

Chapter 2

HARDWARE INSTALLATION

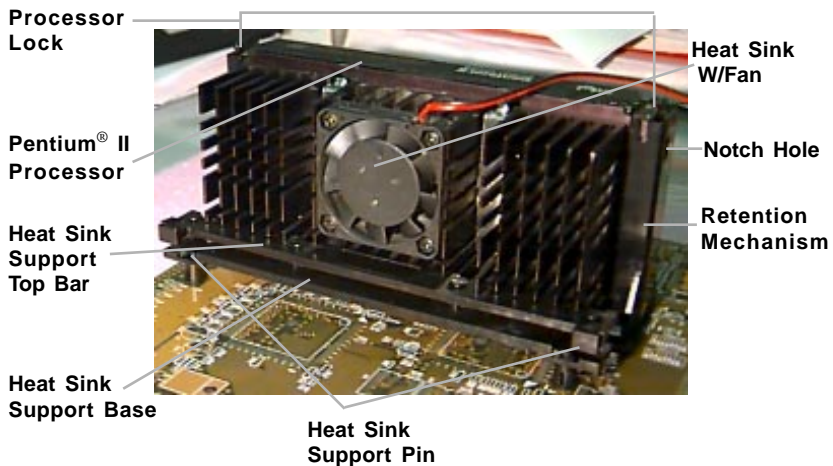
2.1 Central Processing Unit: CPU

The mainboard operates with **Intel® Pentium® II processor**. The mainboard uses a CPU Slot called Slot 1 for easy CPU installation and a DIP switch (JBF1) to set the proper speed for the CPU. The CPU should always have a Heat Sink and a cooling fan attached to prevent overheating.

2.1-1 CPU Installation Procedures

There are two kinds of Pentium® II processors that is currently used: the OEM Pentium® II processor and the Boxed Pentium® II processor. OEM Pentium® II processor has no Heat Sink, Fan and Heat Sink Support, while the Boxed Pentium® II processor is provided with Heat Sink w/ fan and Heat Sink Support.

A. OEM Pentium® II processor Installation Procedures



Required Things:

Pentium® II processor - Processor.

***Retention Mechanism(RM)** - Plastic Guide that holds the S.E.C. Cartridge in the Slot 1 connector.

***Heat Sink Support Base (HSSBASE)** - Plastic support bar mounted to the mainboard under the ATX heatsink.
(One leg is always bigger than the other one)

***Heat Sink Support Pin (HSSPIN)** - Plastic pins inserted through the HSSBASE to secure it to the mainboard (2 required per Assembly).

***Heat Sink Support Top Bar (HSSTOP)** - Plastic bar that clips onto the HSSBASE through the fins on the ATX heatsink.

****Heat Sink w/ fan** - Heat Sink that can be attached to the **Pentium® II processor** with metal clip.

Note: * Provided by MSI mainboard.

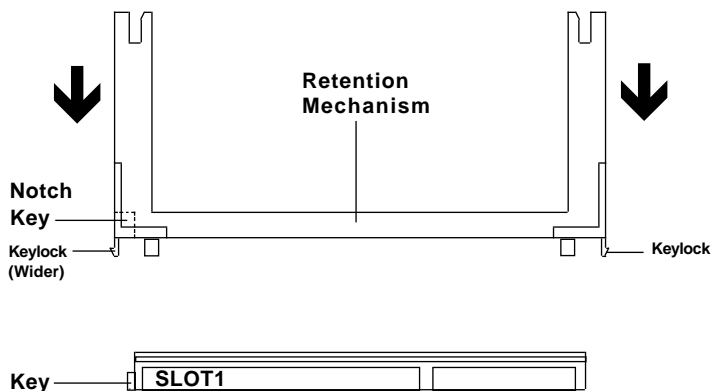
** Provided by Special request.



Step 1: Place the bubble bag that came with your mainboard or use any soft material like Styrofoam underneath the mainboard. Find a flat surface to do the installation.

Step 2: Install the Retention Mechanism.

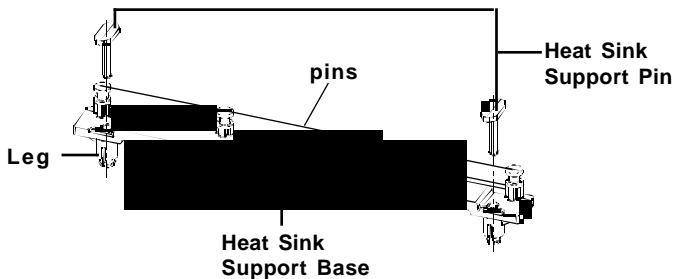
Look for the key on Slot 1, and match it with the Notch Key on the Retention Mechanism for the proper direction. Then, insert the Two Keylock of the Retention Mechanism into the two holes on the sides of Slot 1. Take note that one hole is wider than the other. The Retention Mechanism will only fit in one direction.



Push the Retention Mechanism onto the mainboard, until you hear a “click” sound. Check for a perfect fit.

Step 3: Install the Heat Sink Support Base.

Look for the Two holes across Slot 1, and match it with the Two legs of the Heat Sink Support Base for the proper direction. Take note that one hole/leg is bigger than the other. The Four top pins of the Heat Sink Support Base should also be oriented towards Slot 1.



