

## **Installation Procedures**

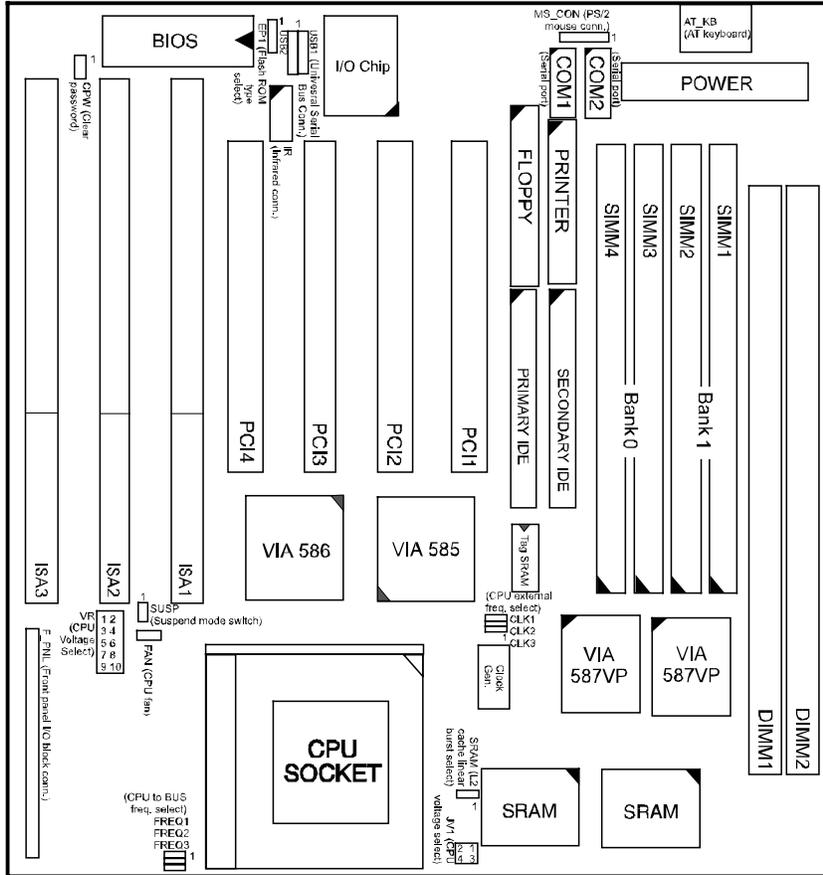
The VA-502 has several user-adjustable jumpers on the board that allow you to configure your system to suit your requirements. This chapter contains information on the various jumper settings on your mainboard.

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

- Step 1 -  
Set system jumpers
- Step 2 -  
Install System Memory
- 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.)

**CAUTION** : If you use an electric drill to install this mainboard 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 chips' pins.

## Mainboard Layout



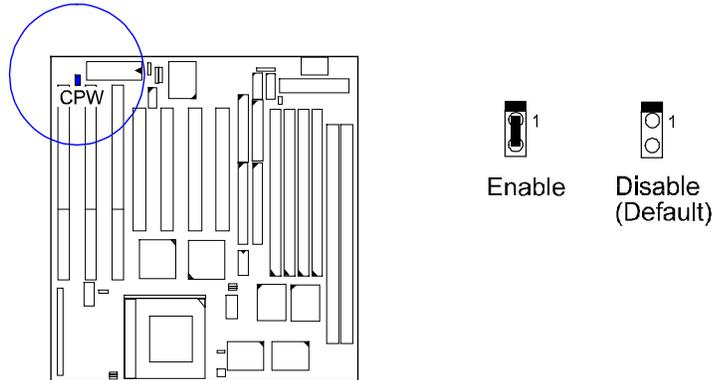
## 1). Set System Jumpers

### *Jumpers*

**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.

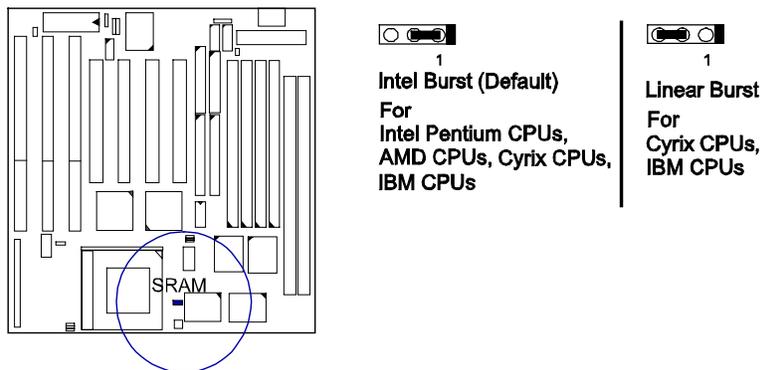
### *Clear Password: CPW*

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.



