

Chapter 2

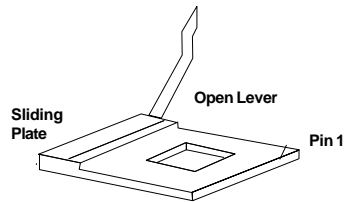
HARDWARE INSTALLATION

2.1 Central Processing Unit: CPU

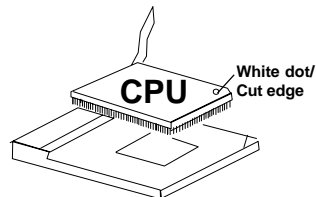
The **Baby AL7** mainboard operates with **Intel® Pentium® Processor/ Pentium® Processor with MMX™ technology, Cyrix® 6x86/6x86L/ 6x86MX** and **AMD® K5/K6** processors. It could operate with 2.1V to 3.5V processors. The mainboard provides a 321-pin ZIF Socket 7 for easy CPU installation, a switch (SW1) to set the proper speed for the CPU and a switch (SW2) for setting the CPU voltage. The CPU should always have a cooling fan attached to prevent overheating.

2.1-1 CPU Installation Procedures

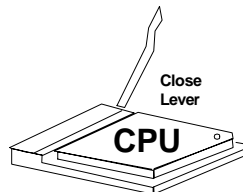
1. Pull the lever sideways away from the socket. Then, raise the lever up to a 90-degree angle.



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 Core Speed Derivation Procedure

1. The Switch SW1 (4 & 5) is used to adjust the CPU clock frequency.

SW1		CPU
4	5	Clock
ON	ON	60MHz
OFF	ON	66MHz
ON	OFF	75MHz
OFF	OFF	83.3MHz

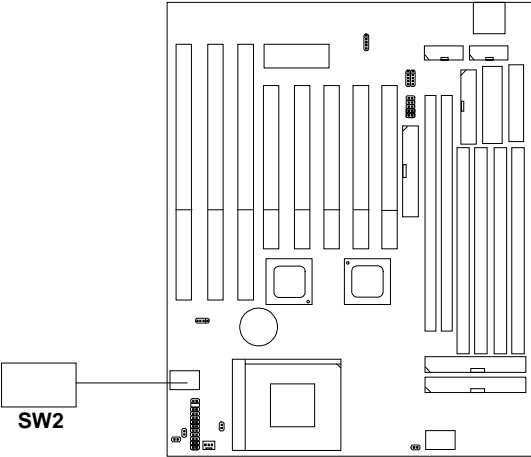
2. The Switch SW1 (1, 2, and 3) is used to set the Core/Bus (Fraction) ratio of the CPU. The actual core speed of the CPU is the Host Clock Frequency multiplied by the Core/Bus ratio. For example:

$$\begin{aligned}
 \text{If } & \frac{\text{CPU Clock}}{\text{Core/Bus ratio}} &= & 66\text{MHz} \\
 & \frac{\text{Core/Bus ratio}}{\text{CPU core speed}} &= & 3/2 \\
 \text{then } & \text{CPU core speed} &= & \frac{\text{Host Clock} \times \text{Core/Bus ratio}}{3/2} \\
 & &= & 66\text{MHz} \times 3/2 \\
 & &= & 100\text{MHz}
 \end{aligned}$$