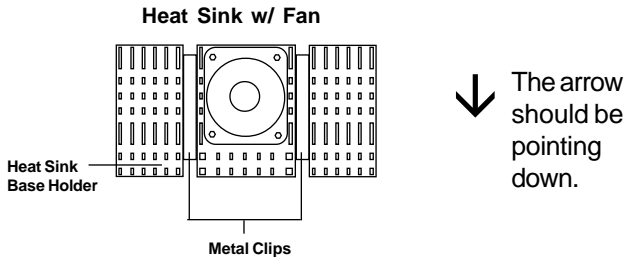
Push the Heat Sink Support Base onto the mainboard, until you hear a click sound. Check for a perfect fit.

Step 4: Install the Heat Sink Support Pin.

Push the Heat Sink Support Pins onto the two holes of the Heat Sink Support Base. Check for a perfect fit. These pins are used to secure the Heat Sink Support Base.

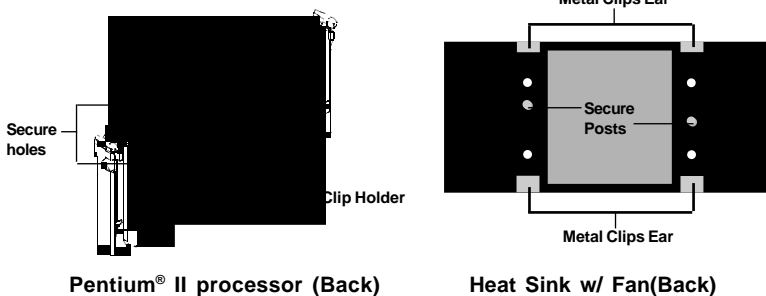
Step 5: Install the Heat Sink with Fan to the Processor.

Push down the metal clips, so that they are in line with the back of the Heat Sink. Be careful, so as not to detach the metal clips from the Heat Sink.



In case the metal clips are detached from the Heat Sink, re-attach them. Look for the arrow on the metal clip. This arrow should be pointing down and aligned with the Heat Sink Support Base Holder.

Attach the Heat Sink to the processor.



- Look at the back of the Heat Sink and take note of the 2 secure posts. Insert these 2 Secure posts to the 2 secure holes on the back of the processor.
- Align the ears of the metal clips with the clip holders on the back of the processor. Use a screw driver to push the metal clips onto the clip holders. Check for a perfect fit.

Step 6: Install the Processor.

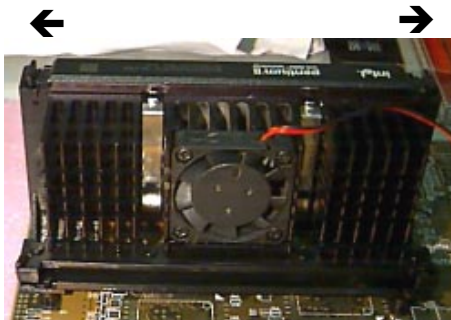
Unlock the Processor by pushing in the Processor Locks.



Insert the Processor like inserting a PCI or an ISA card.

Step 7: Lock the Processor Locks.

Secure the CPU by pulling the Processor Locks out.



Step 8: Install the Heat Sink Support Top Bar.

Push the Heat Sink Support Top Bar to the Heat Sink Support Base, Until you hear a “click” sound. Check for a perfect fit.



**Heatsink
Support Top
Bar**

The installation is now complete.

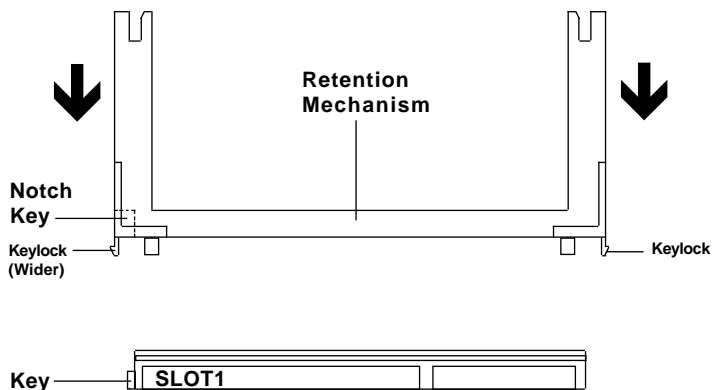
B. Boxed Pentium® II processor Installation Procedures

The Boxed Pentium® II processor has a built-in Fan and Heat Sink. It also has a Heat Sink Support. So if you're going to use a Boxed processor, all you need is the Retention Mechanism.

Step 1: Place the bubble bag that came with your mainboard or use any soft material like Styrofoam underneath the mainboard. Find a flat surface to do the installation.

Step 2: Install the Retention Mechanism.

