

Chapter 2

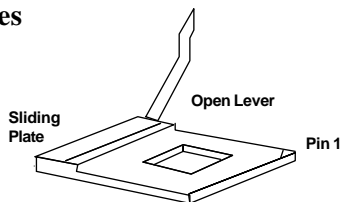
HARDWARE INSTALLATION

2.1 Central Processing Unit: CPU

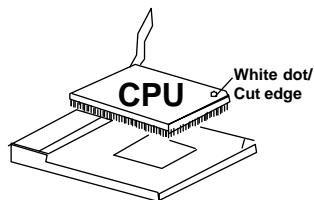
The **MS-5156** mainboard operates with **Intel® Pentium® processors/ Pentium® processors with MMX™ technology, Cyrix® 6x86/6x86L/ 6x86MX** and **AMD® K5/K6** processors. It could operate with 2.8V to 3.52V processors. The mainboard provides a 321-pin ZIF Socket 7 for easy CPU installation, a DIP switch (SW1) to set the proper speed for the CPU and a Jumper block (JV2 - JV5) for setting the CPU voltage. The CPU should always have a cooling fan attached to prevent overheating.

2.1-1 CPU Installation Procedures

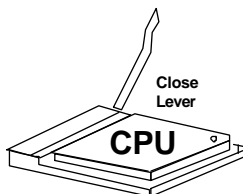
1. Pull the lever sideways away from the socket. Then raise the lever up to a 90-degree angle.



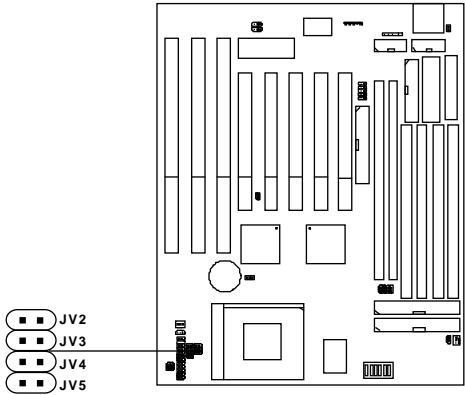
2. Locate Pin 1 in the socket and look for the white dot or cut edge in the CPU. Match Pin 1 with the white dot/cut edge. Then, insert the CPU. It should insert easily.































3. Press the lever down to complete the installation.



2.1-2 CPU Voltage Setting: JV2-JV5



V I/O	Vcore	JV2~JV5
3.5	3.5	
3.3	3.3	
3.3	3.2	
3.3	2.9	
3.3	2.8	

V I/O	Vcore	JV2~JV5
3.3	2.7	 JV2  JV3  JV4  JV5
3.3	2.6	 JV2  JV3  JV4  JV5
3.3	2.5	 JV2  JV3  JV4  JV5
3.3	2.4	 JV2  JV3  JV4  JV5
3.3	2.3	 JV2  JV3  JV4  JV5
3.3	2.2	 JV2  JV3  JV4  JV5
3.3	2.1	 JV2  JV3  JV4  JV5

2.1-3 CPU Speed and Voltage Setting: SW1 & JV2-JV5

To adjust the speed and voltage of the CPU, you must know the specifications of your CPU (*always ask the vendor for CPU specifications*). Then refer to **Table 2.1 (Intel® processors)**, **Table 2.2 (Cyrrix® processors)** and **Table 2.3 (AMD® processors)** for proper setting.

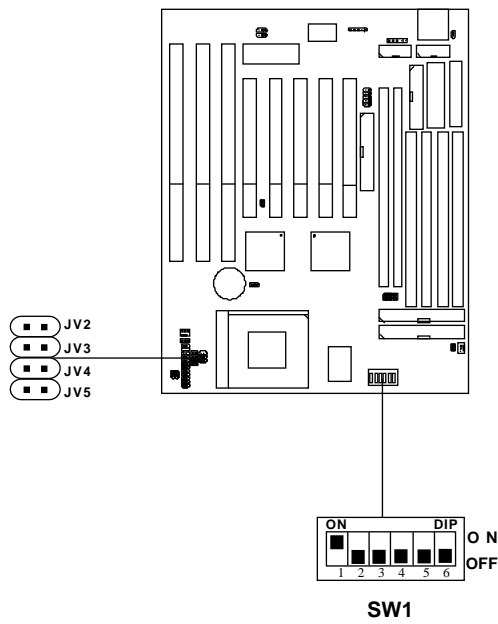

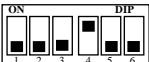











Table 2.1 Intel® processors

Intel® Pentium® processors

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV2~JV5	SW1
90MHz	3.38		 JV2 JV3 JV4 JV5	 ON OFF
	3.52		 JV2 JV3 JV4 JV5	
100MHz	3.38		 JV2 JV3 JV4 JV5	 ON OFF
120MHz	3.38			 ON OFF
133MHz	3.52		 JV2 JV3 JV4 JV5	 ON OFF
150MHz	3.52			 ON OFF
166MHz	3.52			 ON OFF
200MHz	3.52			 ON OFF