### *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 mainboard, please set at 2-3 pin pair and set the **Linear Burst Mode** of **Chipset Features Setup**, page 43.



## 2). Install System Memory

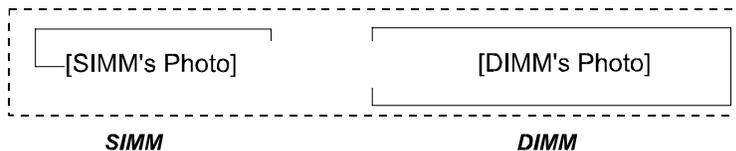
### DRAM and SDRAM

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 VA-502'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 or lightning-fast SDRAM.

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

(Unit : MB)

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

**NOTE :**

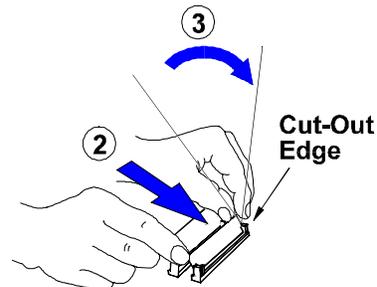
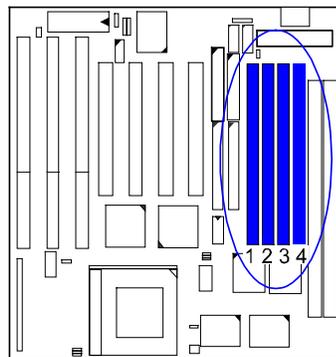
1. \* A RAM module of this size was not available for testing at press time.
2. DIM1 and DIM2 only support 3.3V (unbuffered) EDO and SDRAM modules. It is recommended that SIMMs and DIMMs are not installed at the same time on this mainboard to avoid unexpected failure.
3. The different size of DIM1 and DIM2 is allowed. For example, 16MB is installed on DIM1 socket, 32MB is installed on DIM2 socket. 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. This mainboard allows the SIMMs (without ECC or parity check support) which latency time are 70ns, 60ns, 50ns; and for the DIMMs which latency time are 12ns, 10ns.

## 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.

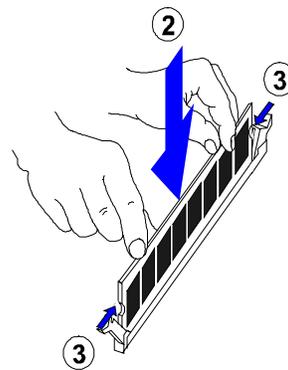
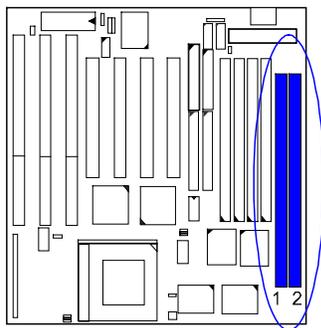
## Remove SIMMs

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. (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.

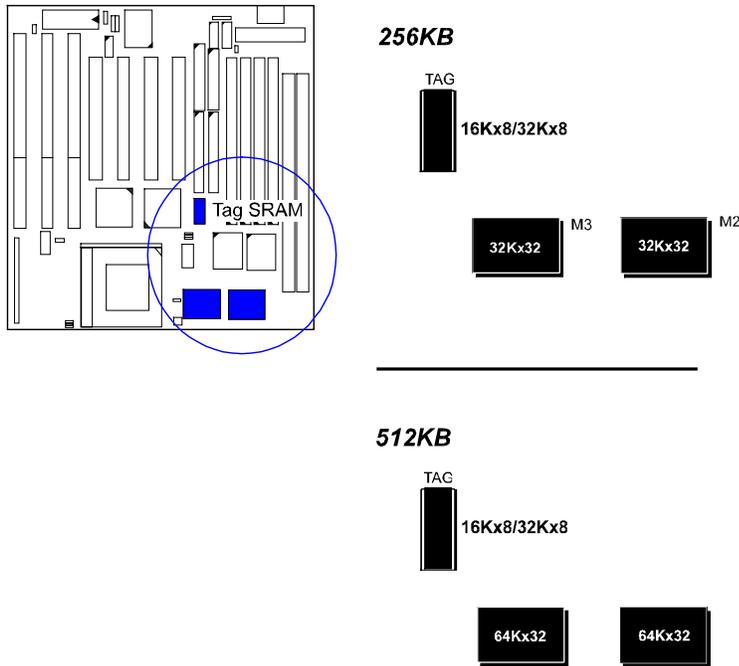
## Remove DIMMs

Press the clips with both hands to remove the DIMM.

