

Chapter 2

HARDWARE INSTALLATION

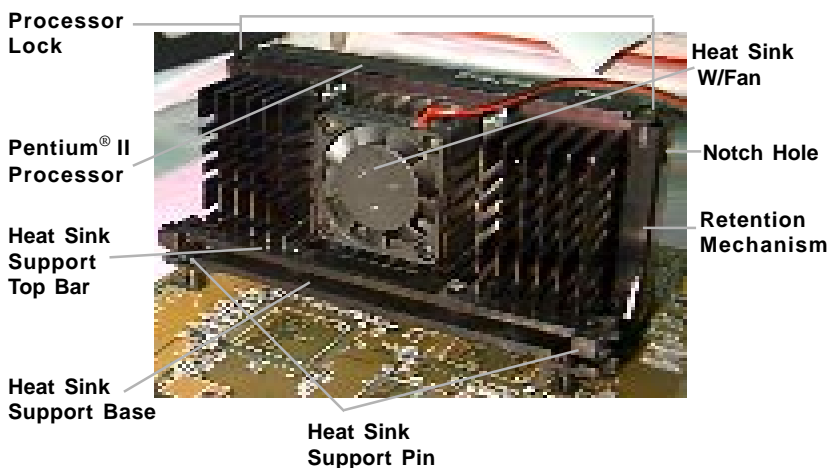
2.1 Central Processing Unit: CPU

The mainboard operates with **Intel®Pentium®II Processor** with MMX™ Technology. The mainboard provides Two CPU Slot called Slot 1 for easy CPU installation, a DIP switch (JCPU1) 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 Procedure

There are two kinds of Pentium® II Processor 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 attach to the **Pentium® II Processor** with metal clip.

Note: * Provided by MSI mainboard.

** Provided by Special request.

RM

HSSBASE

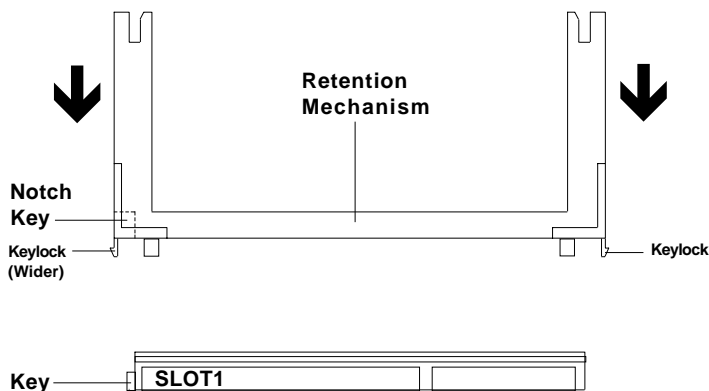
HSSPIN

HSSTOP

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.

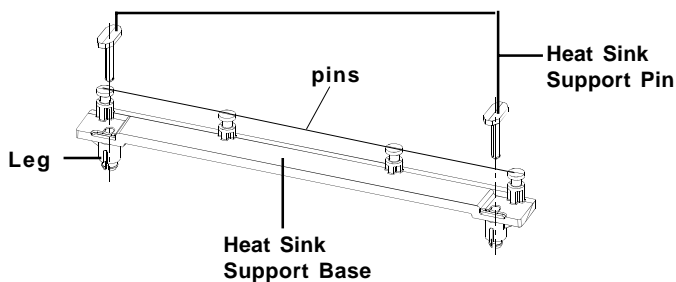
Look for the key on Slot 1, and match it with the Notch Key on the Retention Mechanism for the proper direction. Then, insert the Two Keylock of the Retention Mechanism into the two holes on the sides of Slot 1. Take note that one hole is wider than the other. The Retention Mechanism will only fit in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



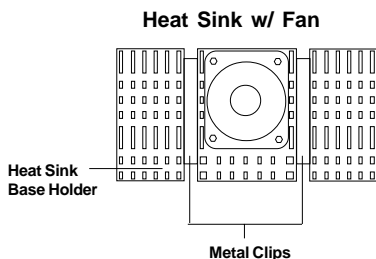
Push the Heat Sink Support Base onto the mainboard, until you hear a click sound. Check for a perfect fit.

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.

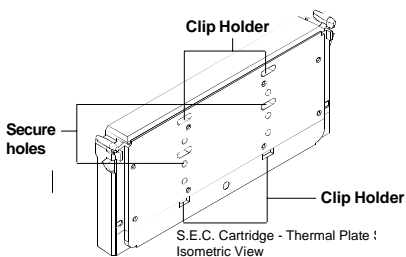
Push down the metal clips, so that they are in line with the back of the Heat Sink. Be careful, so as not to detach the metal clips from the Heat Sink.



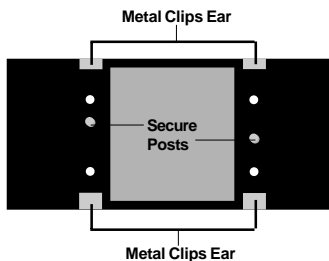
↓
The arrow
should be
pointing
down.

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.