Intel® Pentium® processors with MMX™ technology


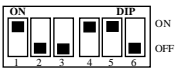




166MHz	3.3	2.8	JV2 JV3 JV4 JV5	ON OFF
200MHz				ON OFF
233MHz				ON OFF

Note: If you encounter a CPU with different voltage, just go to page 2-2 and look for the proper voltage settings.





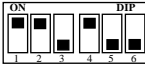

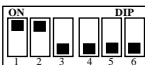




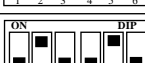
Table 2.2 Cyrix® 6x86/6x86L/6x86MX processors

Cyrix® 6x86 processor uses PR to rate the speed of their processors based on Intel® Pentium® processor core speed. For example PR150 (120MHz) has 150MHz core speed of Intel® Pentium® processor but has 120MHz core speed in Cyrix®. Cyrix® 6x86 processor should always use a more powerful fan (ask vendor for proper cooling fan).

Cyrix® 6x86/6x86L processors

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV2~JV5	SW1
6x86 PR133	3.3			
6x86 PR150				
6x86 PR166	3.3			
6x86L PR166	3.3	2.8		

Cyrrix® 6x86MX processors



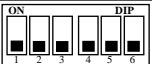



CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV2~JV5	SW1
PR166 (60x2.5)	2.9		 JV2  JV3  JV4  JV5	
(66x2)				
PR200 (66x2.5)				
(75x2)				
PR233 (66x3)				
(75x2.5)				
PR266 (66x3.5)				
(75x3)				

Note: PR200(75x2), PR233, and PR266 CPU are not yet tested, so we still don't guarantee the performances of this CPUs.



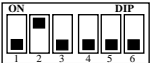

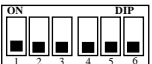
Table 2.3 AMD® K5/K6 processors

AMD® K5/K6 CPU uses PR to rate the speed of their processors based on Intel® CPU core speed . For example PR133(100MHz) has 133MHz core speed of Intel® Pentium® processor but has 100MHz core speed in AMD® K5 CPU.

AMD® K5 processors

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV2~JV5	SW1
PR90	3.52			
PR100				
PR120				
PR133/PR150				
PR166				

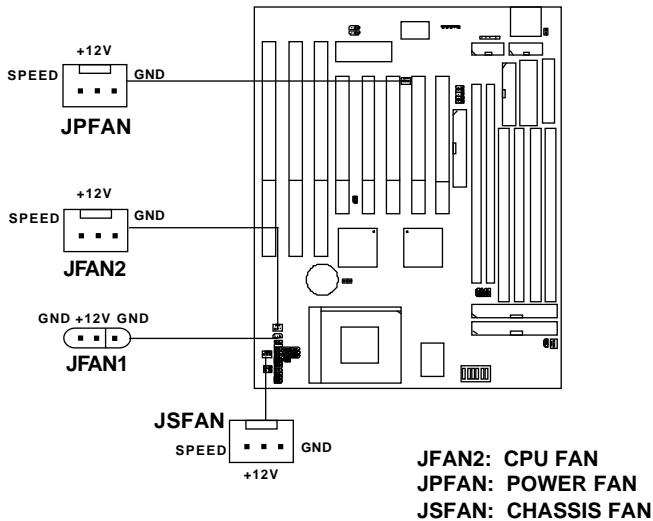
AMD® K6 processors

PR166	3.3	2.9		
PR200				
PR233	3.3	3.2		

Note: If you encounter a CPU with different voltage, just go to page 2-2 and look for the proper voltage settings.