## Cache Memory

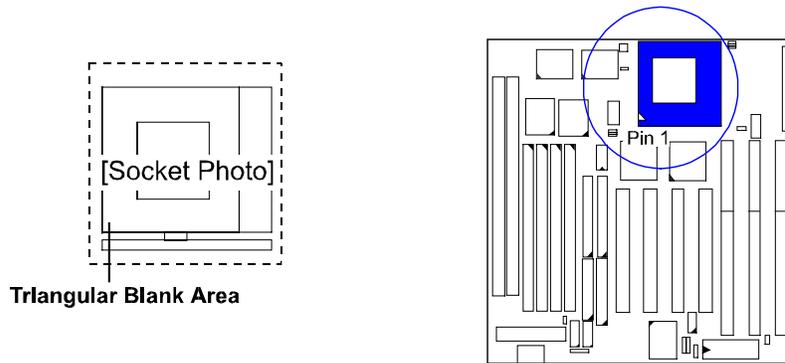
The VA-502 comes with onboard **512KB (256KB is optional) synchronous 3V Pipeline Burst SRAMs**. Cache memory access is very fast compared to main memory access. The cache holds data for imminent use. Since cache memory is from five to more than ten times faster than main memory, the CPU's access time is reduced, giving you better system performance.

Socket 7 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. The cache memory can not be upgraded by end users.



### 3). Install the CPU

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

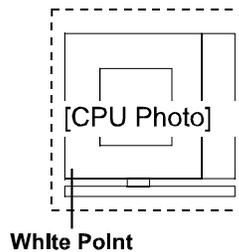


**CAUTION :**

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.

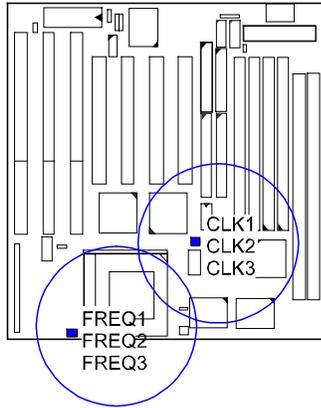
To install the CPU, do the following:

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.
4. Swing the lever to the down position to lock the CPU in place.



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

The table below shows the jumper settings for the different CPU speed configurations.



External (CPU/CLK)	CLK1	CLK2	CLK3
75 MHz	1	1	1
66 MHz	1	1	1
60 MHz	1	1	1
55 MHz	1	1	1
50 MHz	1	1	1

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

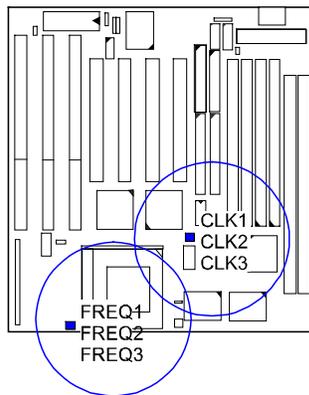
These three jumpers are used in combination to decide the ratio of the internal frequency of the CPU to the bus clock.