Pentium® II Processor (Back)

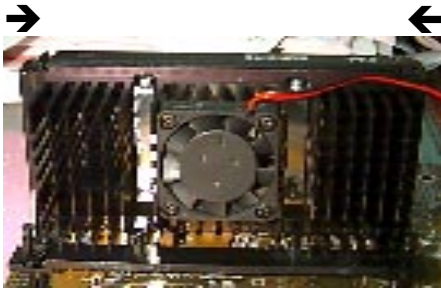


Heat Sink w/ Fan(Back)

- 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.

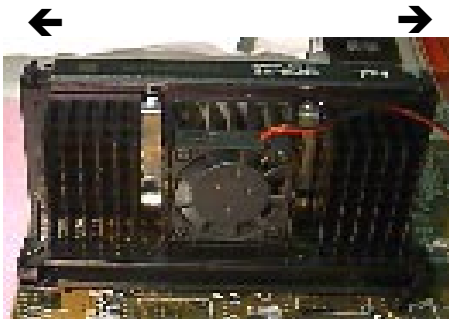
Unlock the Processor by pushing in the Processor Locks.



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

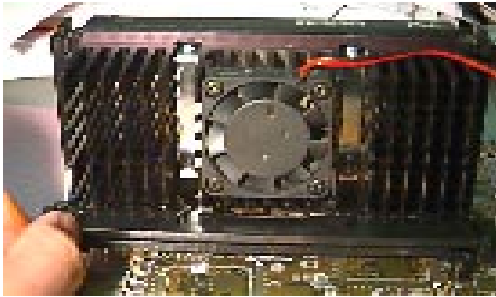
Step 7: Lock the Processor Locks.

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.

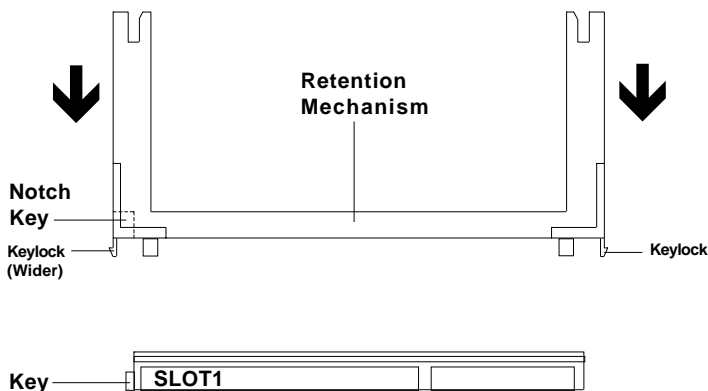
B. Boxed Pentium® II Processor Installation Procedures

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 Pentium™ II 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.

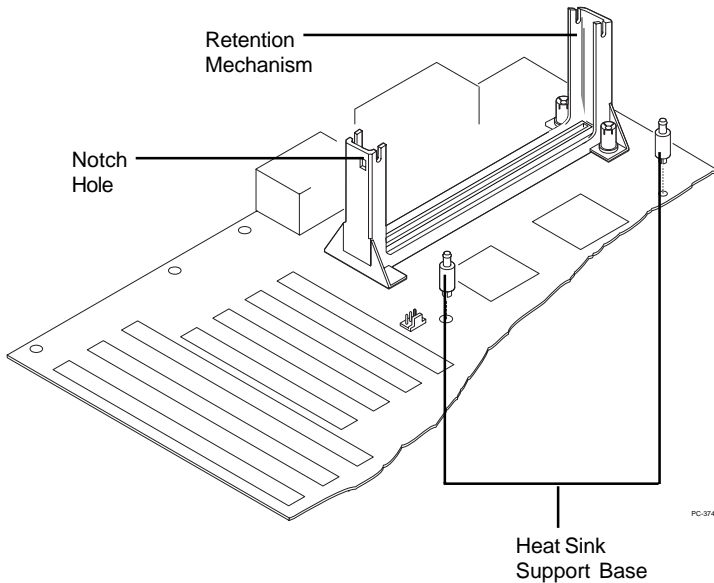
Look for the key on Slot 1, and match it with the Notch Key on the Retention Mechanism for the proper direction. Then, insert the Two Keylock of the Retention Mechanism into the two holes on the sides of Slot 1. Take note that one hole is wider than the other. The Retention Mechanism will only fit in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