2.1-4 CPU Fan Power Connector: JFAN1/JFAN2/JSFAN/ JPFAN

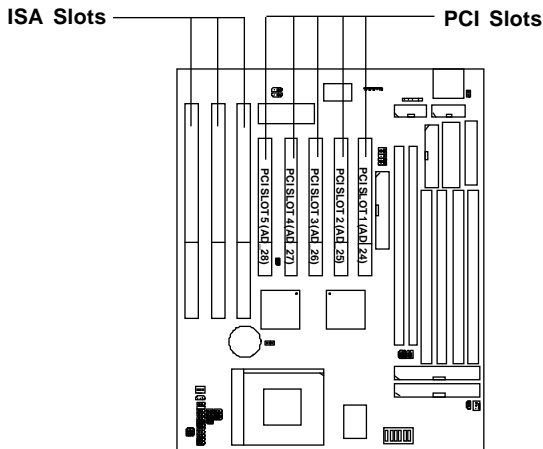
JFAN1 connector supports CPU cooling fan with +12V. It supports both two and three pin head connector. When connecting the wire to the connector, always take note that the red wire is the positive and should be connected to the +12V. While JFAN2, JSFAN, and JPFAN system cooling fan with +12V. It supports three pin head connector. When connecting the wire to the connector, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND, the yellow is the speed sensor. If your mainboard has LM78 on board, you need to use a specially designed fan with speed sensor to take advantage of LM78's CPU fan control function.



- Note:** 1. **JFAN2/JSFAN/JPFAN** is used for CPU Cooling Fan Speed Connectors.
(Reserved for LM78 System Hardware Monitor Option.)
2. Always consult vendor for proper CPU cooling fan.

2.2 PCI and ISA Slots

There are 5 PCI slots and 3 ISA slots. All PCI slots can be used as master. But since the 1st and 5th PCI slots share the same bus master signal, only one of these slots can be used as a master at a time; which means that if a bus master card is installed in PCI slot 1, PCI Slot 5 can only accommodate a slave card, and vice versa.

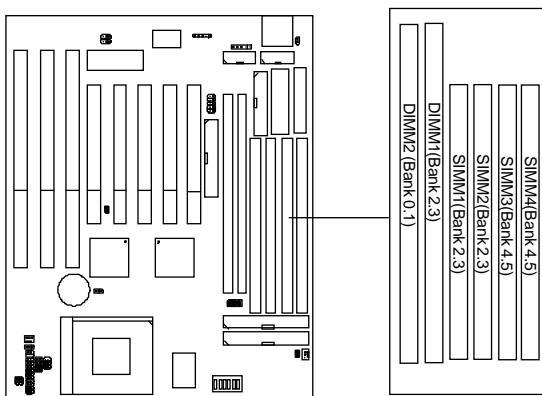


- Note:**
1. You can only use a **3.3 V PCI Card**, if the power supply you're using is an **ATX power supply w/ 3.3V**.
 2. PCI Slot 1 to PCI Slot 5 IDSEL is AD_24(Device Num = 0DM) to AD_28(Device Num = 11H) respectively.

2.3 Memory Installation

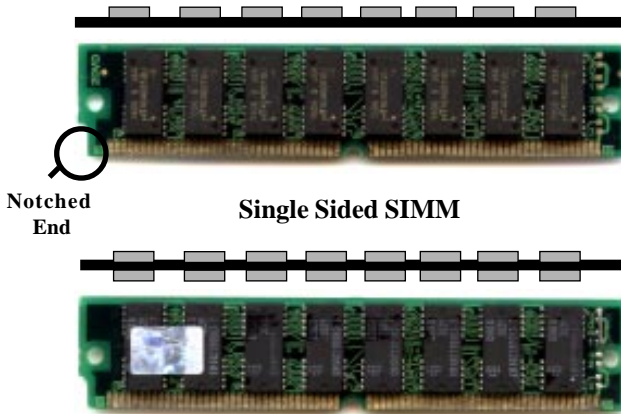
2.3-1 Memory Bank Configuration

The mainboard provides four 72-pin SIMMs (Single In-Line Memory Module) and two 168-pin DIMM(Double In-Line Memory) sockets. It supports six memory banks for a maximum of 256MB memory. Each bank supports up to 64MB memory. You can use SIMM from 4MB, 8MB, 16MB, 32MB, 64MB to 128MB, and DIMM from 8MB, 16MB, 32MB, 64MB to 128MB.



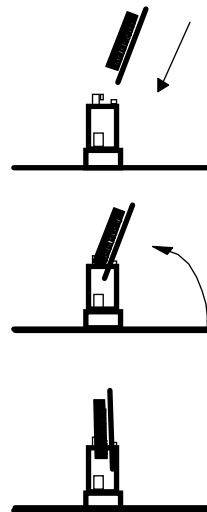
2.3-2 Memory Installation Procedures:

