MS - 6114

ATX LX4 Mainboard
Designed for Dual Pentium® II Processor
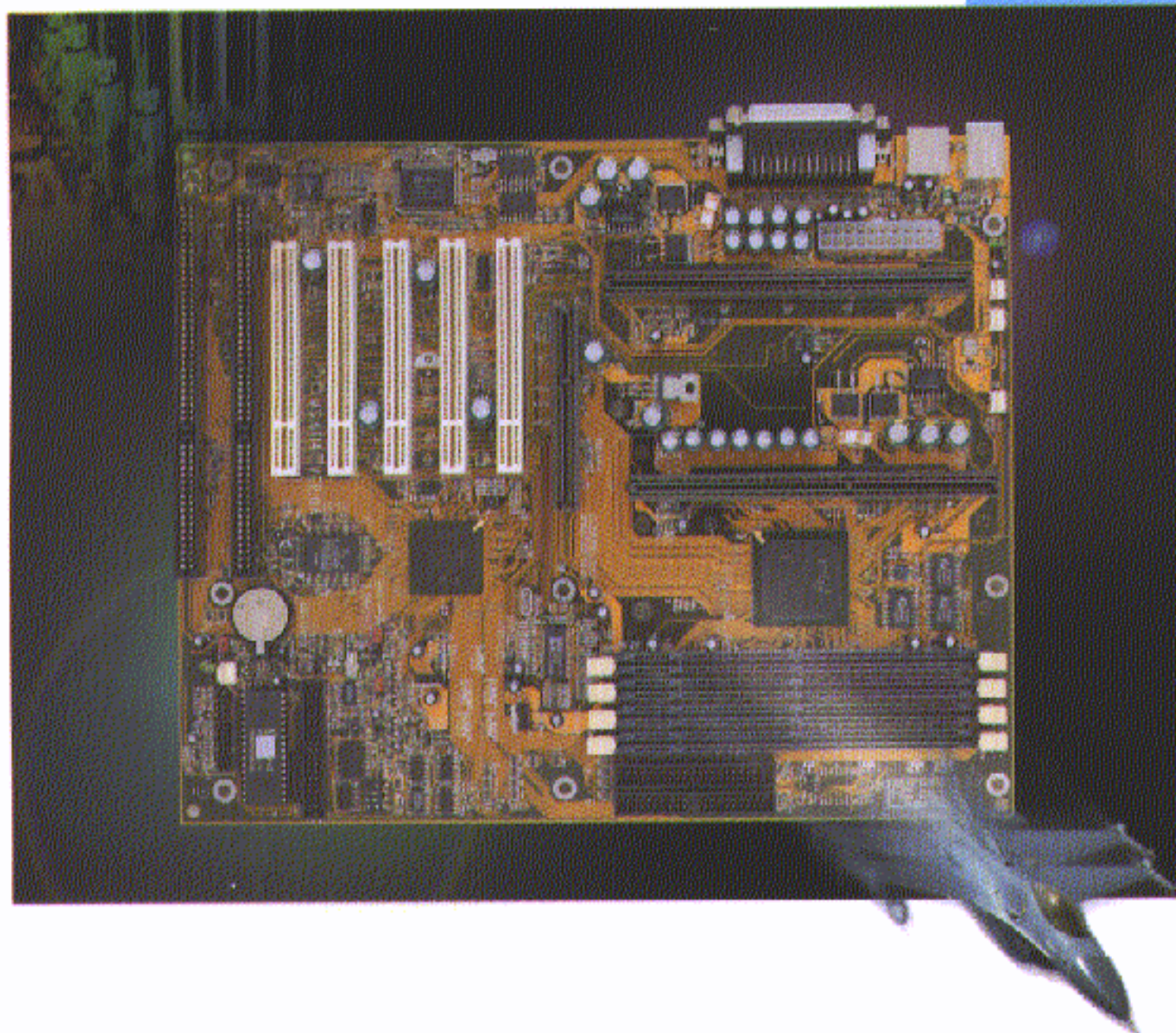
User's Manual

Manual Rev: 1.0A
Release Date: December 1997

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FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device. pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates. uses and can radiate radio frequency energy and. if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. in which case the user will be required to correct the interference at his own expense.
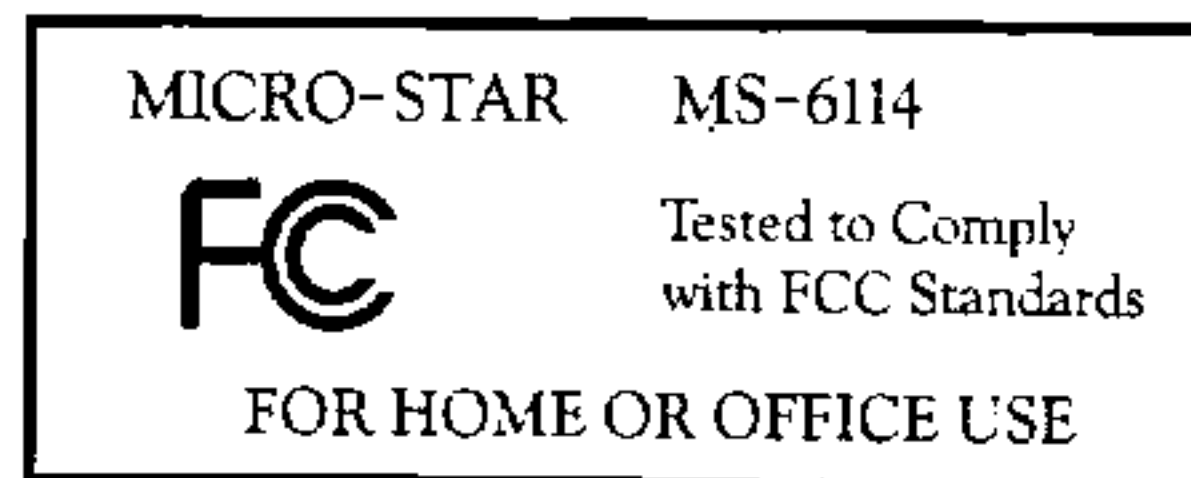
Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2
Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

MICRO-STAR MS-6114

FC

Tested to Comply
with FCC Standards

FOR HOME OR OFFICE USE

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Table of Contents

Chapter 1

INTRODUCTION

The ATX LX4 Dual-P mainboard is a high-performance dual-processor personal computer mainboard based on the Intel® Pentium® II processor.

The mainboard uses the highly integrated Intel® 82440LX AGP chipset which optimize the system bandwidth and concurrency with the implementation of Quad Port Acceleration (QPA). QPA provides 4-port concurrent arbitration of the processor bus, graphics, PCI bus and SDRAM.

The Intel® 82371AB chipset integrates all system control functions such as ACPI (Advanced Configuration and Power Interface). The ACPI provides more Energy Saving Features for the OSPM(OS Direct Power Management) function. The Intel® 82371AB chipset also improves the IDE transfer rate by supporting Ultra DMA/33 IDE that transfers data at the rate of 33MB/s.

The mainboard also supports the LM78 System Hardware Monitor Controller as an optional function. The LM78 function includes: CPU / power supply/chassis fan revolution detect, CPU/system voltage monitor, system temperature monitor, and chassis intrusion detect(optional).

1.1 Mainboard Features

CPU
- Two Slot 1 for dual Pentium® II processor
- Supports 200MHz, 233MHz, 266MHz, 300MHz, 333MHz, and faster.
- Core/Bus ratios are x2, x2.5, x3, x3.5, x4, x4.5, x5, x5.5, x6 and higher.

Switching Voltage Regulator
- On-board switching mode DC-DC Step Down Regulator.
- Conforms to Intel® VRM ver 8.1 specifications.
- Over-Voltage and Over-Current protection.

Chipset
- Intel® 82440LX AGP chipset.

Clock Generator
- 66.6MHz clocks are supported.

Main Memory
- Supports eight memory banks using four 168-pin unbuffered DIMM sockets.
- Supports a maximum memory size of 512MB with SDRAM, or 1GB with EDO.
- Supports ECC(1-bit Error Checking) and EC(Multiple-Bit Error Correction) function.
- Supports 3.3v Extended Data Output (EDO) and SDRAM DIMM.

Slots
- One AGP(Accelerated Graphics Port) slot.
  - AGP 1.0 specification compliant
  - AGP 66/133MHz 3.3v device support
- Five 32-bit Master PCI Bus slots and two 16-bit ISA bus slots wherein one shared slot can be used as ISA or PCI.
- Supports 3.3v/5v PCI bus Interface.

On-Board IDE
- An IDE controller on the Intel® 82371AB PCI chipset provides IDE HDD/ CD-ROM with PIO, Bus Master and Ultra DMA/33 operation modes.
- Connect up to four IDE devices.

On-Board Peripherals
- On-Board Peripherals include:
  - 1 floppy port supports 2 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes.
  - 2 serial ports (COMA + COMB)
  - 1 parallel port supports SPP/EPP/ECP mode
  - 2 USB ports
  - 1 IrDA connector for IrDA.

BIOS
- The mainboard BIOS provides "Plug & Play" BIOS which detects the peripheral devices and expansion cards of the board automatically.
- The mainboard provides a Desktop Management Interface(DMI) function which records your mainboard specifications.

On-Board System Hardware Monitor(LM78)
- CPU/Power Supply/Chassis Fan Revolution Detect
- CPU Fan Control (the fan will automatically stop when the system enters suspend mode)
- System Voltage Detect
- Chassis Intrusion Detect(optional)
- Display Actual Current Voltage

RTC
- PIIX-4 (82371AB) built-in RTC.

Keyboard Connector
- PS/2® keyboard interface and PS/2® mouse interface.

Dimension
- ATX Form Factor: 30cm(L) x 25cm(W) x 4 layers PCB.
- Double deck PS/2® keyboard and PS/2® mouse.
- Double deck USB ports.
- Double deck Serial and LPT ports.
- Double deck I/O connectors, compatible with Intel® Venus Mainboard.

Mounting
- 9 mounting holes.

Special Connector
- LAN Wake-Up Connector.
- Internal Modem Wake-Up Connector
- Distributed DMA connector for PCI 3D Sound Card.

1.2 Mainboard Layout
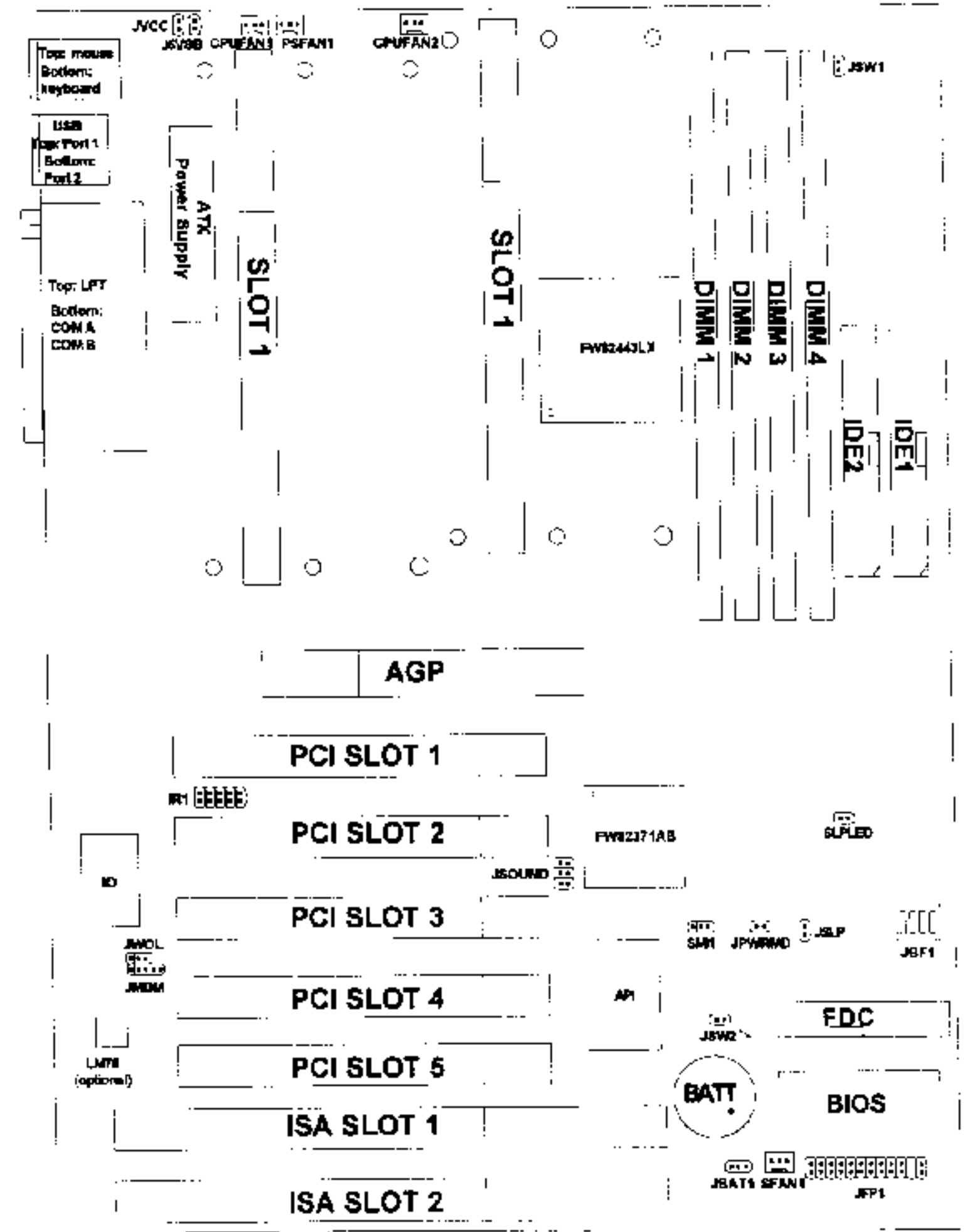
MS-6114

Chapter 2

HARDWARE INSTALLATION

2.1 Central Processing Unit: CPU

The mainboard operates with **Intel® Pentium® II processor with MMX™ technology.** 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 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
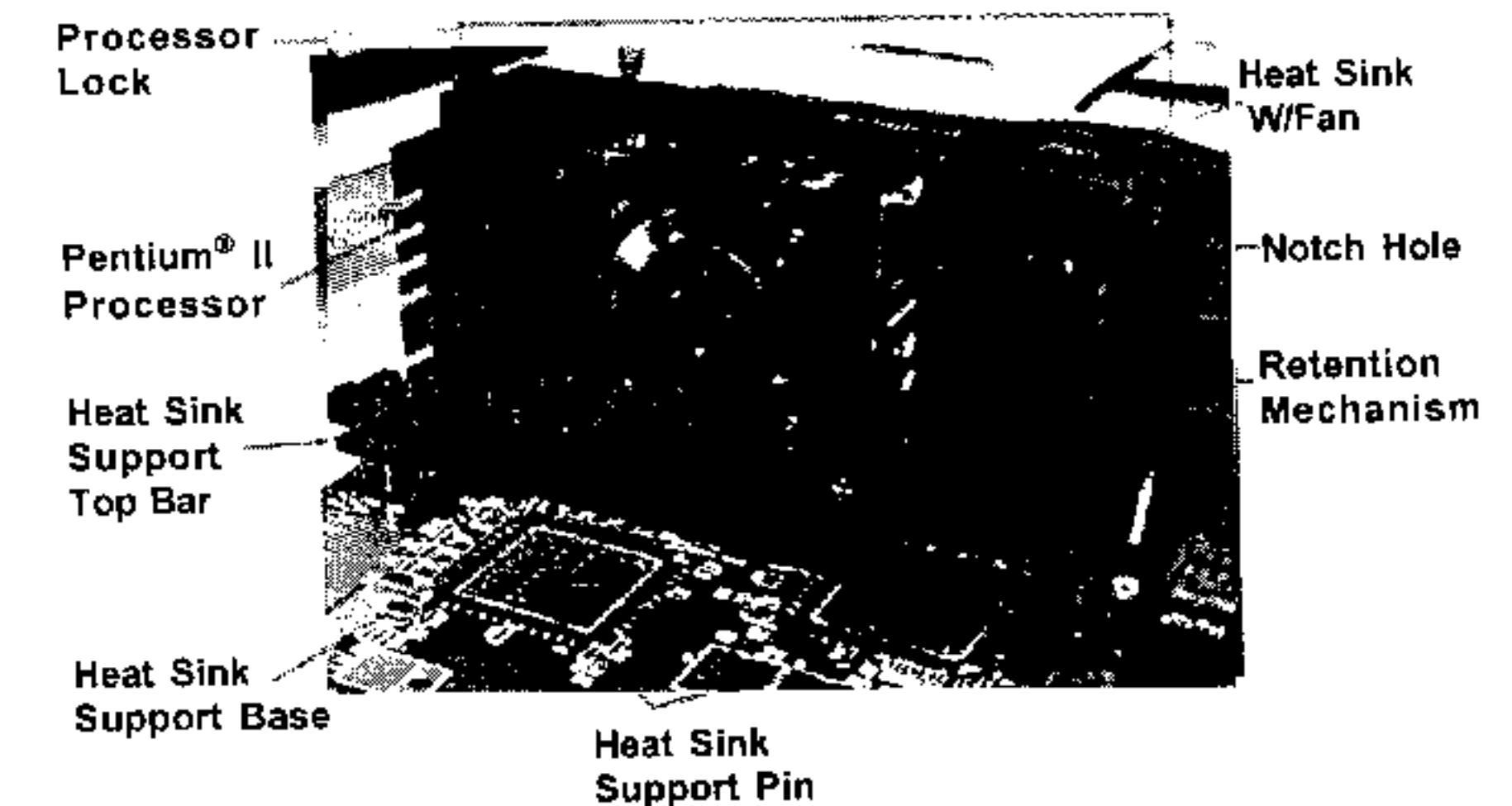
Required Things:

Pentium® II processor - Processor.