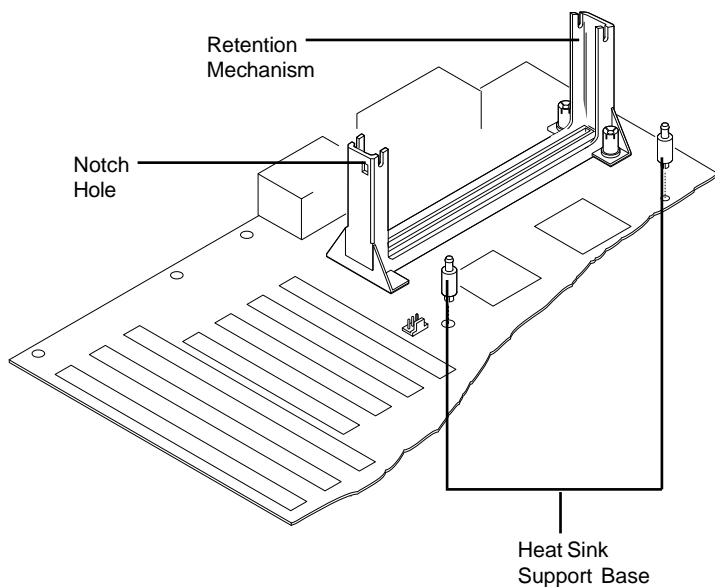
Look for the key on Slot 1, and match it with the Notch Key on the Retention Mechanism for the proper direction. Then, insert the Two Keylock of the Retention Mechanism into the two holes on the sides of Slot 1. Take note that one hole is wider than the other. The Retention Mechanism will only fit in one direction.



Push the Retention Mechanism onto the mainboard, until you hear a "click" sound. Check for a perfect fit.

Step 3: Install the Heat Sink Support Base.

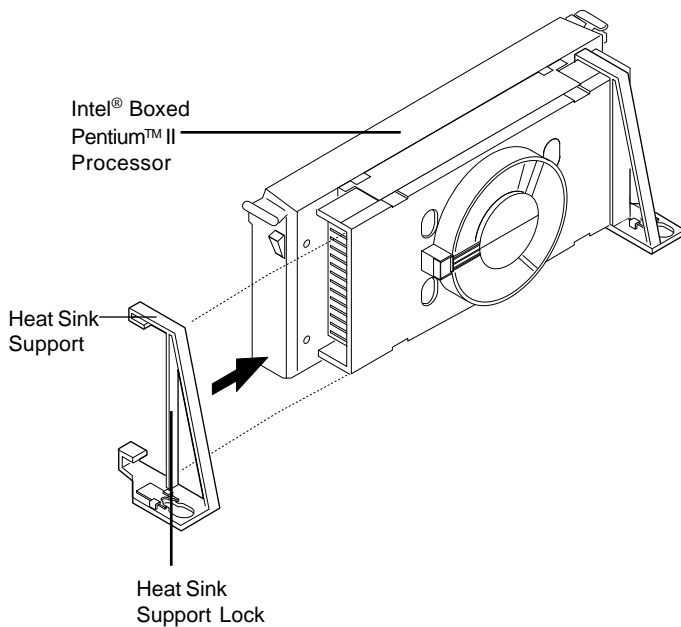
Look for the 2 holes across Slot 1, and match it with the 2 Heat Sink Support Base. Take note that one hole/base is bigger than the other.



Push the Heat Sink Support Base onto the mainboard, until you hear a click sound. Check for a perfect fit.

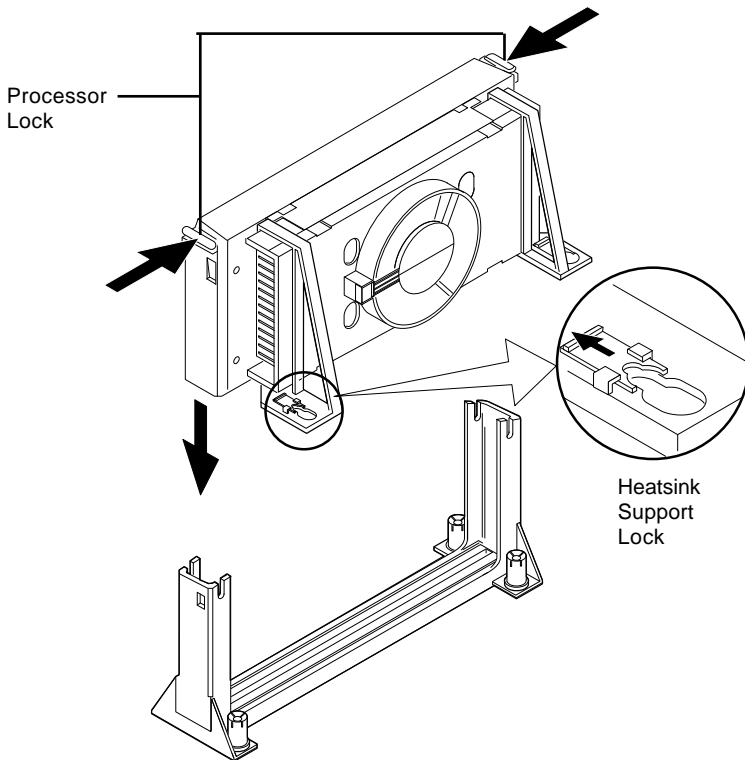
Step 4: Install the Heat Sink Support.

Attach the 2 Heat Sink Supports to the sides of the Processor. These Heat Sink Supports will fit in any direction, so be sure that the Heat Sink Support Locks are oriented outwards for the proper direction.

