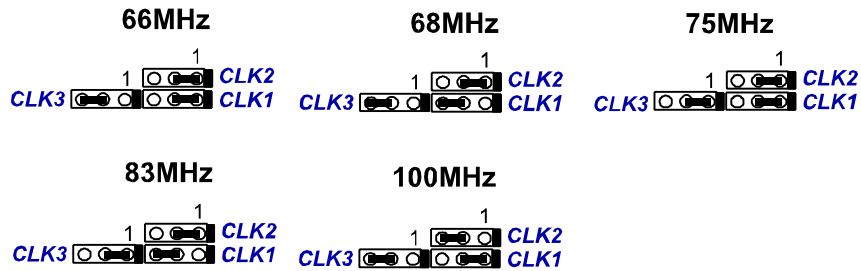
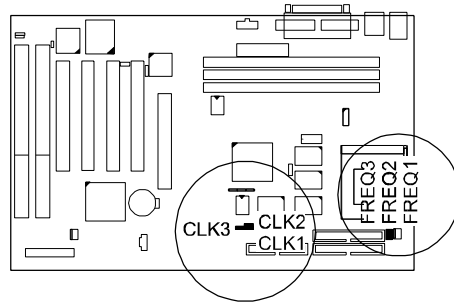
**Socket With CPU**



### ***CPU External (BUS)***

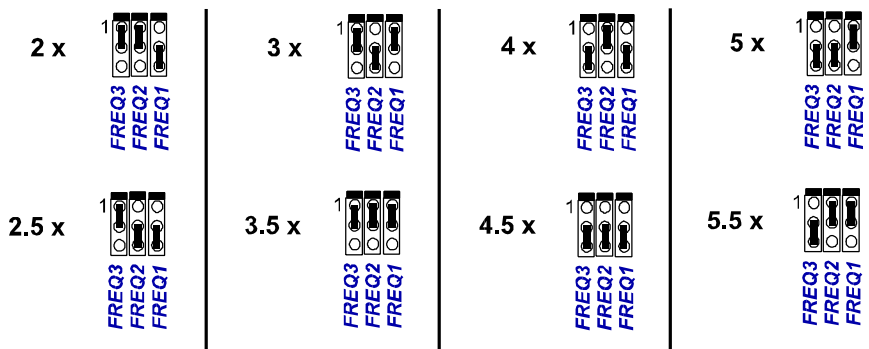
#### ***Frequency: CLK1, CLK2, CLK3***

The motherboard may have two types of clock generator onboard. The table below shows the jumper settings for the different CPU speed configurations when the listed clock generator onboard.



### ***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.



### Set CPU Frequency

*Intel Pentium MMX (Unit of Freq. and Bus Freq. : MHz)*

Type	Freq.	Bus Freq.	Ratio
Pentium P54C	200	66	3 x
	166	66	2.5 x
	133	66	2 x
	100	66	1.5 x
Pentium MMX	233	66	3.5 x
	200	66	3 x
	166	66	2.5 x

*AMD-K6 (Unit of Freq. and Bus Freq. : MHz)*

Type	Freq.	Bus Freq.	Ratio
K6-2/300*	300	100	3 x
		66	4.5 x
K6-2/266*	266	66	4 x
	250	100	2.5 x
K6-300	300	66	4.5 x
K6-266	266	66	4 x
K6-233	233	66	3.5 x
K6-200	200	66	3 x
K6-166	166	66	2.5 x

*IBM/Cyrix 6x86L/6x86MX (Unit of Freq. and Bus Freq. : MHz)*

Type	Bus Freq.	Ratio
6x86MX-PR266	83	2.5 x
6x86MX-PR233	83	2 x
	75	2.5 x
6x86MX-PR200	66	2.5 x
	75	2 x
6x86MX-PR166	66	2 x
6x86L-PR200+	75	2 x
6x86L-PR166+	66	2 x

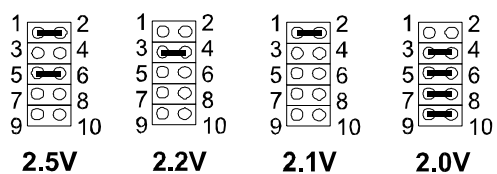
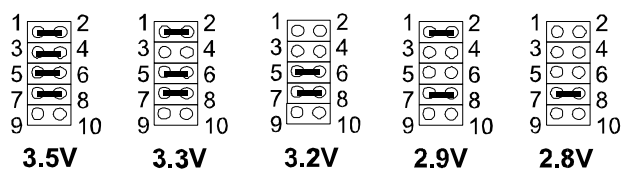
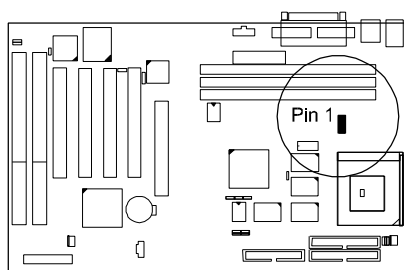
<b>NOTE : 1.</b> * This CPU was not available for testing at time of printing.
--

2. Please refer to your CPU top marking about the actual CPU speed and ratio.

## Set CPU Voltage

This section lists all possible CPU voltages that this board supports. There are two rows of CPU voltage (core voltage) jumper setting in the diagram below.