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

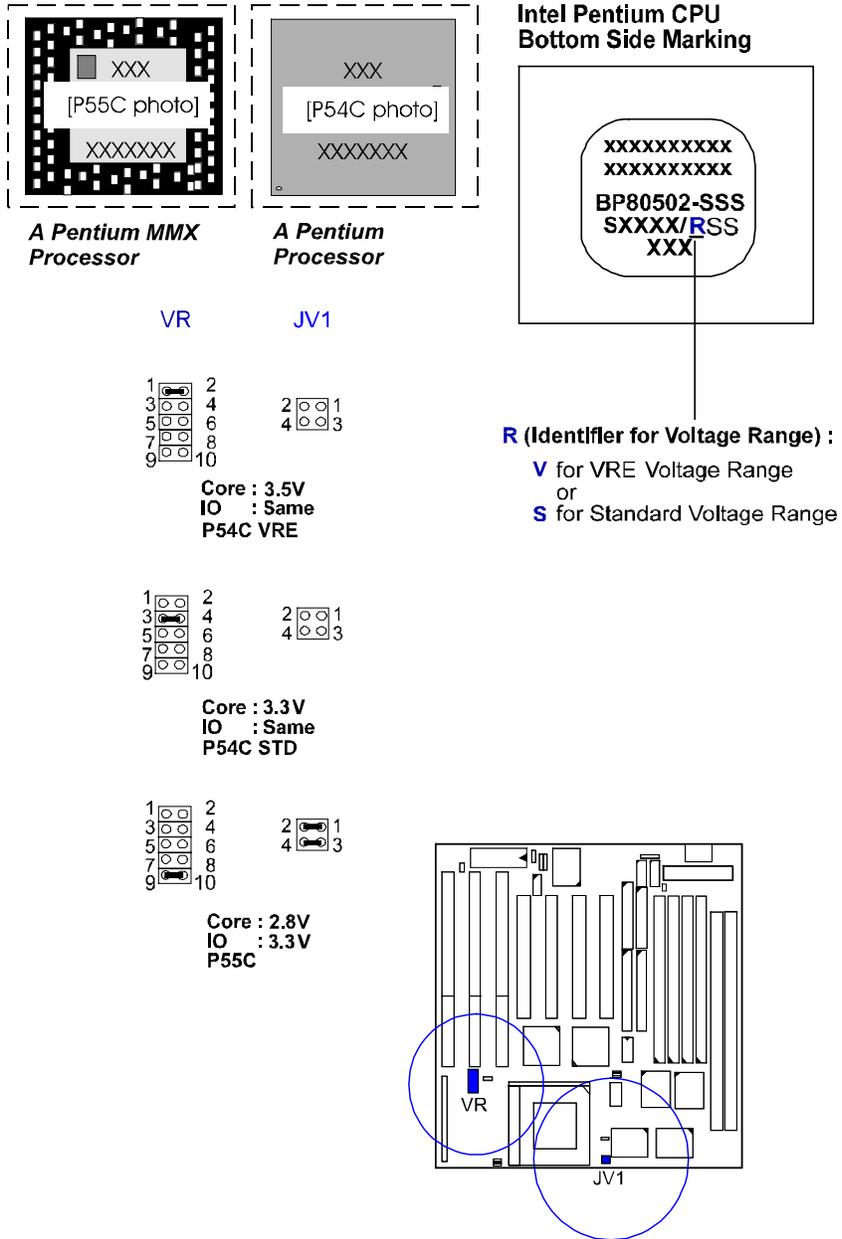
## Intel Pentium/Pentium MMX CPUs

### Frequency

CPU Speed (MHz)	External (CPU/CLK) (MHz)	CLK1	CLK2	CLK3	Internal	CPU Clock Rate		
						FREQ1	FREQ2	FREQ3
<b>Pentium MMX</b>								
233	66				3.5 x			
200	66				3 x			
166	66				2.5 x			
<b>Pentium</b>								
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**

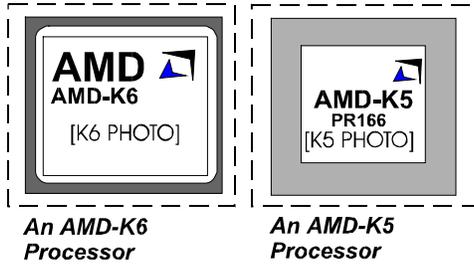


## AMD-K5/K6 CPUs

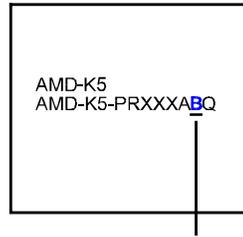
### Frequency

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

**Voltage**

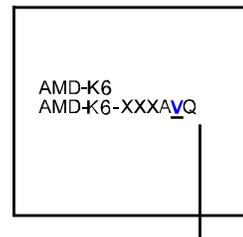


**AMD-K5 CPU  
Top Side Marking**



**V** (Identifier for Operation Voltage)

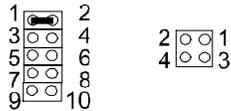
**AMD-K6 CPU  
Top Side Marking**



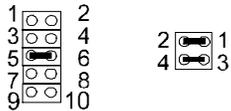
**V** (Identifier for Operation Voltage) :  
**N** 3.1-3.3V Core/3.135-3.6V I/O  
**L** 2.755-3.045V Core/3.135-3.6V I/O