SW1			CPU
1	2	3	Core/Bus Ratio
OFF	ON	OFF	3
ON	ON	OFF	2.5
ON	OFF	OFF	2
OFF	OFF	OFF	1.5/3.5

3. The PCI Bus Clock is the CPU Clock Frequency divided by 2.

2.1-3 CPU Voltage Setting: SW2



V I/O	Vcore	SW2
3.5	3.5	OFF ON ON ON ON
3.3	3.3	OFF ON ON OFF ON
3.3	3.2	OFF ON ON OFF OFF
3.3	2.9	OFF ON OFF OFF ON

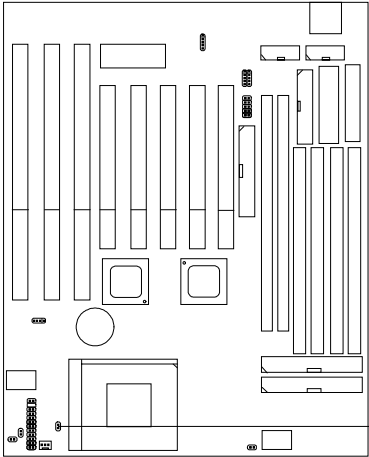
ON-Short OFF-Open

V	I/O	Vcore	SW2
3.3	2.8	OFF ON OFF OFF OFF	
3.3	2.5	OFF OFF ON OFF ON	
3.3	2.1	OFF OFF OFF OFF ON	



ON-Short OFF-Open

a. CPU Single or Dual Voltage Setting: JV1

This jumper is used to set the CPU single or dual voltage.



The diagram shows a top-down view of a motherboard. The CPU socket is located in the lower-left quadrant. To its right, near the edge of the board, is the JV1 jumper. A line connects the JV1 label to the jumper's location.

JV1	CPU
	Dual Voltage CPU
	Single Voltage CPU

Note: If you're using a single voltage CPU, leave JV1 open. If you're using a dual voltage CPU, short the JV1.

JV1

2.1-4 CPU Speed and Voltage Setting: SW1 & SW2

To set the proper 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® Pentium® Processor/Pentium® Processor with MMX™ technology)**, **Table 2.2 (Cyrix® 6x86/6x86L/6x86MX processor)** and **Table 2.3 (AMD® K5/K6 processor)** for proper setting.

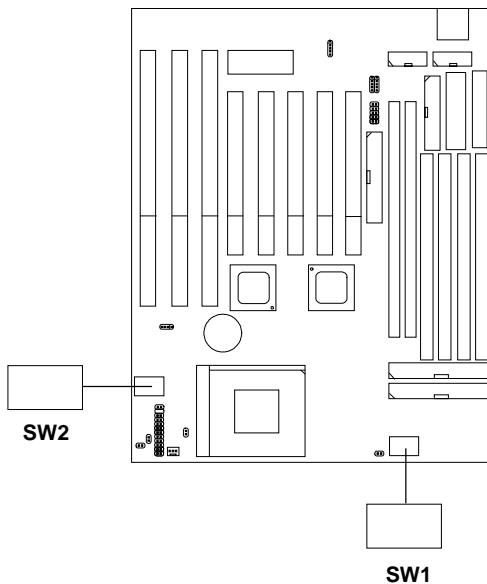




Table 2.1 Intel® Processor

a. Intel® Pentium® Processor

CPU Type	CPU Voltage				CPU Speed
	VI/O	Vcore	JV1	SW2	SW1
90 MHz	3.38			OFF ON ON OFF ON	OFF OFF OFF ON ON
	3.52			OFF ON ON ON ON	
100 MHz	3.38			OFF ON ON OFF ON	OFF OFF OFF OFF ON
120 MHz	3.38				ON OFF OFF ON ON
133 MHz	3.52			OFF ON ON ON ON	ON OFF OFF OFF ON
150 MHz	3.52				ON ON OFF ON ON
166 MHz	3.52				ON ON OFF OFF ON
200 MHz	3.52				OFF ON OFF OFF ON

b. Intel® Pentium® Processor with MMX™ Technology




166 MHz	3.3	2.8		OFF ON OFF OFF OFF	ON ON OFF OFF ON
200 MHz					OFF ON OFF OFF ON
233 MHz					OFF OFF OFF OFF ON

Note: If you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.