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

*Retention Mechanism Attach Mount(RMAM) - Bolt/Bridge assemblies inserted up through the bottom of the motherboard. RM secures to RMAM (2 RMAM required per RM).

*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.
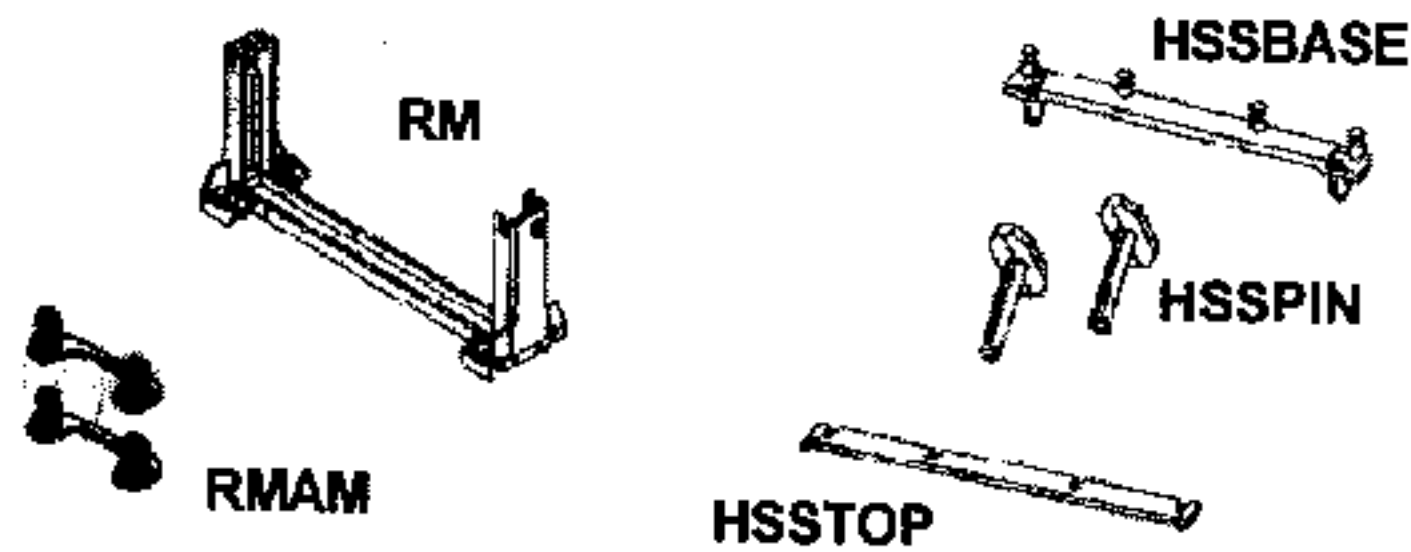
Step 1: Insert the Retention Mechanism Attach Mount at the bottom of the mainboard.

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 proper direction. Then, attach the Retention Mechanism to the Retention Mechanism Attach Mount. Use a Screwdriver to secure the Retention Mechanism.
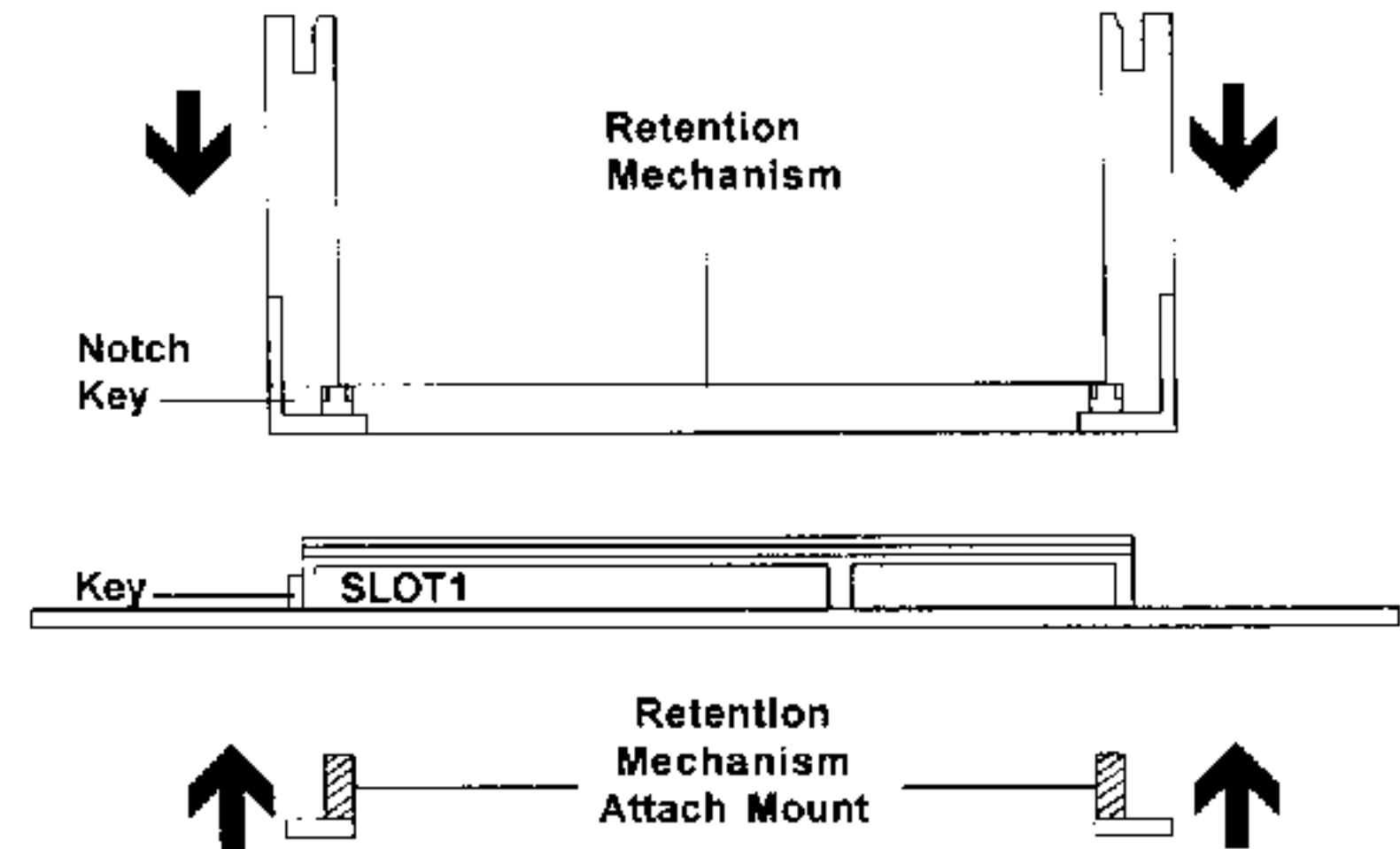
Step 3: Install the Heat Sink Support Base.

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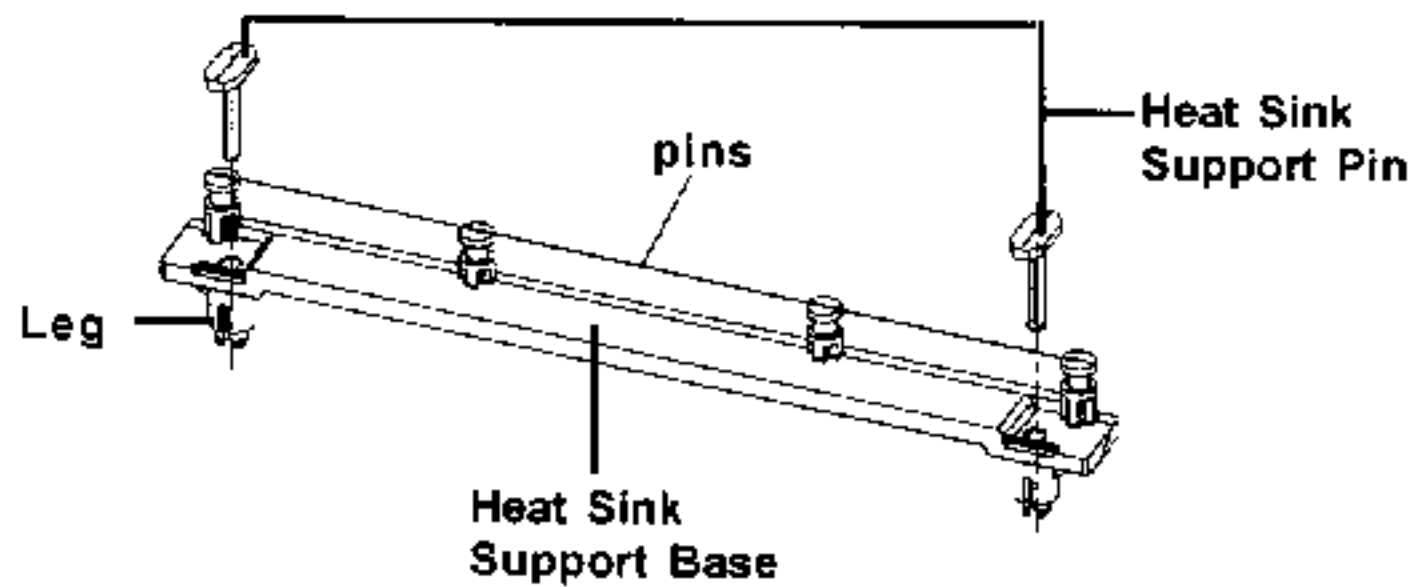
Push the Heat Sink Support Base onto the mainboard, until you hear a click sound. Check for a perfect fit.

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 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.
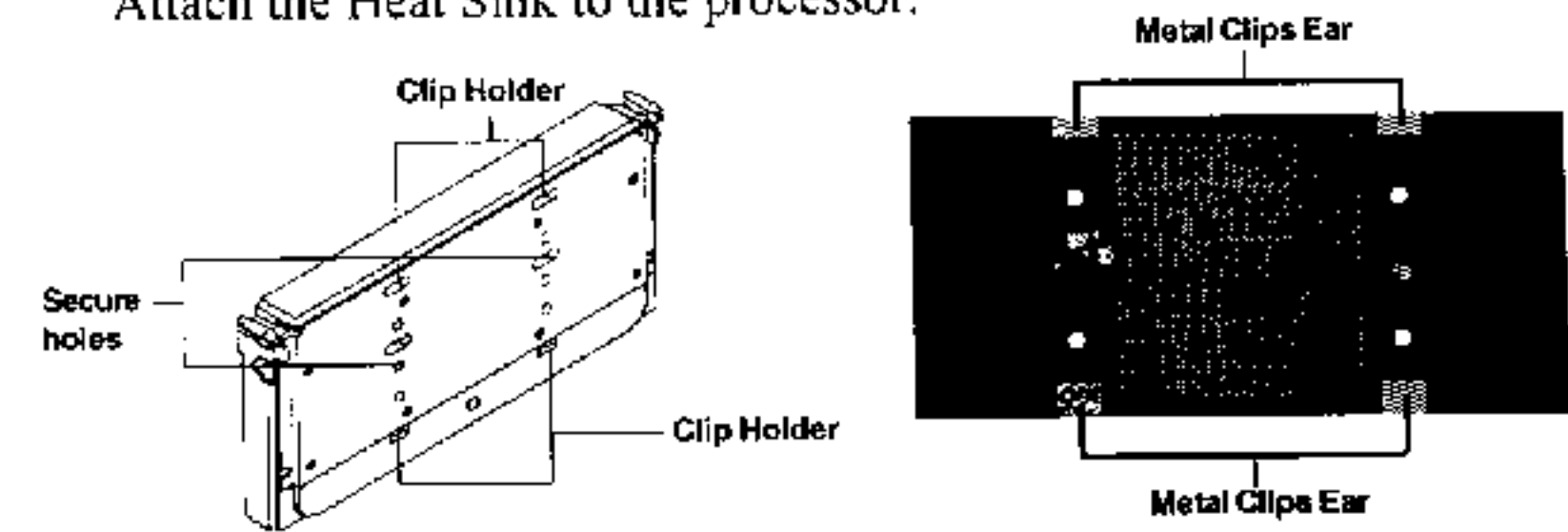
- Look at the back of the Heat Sink and take note of the 2 secure posts. Insert these 2 Secure posts to the 2 secure holes on the back of the processor.

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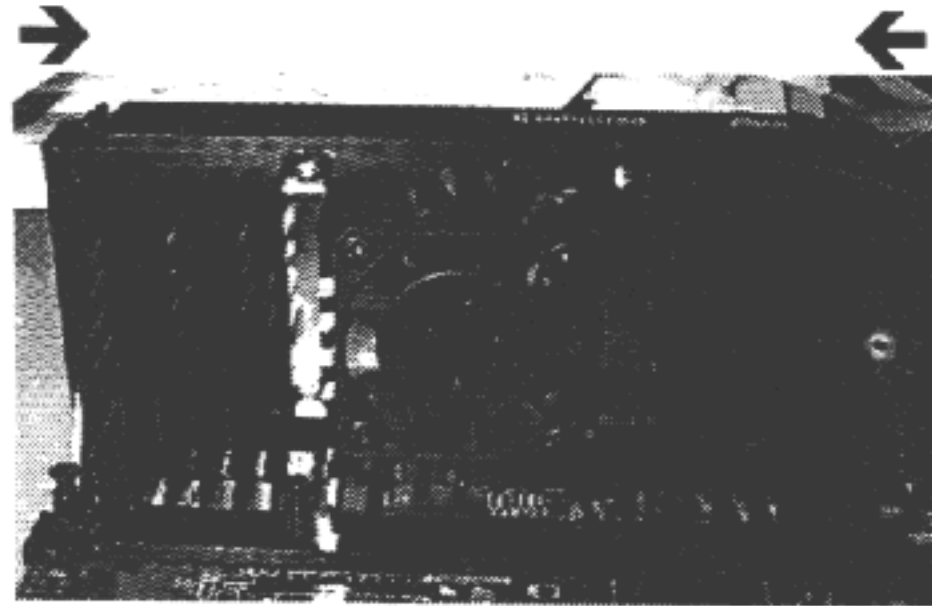
Insert the Processor like inserting a PCI or an ISA card.

Step 7: Lock the Processor Locks.