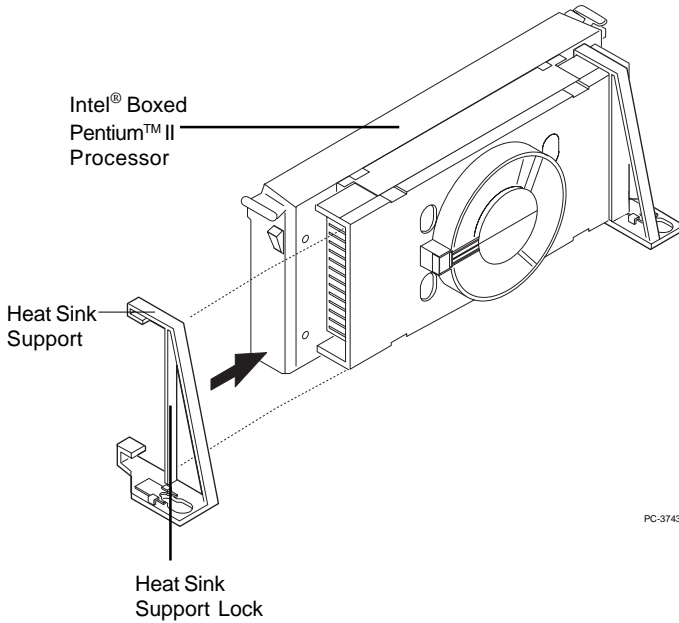
Look for the 2 holes across Slot 1, and match it with the 2 Heat Sink Support Base. Take note that one hole/base is bigger than the other.



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

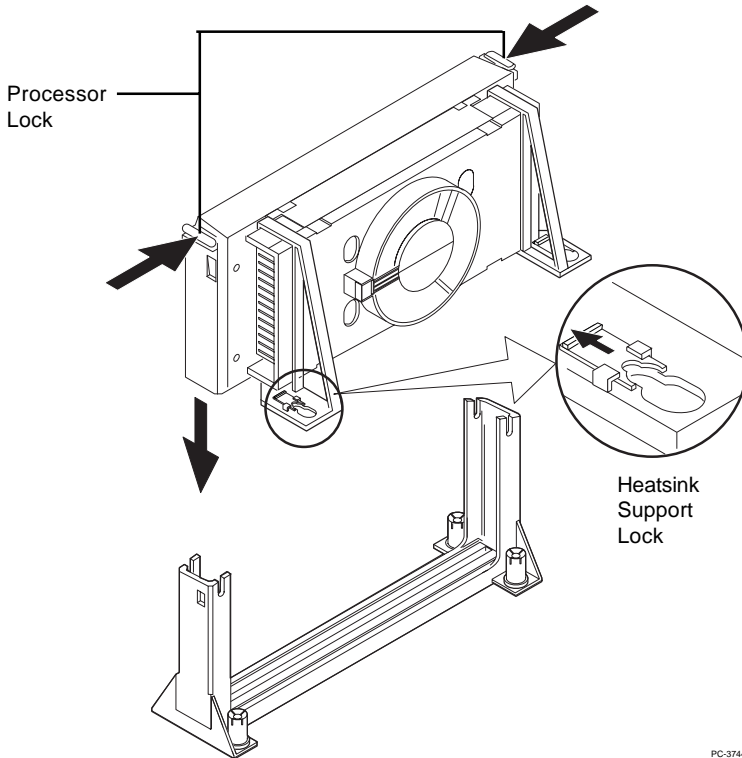
Step 4: Install the Heat Sink Support.

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.

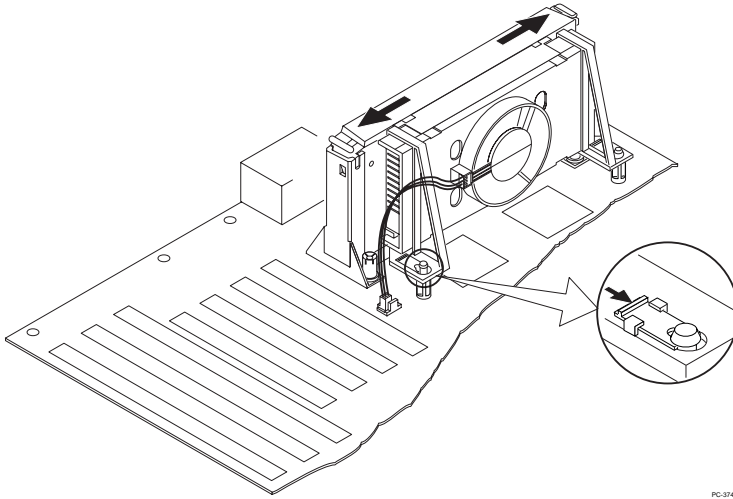


Step 5: Unlock the Processor Locks and Heat Sink Support Locks.

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



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



PC-3746

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 Core Speed Derivation Procedures

1. The DIP switch JCPU1 (1, 2, 3, and 4) is used to adjust the CPU clock frequencies.

JCPU1				CPU
1	2	3	4	CLOCK
OFF	OFF	ON	ON	60MHz
ON	ON	OFF	OFF	66MHz

2. The DIP switch JCPU1 (5, 6, 7, and 8) 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:

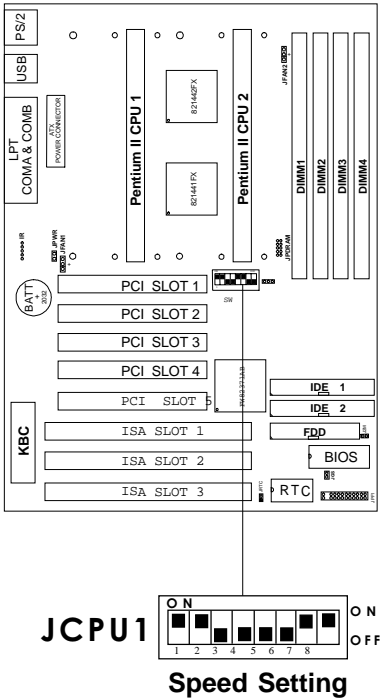
$$\begin{array}{llll} \text{If} & \text{CPU Clock} & = & 66\text{MHz} \\ & \text{Core/Bus ratio} & = & 3.5\text{x} \\ \text{then} & \text{CPU core speed} & = & \text{Host Clock} \times \text{Core/Bus ratio} \\ & & = & 66.6\text{MHz} \times 7/2 \\ & & = & 233\text{MHz} \end{array}$$