Table 2.2 Cyrix® Processor

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 it has 120MHz core speed in Cyrix® processor. Cyrix® 6x86 processor should always use a more powerful fan (ask vendor for proper cooling fan).

a. Cyrix® 6x86/6x86L processor

CPU Type	CPU Voltage				CPU Speed
	VI/O	Vcore	JV1	SW2	SW1
6x86 PR150	3.5			OFF ON ON ON ON	ON OFF OFF ON ON
6x86 PR166					ON ON OFF ON ON
6x86L PR166	3.3	2.8		OFF ON OFF OFF OFF	
6x86 PR200	3.5			OFF ON ON ON ON	ON OFF OFF ON OFF
6x86L PR200	3.3	2.8		OFF ON OFF OFF OFF	

b. Cyrix® 6x86MX Processor


CPU Type	CPU Voltage				CPU Speed
	VI/O	Vcore	JV1	SW2	SW1
PR166 (60 x 2.5)	3.3	2.9		OFF ON OFF OFF ON	ON ON OFF ON ON
PR200 (66 x 2.5)					ON ON OFF OFF ON
PR233 (75 x 2.5)					ON ON OFF ON OFF
(66 x 3)					OFF ON OFF OFF ON
PR266 (75 x3)					OFF ON OFF ON OFF
(66 x 3.5)					OFF OFF OFF OFF ON

Note: If you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.


Table 2.3 AMD® Processor

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

a. AMD® K5 Processor

CPU Type	CPU Voltage				CPU Speed
	VI/O	Vcore	JV1	SW2	SW1
PR90	3.52			OFF ON ON ON ON	OFF OFF OFF ON ON
PR100					OFF OFF OFF OFF ON
PR120					ON OFF OFF ON ON
PR133					ON OFF OFF OFF ON
PR150					ON ON OFF ON ON
PR166					ON ON OFF OFF ON

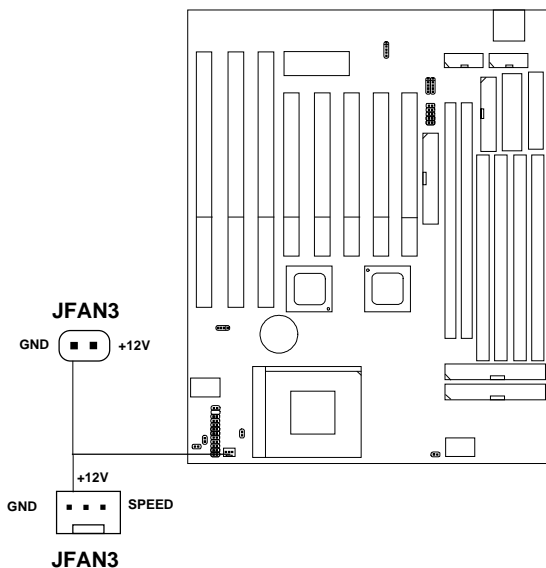
b. AMD® K6 Processor

PR166	3.3	2.9		OFF ON OFF OFF ON	ON ON OFF OFF ON
PR200					OFF ON OFF OFF ON
PR233	3.3	3.2		OFF ON ON OFF OFF	OFF OFF OFF OFF ON

Note: If you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.

2.1-5 CPU Fan Power Connector: JFAN3

This connector supports 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. If your mainboard has LM78 chipset on-board, you can use a specially designed fan w/ speed sensor to take advantage of LM78's CPU fan control.



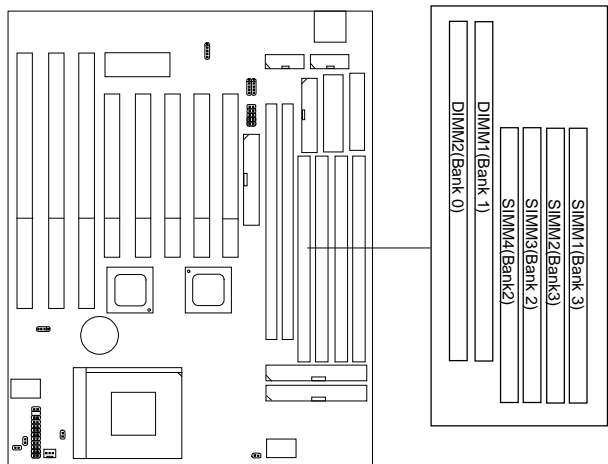
For fans with fan speed sensor, every rotation of the fan will send out 2 pulses. LM78 will count and report the fan rotation speed.

Note: Always consult vendor for proper CPU cooling fan.