**NOTE:** Please refer to your CPU top marking about the actual CPU voltage.  
(It is core voltage, the IO voltage is 3.3V.)



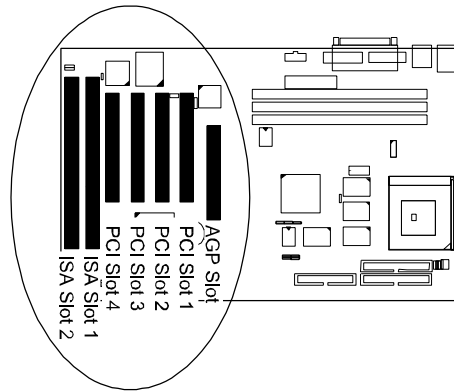
## 4). Install Expansion Cards

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 motherboard, increase the capabilities of your system. For example, expansion cards can provide video and sound capabilities.

Your PA-2013 features **one 32-bit AGP Bus, two 16-bit ISA Bus, and four 32-bit PCI Bus** expansion slots.

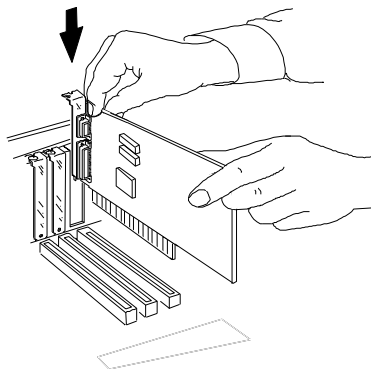
### CAUTION:

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.)



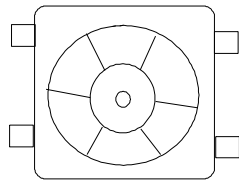
4. Push the card firmly into the slot. Push down on one end of the expansion card, then the other. Use this "rocking" motion until the add-in card is firmly seated inside the slot.
5. Secure the board with the mounting screw removed in Step 2. Make sure that the card has been placed evenly and completely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



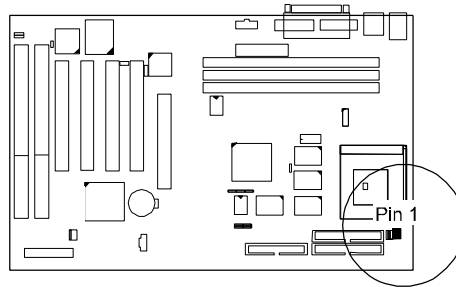
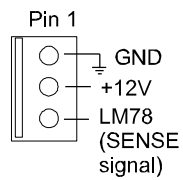


***CPU Fan Connector: FAN1***

This connector is linked to the CPU fan for cooling the processor temperature. Please read the CPU fan installation guide before connection.

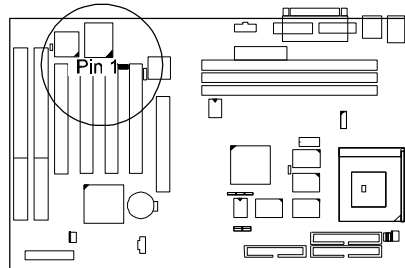
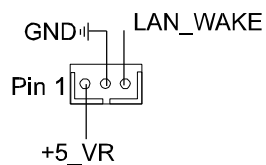


[CPU fan photo]



***Wake-ON-LAN (WOL) Connector: RWU***

This 3-pin connector allows LAN servers to manage the system that installed this board via network adapters support WOL. Please read the network card's guide for details and Page 37 **Resume on Ring & LAN**.