JCPU1				CPU
5	6	7	8	CORE/BUS RATIO
ON	ON	ON	ON	2x
OFF	ON	ON	ON	2.5x
ON	OFF	ON	ON	3x
OFF	OFF	ON	ON	3.5x
ON	ON	OFF	ON	4x
OFF	ON	OFF	ON	4.5x
ON	OFF	OFF	ON	5x (Reserved)
OFF	OFF	OFF	OFF	5.5x (Reserved)
ON	ON	ON	ON	6x (Reserved)
OFF	ON	ON	ON	6.5x (Reserved)

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

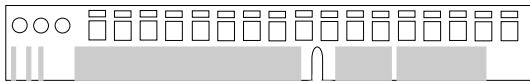
2.1-3 CPU Speed Setting: JCPU1

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** (Intel® 233 ~ 266MHz Pentium® II Processor) for proper setting.



2.1-4 CPU Terminator

The CPU terminator is used, when only one CPU is installed. If only one CPU is installed. You must always install the CPU terminator on the empty slot. For Example: If you install the CPU on the 1st slot, then you must install the CPU terminator on the 2nd slot or vice versa.



CPU Terminator

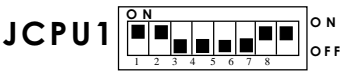
Important:

To use Dual CPU, you must use the same CPU speed: which means that if you install 233MHz in the 1st CPU slot, then you must also install 233MHz on the 2nd slot.

Table 2.1 Intel® 233 ~ 266MHz Pentium® II Processor

Intel® Pentium® II Processor is currently available in two speed setting:
233MHz and 266MHz . For future reference, refer to the CPU core speed
derivation procedure on **Section 2.1-2**.

SPEED SETTING



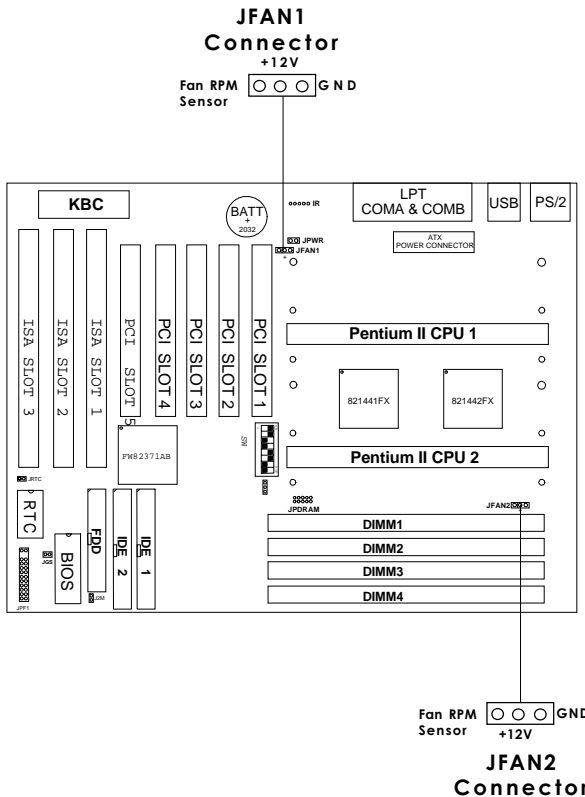
Intel® 233MHz Pentium® II Processor
(66MHz x 3.5x)



Intel® 266MHz Pentium® II Processor
(66MHz x 4x)

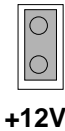
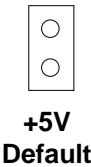
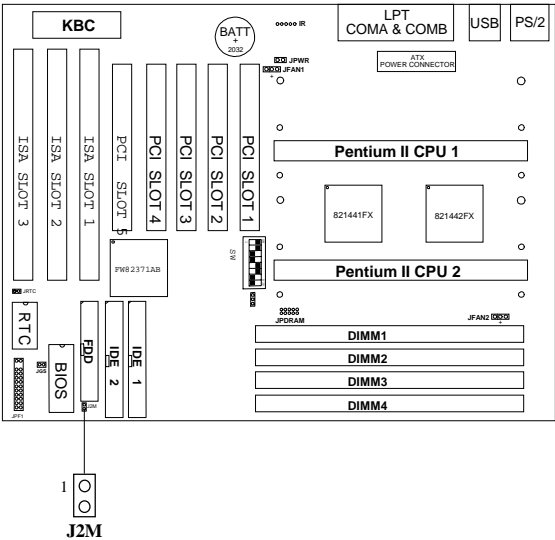
2.1-5 CPU Fan Power Connector: JFAN1 & JFAN2

This 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 positive and should be connected to the +12V. While the Black wire is ground and should be connected to GND.