**VR**

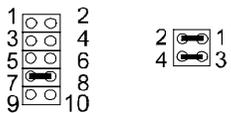
**JV1**



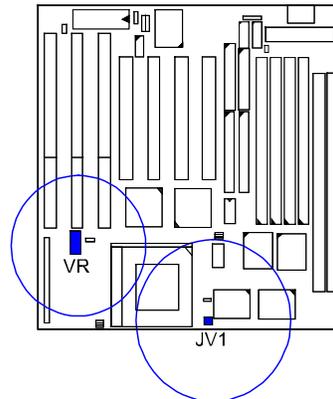
**Core : 3.5V  
IO : Same  
AMD-K5 - B**



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



**Core : 2.9V  
IO : 3.3V  
AMD-K6 (166, 200 MHz)**



## Cyrix 6x86/MX CPUs

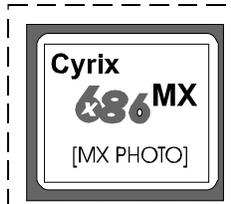
### Frequency

Model	CPU Speed (MHz)	External (CPU/CLK) (MHz)	CLK1	CLK2	CLK3	Internal	CPU Clock Rate		
							FREQ1	FREQ2	FREQ3
6x86MX-PR266*	233	66				3.5 x			
6x86MX-PR266*	225	75				3 x			
6x86MX-PR233*	200	66				3 x			
6x86MX-PR233*	188	75				2.5 x			
6x86MX-PR200	180	60				3 x			
	166	66				2.5 x			
	165	55				3 x			
	150	75				2 x			
6x86MX-PR166	133	66				2 x			
	150	60				2.5 x			
	138	55				2.5 x			
	150	50				3 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 :**

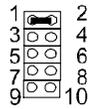
- \* This CPU had not been tested when this manual was printed.
- Please refer to your Cyrix CPU top marking about the actual CPU speed and ratio.

**Voltage**

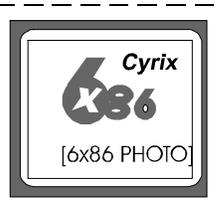


A Cyrix 6x86MX Processor

VR

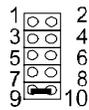


Core : 3.5V  
IO : Same  
Cryix 6x86-028

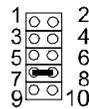


A Cyrix 6x86 Processor

JV1

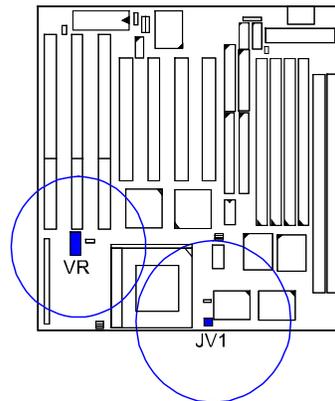
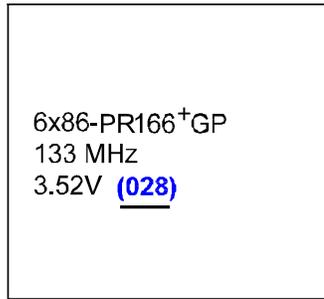


Core : 2.8V  
IO : 3.3V  
Cryix 6x86L



Core : 2.9V  
IO : 3.3V  
Cryix 6x86MX

**Cyrix 6x86 CPU  
Top Side Marking**



## IBM 6x86/MX CPUs

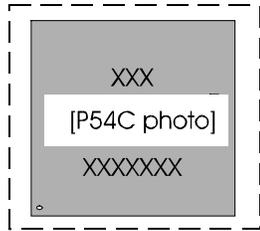
### Frequency

Model	CPU Speed (MHz)	External (CPU/CLK) (MHz)	CLK1	CLK2	CLK3	Internal	CPU Clock Rate		
							FREQ1	FREQ2	FREQ3
6x86MX-PR266*	233	66				3.5 x			
6x86MX-PR266*	225	75				3 x			
6x86MX-PR233*	200	66				3 x			
6x86MX-PR233*	188	75				2.5 x			
6x86MX-PR200	180	60				3 x			
	166	66				2.5 x			
	165	55				3 x			
	150	75				2 x			
6x86MX-PR166	133	66				2 x			
	150	60				2.5 x			
	138	55				2.5 x			
	150	50				3 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 :**

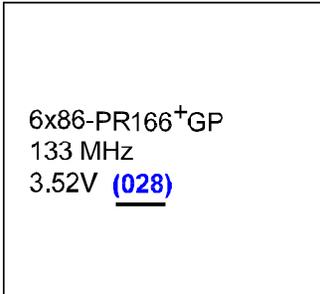
- \* This CPU had not been tested when this manual was printed.
- Please refer to your IBM CPU top marking about the actual CPU speed and ratio.