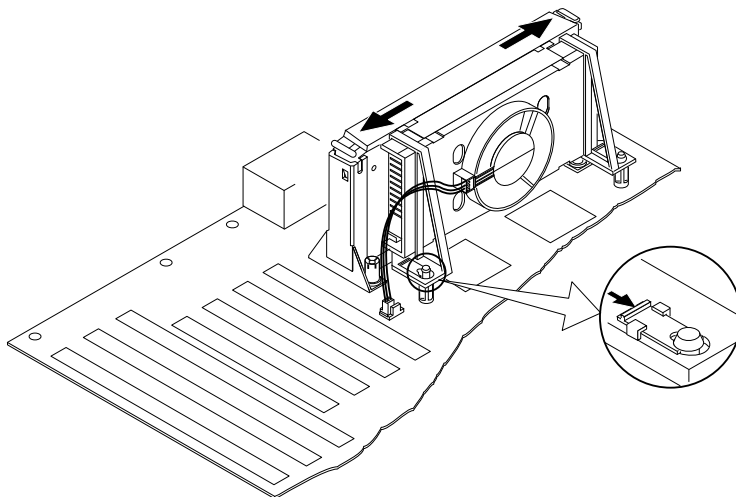


Step 5: Unlock the Processor Locks and Heat Sink Support Locks.

Push in the Processor Locks. Open the Heat Sink Support Locks.



Step 6: Insert the Processor like inserting a PCI or an ISA card.

**Step 7:** Lock the Processor Locks and Heat Sink Support Locks

Secure the CPU by pushing out the Processor Locks. Close the Heat Sink Support Locks.

The installation is now complete.

2.1-2 CPU Speed Setting: JBF1

To adjust the speed of the CPU, you must know the specification of your CPU (*always ask the vendor for CPU specification*). Then look at **Table 2.1** (**200 ~ 333MHz Intel® Pentium® II processor**) for proper setting.

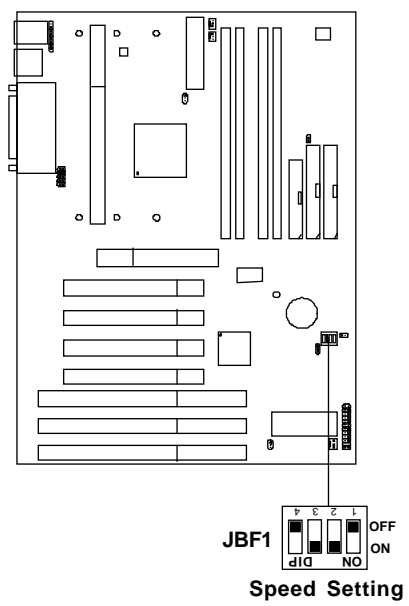
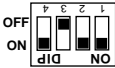
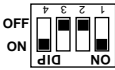
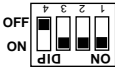
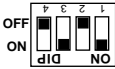
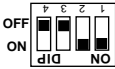
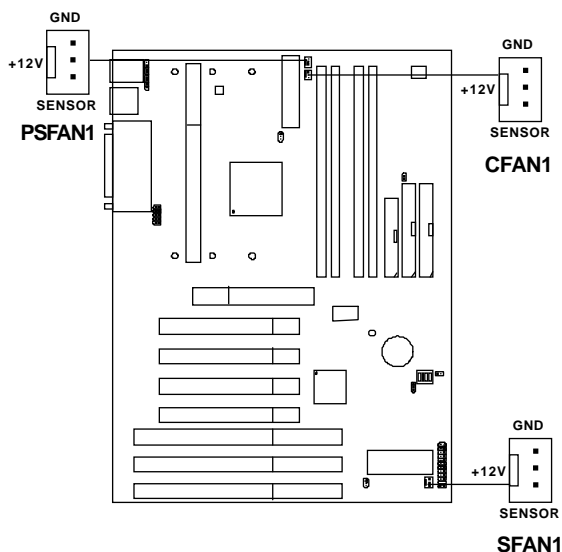


Table 2.1 200 ~ 333MHz Intel® Pentium® II processor

CPU Type	CPU SPEED JBF1
200MHz	
233MHz	
266MHz	
300MHz	
333MHz	

2.1-3 CPU Fan Power Connectors: CFAN1/SFAN1/PSFAN1

These connectors support 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 must use a specially designed fan with speed sensor to take advantage of LM78's CPU fan control.



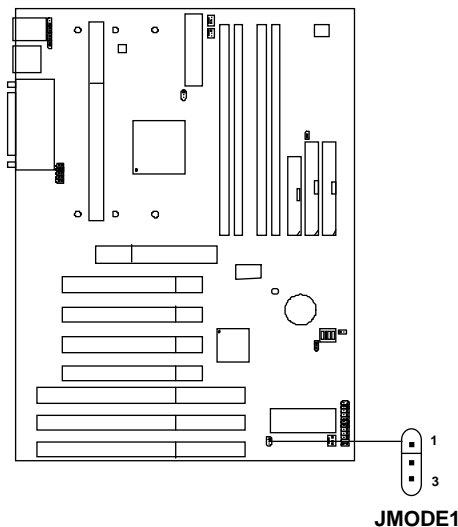
PSFAN1 : Power Supply Fan
CFAN1 : CPU Fan
SFAN1 : System(Chassis) Fan

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.