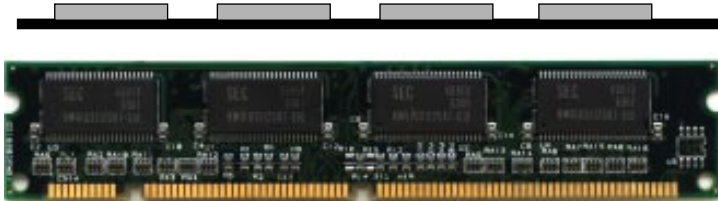
A. How to install SIMM Module



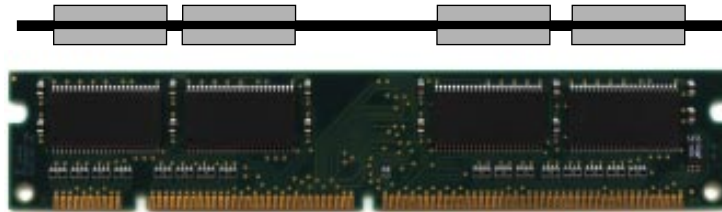
Double Sided SIMM

1. The SIMM slot has a “*Plastic Safety Tab*” and the SIMM memory module has a “*Notched End*”, so the SIMM memory module can only fit in one direction.
2. Insert the SIMM memory modules into the socket at 45-degree angle, then push into a vertical position so that it will snap into place.
3. The Mounting Holes and Metal Clips should fit over the edge and hold the SIMM memory modules in place.



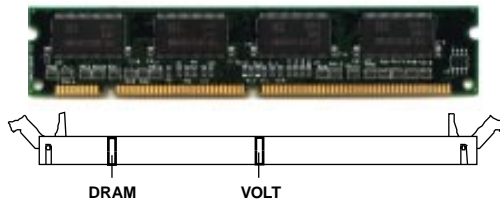
B. How to install DIMM Module

Single Sided DIMM



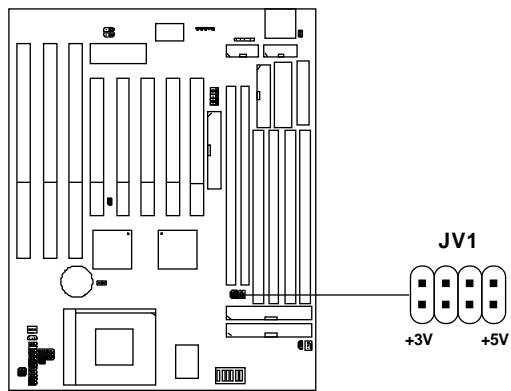
Double Sided DIMM



1. The DIMM slot has two keys marked “VOLT and DRAM” , so the DIMM memory module can only fit in one direction.
2. Insert the DIMM memory module vertically into the DIMM slot. Then, push it in.



3. Close the plastic clip at the side of the DIMM slot.

B.1 DIMM Power Voltage Selector: JV1



DIMM Voltage	JV1
5V	+3V  +5V
3.3V	+3V  +5V

SIMM Power Level : 5 Volts
DIMM Power Level : 3.3V or 5V

NOTE: DIMM and SIMM cannot be used at the same time. Only one kind can be used at a time. If you want to use both of them at the same time, you must use 5V DIMM.

2.3-3 Memory Population Rules

1. Make sure that the SIMM banks are using the same type and equal size density memory.
2. To operate properly, at least two 72-pin SIMM module must be installed in the same bank or one 168-pin DIMM module must be installed. The system cannot operate with only one 72-pin SIMM module.
3. This mainboard supports Table Free memory, so memory can be installed on (SIMM1 + SIMM2),(SIMM3 + SIMM4), (DIMM1), or (DIMM 2), in any order.
4. If you use DIMM with 64Mbit SDRAM, then Bank2.3 (SIMM1+SIMM2) can not be use.
5. DIMM and SIMM cannot be used at the same time. Only one kind can be used at a time. If you want to use both of them you must use a 5V DIMM.

2.4 Case Connector: JFP1

The Turbo LED, Turbo Switch, Hardware Reset, Key Lock, Power LED, Power Saving LED, Sleep Switch, Speaker and HDD LED are all grouped in JFP1 connector block for easy installation.