Secure the CPU by pulling the Processor Locks out.
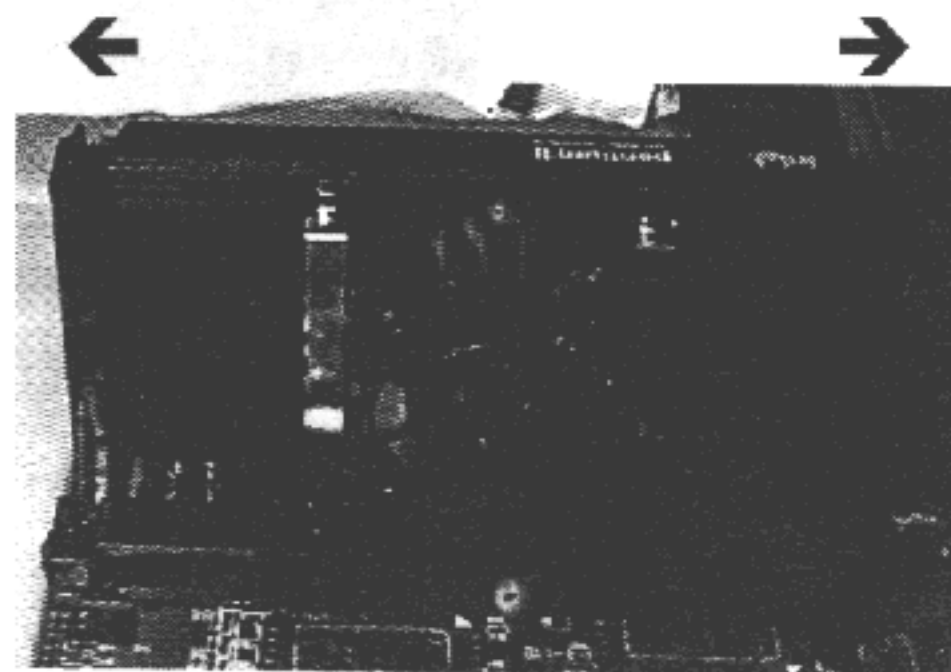
Step 8: Install the Heat Sink Support Top Bar.

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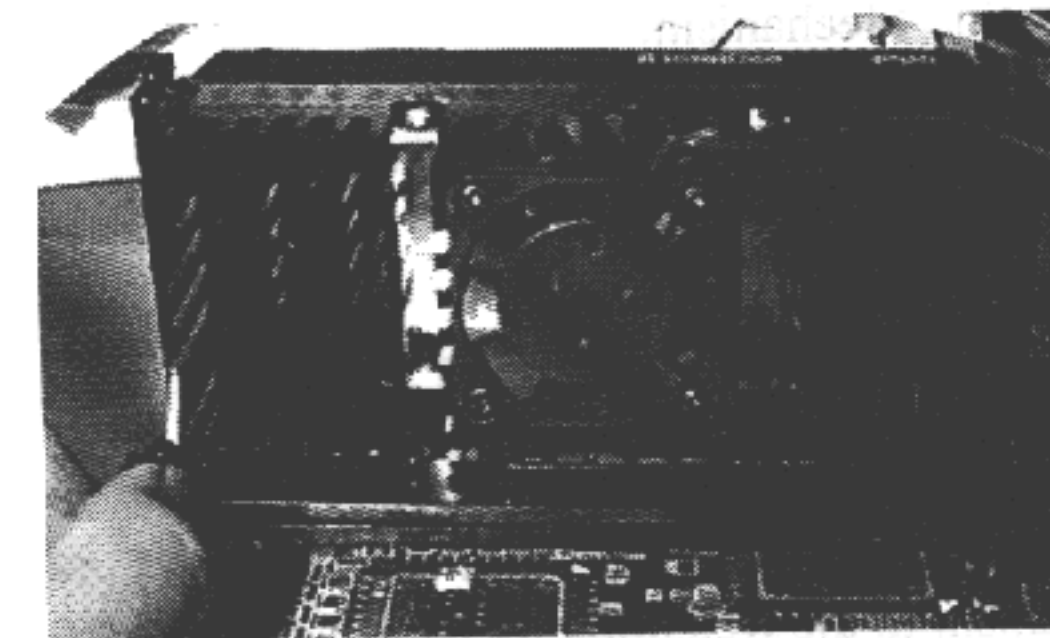
Heatsink Support Top Bar

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 the Boxed processor, all you need is the Retention Mechanism.

**Step 1:** Insert the Retention Mechanism Attach Mount at the bottom of the mainboard.

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 proper direction. Then, attach the Retention Mechanism to the Retention Mechanism Attach Mount. Use a Screwdriver to secure the Retention Mechanism.
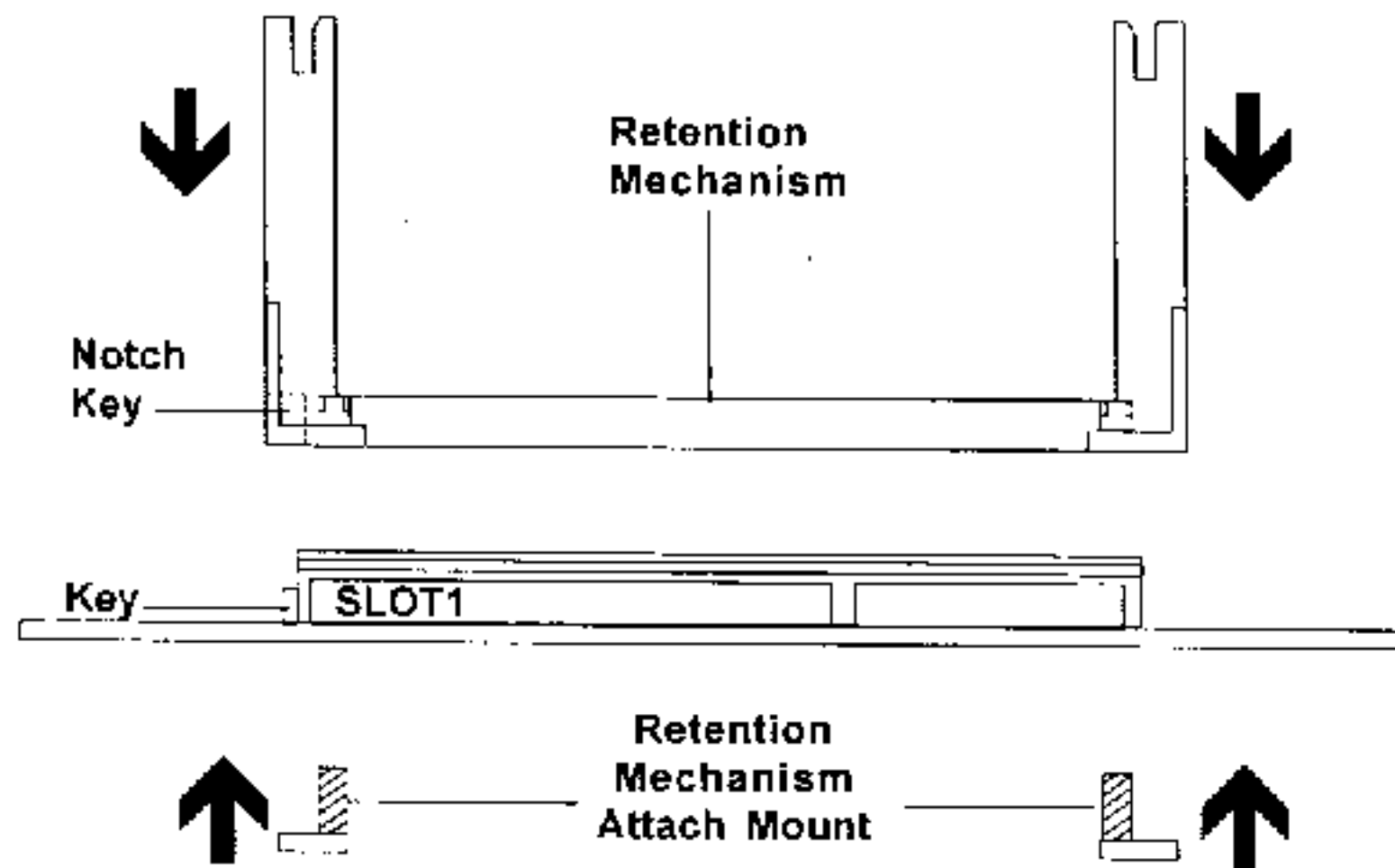
Step 3: Install the Heat Sink Support Base.

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.
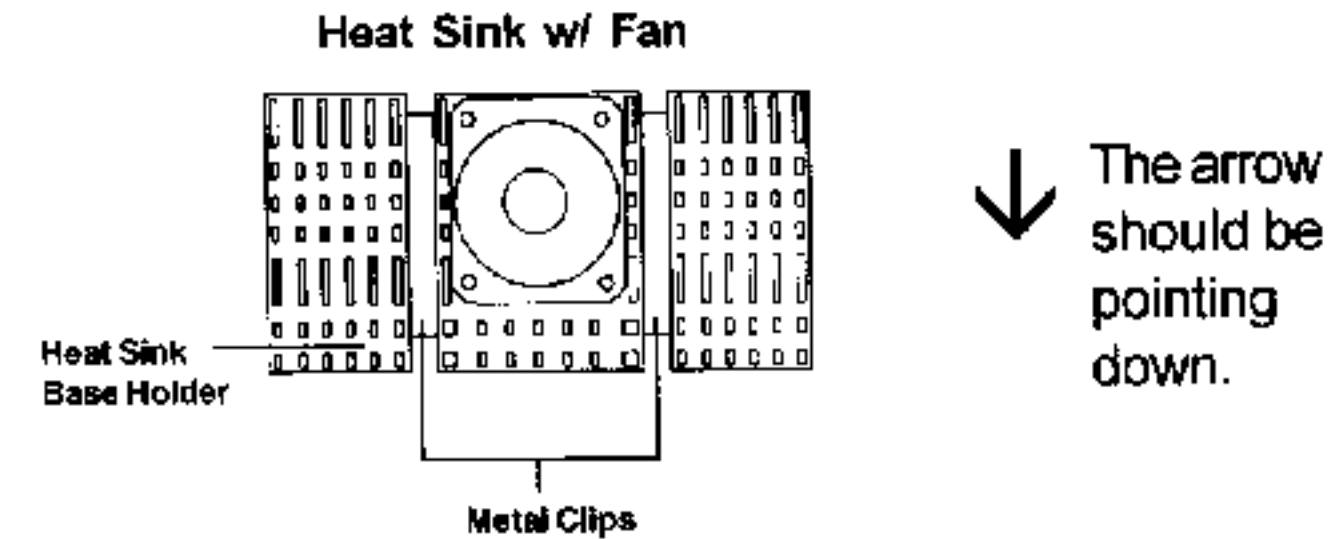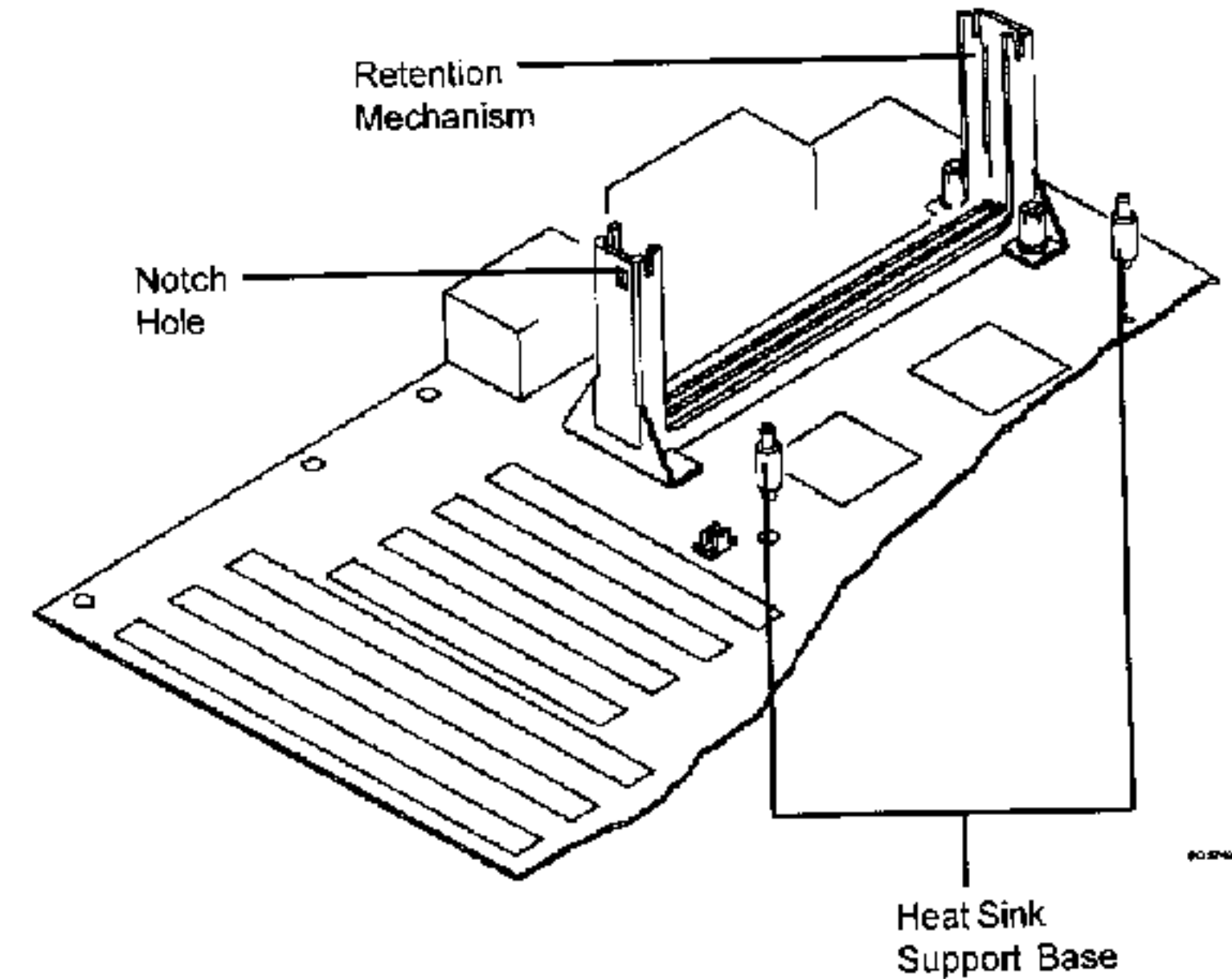

Push the Heat Sink Support Base onto the mainboard, until you hear a click sound. Check for a perfect fit.

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.

Intel® Boxed
Pentium™ II
Processor

Heat Sink
Support

Heat Sink
Support Lock

PO 274E
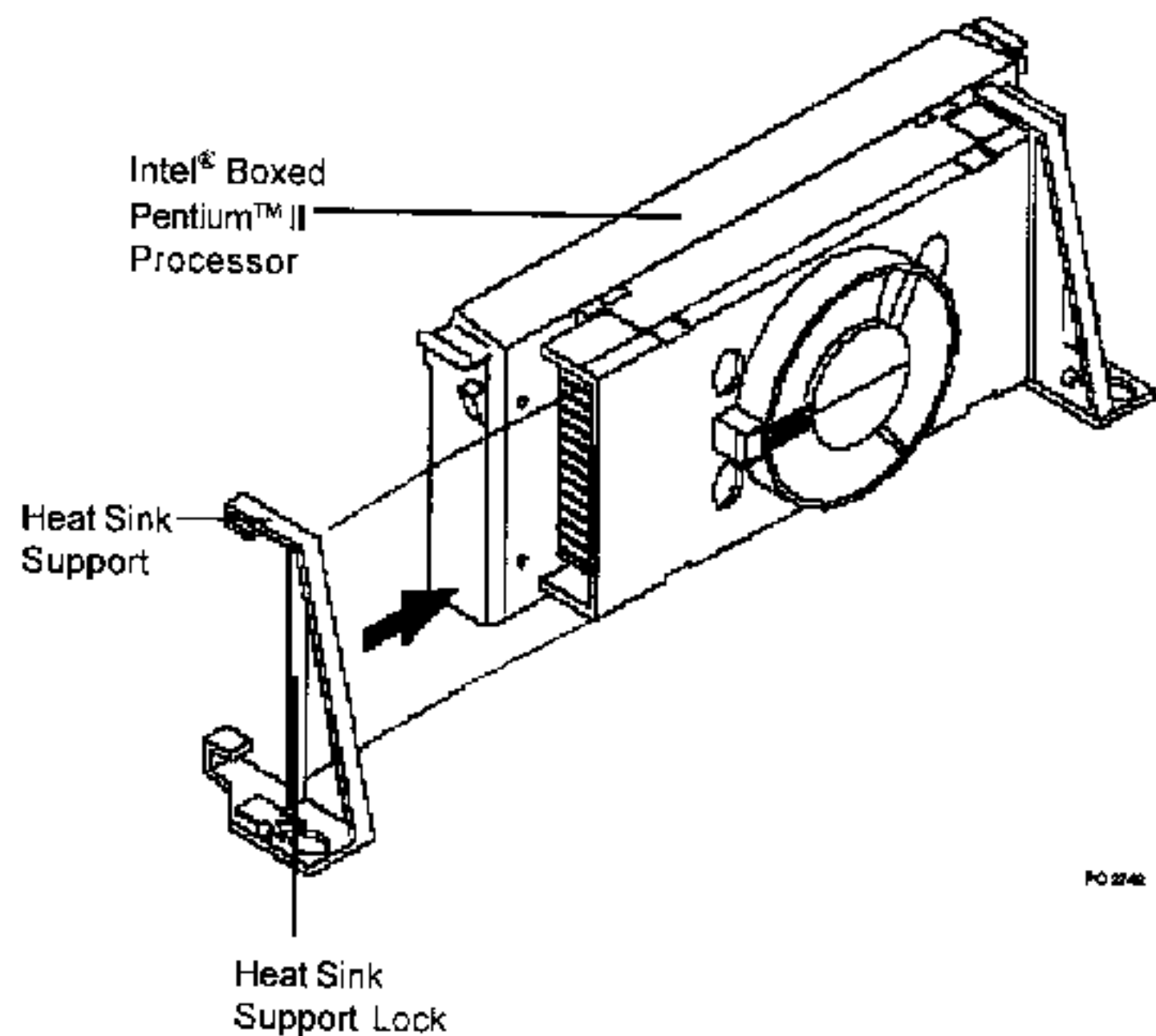
Step 5: Unlock the Processor Locks and Heat Sink Support Locks.