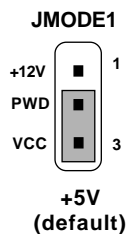
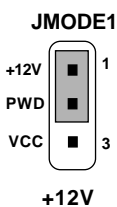
Note: 1. **SFAN1** and **PSFAN1** are the Power and Chassis Cooling Fan Speed Connector (reserved for LM78 System Hardware Monitor Option.)
2. Always consult vendor for proper CPU cooling fan.

2.2 Flash ROM Programming Voltage: JMODE1

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



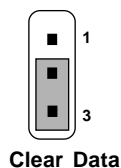
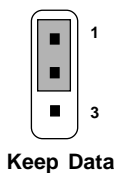
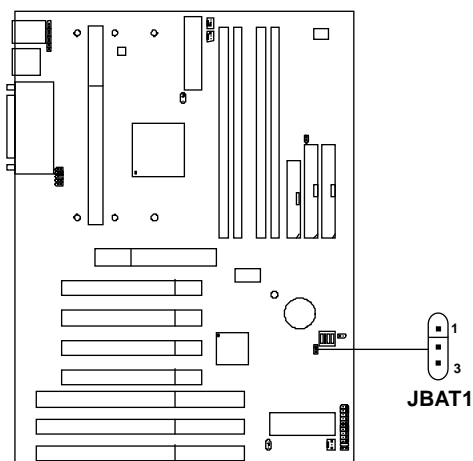
Voltage Setting



- Note:**
- Short 1-2 pin, if you're using Intel® or MXIC® flash memory and you want to flash the ROM data.
 - Short 2-3 pin, if you're using Intel® or MXIC® flash memory for normal operation.
 - Leave JMODE1 open, if you're using Winbond® flash memory.

2.3 External Battery Connector: JBAT1

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

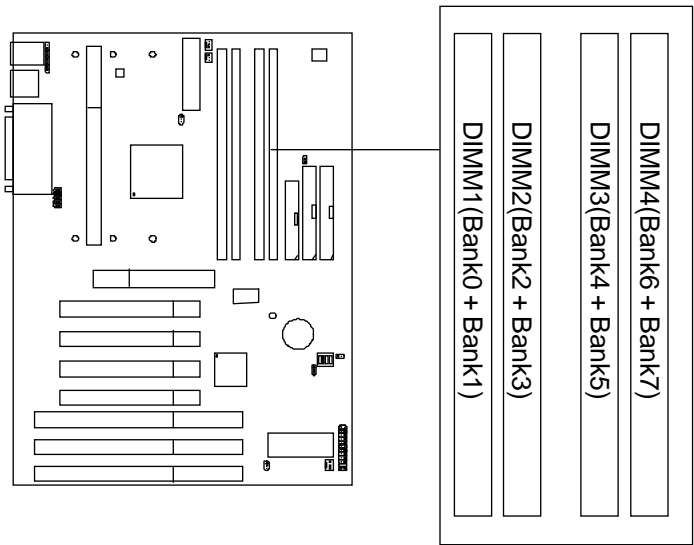


Note: You can clear CMOS by shorting 2-3 pin, while the system is off. Then, return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

2.4 Memory Installation

2.4-1 Memory Bank Configuration

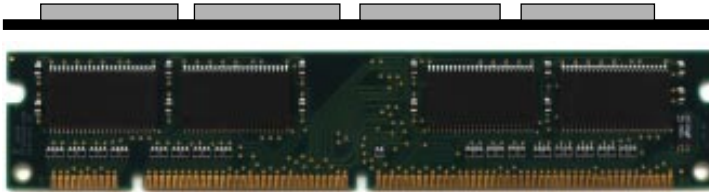
The mainboard supports a maximum of 1 GB of memory for EDO and 512MB for SDRAM: It provides four 168-pin **unbuffered** DIMMs (Double In-Line Memory Module) sockets. It supports 8 MB to 256 MB of memory. The memory module can be either SDRAM or EDO (Extended Data Output) Mode DRAM. A DIMM consists of two Banks and may have a maximum of 256 MB of memory.



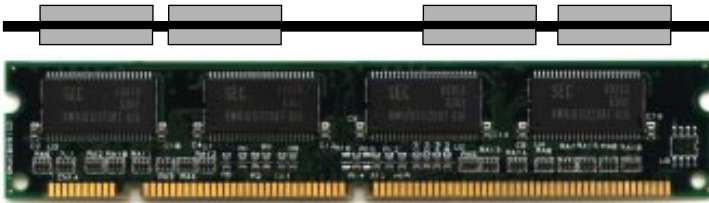
Note: FP(Fast Page) & BEDO(Burst EDO) are not supported.

2.4-2 Memory Installation Procedures

A. How to install a DIMM Module

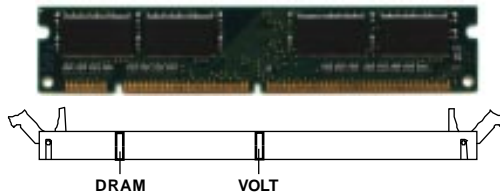


Single Sided DIMM



Double Sided DIMM

1. The DIMM slot has a two Notch Key “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.

Note: You can only use a 3.3 volt DIMM module (EDO or SDRAM).