Note: MS6110 supports Fan Speed Sensor function. So if you're going to use this function, you must use a fan with a Fan RPM Sensor.

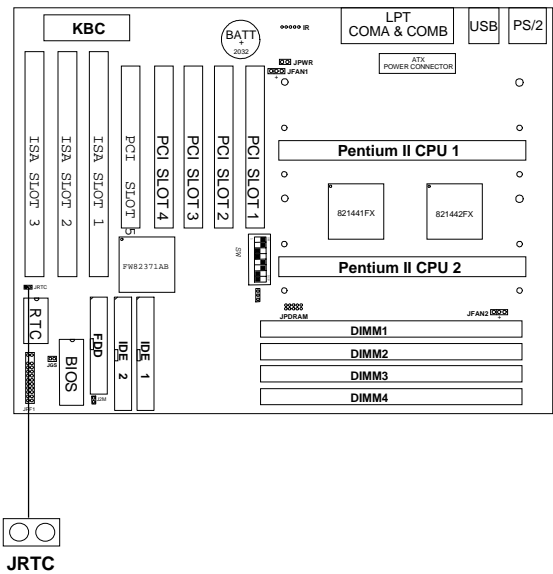
2.2 Flash ROM Programming Voltage: J2M



Note: SST & Winbond Flash ROM are set in +5V
MXIC & Intel Flash ROM are set in +12V.

2.3 CMOS RAM Clear: JRTC

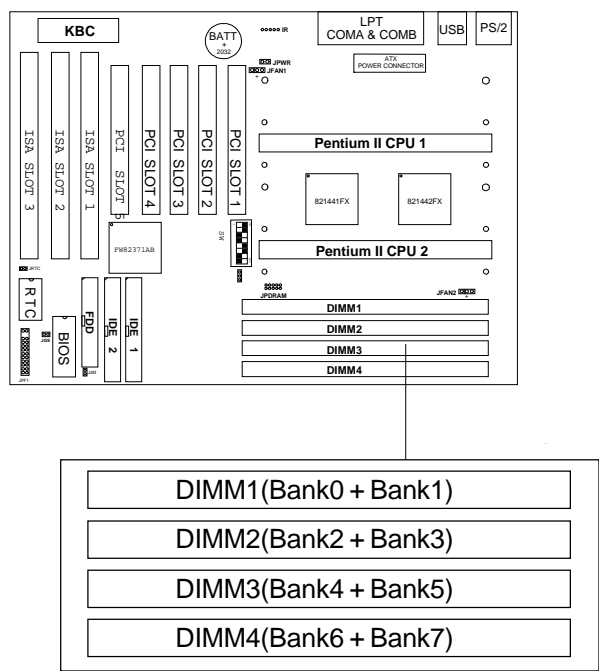
This jumper is for clearing the CMOS data. To do this, turn off the system, short JRTC and then open it again.



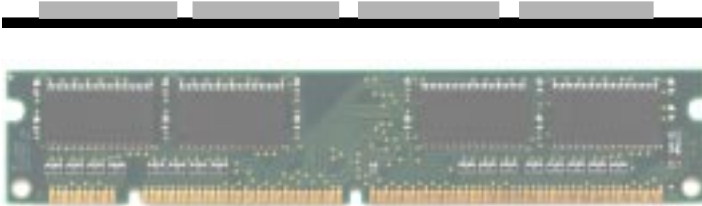
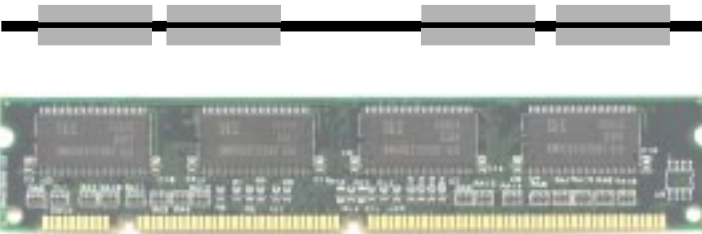
2.4 Memory Installation

2.4-1 Memory Bank Configuration

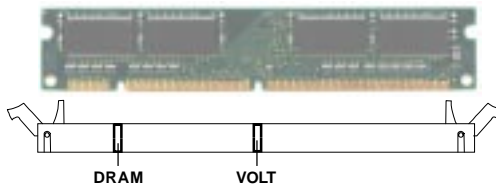
The system board supports a maximum of 1 GB of memory: It provides Four 168-pin **unbuffered** DIMMs (Double In-Line Memory Module) sockets. It supports 8 MB up to 256 MB of memory. The memory module can be either FP (Fast Page) or EDO (Extended Data Output) Mode DRAM. A DIMM consist of two Banks and may have a maximum of 256 MB of memory.



Note: EDO & SDRAM are not supported.