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

Processor
Lock

Heatsink
Support
Lock

PO 274L
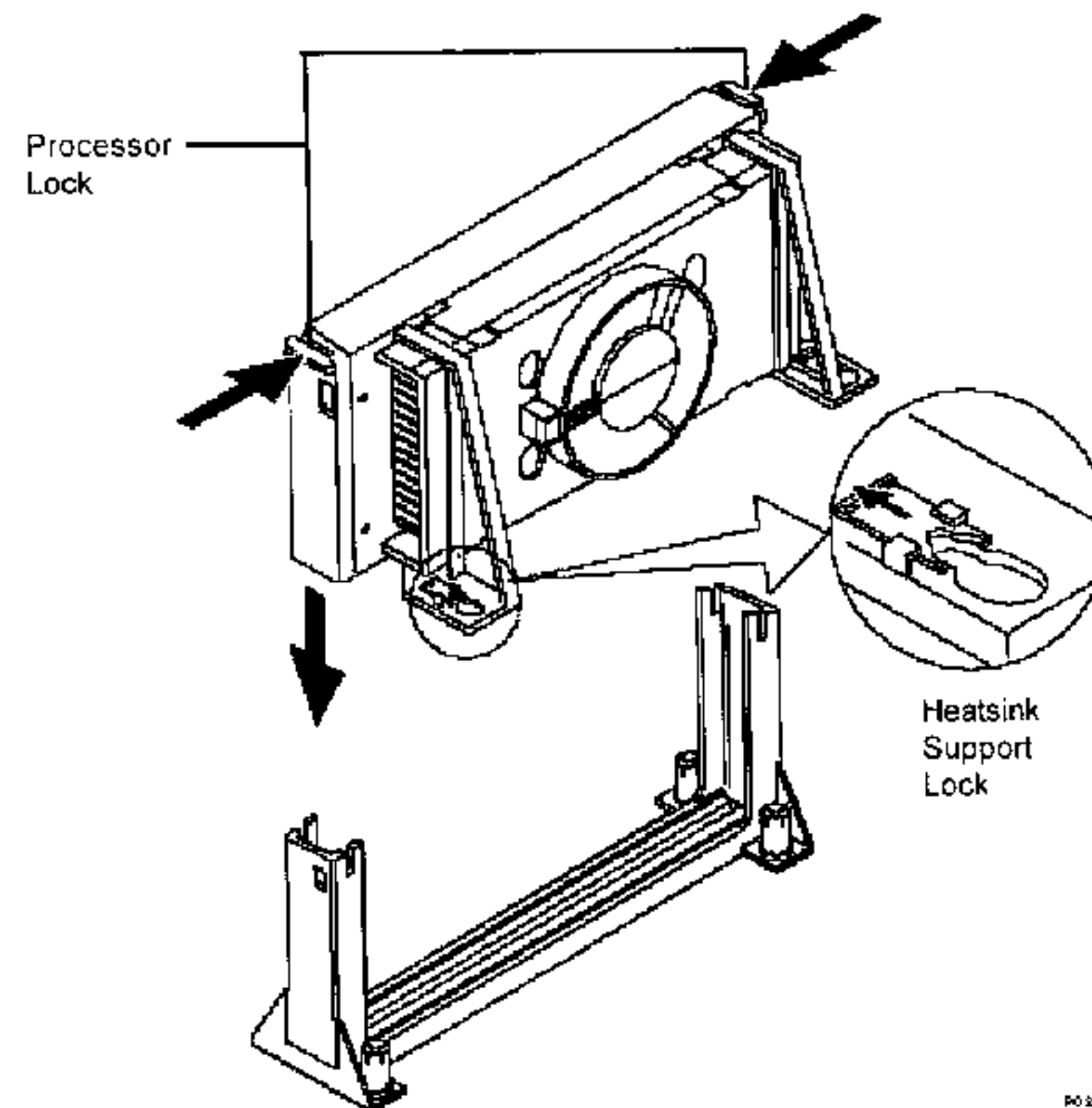
Step 6: Insert the Processor like inserting a PCI or an ISA card.
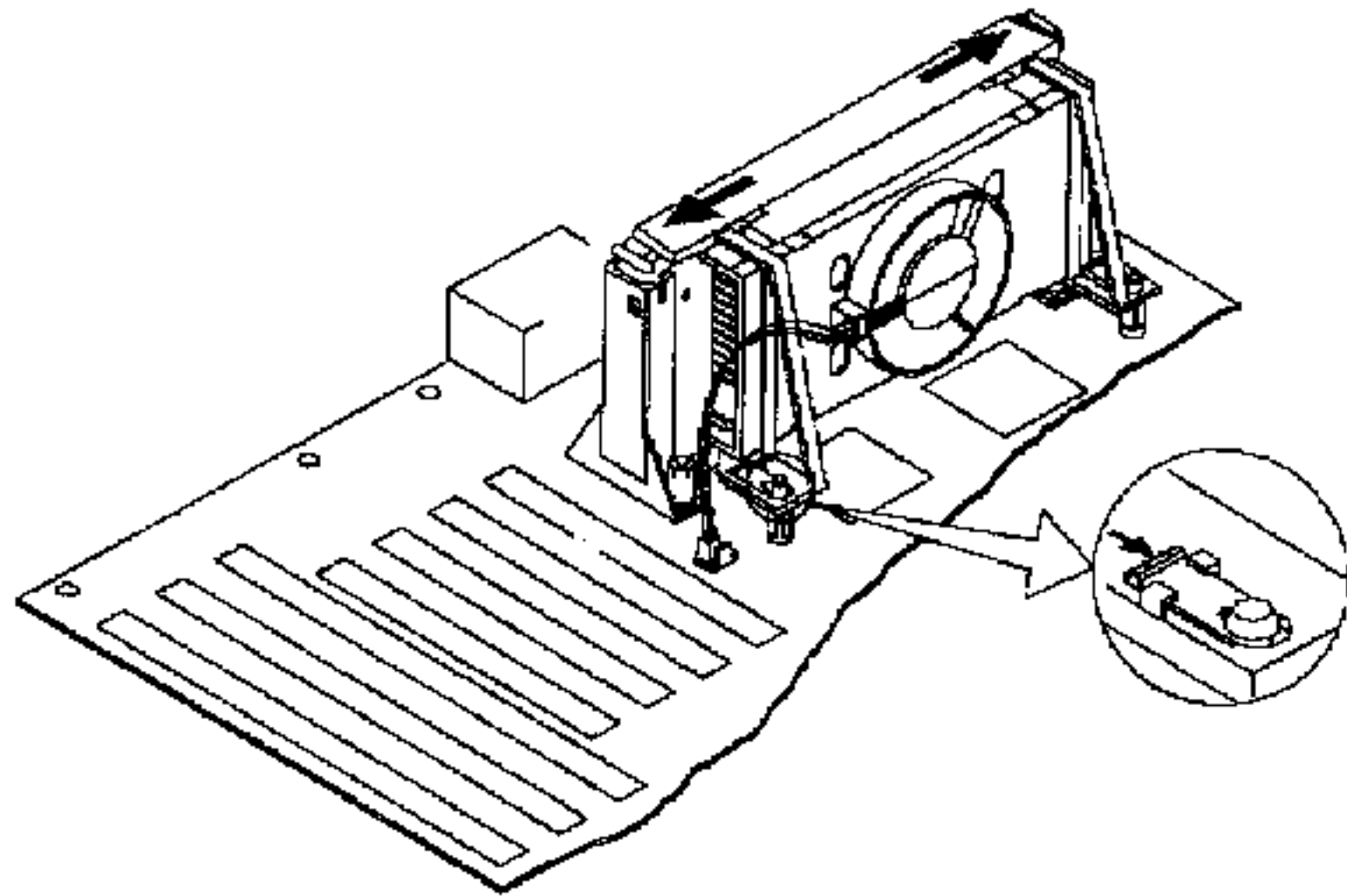
Step 7: Lock the Processor Locks and Heat Sink Support Locks

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 specifications of your CPU (*always ask the vendor for CPU spec.*). Then look at **Table 2.1** (200 ~ 333MHz Intel® Pentium® II processor) for setting.

JBF1

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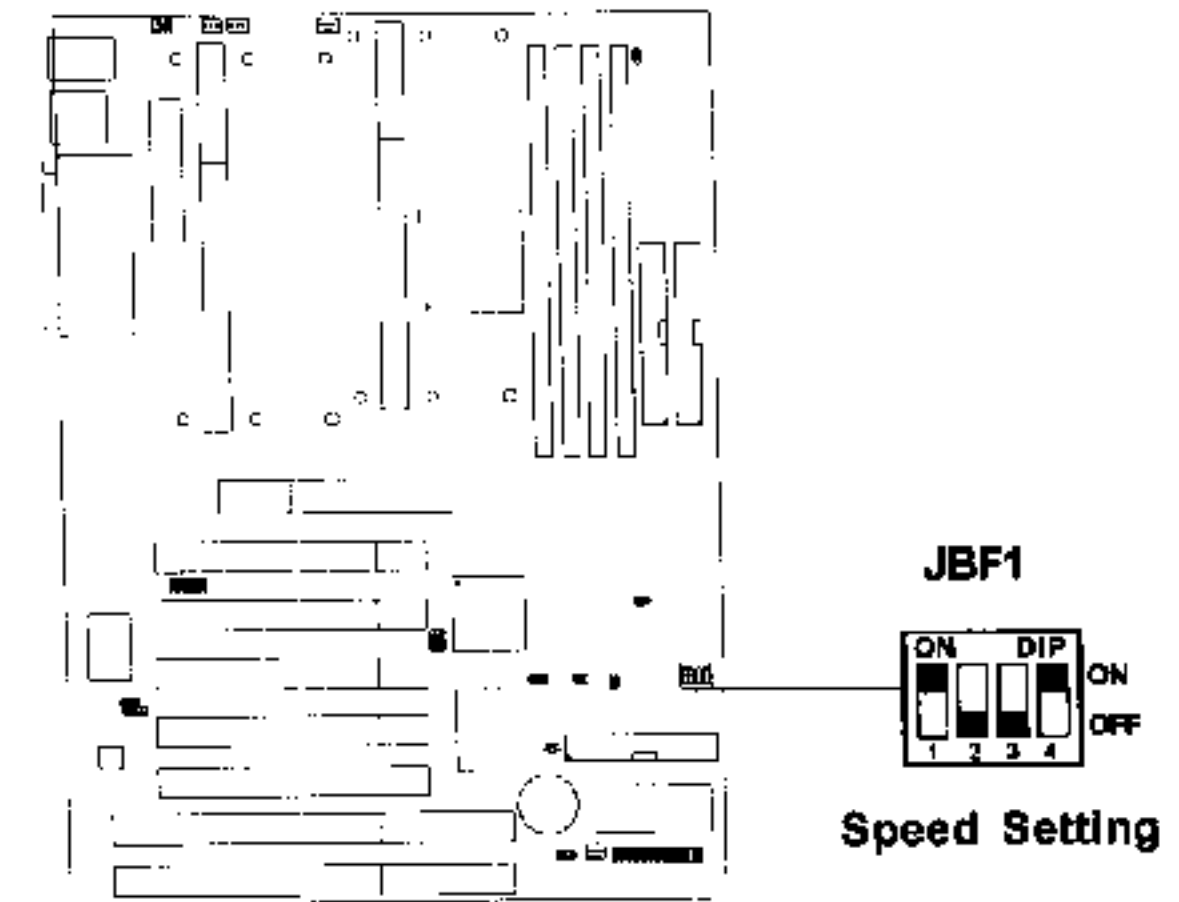
Table 2.1 200 ~ 333MHz Intel® Pentium® II processor

200MHz	
233MHz	
266MHz	
300MHz	
333MHz	

2.1-3 CPU Terminator

The CPU terminator is used, when 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.

2.1-4 Fan Power Connectors: CPUFAN1/CPUFAN2/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.
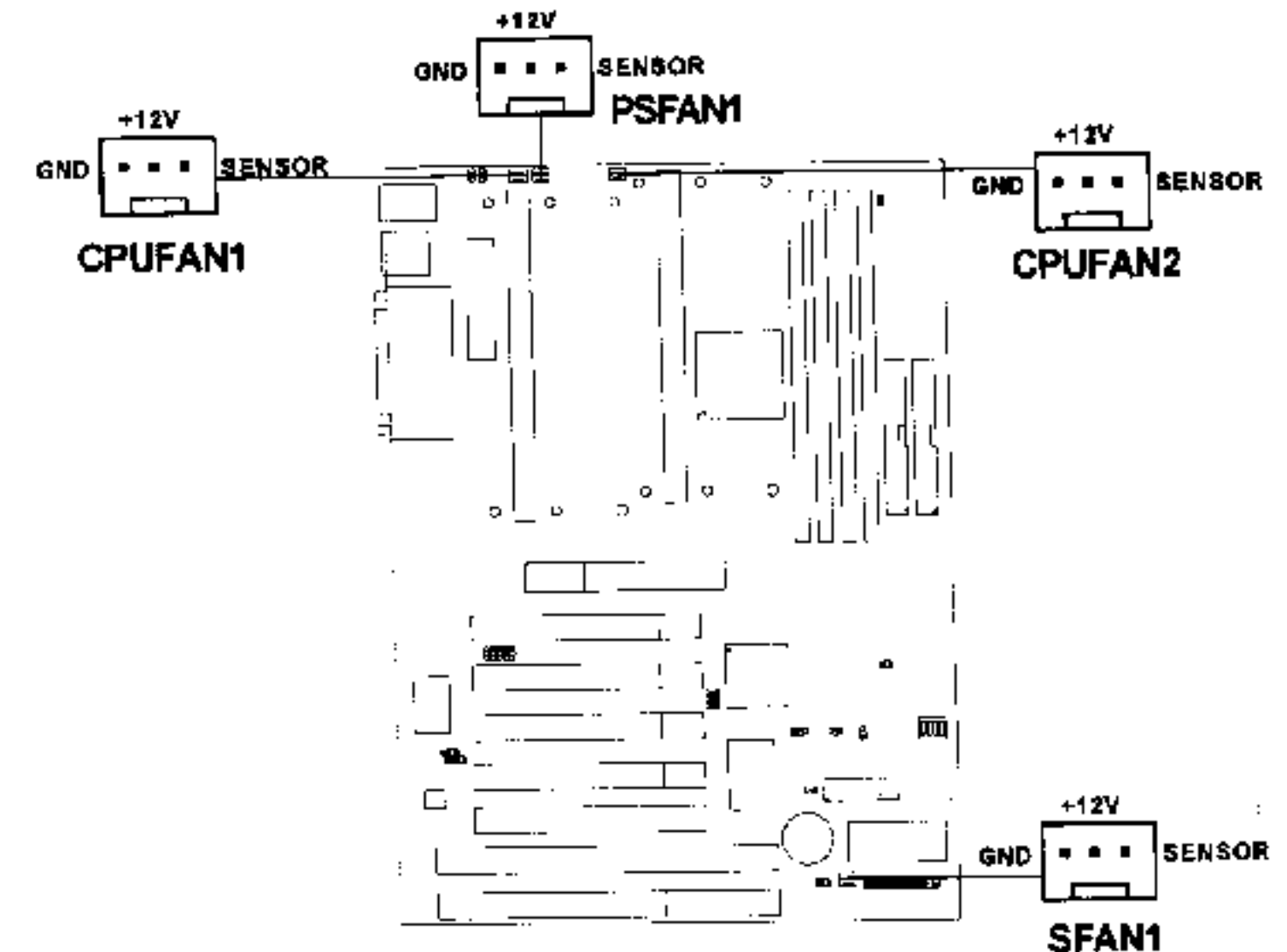
CPUFAN1   : processor fan
CPUFAN2   : processor fan
PSFAN1   : power supply fan
SFAN1   : system fan

Note: There are four fan connectors provided by this mainboard. But the System Hardware Monitor can only monitor up to three fans, so the PSFAN1 is not supported. For fans with speed sensor, every rotation of the fan will send out 2 pulses. System Hardware monitor will count and report the fan rotation speed.