2.4-1 Memory Population Rules

1. You can use any kind of DIMM **except for FP and BEDO**.
2. You can only used an **unbuffered** DIMM.
3. To operate properly, at least one 168-pin DIMM module must be installed.
4. This mainboard supports Table Free memory, so memory can be installed on DIMM1, DIMM2, DIMM3 or DIMM 4 in any order.
5. You can only use a 3.3 volt DIMM.
6. The DRAM addressing and the size supported by the mainboard is shown next page.

**WARNING!**

If three or four double-side DIMMs is used, you must use a DIMM with 16/18pcs of DRAM per DIMM, it should also have MA Buffers on the DIMM. (MS-5927 16/32M or MS-5928 64/128M)

Table 2.4-1 440LX EDO DRAM Addressing

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
	2Mx8	ASYM	12	9	8MBx4	16MBx8
	4Mx4	SYMM	11	11	16MBx8	32MBx16
	4Mx4	ASYM	12	10	16MBx8	32MBx16
64M	2Mx32	ASYM	11	10	8MBx1	16MBx2
	2Mx32	ASYM	12	9	8MBx1	16MBx2
	2Mx32	ASYM	13	8	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 2.4-2 440LX SDRAM Addressing

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	11	8	8MBx4	16MBx8
	2Mx8	ASYM	11	9	16MBx8	32MBx16
	4Mx4	ASYM	11	10	32MB	64MB
64M	2Mx32	ASYM	11	9	32MBx2	64MBx4
	2Mx32	ASYM	12	8	16MBx2	32MBx4
	4Mx16	ASYM	11	10	32MB	64MB
	4Mx16	ASYM	13	8	32MB	64MB
	8Mx8	ASYM	13	9	64MB	128MB
	16Mx4	ASYM	13	10	128MB	256MB
64M	2Mx32	ASYM	11	8		
	4Mx16	ASYM	12	8		
	8Mx8	ASYM	12	9		
	16Mx4	ASYM	12	10		

2.5 Case Connector: JFP1

The Turbo LED, Hardware Reset, Key Lock, Power LED, Speaker and HDD LED are all connected to the JFP connector block.

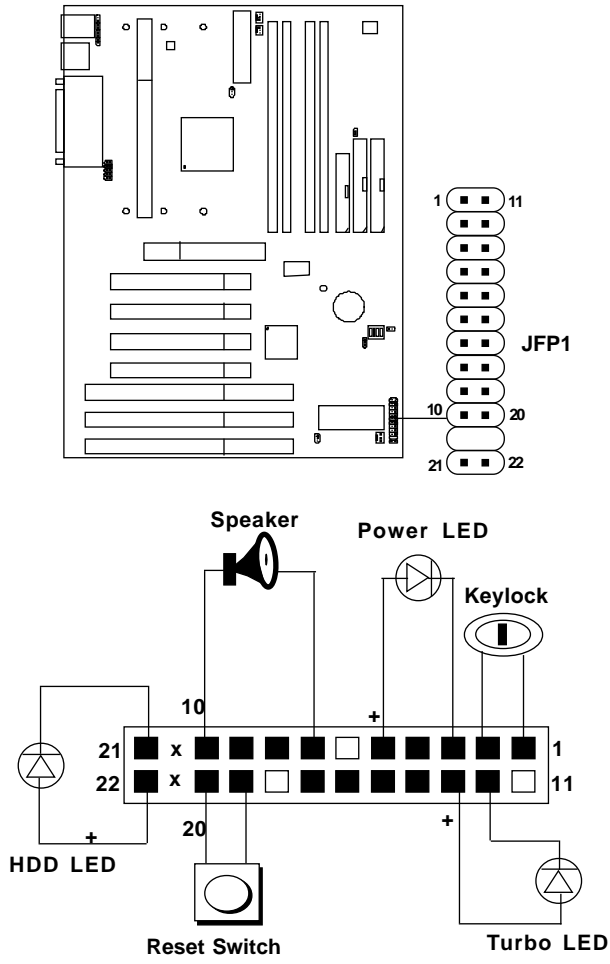


Figure 2.1

2.5-1 Turbo LED

The Turbo LED is always ON. You can connect the Turbo LED from the system case to this pin. (See Figure 2.1)

2.5-2 Hardware Reset

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

2.5-3 Keylock

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

2.5-4 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)

2.5-5 Speaker

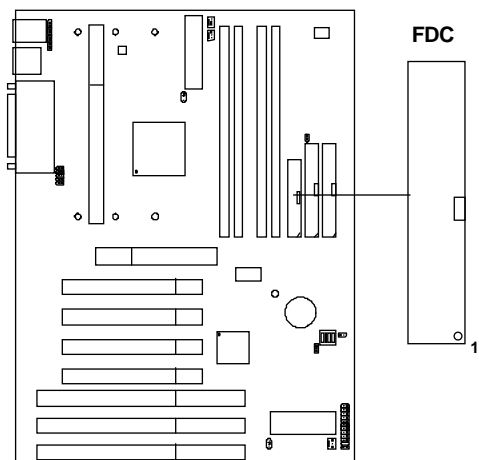
Speaker from the system case is connected to this pin. (See Figure 2.1)

2.5-6 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).