*Voltage*



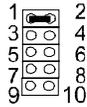
**An IBM 6x86 Processor**

**IBM 6x86 CPU  
Top Side Marking**

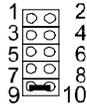


**VR**

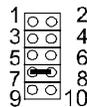
**JV1**



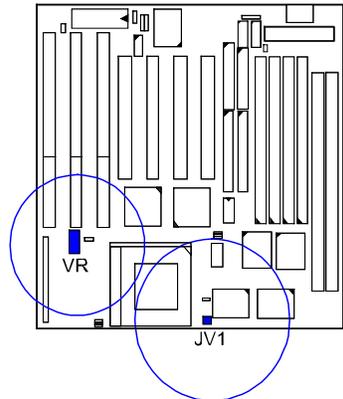
**Core : 3.5V  
IO : Same  
IBM 6x86-028**



**Core : 2.8V  
IO : 3.3V  
IBM 6x86L**

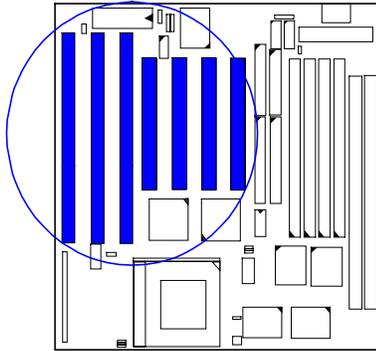


**Core : 2.9V  
IO : 3.3V  
IBM 6x86MX**



## 4). Install Expansion Cards

Your mainboard features three 16-bit ISA Bus and four 32-bit PCI Bus expansion slots.



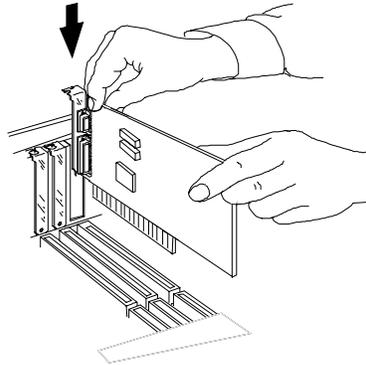
This section describes how to connect an expansion card to one of your system's expansion slots. Expansion cards are printed circuit boards that, when connected to the mainboard, increase the capabilities of your system. For example, expansion cards can provide video and sound capabilities.

<p><b>CAUTION :</b></p> <ol style="list-style-type: none"><li>1. Always turn the system power off before installing or removing any device.</li><li>2. Always observe static electricity precautions. See "Handling Precautions" at the start of this manual.</li></ol>
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To install an expansion card, do the following:

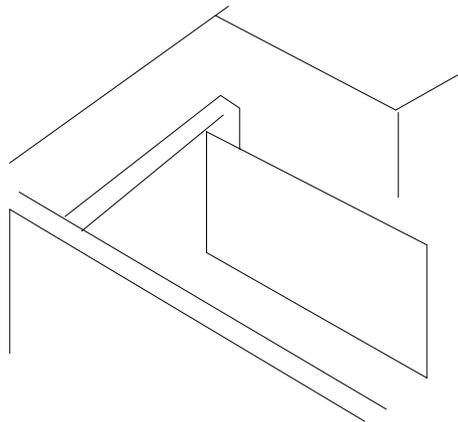
1. Remove the chassis cover and select an empty expansion slot.
2. Remove the corresponding slot cover from the chassis.  
Unscrew the mounting screw that secures the slot cover and pull the slot cover out from the chassis. Keep the slot cover mounting screw nearby.

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.

The photo below shows an add-on card that was installed in a system.