2.6 Memory Installation

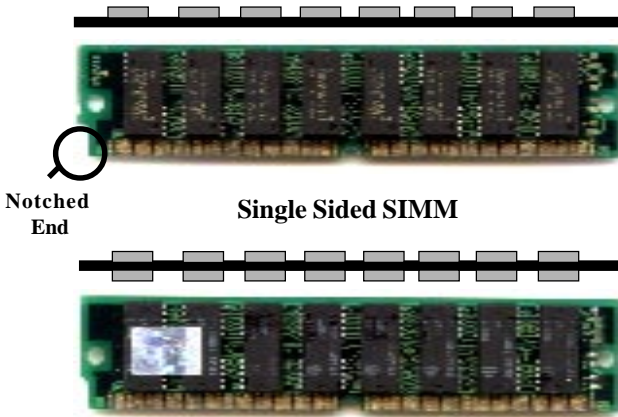
2.6-1 Memory Bank Configuration

The mainboard provides four 72-pin SIMMs (Single In-Line Memory Module) and two 168-pin DIMM(Double In-Line Memory) sockets. It supports five memory banks for a maximum of 1 GB memory. You can use SIMM from 4MB, 8MB, 16MB, 32MB, 64MB to 128MB, and DIMM from 8MB, 16MB, 32MB, 64MB, 128MB, to 256MB.



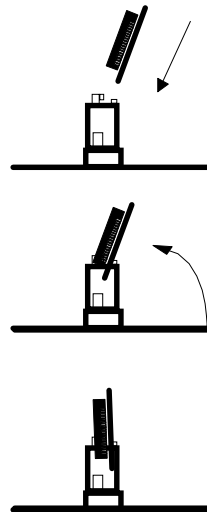
2.6-2 Memory Installation Procedures:

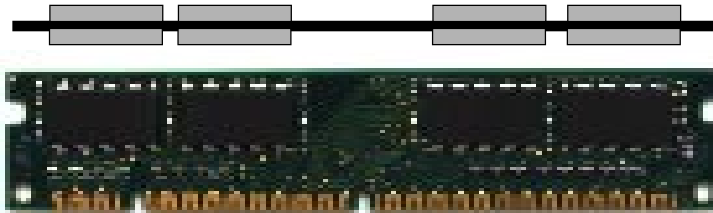
A. How to install SIMM Module



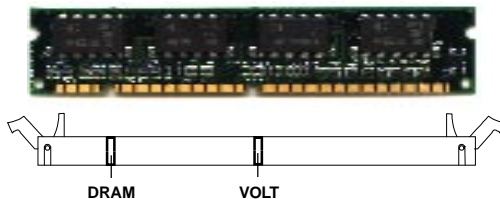
Double Sided SIMM

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.

2.6-3 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. Each RAS cannot exceed 16 pcs of DRAM.
4. It is not recommended to mix SIMM with DIMM, for it may cause unreliability.
5. You can only use a 3.3V unbuffered DIMM.

Table 2.6-1 Minimum (upgradeable) and Maximum Memory Size for each configuration for SIMM

DRAM Tech.	DRAM Density & Width	DRAM Addressing	Address Size		MB/SIMM	
			Row	Column	Single no. Side(S) pcs.	Double no. Side(D) pcs.
4M	1Mx4	SYMM	10	10	4MBx8	8MBx16
16M	1Mx16	SYMM	10	10	4MBx2	8MBx4
	1Mx16	ASYM	12	8	4MBx2	8MBx4
	2Mx8	ASYM	11	10	8MBx4	16MBx8
	4Mx4	SYMM	11	11	16MBx8	32MBx16
	4Mx4	ASYM	12	10	16MBx8	32MBx16
64M	2Mx32	ASYM	12	9	8MBx1	16MBx2
	4Mx16	SYMM	11	11	16MBx2	32MBx4
	4Mx16	ASYM	12	10	16MBx2	32MBx4
	8Mx8	ASYM	12	11	32MBx4	64MBx8
	16Mx4	SYMM	12	12	64MBx8	128MBx16

Table 2.6-2 Minimum (upgradeable) and Maximum Memory Size for each configuration for DIMM