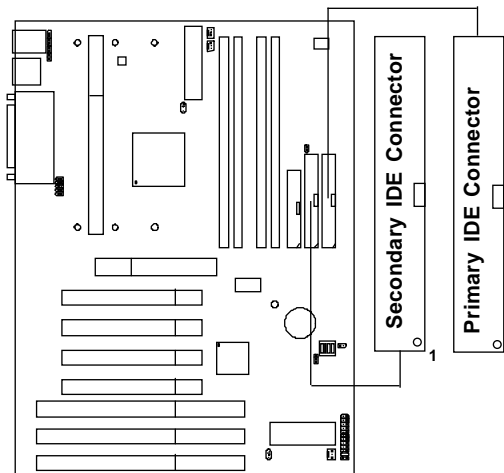
2.6 Floppy Disk Connector: FDC

The mainboard also provides a standard floppy disk connector FDC that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. These connectors support the provided floppy drive ribbon cable.



2.7 Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE Controller that provides PIO mode 0~4, Bus Master, and Ultra DMA/33 function. It has 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. These connectors support the provided IDE hard disk cable.



IDE1(Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

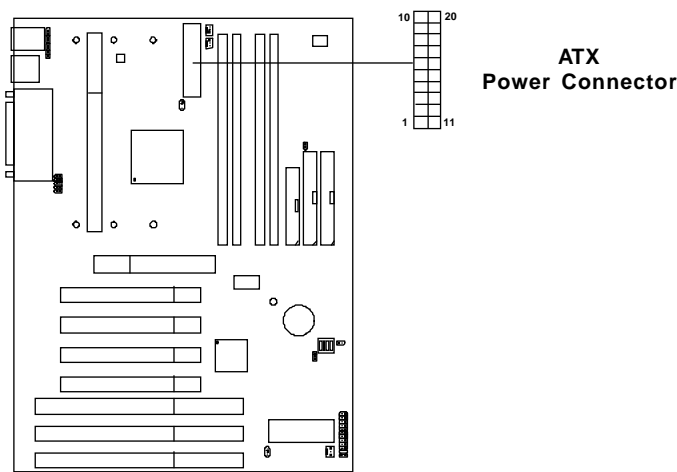
IDE2(Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

2.8 Power Supply

2.8-1 ATX 20-pin Power Connector: JWR1

This connector supports the power button on-board. Using the ATX power supply, functions such as Modem Ring Wake-Up and Soft Power Off are supported by this mainboard.



ATX Power Connector Pin Description

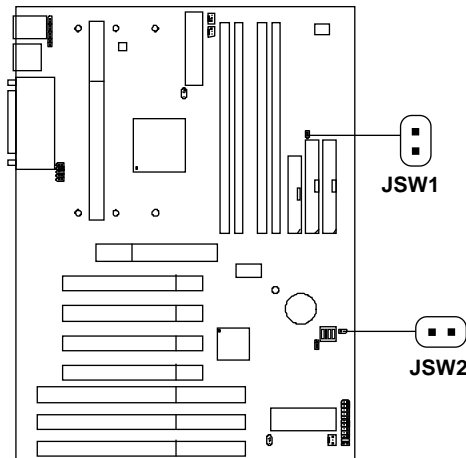
20	19	18	17	16	15	14	13	12	11
5V	5V	-5V	GND	GND	GND	PS_ON	GND	-12V	3.3V
12V	5V_SB	PW_OK	GND	5V	GND	5V	GND	3.3V	3.3V
10	9	8	7	6	5	4	3	2	1

2.8-2 Remote Power On/Off Switch: JSW1/JSW2

Connect to a 2-pin push button switch. 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: pushing it more than 4 seconds will change its status from ON to OFF. If you want to change the setup, you could go to the BIOS Power Management Setup.

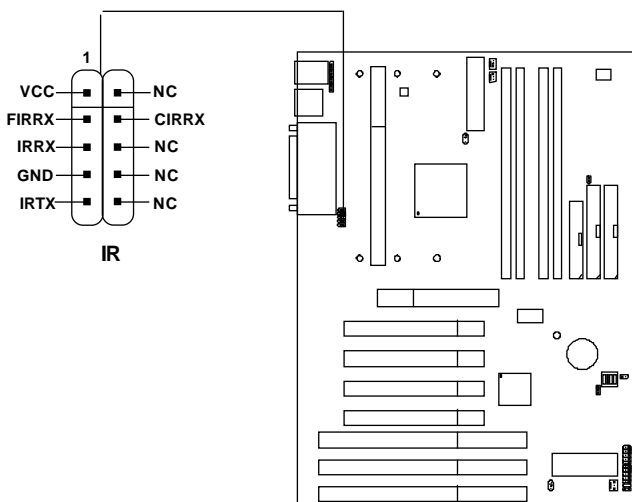
This is used for ATX type power supply.



Note: The two switches are provided by the mainboard for your convenience, so you can use any of them. The two switches have the same feature.

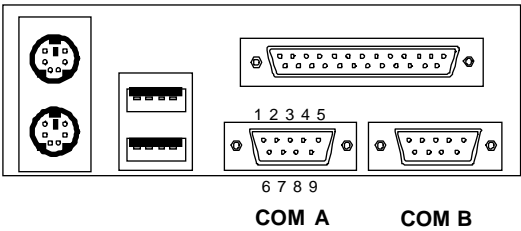
2.9 IrDA Infrared Module Connector: IR

The mainboard provides two 5-pin infrared (IR) connectors for IR modules. These connectors are for optional wireless transmitting and receiving infrared module. You must configure the setting through the BIOS setup to use the IR function. FIR and Consumer IR are reserved functions.