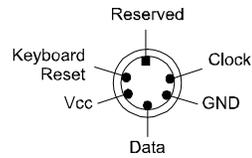
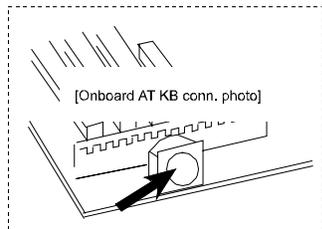


[System with an add-on card photo]

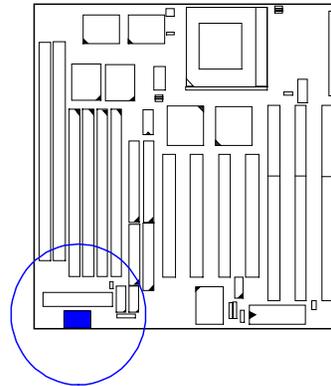
## 5). Connector Cables and Power Supply

### *AT Keyboard Connector: AT\_KB*

The cable of your 101-key enhanced keyboard or 106-key Windows 95 keyboard is plugged into this connector.

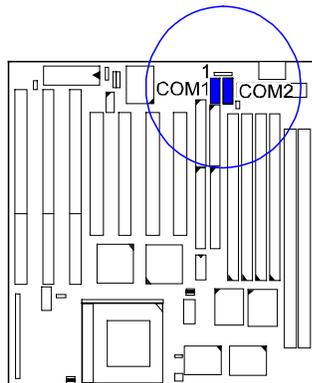


**Plug of Keyboard**



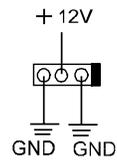
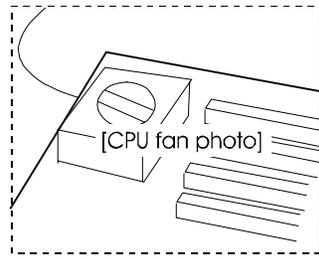
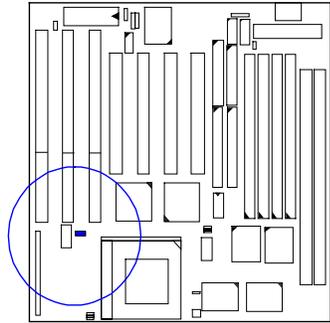
### *Serial Port Connectors: COM1, COM2*

These two connectors allow you to connect with your devices that take serial ports, such as a serial mouse or a modem. Because COM2 and IR utilizes the same IRQ, COM2 will not work if an IR device is connected to the IR connector.



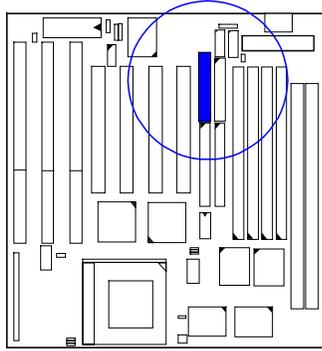
***CPU Fan Connector: FAN***

This connector is linked to the CPU fan for cooling the processor temperature.



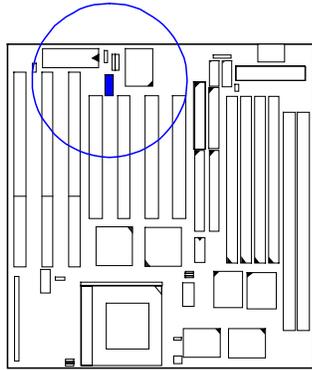
***Floppy Diskette Drive Connector: FLOPPY***

This connector provides the connection with your floppy disk drive.



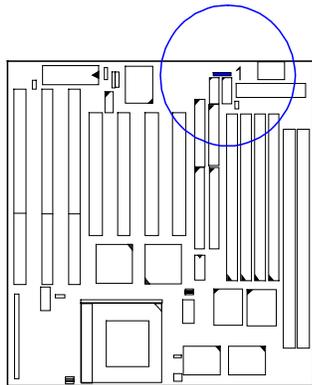
***Infrared Connector: IR***

This connector supports the connection to your IR device. The IR port uses the same IRQ as COM2 port, therefore you need to adjust this BIOS option when an IR device is installed.



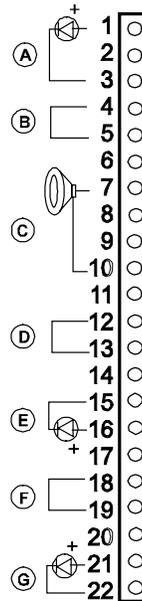
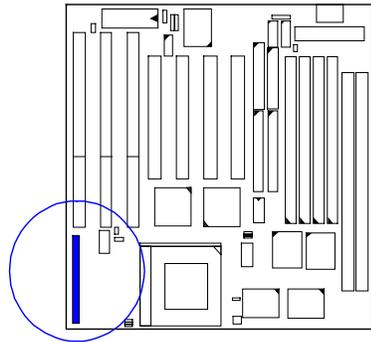
***PS/2 Mouse Connector: MS\_CON***

This connector is connected to the PS/2 mouse.