A. How to install a DIMM Module**Single Sided DIMM****Double Sided DIMM**

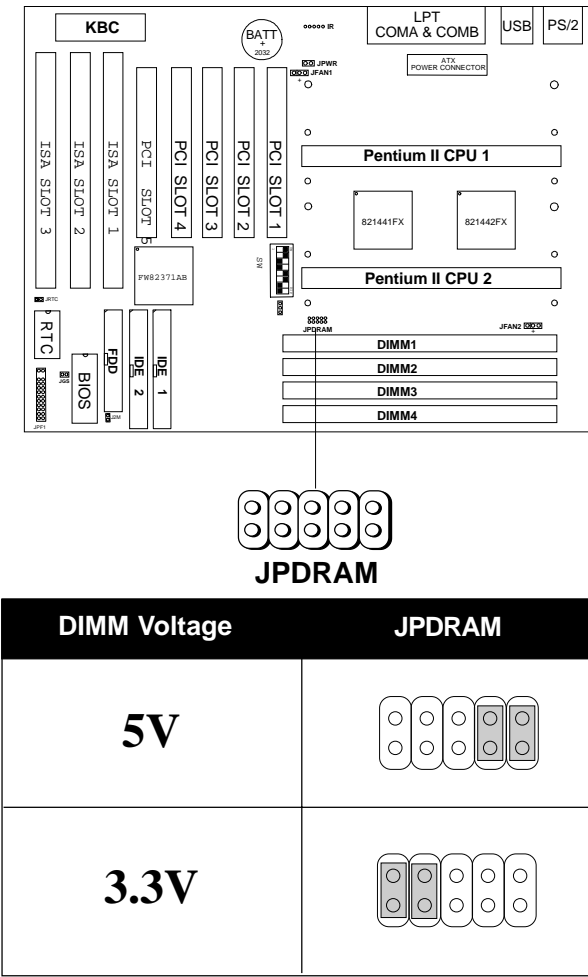
1. The DIMM slot has two Notch Keys called “VOLT and DRAM”, so the DIMM memory module can only fit in one direction.
2. Insert the DIMM memory module vertically into the DIMM slot then push it in.



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

Note: You can use a 5 volt or a 3.3 volt DIMM module (EDO or FP). However, take note that you cannot mixed 5 volt with 3 volt DIMM module.

A.1 DIMM Power Voltage Selector : JPDRAM



DIMM Power Level : 3.3V or 5V

2.2-1 Memory Population Rules

1. You can use any kind of DIMM **except for SDRAM and BEDO**.
2. To operate properly at least one 168-pin DIMM module must be installed.
3. This mainboard supports Table Free memory, so memory can be installed on DIMM1, DIMM2, DIMM3 or DIMM 4 in any order.
4. The DRAM addressing and the size supported by the mainboard is shown below.

Memory Mapping Options

DRAM Tech.	Memory Org.	Addressing	Address Size	MB/DIMM	
				Single Side	Double Side
4M	1M x 4	Symmetric	10 x 10	8MB	16MB
16M	1M x 16	Symmetric	10 x 10	8MB	16MB
	2M x 8	Asymmetric	11 x 10	16MB	32MB
	4M x 4	Symmetric	11 x 11	32MB	64MB
64M	4M x 16	Symmetric	11 x 11	32MB	64MB
	8M x 8	Asymmetric	12 x 11	64MB	128MB
	16M x 4	Symmetric	12 x 12	128MB	256MB