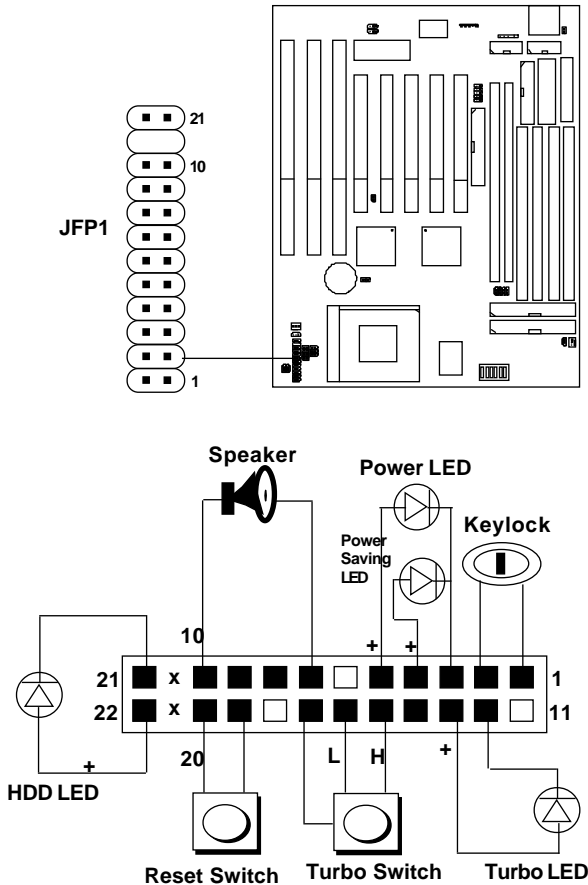


Figure 2.1

2.4-1 Turbo LED

This mainboard is always on Turbo speed. Connecting a Turbo LED will just lit the LED. (See Figure 2.1)

2.4-2 Hardware Reset

Reset switch are used to reboot the system rather than turning the power ON/OFF. Avoid rebooting the system when the HDD LED is lit. You can connect the Reset switch from the system case to this pin. (See Figure 2.1)

2.4-3 Keylock

Keylock allows you to disable the keyboard for security purposes. You can connect the keylock to this pin. (See Figure 2.1)

2.4-4 Power LED

The Power LED is always lit while the system power is on. You can connect the Power LED from the system case to this pin. (See Figure 2.1)

2.4-5 Turbo Switch

This mainboard is always on Turbo Speed. So the Turbo Switch is non-functional. (See Figure 2.1)

2.4-6 Speaker

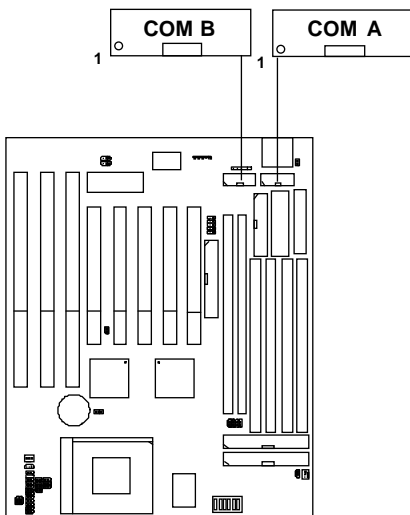
Speaker from the system case are connected to this pin. (See Figure 2.1)

2.4-7 HDD LED

HDD LED shows the activity of a hard disk drive. Avoid turning the power off while the HDD led is lit. You can connect the HDD LED from the system case to this pin. (See Figure 2.1).

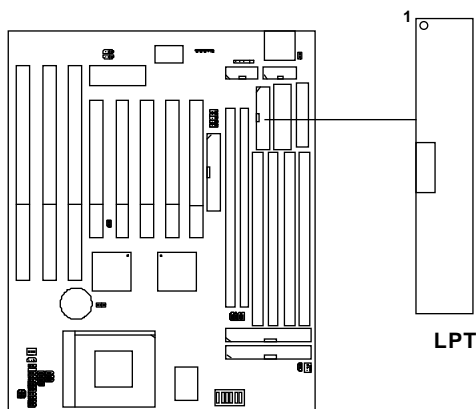
2.5 Serial Port Connectors: COM A & COM B

The mainboard has two serial ports COM A and COM B. These two ports are 16550A fully compatible high speed communication ports that send/receive 16 bytes FIFOs. You can attach a mouse or a modem cable directly into these connectors.



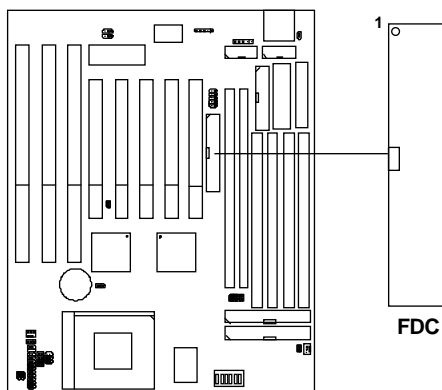
2.6 Parallel Port Connector: LPT

The mainboard provides a connector for LPT. A parallel port is a standard printer port that also supports Enhanced Parallel Port(EPP) and Extended capabilities Parallel Port(ECP).