2.2 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.
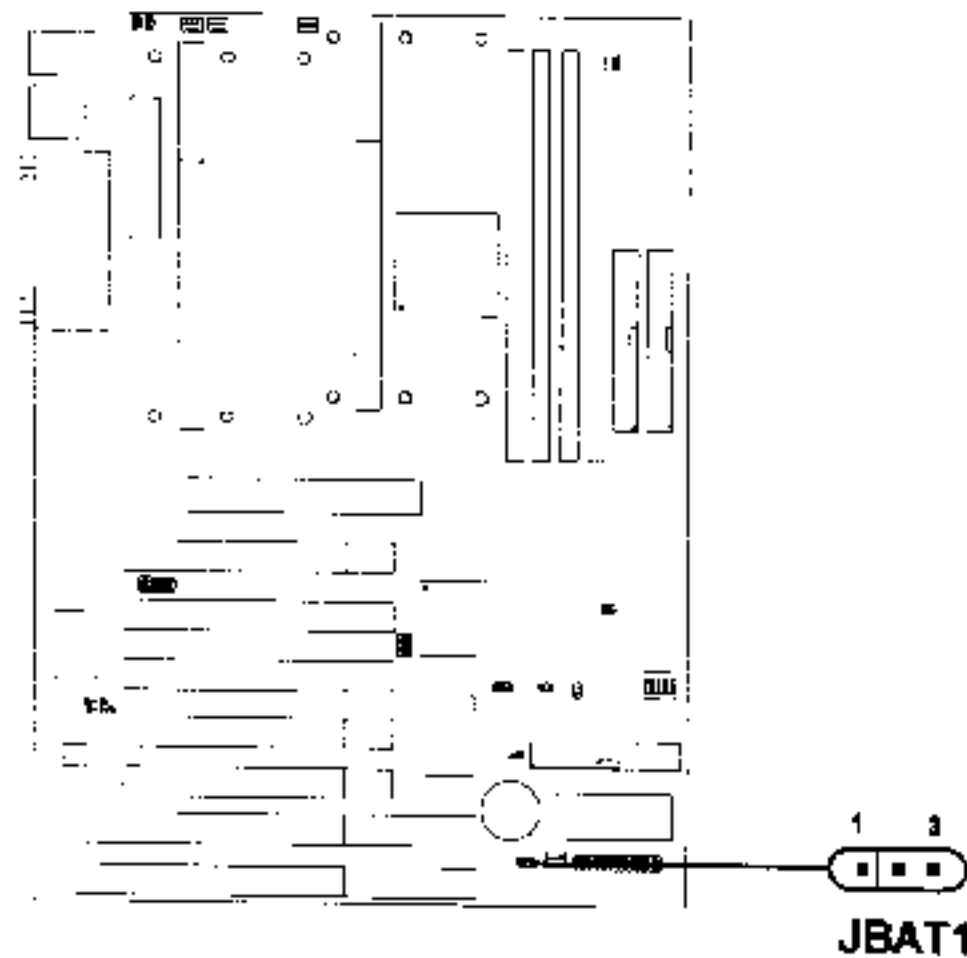
JBAT1

JBAT1	Function
1 3	Keep Data
1 3	Clear Data

Note: You can clear CMOS by shorting 2-3 pin, while the system is off. Then, return to 1-2 pin position. To be able to clear the CMOS, you need to unplug the power plug of the system, because there's a 3V standby power for PIIX4 chipset which is provided by the power supply. Otherwise, the CMOS will not be cleared.

2.3 Keyboard Power-On Disabled: JVCC

This is used to disable the keyboard power on feature.
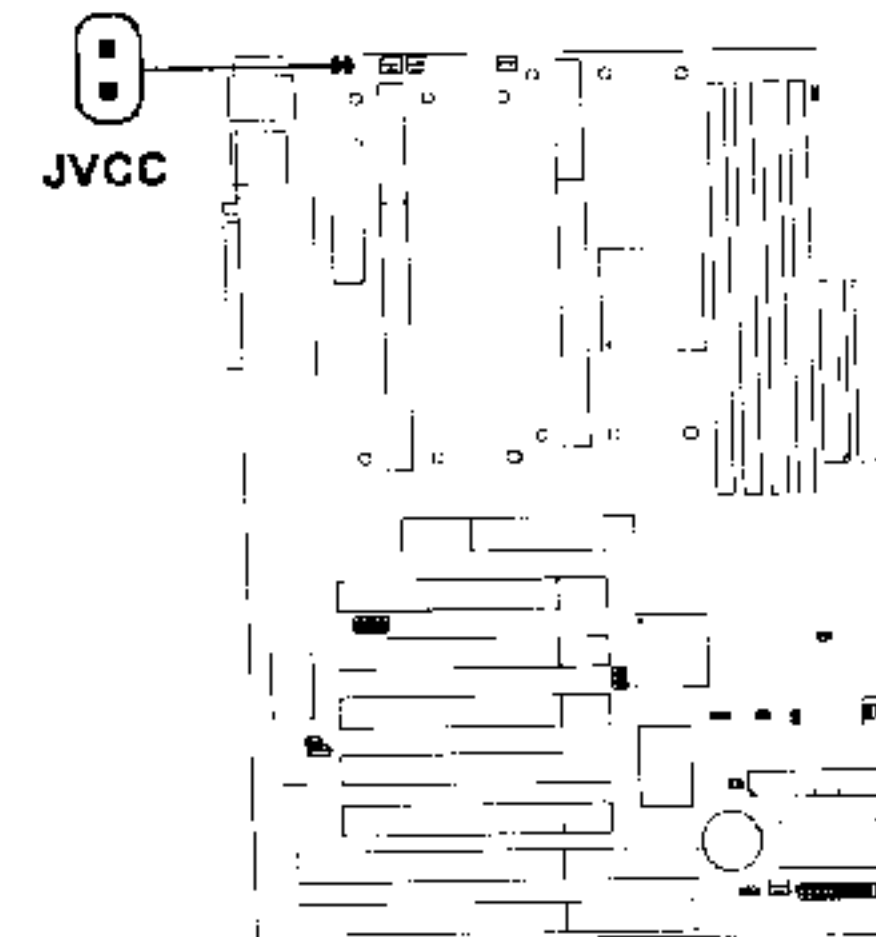
JVCC

JVCC	Feature
	Disabled Keyboard Wake-up System Power Feature

Note: Short JVCC, to disable the keyboard wake-up system power feature. Factory default is "short".

2.4 Keyboard Power-On Enabled: J5VSB

This is used to enable the keyboard power on feature. This mainboard supports keyboard power-on feature. The keyboard needs to have a power supply which can provide sufficient 5V standby power for both the keyboard and the mainboard.
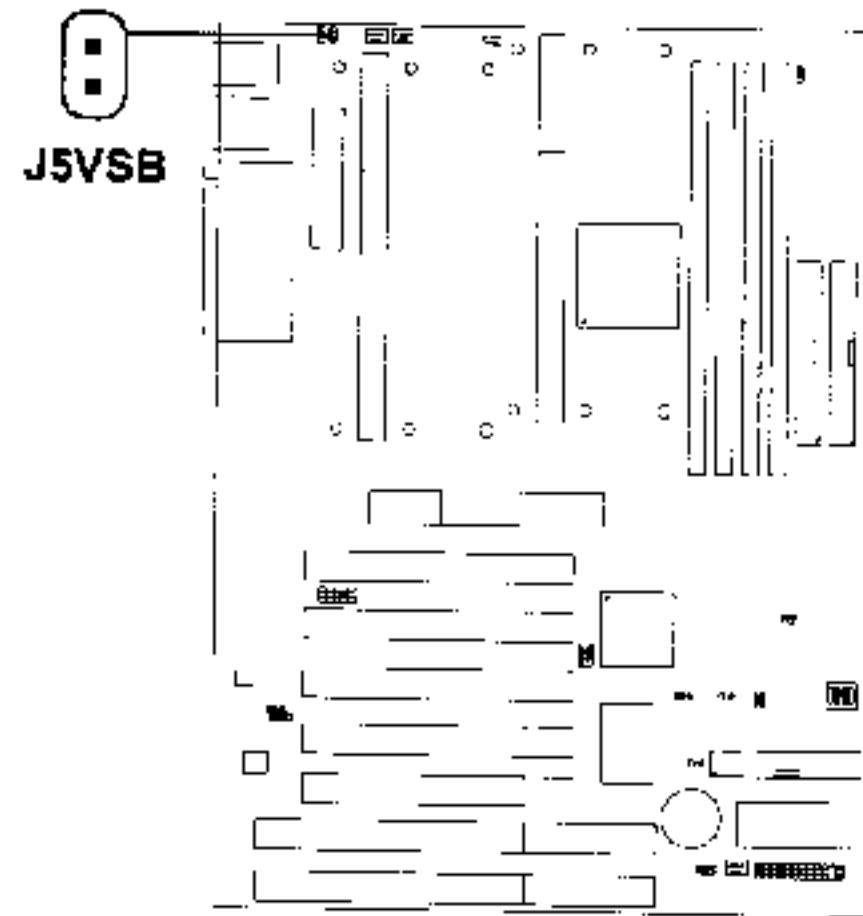
J5VSB

J5VSB	Feature
	Enabled Keyboard Wake-up System Power Feature

Note: Short **J5VSB**, to enable the keyboard wake-up system power feature.

Note: a. To be able to use this function, you need a power supply that provide enough power for the keyboard power on feature.
(750 ma power supply with 5V Stand-by)
b. Consult power supply vendor about the 5V stand-by for your keyboard power consumption.
This function has been removed due to the possibility of user forgetting password; or commiting mistake in operation causing system failing to power on.

2.5 Power On Mode Jumper: JPWRMD

The mainboard supports two kinds of system boot up: the Boot-Up by switch and the Immediate Boot-Up. With the Boot-Up by Switch, the system will boot up only when the power on switch is pressed. For Immediate Boot-Up, the system will boot up instantly when the power connector is connected into the system.
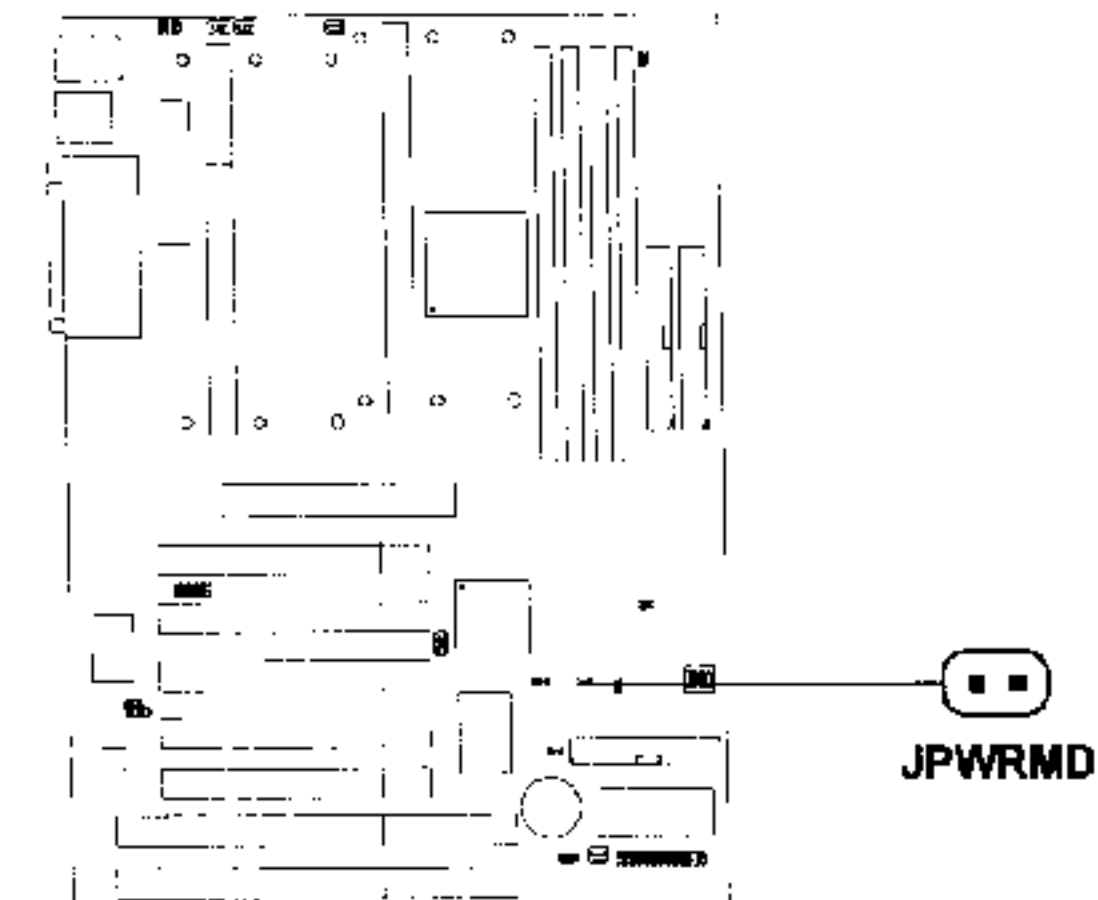
JPWRMD

A. Factory Default Setting for JPWRMD is "short" (Boot-Up by Switch)
- Power Management Enabled: During Power On, press the power button switch and the system goes into suspend mode. Press it more than four seconds and the system will power off.
- Power Management Disabled: During Power On, press the power switch button and the system will power off.

B. Immediate Boot-Up
The system will boot up instantly when the power connector is connected into the system.

Table 2.5: Power On Mode Feature

JPWRMD	Feature
▮▮▮▮	Select Boot-Up by Swtich
• •	Select Immediate Boot-Up

Note: Short **JPWRMD**, when using Boot-Up by Switch feature. Open **JPWRMD**, to enable Immediate Boot-Up.

2.6 Memory Installation

2.6-1 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 Mbytes DIMM memory module. 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.