2.10 Serial Port Connectors: COM A & COM B

The mainboard has two 9-pin male DIN connectors for serial ports COM A and COM B. These two ports are 16550A high speed communication ports that send/receive 16 bytes FIFOs. You can attach a mouse or a modem cable directly into these connectors.

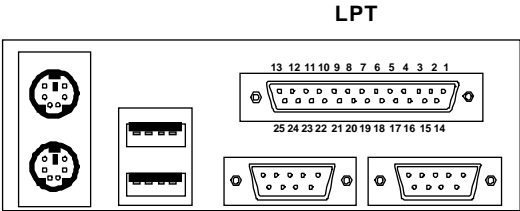


Pin Definition

Pin #	Definition
1	DCD (Data Carry Detect)
2	SIN (Serial In or Receive Data)
3	SOUT (Serial Out or Transmit Data)
4	DTR (Data Terminal Ready)
5	GND
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear To Send)
9	RI (Ring Indicate)

2.11 Parallel Port Connector: LPT

The mainboard provides a 25 pin female centronic connector for LPT. A parallel port is a standard printer port that also supports Enhanced Parallel Port(EPP) and Extended capabilities Parallel Port(ECP). See connector and pin definition below:

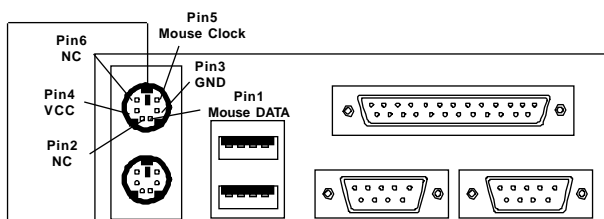


Pin Definition

PIN #	DEFINITION	PIN #	DEFINITION
1	STROBE	14	AUTO FEED#
2	DATA0	15	ERR#
3	DATA1	16	INIT#
4	DATA2	17	SLIN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACK#	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SELECT		

2.12 Mouse Connector: JKBMS1

The mainboard provides a standard PS/2[®] mouse mini DIN connector for attaching a PS/2[®] mouse. You can plug a PS/2[®] mouse directly into this connector. The connector location and pin definition are shown below:

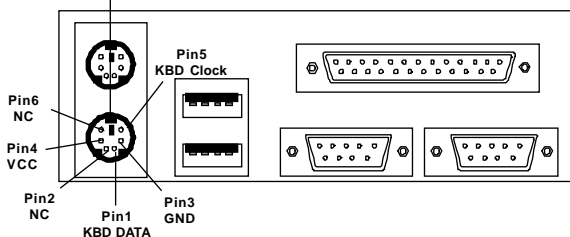


PS/2[®] Mouse (6-pin Female)

2.13 Keyboard Connector: JKBMS1

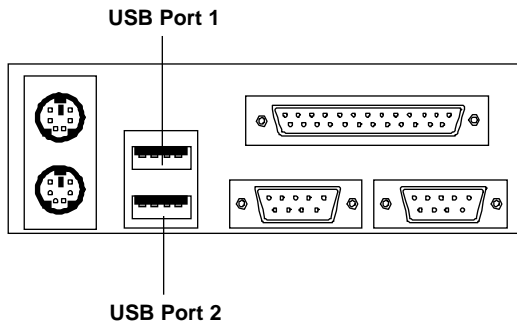
The mainboard provides a standard PS/2[®] keyboard mini DIN connector for attaching a keyboard. You can plug a keyboard cable directly into this connector.

PS/2[®] Keyboard (6-pin Female)



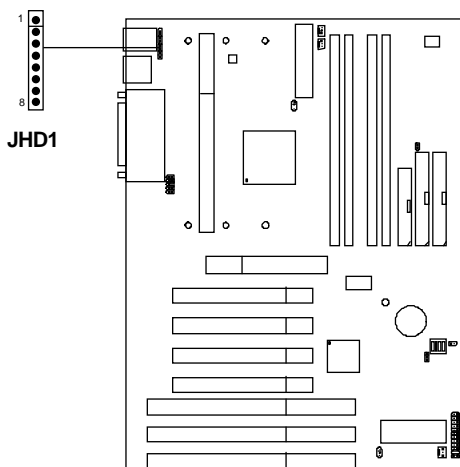
2.14 USB Connector: USB

The mainboard provides a **UHCI(Universal Host Controller Interface)** **Universal Serial Bus root** for attaching USB devices like: keyboard, mouse and other USB devices. You can plug the USB device directly to this connector.



2.15 Keyboard and Mouse Pin Connectors: JHD1

These connectors are used by some special customer. They can use these connectors to customize remote control module for keyboard and mouse. Default settings are pin 1-2, 3-4, 5-6, and 7-8 short respectively.



JHD1 PIN DEFINITION

- PIN1: KBDCLK_1
- PIN2: KBDCLK_2
- PIN3: KBDDATA_1
- PIN4: KBDDATA_2
- PIN5: MSDATA_1
- PIN6: MSDATA_2
- PIN7: MSCLK_1
- PIN8: MSCLK_2