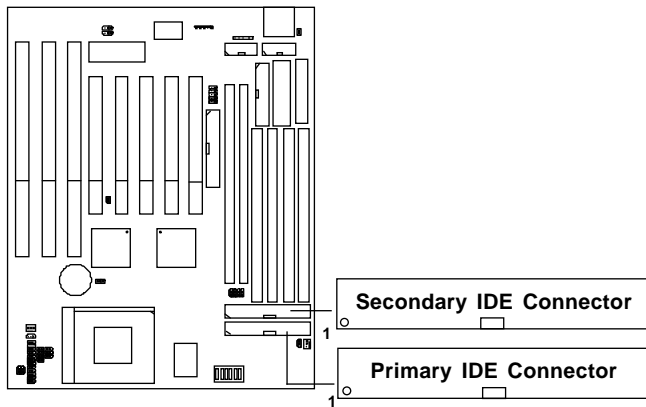
2.7 Floppy Disk Connector: FDC

The mainboard also provides a standard floppy disk connector, FDC that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. You can attach a floppy disk cable directly to this connector.



2.8 Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE Controller that provides for two HDD connectors IDE1 (primary) and IDE2 (secondary). You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices to IDE1 and IDE2.



IDE1(primary IDE connector)

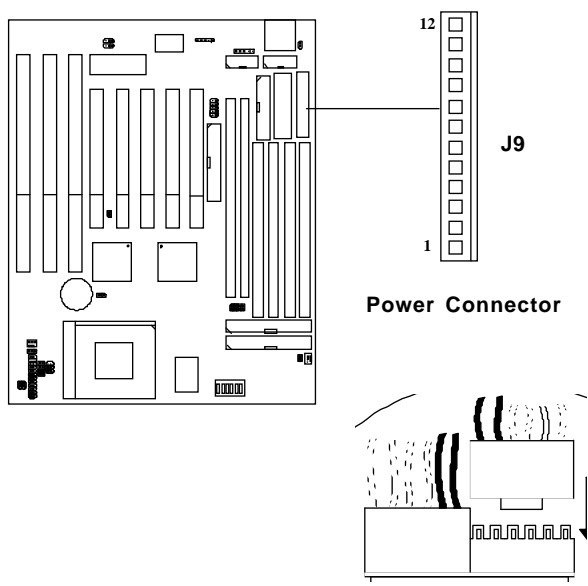
The first hard disk should always be connected to IDE1. IDE1 can connect a Master and a Slave drive.

IDE2(secondary IDE connector)

IDE2 can connect a Master and a Slave drive.

2.9 Power Supply Connector: J9

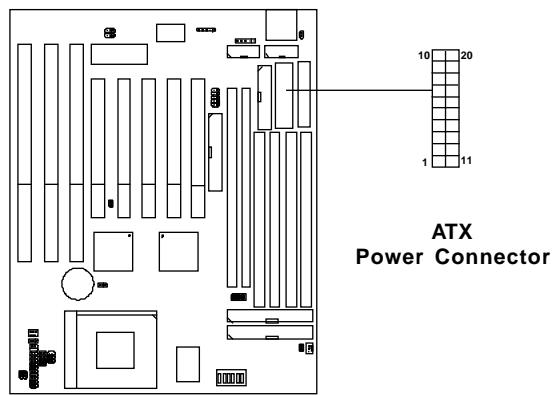
J9 is a standard 12-pin AT® or PS/2® connector. Be sure to attach the connectors with the two black wires at the center.



Pin	Description	Pin	Description
1	Power Good	7	Ground
2	+5V DC	8	Ground
3	+12V DC	9	-5V DC
4	-12V DC	10	+5V DC
5	Ground	11	+5V DC
6	Ground	12	+5V DC

2.10 ATX 20-pin Power Connector: JWR1

This type of connector already supports the remote ON/OFF function. You don't need to connect the JRMC1. However, you need to connect the Remote Power On/OFF switch (JRMS1 or JRMS2).