2.5 Case Connector: JFP1

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

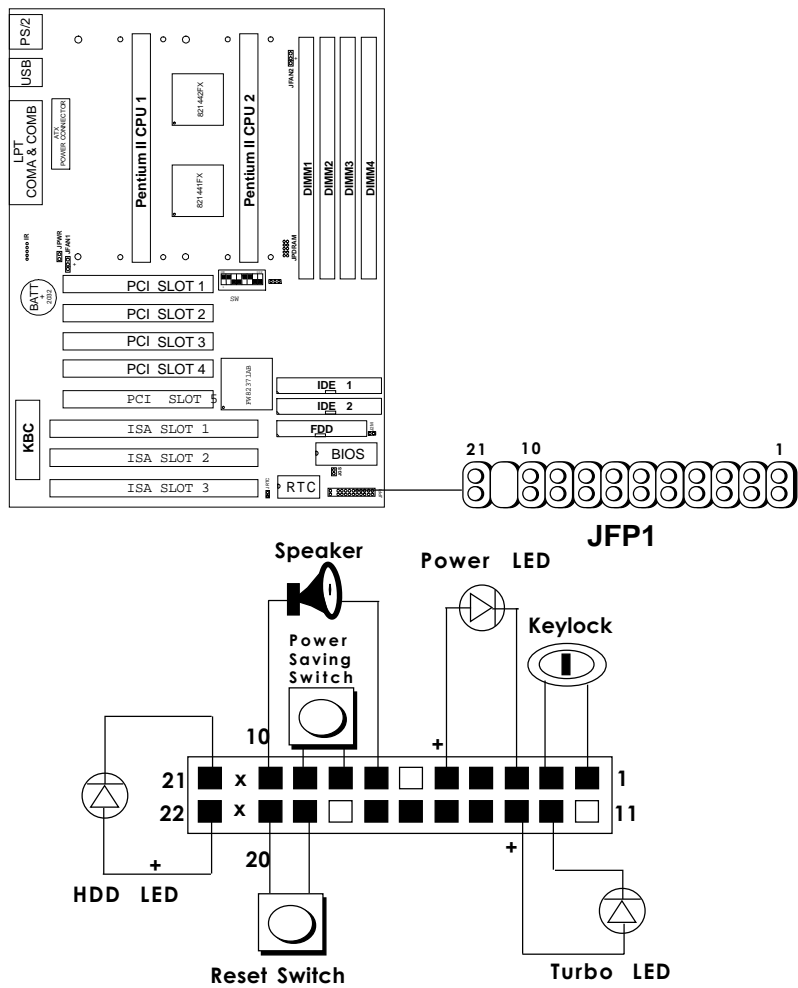


Figure 2.1

2.5-1 Turbo LED

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

2.5-2 Hardware Reset

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

2.5-3 Keylock

Keylock allows you to disable the keyboard for security purposes. You can connect the keylock. (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

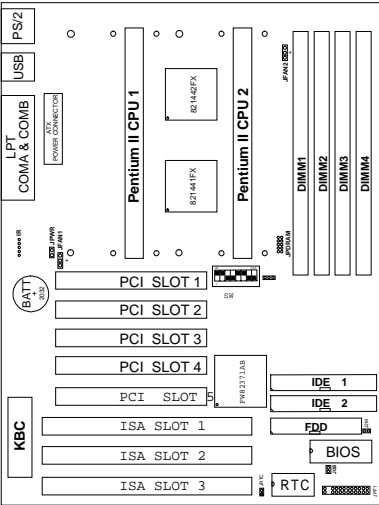
Speaker from the system case are connected to this pin. (See Figure 2.1)

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).

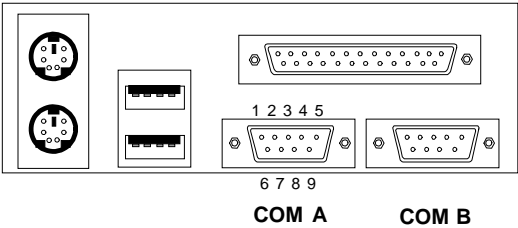
2.6 Power Saving Switch Connector: JGS

Attach a power saving switch to **JGS**. When the switch is pressed, the system immediately goes into suspend mode. Press any key and the system wakes up.



2.7 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.

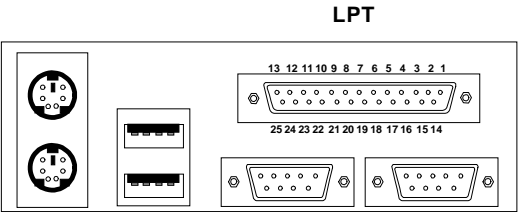


PIN DEFINITION

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)

2.8 Parallel Port Connectors: 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:

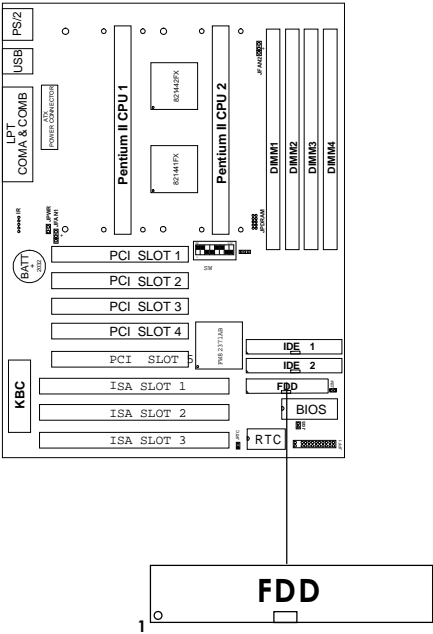


PIN DEFINITION

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		

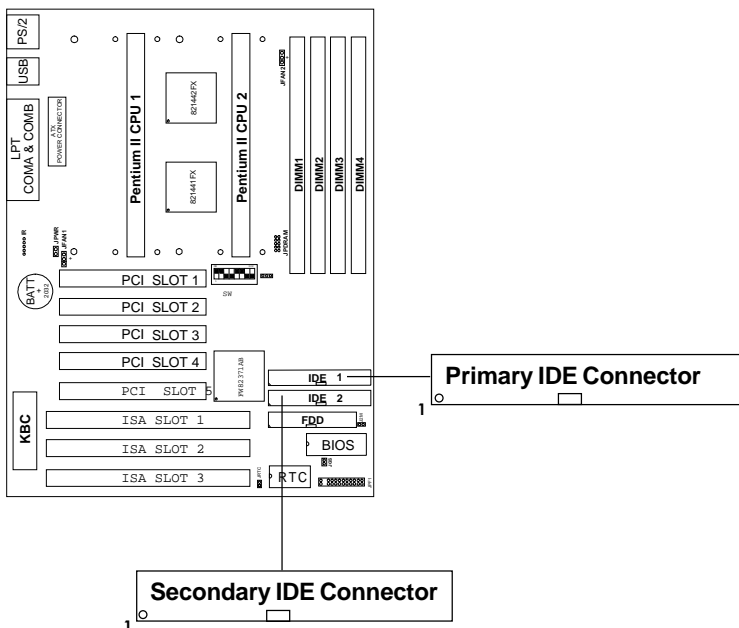
2.9 Floppy Disk Connector: FDD

The mainboard also provides a standard floppy disk connector(FDD) 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.