DRAM Tech.	DRAM Density & Width	DRAM Addressing	Address Size		MB/DIMM	
			Row	Column	Single no. Side(S) pcs.	Double no. Side(D) pcs.
16M	1Mx16	ASYM	12	8	8MBx4	16MBx8
	2Mx8	ASYM	12	9	16MBx8	32MBx16
	4Mx4	ASYM	12	10	32MB	64MB
64M	2Mx32	ASYM	12	10	32MBx2	64MBx4
	2Mx32	ASYM	13	8	16MBx2	32MBx4
	4Mx16	ASYM	14	8	32MB	64MB
	8Mx8	ASYM	14	9	64MB	128MB
	16Mx4	ASYM	14	10	128MB	256MB

2.7 Case Connector: JFP1

The Turbo LED, 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.

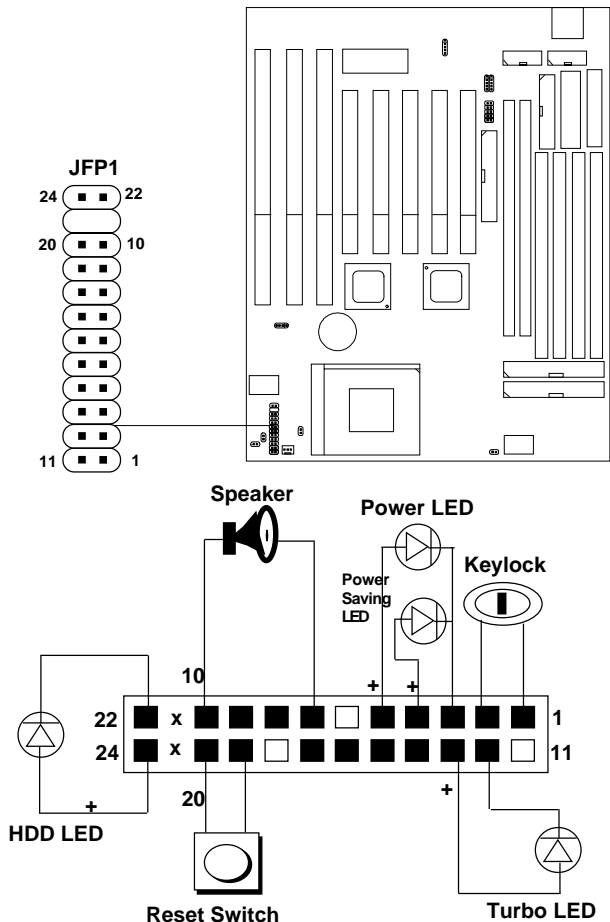


Figure 2.1

2.7-1 Turbo LED

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

2.7-2 Hardware Reset

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

2.7-3 Keylock

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

2.7-4 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)

2.7-5 Speaker

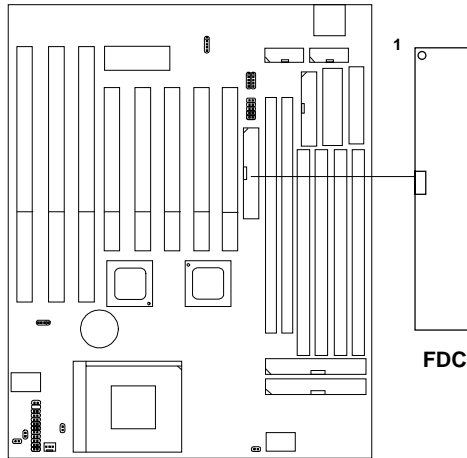
Speaker from the system case are connected to this pin. (See Figure 2.1)

2.7-6 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).