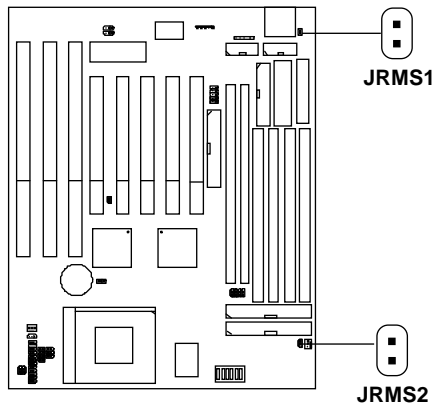


ATX Power Connector Pin Description

20	19	18	17	16	15	14	13	12	11
5V	5V	-5V	GND	GND	GND	PS_ON	GND	-12V	3.3V
12V	5V_SB	PW_OK	GND	5V	GND	5V	GND	3.3V	3.3V
10	9	8	7	6	5	4	3	2	1

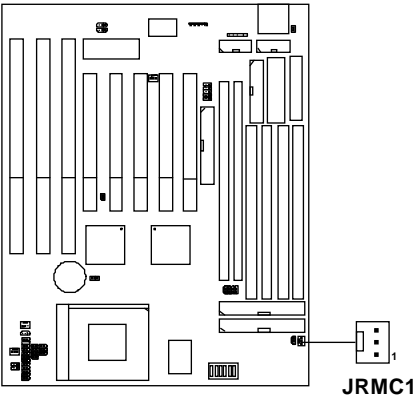
2.11 Remote Power On/Off Switch: JRMS1/JRMS2

Connect to a 2-pin push button switch to JRMS1 or JRMS2. Every time the switch is shorted by pushing it once, the power supply will change its status from OFF to ON and ON to OFF. This is used for ATX type power supply. You can program this through BIOS. Refer to Soft-Off by PWR-BTTN in BIOS.



2.12 Remote Power Connector: JRMC1

Some PS/2® power supply support 3-pin remote power connector. This 3-pin connector should be connected to JRMC1, then use JRMS1 or JRMS2 to switch ON/OFF the system.

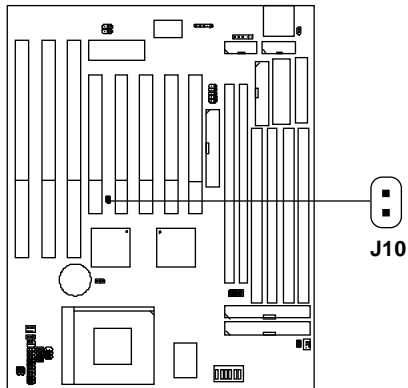




PIN#	Description
1	PS-
2	5V Standby
3	GND

Note: The pin definition of the PS/2® power supply remote power connector should be the same as shown above.

2.13 ATX Power Supply 3.3V : J10

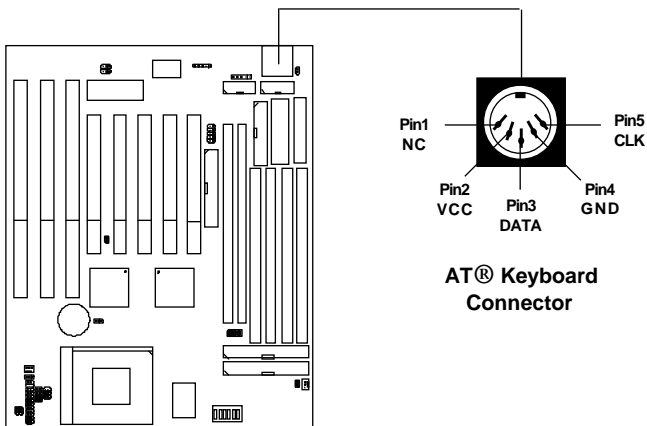
This jumper setting is used by ATX power supply without 3.3V, using ATX power supply with 3.3V or AT® power supply should keep J10 open.



POWER SUPPLY	J10
ATX w/o 3.3V	
ATX or AT®	

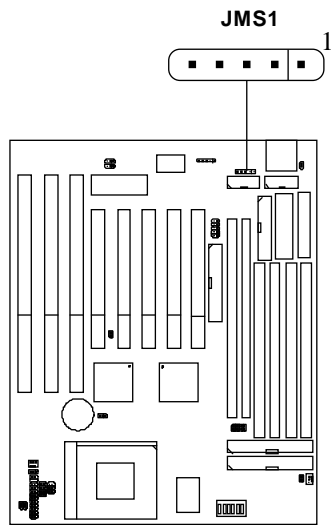
2.14 Keyboard Connector: ATKBC

The mainboard provides a standard AT® keyboard DIN connector for attaching a keyboard. You can plug a keyboard cable directly to this connector.



2.14 Mouse Connector: JMS1

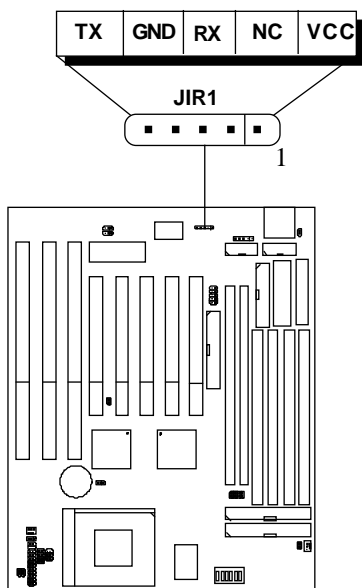
The mainboard provides a 5-pin connector for PS/2® mouse cable (optional). You can plug a PS/2® mouse to PS/2® mouse cable. The connector location as shown below.