DIMM1(Bank0 + Bank1)
DIMM2(Bank2 + Bank3)
DIMM3(Bank4 + Bank5)
DIMM4(Bank6 + Bank7)
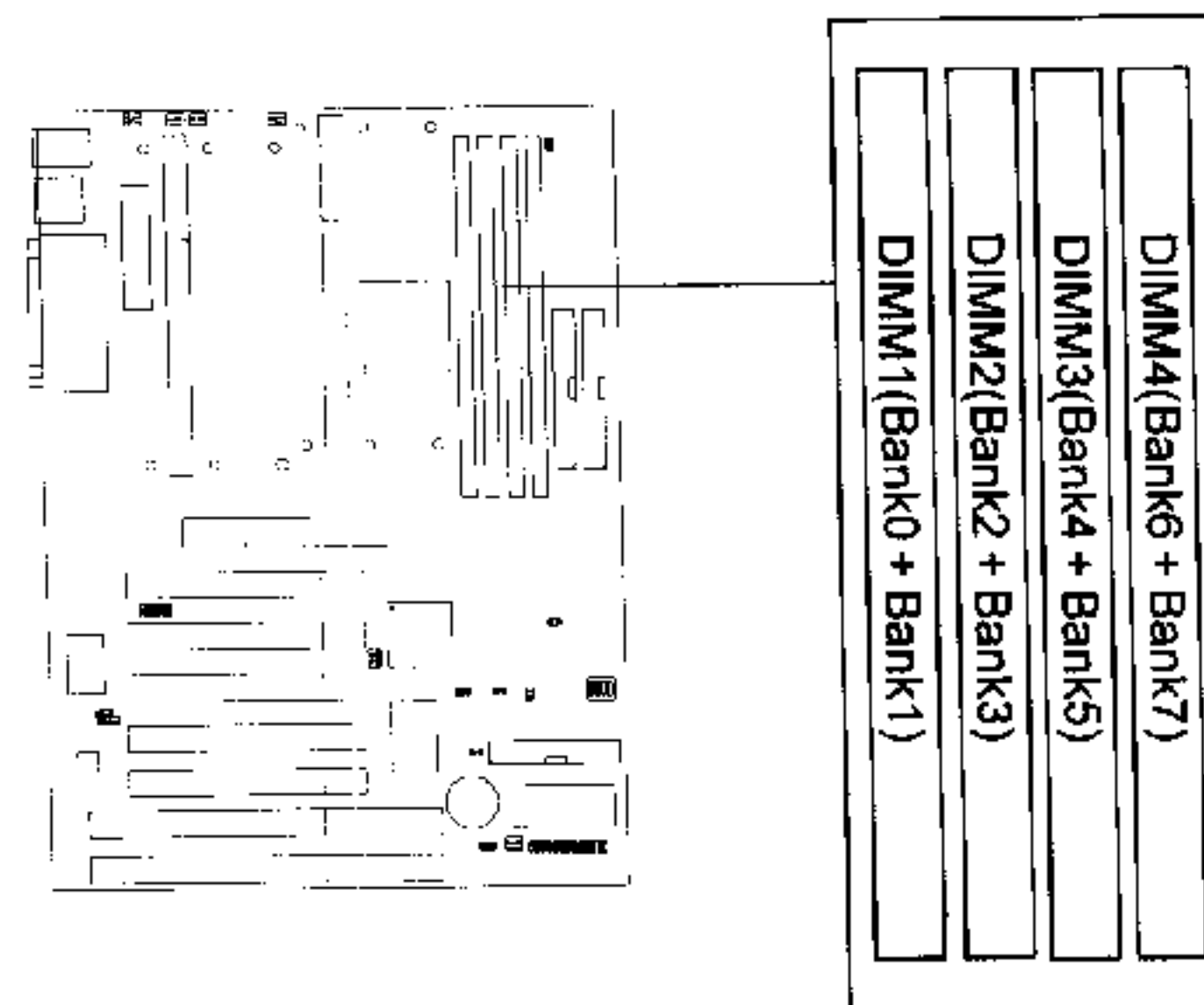
Note: FP(Fast Page) & BEDO(Burst EDO) DIMM are not supported.

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.

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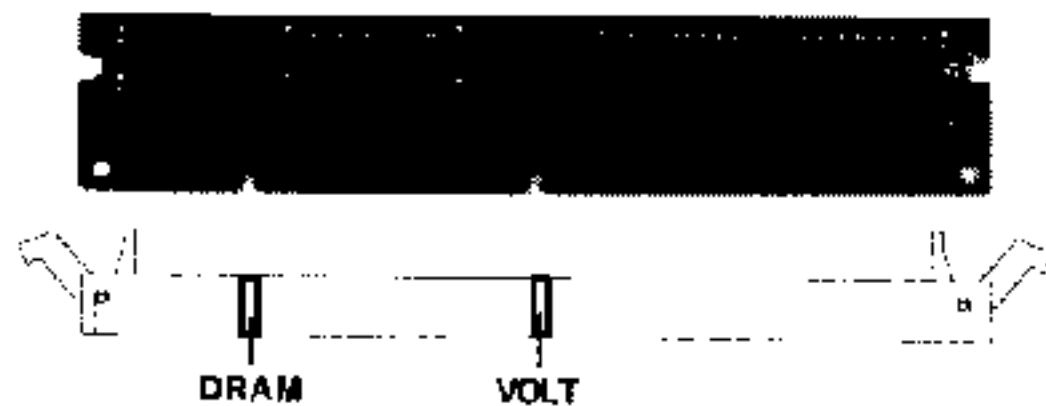
3. Close the plastic clip at the side of the DIMM slot.

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

2.6-2 Memory Population Rules

1. Supports EDO and SDRAM.

2. Supports **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 DIMM 1, DIMM 2, DIMM 3, or DIMM 4 in any order.

5. Supports only 3.3 volt DIMM.

6. The DRAM addressing and the size supported by the mainboard is shown next page.

Table 2.6-1 EDO DRAM Memory 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 2.6-2 SDRAM Memory 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		

2.7 Case Connector: JFP1

The Turbo LED, Reset Switch, Key Lock, Power LED, Speaker and HDD LED are all connected to the JFP1 connector block.

JFP1
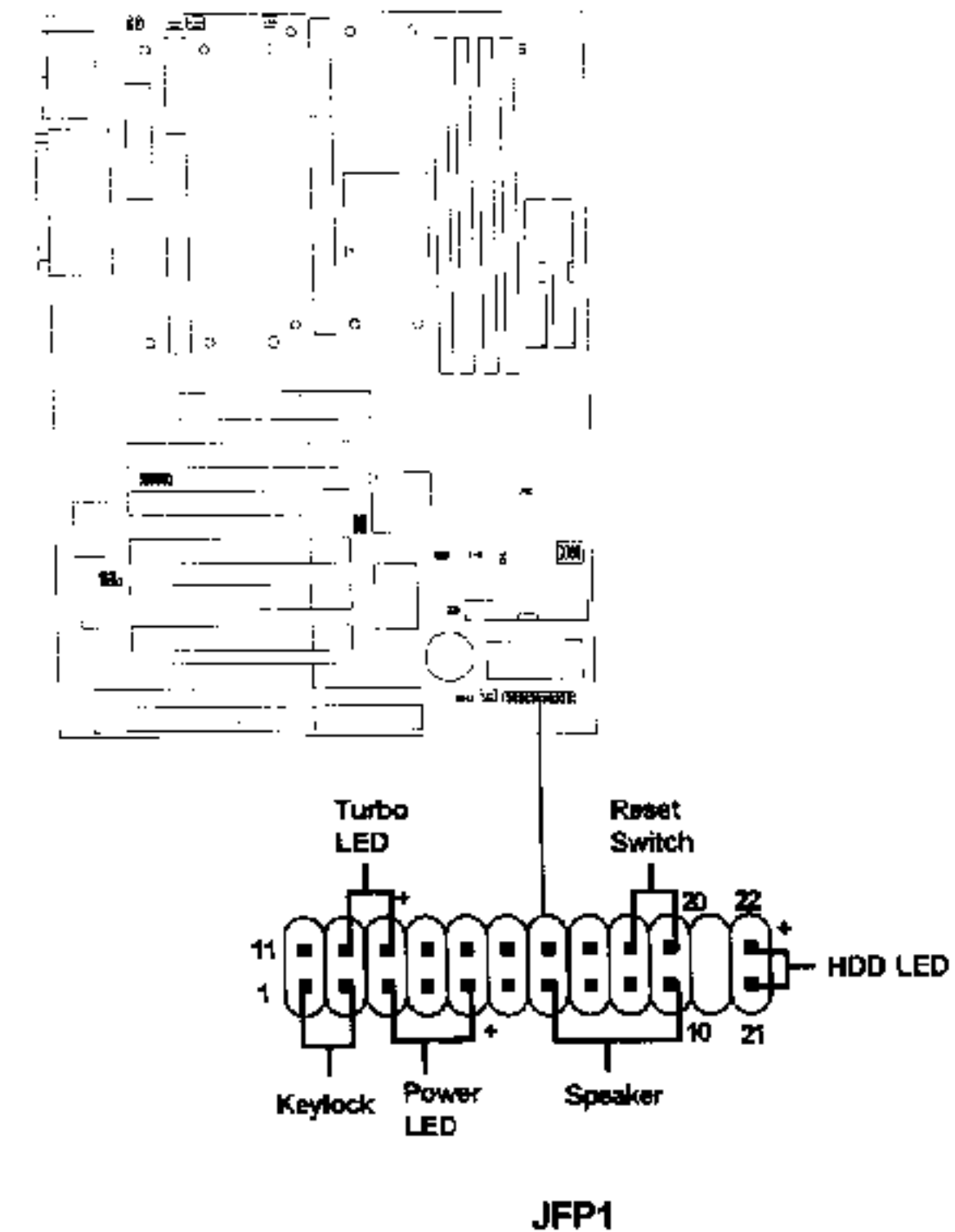
2.7-1 Turbo LED

The Turbo LED is always ON. You can connect the Turbo LED from the system case to this pin.

2.7-2 Reset Switch

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.

2.7-3 Keylock

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

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.

2.7-5 Speaker

Speaker from the system case is connected to this pin.

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.

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. This connector support the provided floppy drive ribbon cables.

FDC
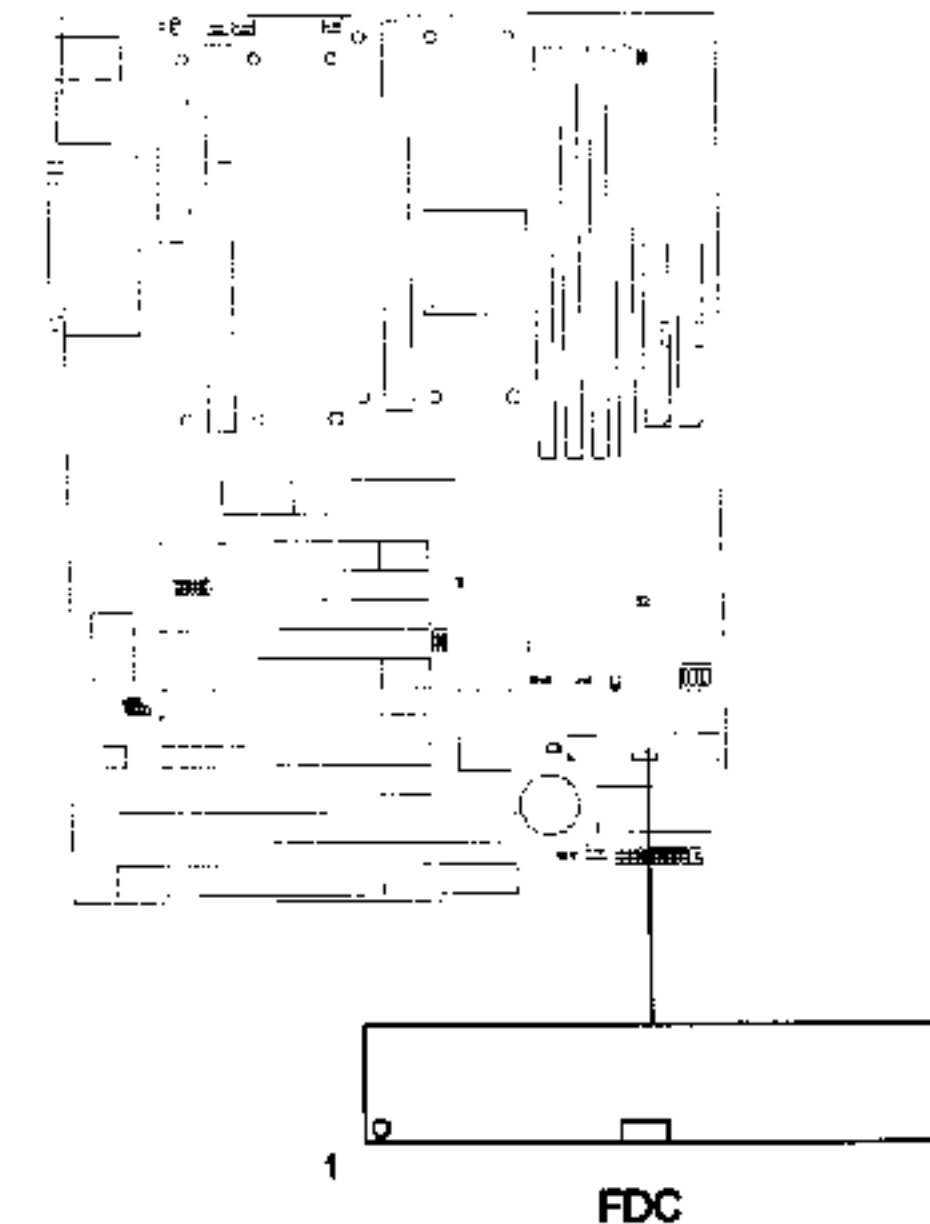
2.9 Hard Disk Connectors: IDE1 & IDE2

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.
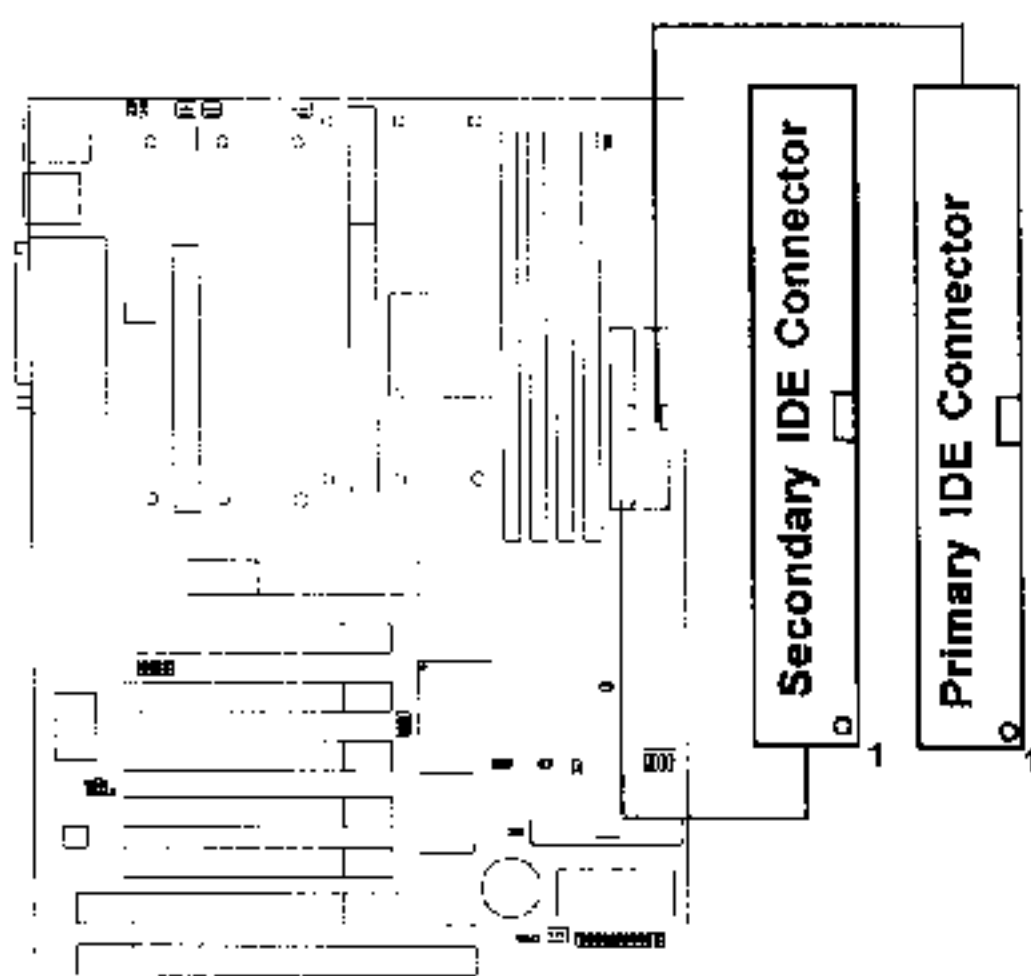
IDE1(Primary IDE Connector)

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.