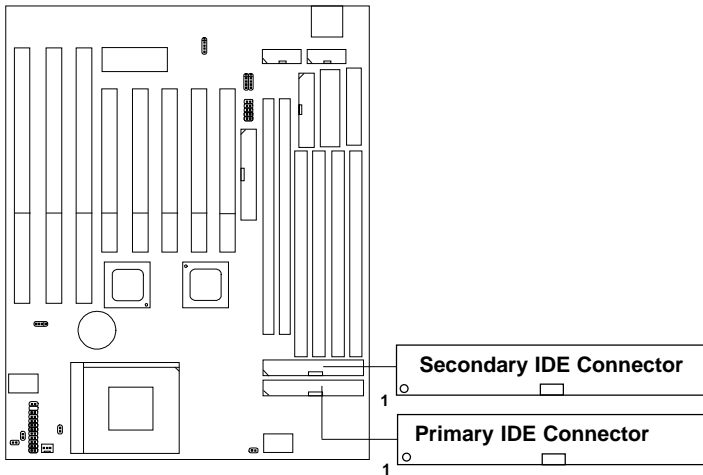
2.8 Floppy Disk Connector: FDC

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.



2.9 Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE Controller that provides 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)

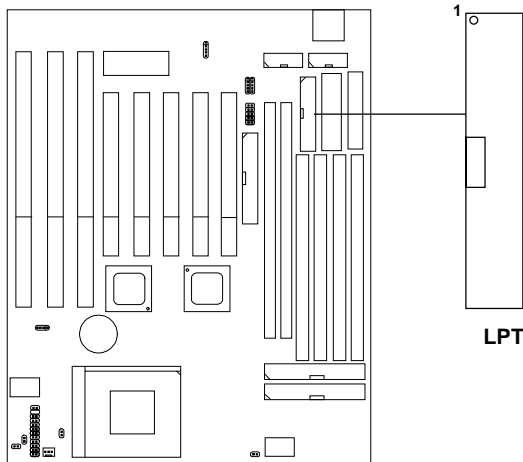
The first hard disk should always be connected to IDE1. IDE1 can connect a Master and a Slave drive.

IDE2(Secondary IDE Connector)

IDE2 can connect a Master and a Slave drive.

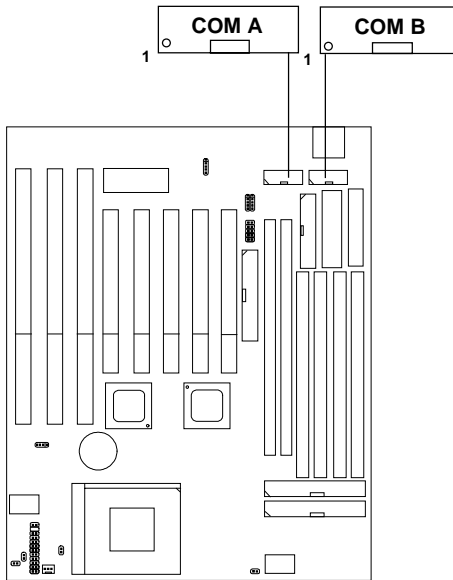
2.10 Parallel Port Connector: LPT

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).



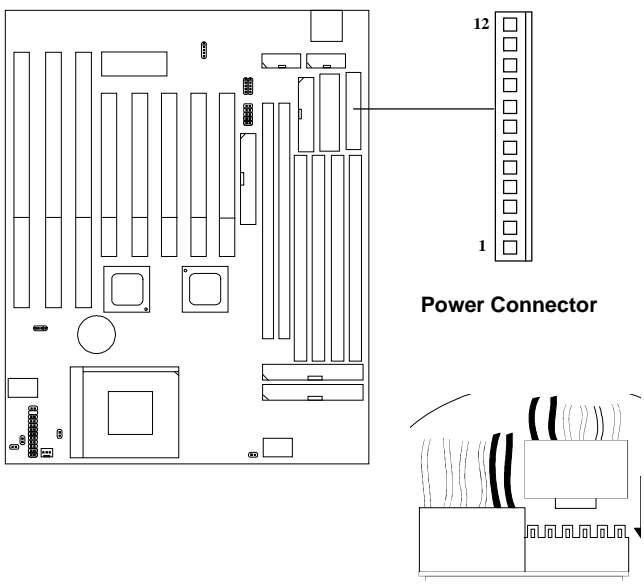
2.11 Serial Port Connectors: COM A & COM B

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.