Pin 1	VCC
Pin 2	-
Pin 3	GND
Pin 4	CLK
Pin 5	DATA

2.15 Infrared Module Connector: JIR1

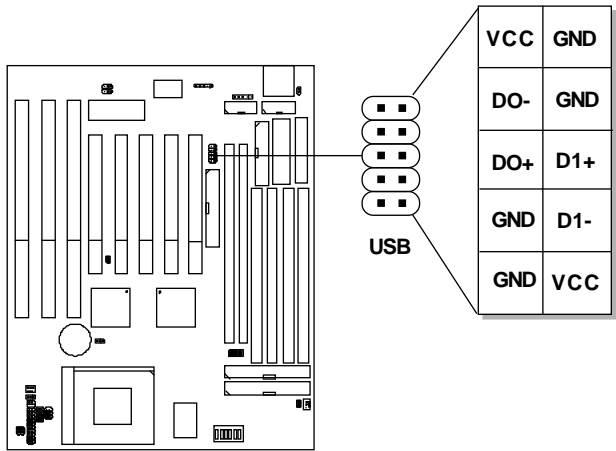
The mainboard provides a 5-pin infrared connector(IR) for IR module. This connector is for optional wireless transmitting and receiving infrared module. If you want to use this function, you must configure the setting through BIOS setup.



Note: This mainboard support SIR.

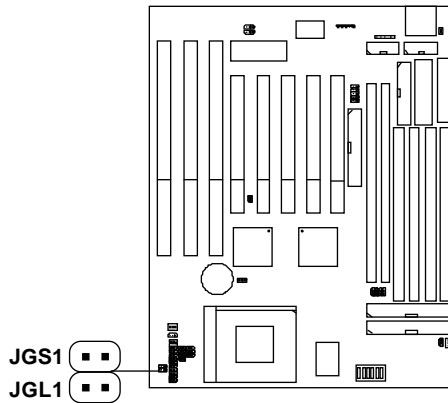
2.16 USB Connector: USB

Connect a USB cable to support USB device, such as keyboard and mouse.



2.17 Power Saving Switch Connector: JGS1/ Power Saving LED Connector: JGL1

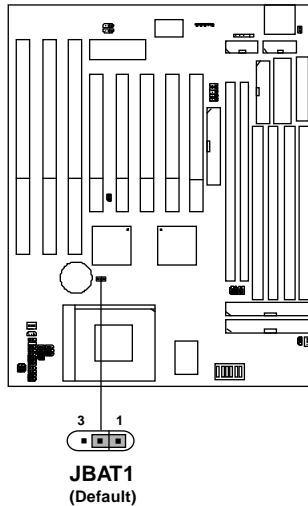
Attach a power saving switch to JGS1. When the switch is pressed, the system immediately goes into suspend mode. Press any key and the system wakes up. JGL1 can be connected with LED to monitor the JGS1. This will lit while the system is in suspend mode.



Note: To make JGS1 function, you must go to the BIOS power management and enable it there.

2.18 Battery Connector: JBAT1

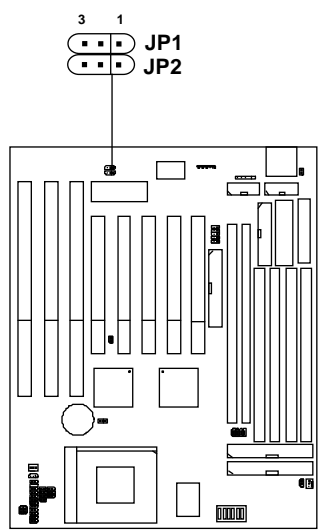
A battery must be used to retain the mainboard configuration in CMOS RAM. To retain the on-board battery you must always short pins 1,2 of JBAT1.



Note: You can clear CMOS by shorting 2-3 pin, while the system is off. Then, return to 1-2 pin position. Avoid clearing the CMOS while the system is on , it will damage the mainboard.

2.19 Flash ROM Programming Voltage: JP1/JP2

This jumper is for setting the voltage of the Flash ROM BIOS.



+12V (Default)	<p>JP1 JP2</p>
+5V (Reserved)	<p>JP1 JP2</p>