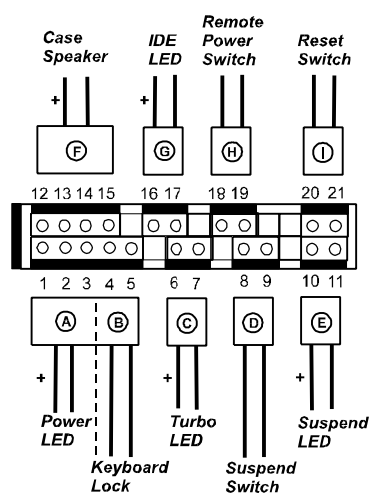
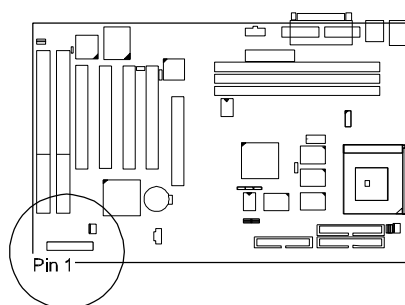


## Connectors to System Case

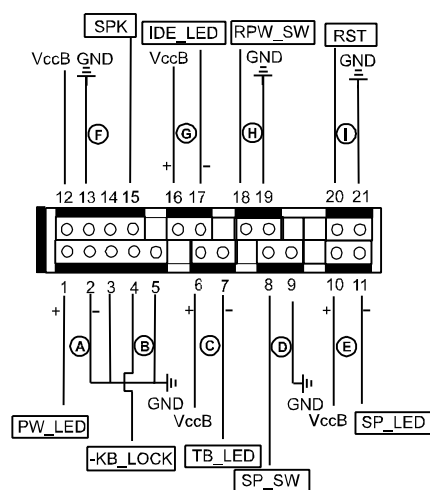
### Front Panel Block Connector: F\_PNL

This block connector concludes: PWR\_LED, KB\_LOCK, TB\_LED, SP\_SW, SPK, SP\_LED, IDE\_LED, RPW\_SW, and RST connectors.

Usually, the plugs with wires for above LEDs (indicators), speaker and switches come with the system case. Please identify polarities of plug wires for the case speaker and LEDs; that is, which wires are positive (+). Please ask vendor about this information when you buy them and install the system by yourself. The switches are called *Miniature Push Switches*. The plug wires' polarities of this switches will not affect the function.



Connection Diagram



Pin Assignment

**PWR\_LED (A) & KB\_LOCK (B)**

PWR\_LED is connected with the system power indicator to indicate whether the system is on/off and the case-mounted keyboard lock to lock keyboard. KB\_LOCK prevents keyboard access to the system (this feature is used in combination with the case-mounted keylock).

**TB\_LED (C)** is connected with turbo indicator. It always lights.

**SP\_SW (D)** is connected with suspend mode switch.

**SP\_LED (E)** is connected with suspend mode indicator.

**SPK (F)** is connected with the case speaker.

**IDE\_LED (G)** is connected IDE device indicator.

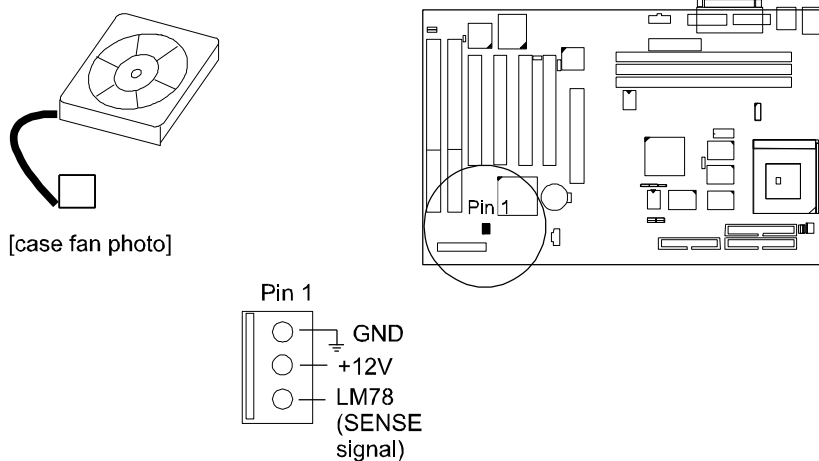
**RPW\_SW (H)** is connected with remote power (soft power) switch.

Push this switch will turn off and on the system instead of turning the power switch on the power supply.

**RST (I)** is connected to the reset switch. Push this switch to reboot the system instead of turning power switch off and on.

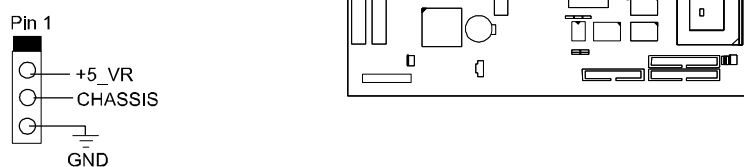
### ***System Case Fan Connector: FAN2***

This 3-pin connector links to your cooling fan on the system case to lower the system temperature.



### ***Chassis Open Alarm Connector: CHASSIS1***

This 3-pin pinhead provides users with the functions that messages from the operating systems and system cases which support LDCM if the system cases intrusion occurred.