2.12 AT Power Supply Connector

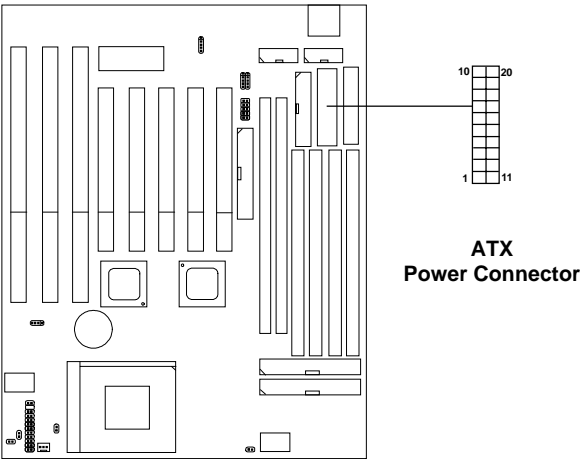
This is a standard 12-pin AT® or PS/2® connector. Be sure to attach the connectors with the two black wires at the center.



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

2.13 ATX 20-pin Power Connector

This type of connector already supports the remote ON/OFF function. However, you need to connect the **Remote Power ON/OFF switch (JRMS1 or JRMS2)**.

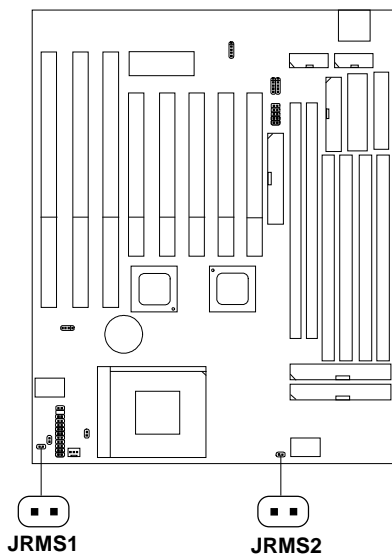


PIN DEFINITION

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

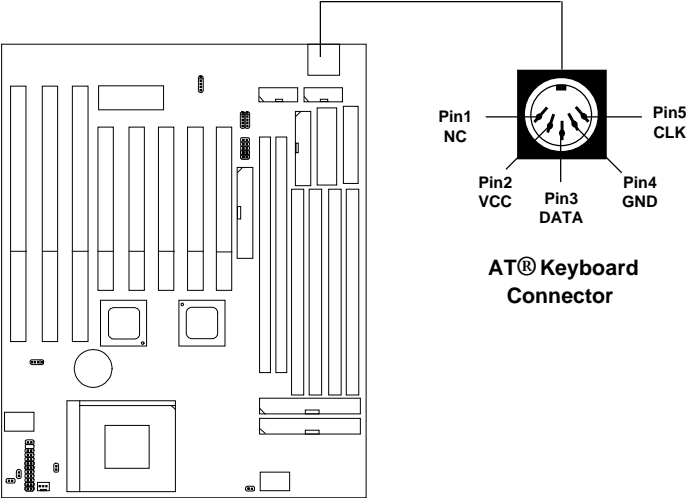
2.14 Remote Power On/Off Switch: JRMS1/JRMS2

Connect 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. During ON stage: push once and the system goes to sleep mode; push it more than 4 seconds will change its status from 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.