**Front Panel Block Connector: F\_PNL**

This block connector concludes : Power LED, Key lock, Speaker, Reset, Turbo LED, Turbo switch, IDE HDD LED connectors.

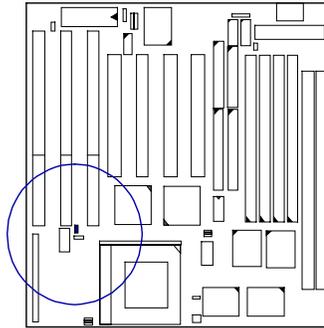


Item	Connector	Pin Type	Feature
A	Power LED	2-pin male	indicates the system power status
B	Keylock	2-pin male	allows the keyboard to access the system
C	Speaker	4-pin male	connects to speaker
D	Reset	2-pin male	allows you to reset the system
E	SP_LED	2-pin male	indicates the system is in Suspend mode, when the LED lit
F	Turbo Switch	2-pin male	(Reserved)
G	HDD LED	2-pin male	indicates the IDE HDD I/O access LED lit

**NOTE :** Software Turbo Speed feature is not supported.

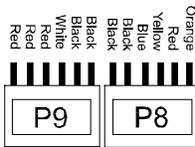
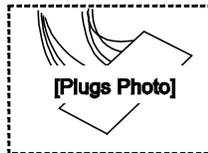
### ***Suspend Switch Connector: Susp***

The mainboard provides Suspend mode switch (2-pin male) connector. If the connector is onboard, it is used to enter the system into Suspend mode and Suspend LED (SP\_LED) will light.

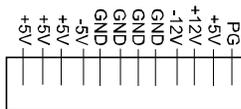
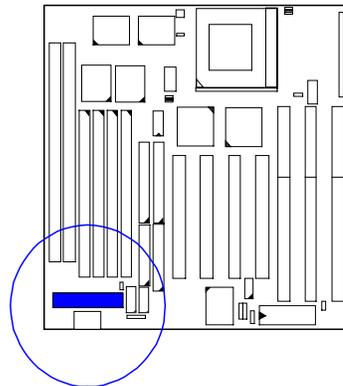


### ***Standard Power Connector: POWER***

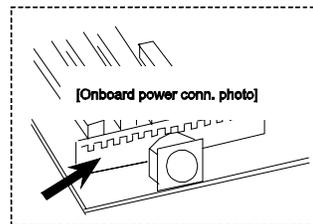
This 12-pin block connector is used for connecting to the standard 5V power supply. In the picture below, notice that, in most cases, there are two marks “P8” and “P9” on the surface of the connector. You have to insert the “P8” plug into the “P8” section of the connector, and so forth for “P9”. Two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



**Power Plugs  
of  
Power Supply**

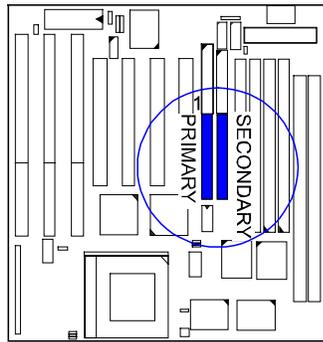


**Power  
Connector**



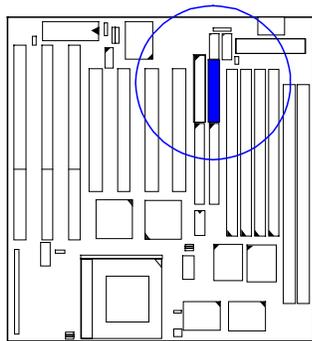
***IDE HDD Device Connectors: PRIMARY, SECONDARY***

These two 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.



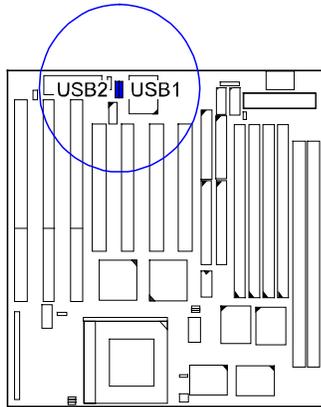
***Printer Connector: PRINTER***

This connector is featured onboard for the connection with your printer.



***Universal Serial Bus Connectors: USB1, USB2***

These two connectors link with USB peripheral devices via an optional USB riser card.



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