2.10 Power Supply

2.10-1   ATX 20-pin Power Connector: JPWR1

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
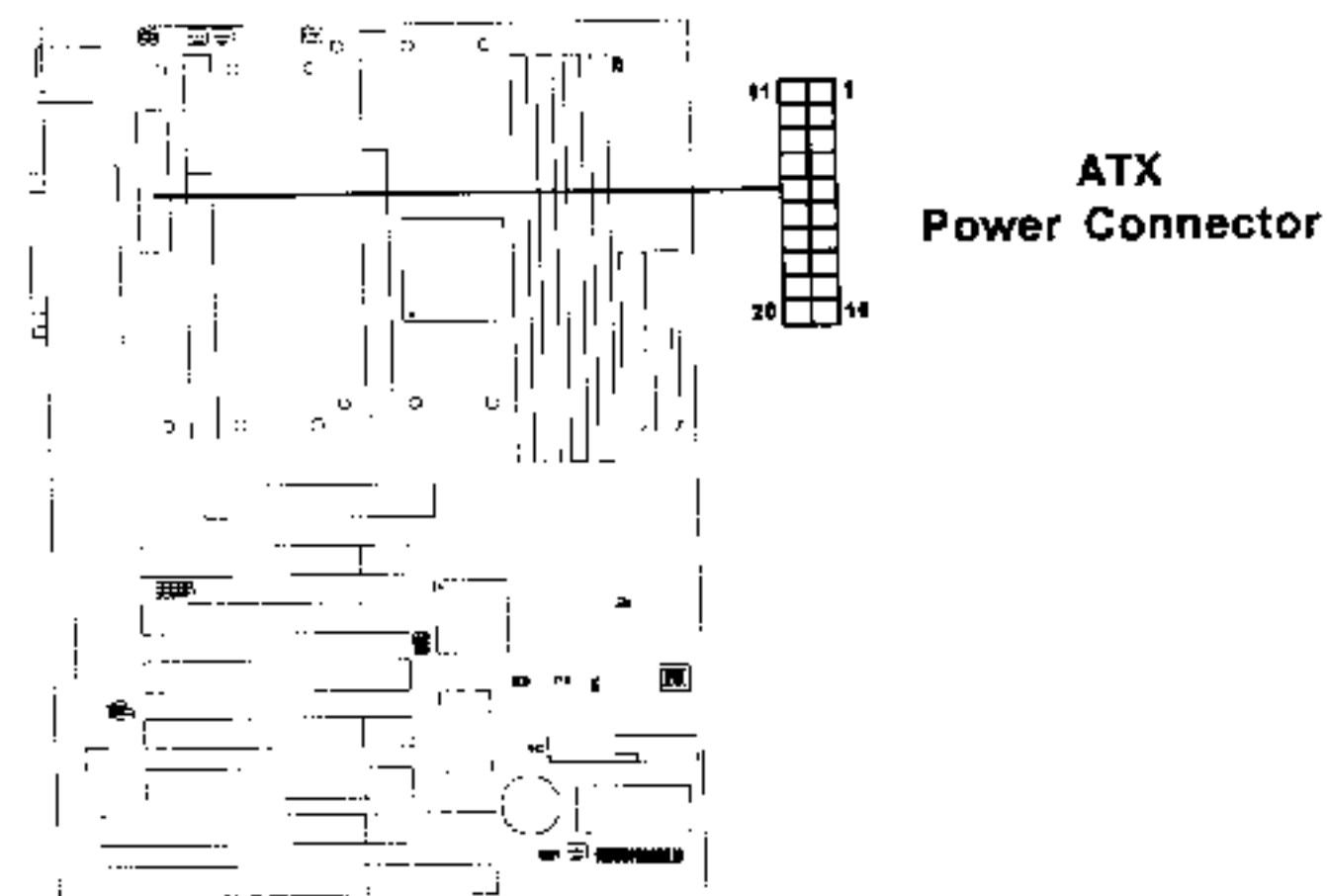
PIN DEFINITION

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

2.10-2 Remote Power On/Off Switches: JSW1/JSW2

Connect to a 2-pin push button switch. If Instant-on is Enabled, every time
the switch is shorted by pushing it once, the power supply will change its
status from OFF to ON. **If Instant-on is Disabled: 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.
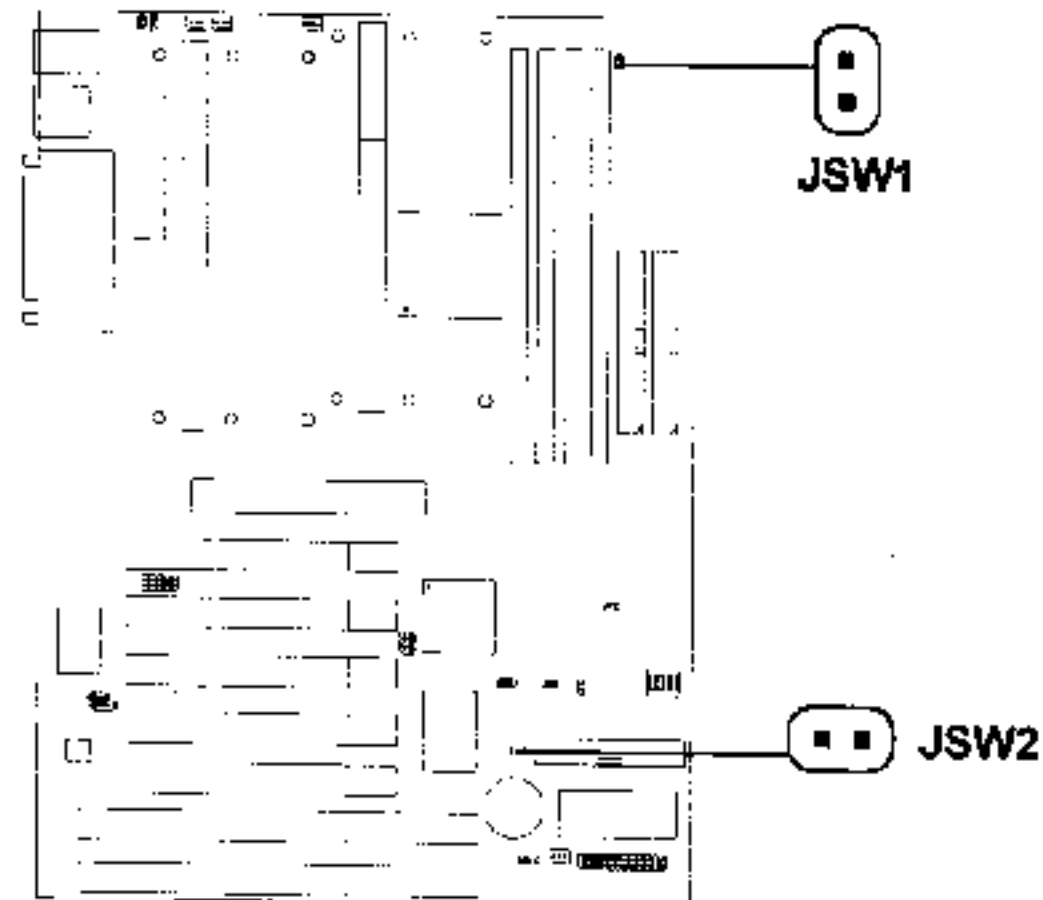
Note: The two switches are provided by the mainboard for your
convenience, so you can use any of them. The two switches have
the same function.

2.11 IrDA Infrared Module Connector: IR1

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 for future
Super I/O chipset.
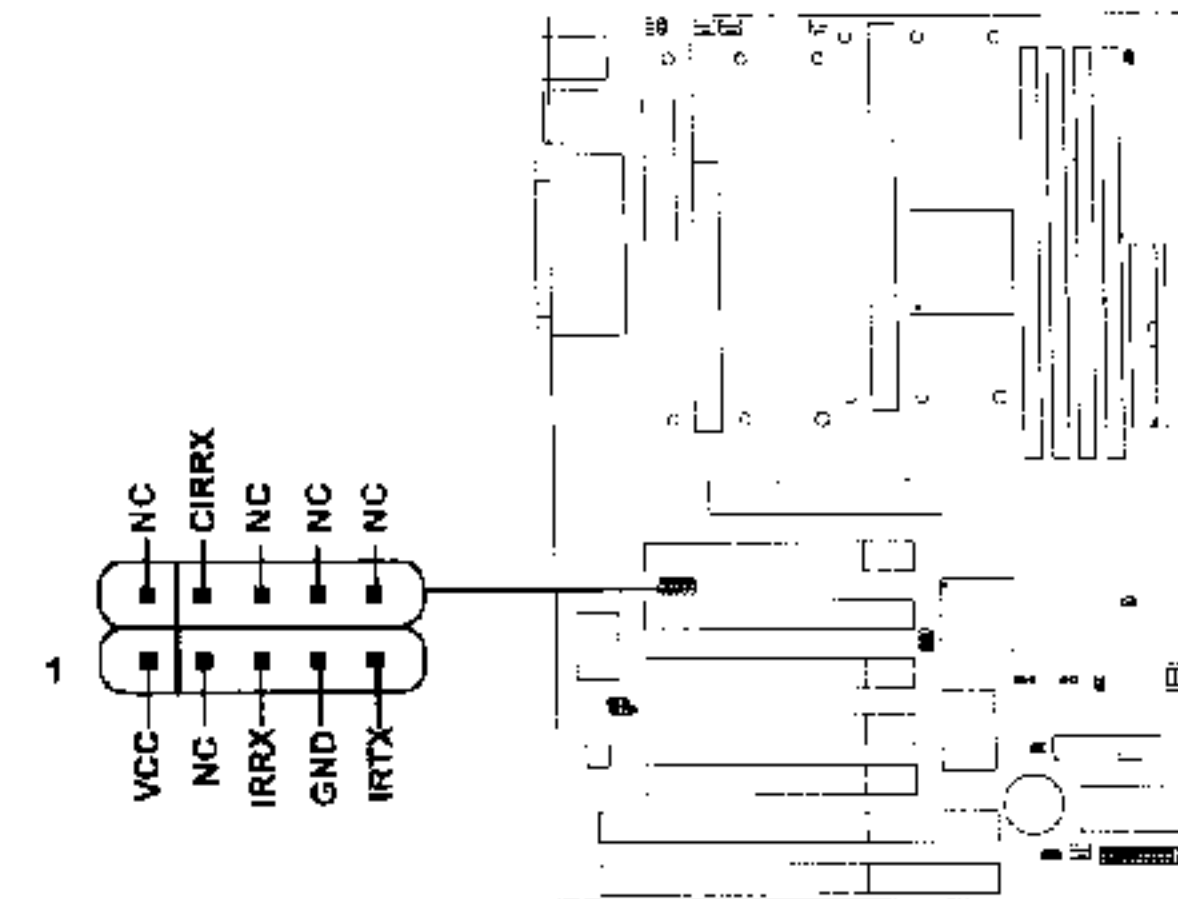
Note: Future Super I/O (w893977ATF) chip will provide FIR & Consumer
I/O. The IrDA connector support future feature, but it has not yet
been tested.

2.12 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.

COM A   COM B
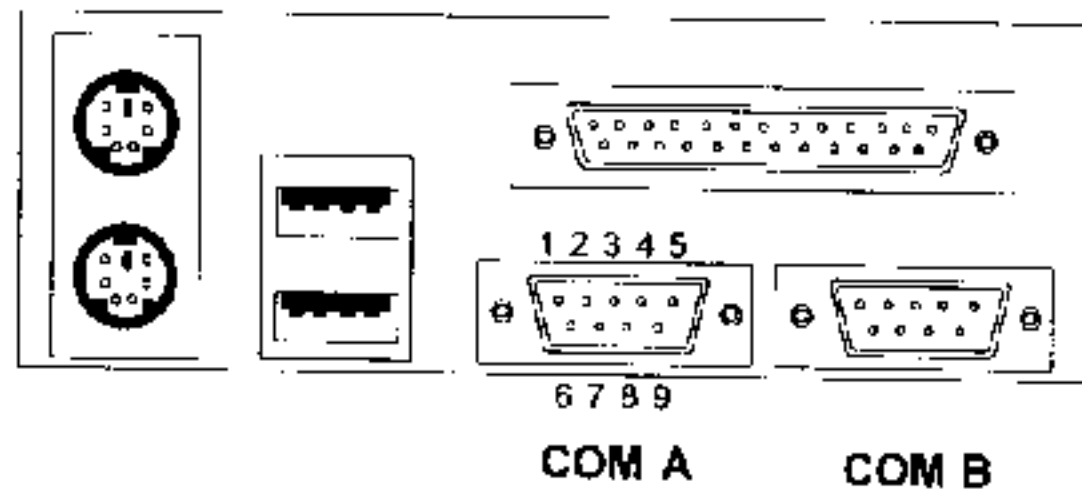
PIN DEFINITION

PIN	SIGNAL
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)

2.13 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:

LPT
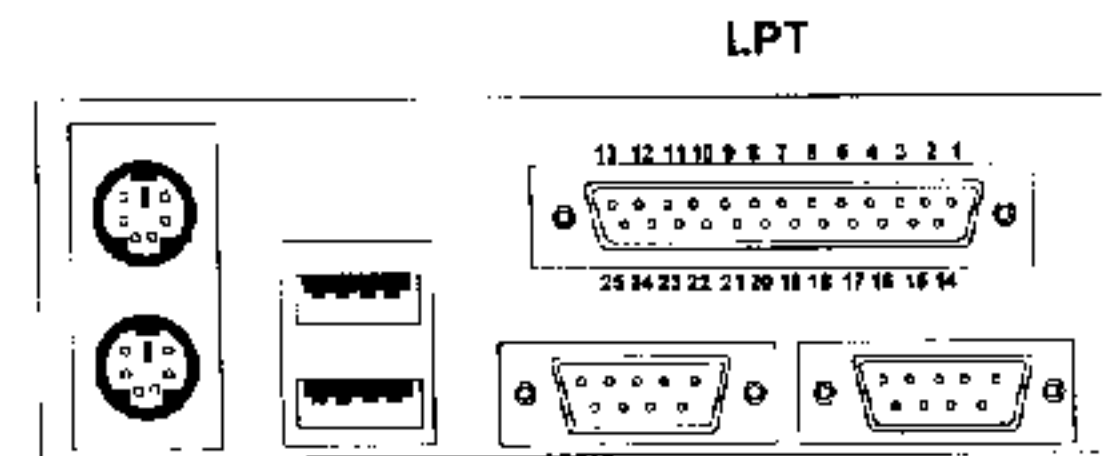
PIN DEFINITION

PIN	SIGNAL	PIN	SIGNAL
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		

2.14 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)
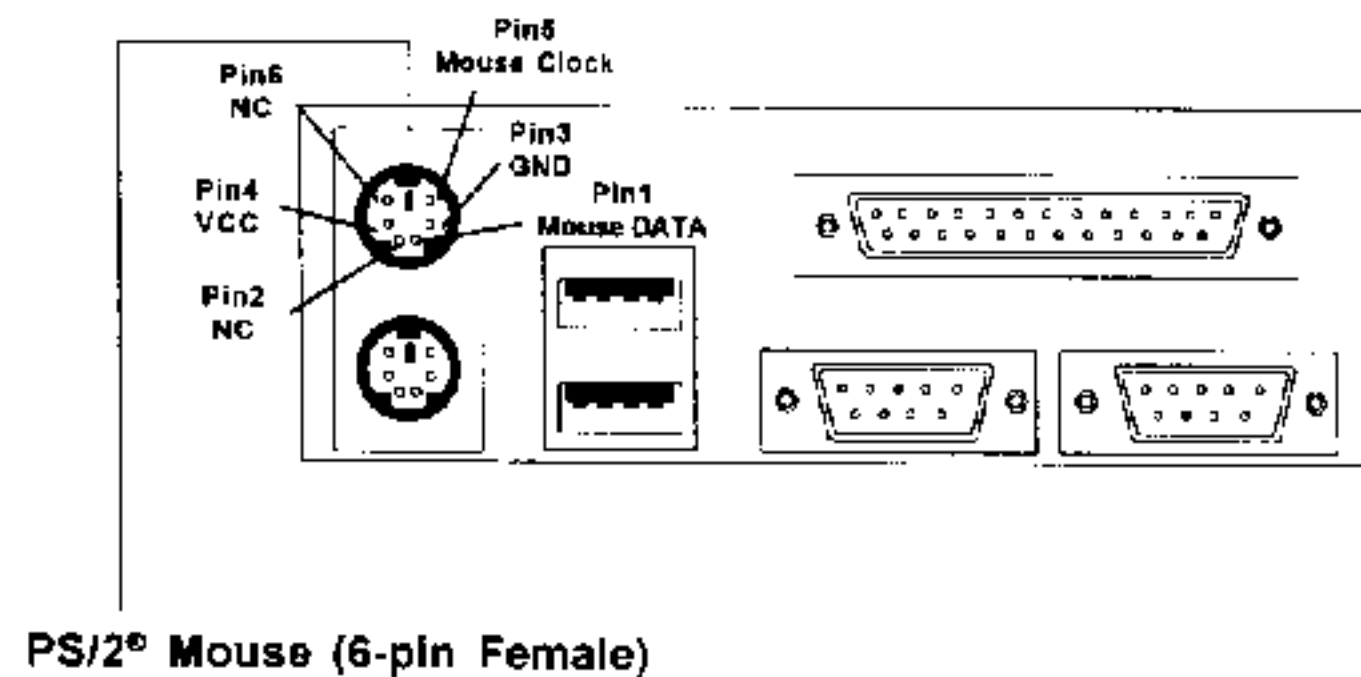
2.15 Keyboard Connector: JKBMS1