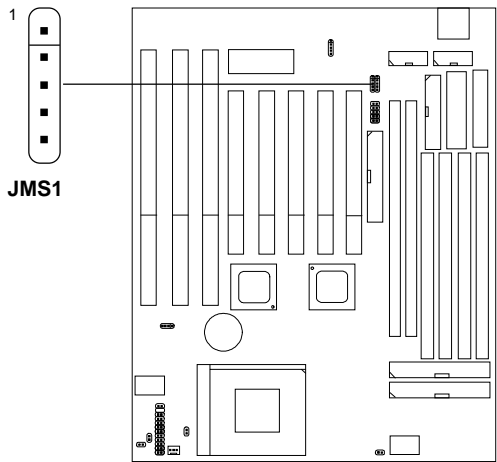
2.15 Keyboard Connector: ATKBC

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



2.16 Mouse Connector: JMS1

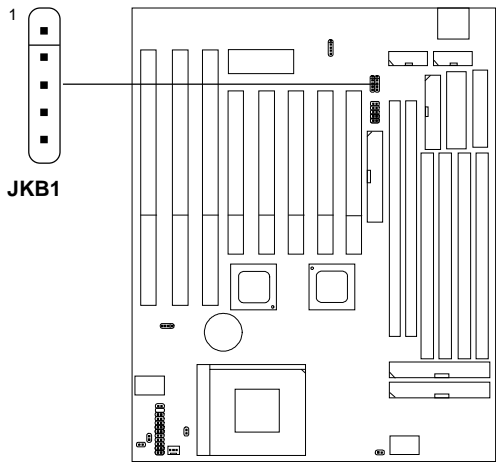
The mainboard provides a 5-pin connector for PS/2® mouse cable (optional). You can plug a PS/2® mouse to PS/2® mouse cable. The connector location is shown below.



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

2.17 Keyboard Connector: JKB1

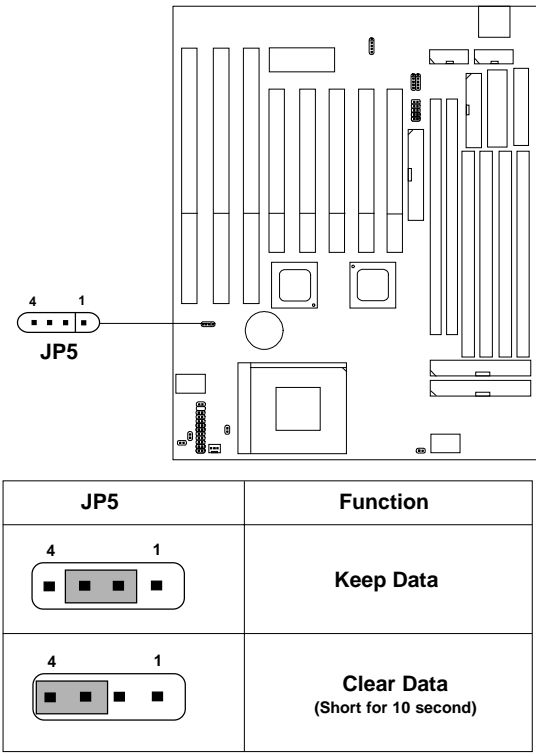
The mainboard provides a 5-pin connector for PS/2® keybaord cable (optional). You can plug a PS/2® keyboard to PS/2® keyboard cable. The connector location is shown below.



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

2.18 External Battery Connector: JP5

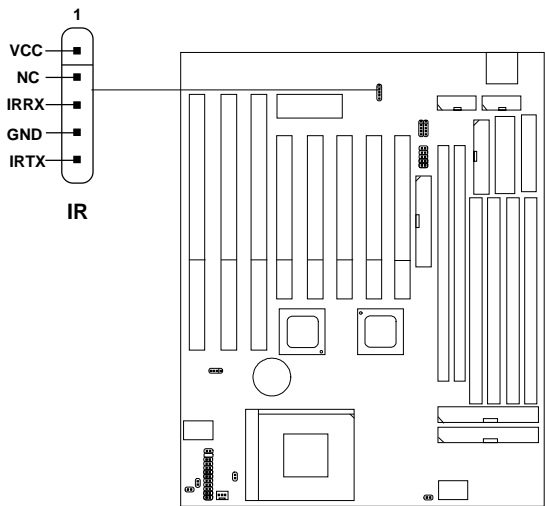
A battery must be used to retain the mainboard configuration in CMOS RAM. If you use the on-board battery, you must short 2-3 pins of JP5 to keep the CMOS data.



Note: You can clear CMOS by shorting 3-4 pin for 10 second, while the system is off. Then, return to 2-3 pin position. To be able to clear the CMOS, You need to unplug the system, because the chipset with 3V standby that is provide by the power supply 5V stanby. There is always a 3V Standby power, so you need to unplug the system.

2.19 Infrared Module Connector: IR

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.



2.20 USB Connector: USB

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