2.10 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 IDE devices like: Hard disk, CD-ROM, 120MB Floppy and other devices.



IDE1(Primary IDE connector)

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

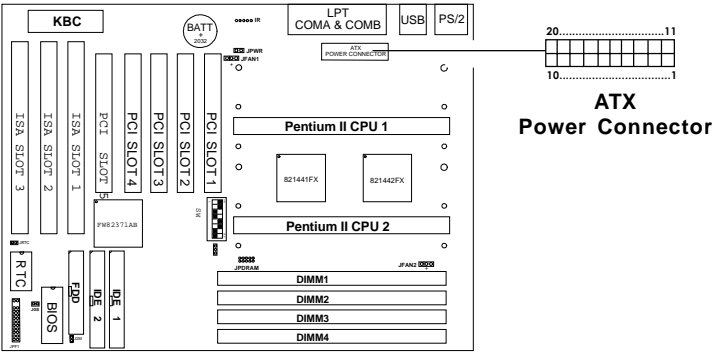
IDE2(Secondary IDE connector)

IDE2 can connect a Master and a Slave drive.

2.11 Power Supply

2.11-1 ATX 20-pin Power Connector: JPWR20

This type of connector already supports the remote ON/OFF function. You need to connect the **Remote Power On/OFF switch JPWR**.

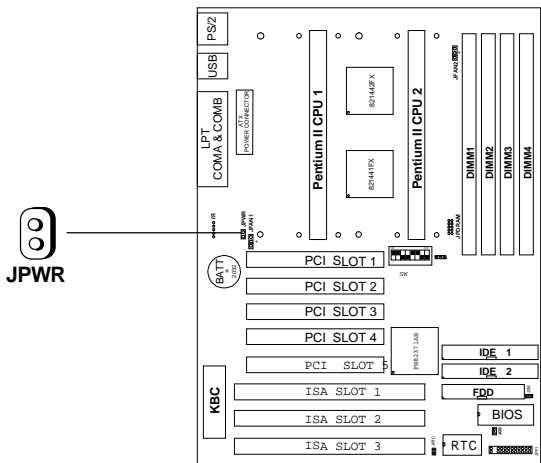


ATX Power Connector Pin Description

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

2.11-2 Remote Power On/Off Switch: JPWR

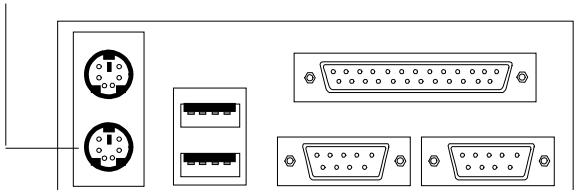
Connect to a 2-pin push button switch. Every time the switch is shorted by pushing it once, the power supply will change its status from OFF to ON and On to OFF. This is used for ATX type power supply.



2.12 Keyboard Connector: PSKBC

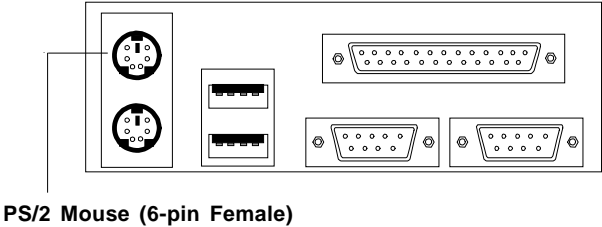
The mainboard provides a standard PS/2 style keyboard mini DIN connector for attaching a keyboard. You can plug a keyboard cable directly to this connector.

PS/2 Keyboard (6-pin Female)



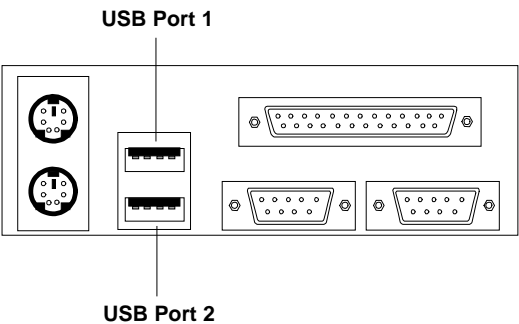
2.13 Mouse Connector: PSMSC

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



2.14 USB Connector: USB

This 10-pin connector supports USB(Universal Serial Bus) devices. This function is a reserved function.



2.15 IrDA Infrared Module Connector: JIR

The mainboard provides a 5-pin infrared connector(IR) for IR module. This connector is for optional wireless transmitting and receiving infrared module. You must configure the BIOS setting for this to function properly.