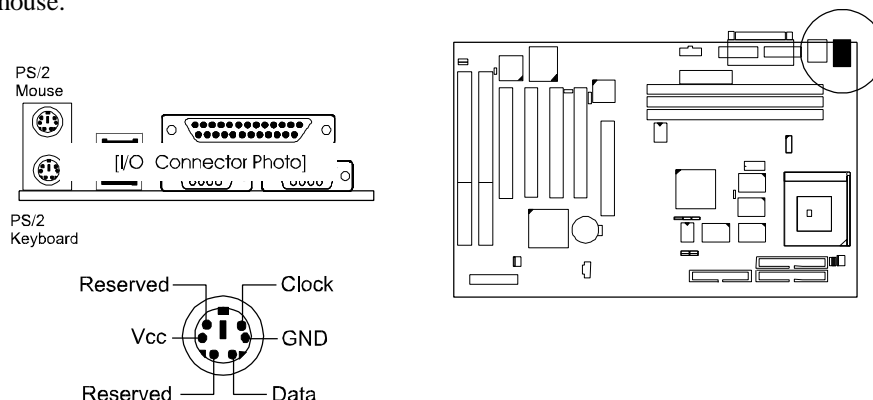


This feature is cooperated with the system case either by optical or mechanical way. If you purchase a case that supports the intrusion alarm by mechanical means; please check with your vendor carefully if it can work with this board. If this connector is unused, it is shortened on pin pair 2-3.

## Connectors to External Devices

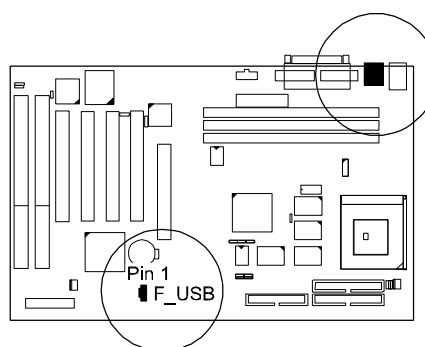
### PS/2 Keyboard and Mouse Connector: KB, MS

These two 6-pin female connectors are used for your PS/2 keyboard and PS/2 mouse.

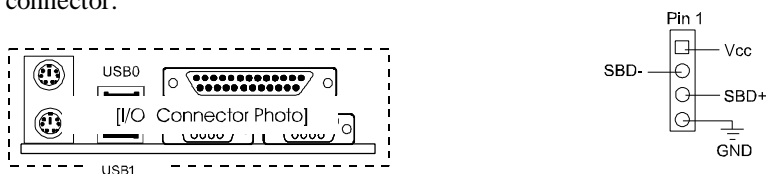


### Universal Serial Bus Connectors: USB0, USB1, F\_USB

These two connectors that integrated on the edge of the board are used for linking with USB peripheral devices. Also, this board provides an manufacturing optional connector F\_USB (shared with USB0) for linking with the USB socket on the front panel of some system cases. If this connector is onboard and is used, the USB0 connector is disabled.



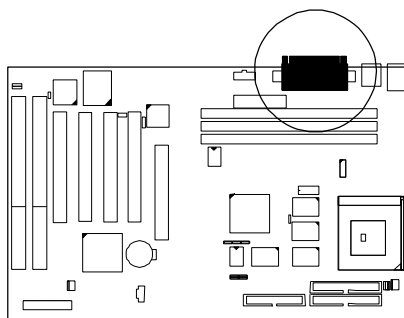
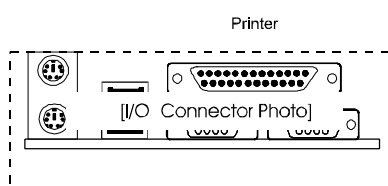
The figure above right is the pin assignments of the onboard F\_USB connector.





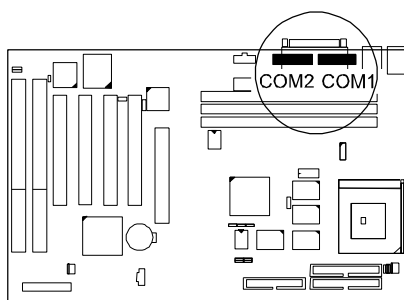
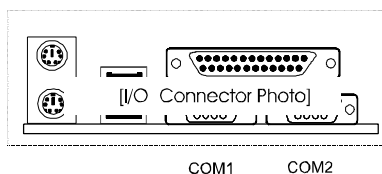
### ***Printer Connector: LPT***

This 25-pin D-Sub female connector is attached to your printer.



### ***Serial Port Connectors: COM1, COM2***

These two 9-pin D-Sub male connectors allow you to connect with your devices that use serial ports, such as a serial mouse or a modem.



### ***Infrared Connector: IR***

This connector supports the connection to your IR device.