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

PS/2® Keyboard (6-pin Female)
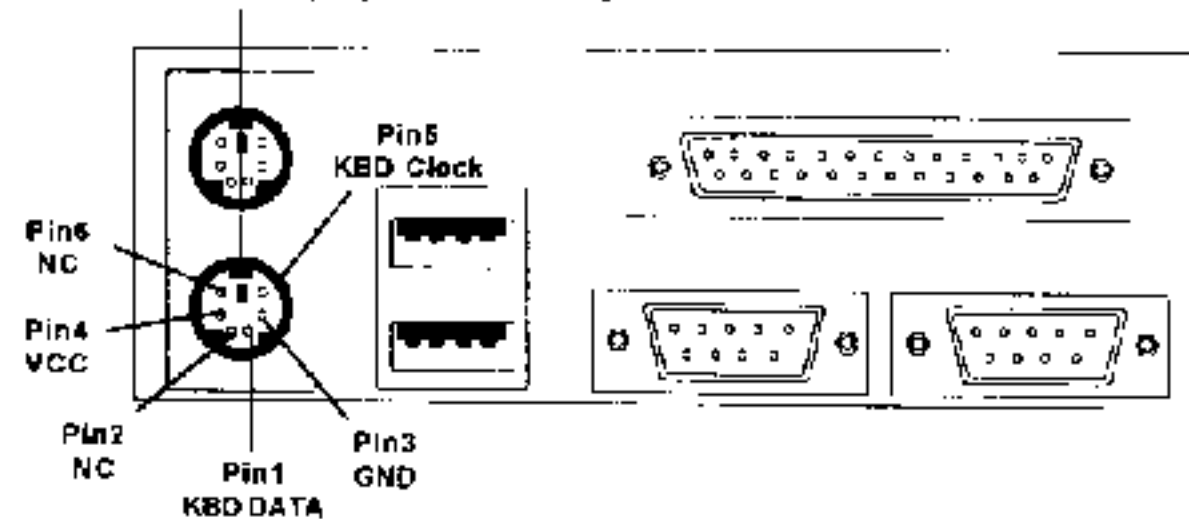
2.16 USB Connector: USB

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.

USB Port 1

USB Port 2
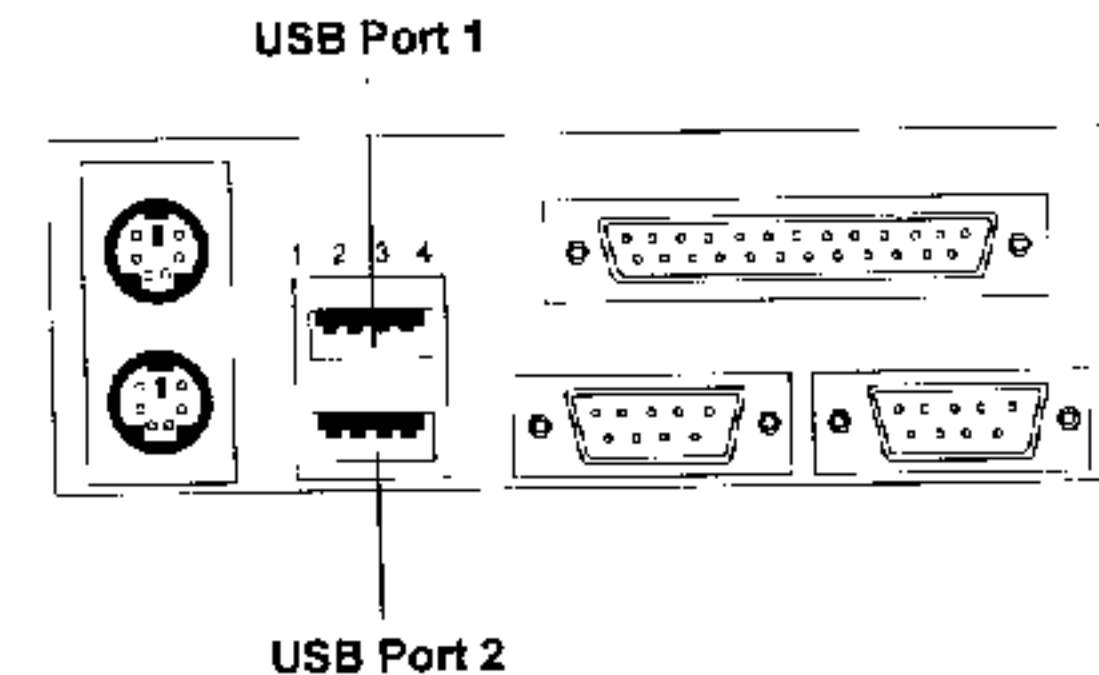
PIN	SIGNAL
1	VCC
2	-Data0
3	GND
4	+Data0

2.17 Sleep Switch Connector: JSLP

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

GND
SLEEP#

JSLP
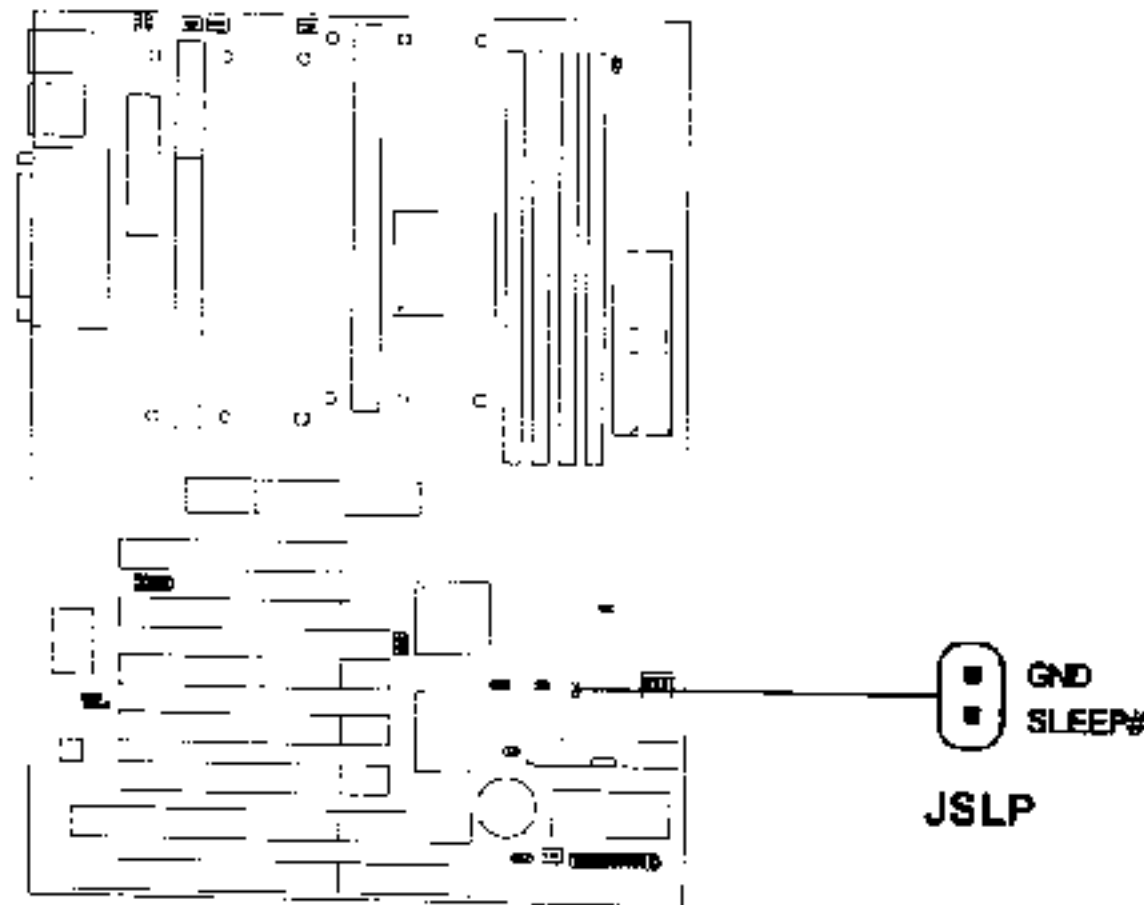
2.18 Sleep LED Connector: SLPLED

Connect a 2-pin LED to SLPLED. When the system goes into sleep mode, the LED lights up. It is always lit while the system is in sleep mode.

LED+ LED-

SLPLED
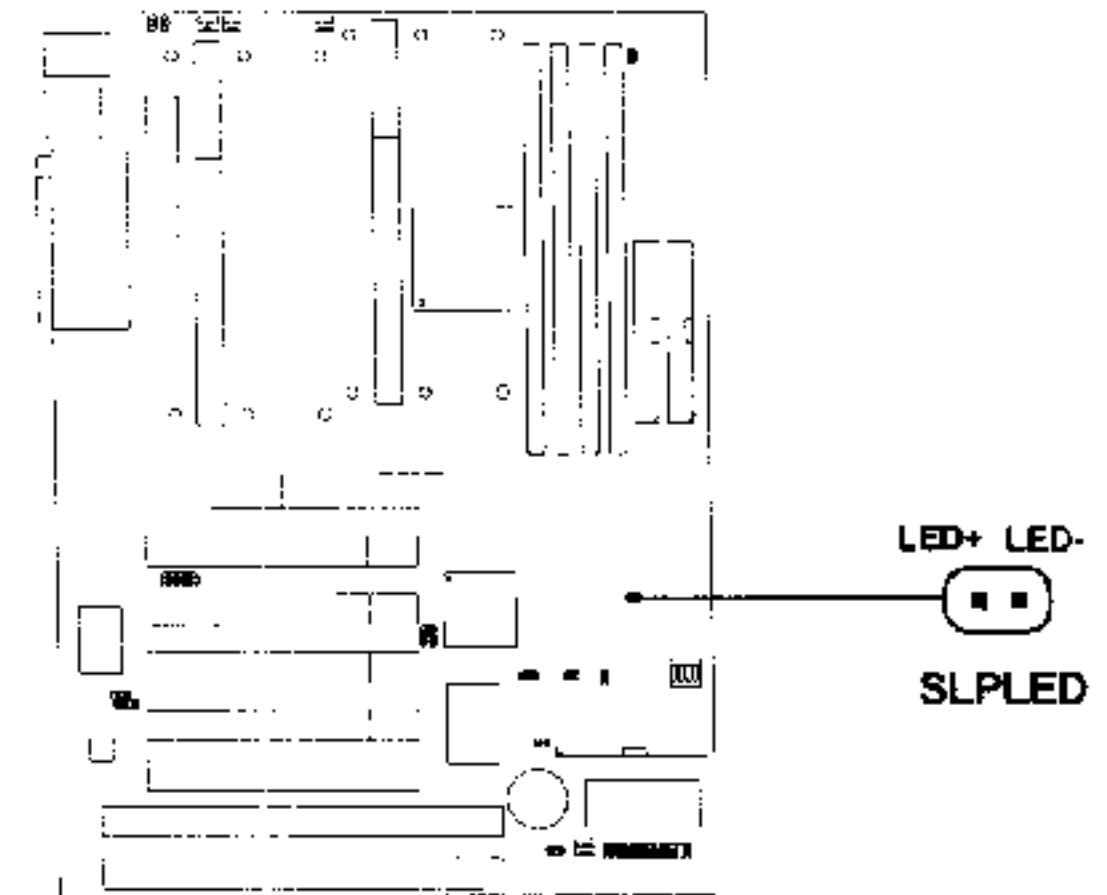
2.19 Modem Wake Up Connector: JMDM

The JMDM connector is for used with Modem add-on card that supports the Modem Wake Up function.

JMDM
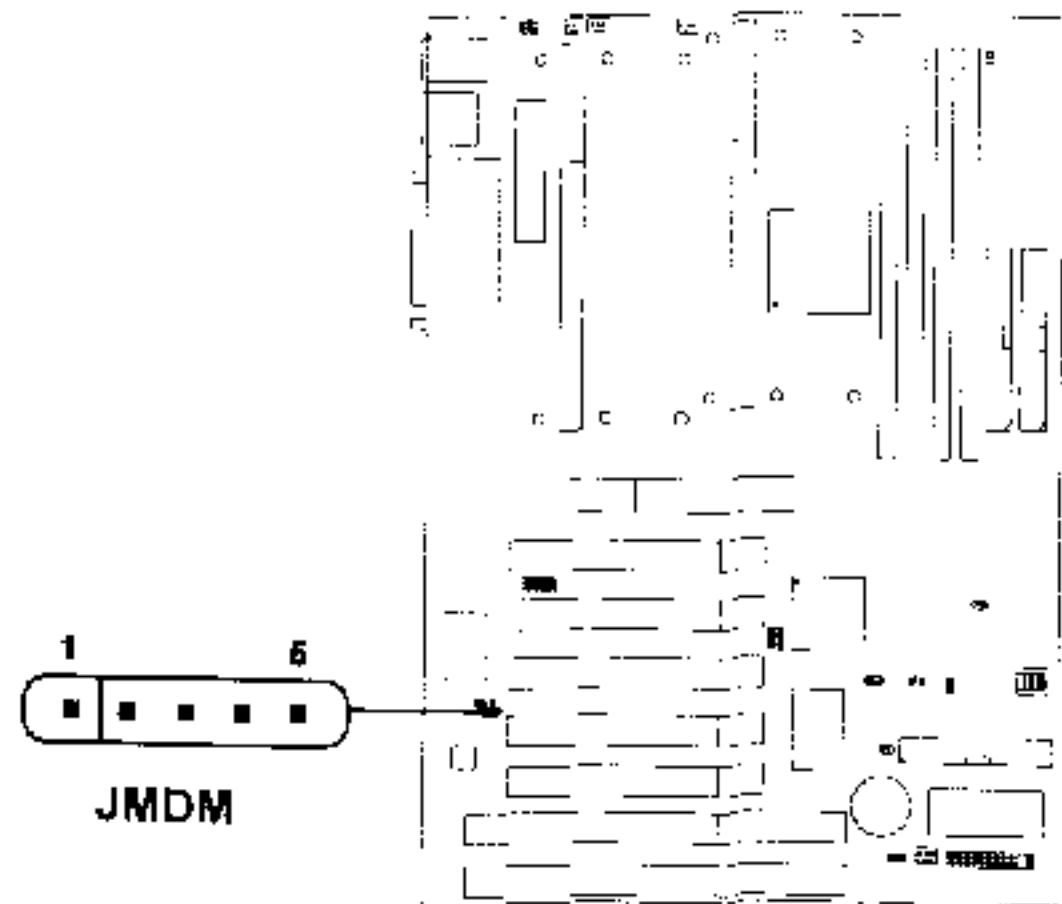
PIN	SIGNAL
1	NC
2	GND
3	MDM_WAKEUP
4	NC
5	5VSB

Note: Modem wake-up signal is active "low".

Note: To be able to use this function, you need a power supply that provide enough power for this feature.
(750 ma power supply with 5V Stand-by)

2.20 Wake-Up on LAN Connector: JWOL

The JWOL connector is for use with LAN add-on cards that supports Wake Up on LAN function.

JWOL

PIN	SIGNAL
1	5VSB
2	GND
3	MP_WAKEUP

Note: LAN wake-up signal is active "high".

Note: To be able to use this function, you need a power supply that provide enough power for this feature.
(750 ma power supply with 5V Stand-by)

2.21 Add-On Card Sound Connector: JSOUND

The mainboard provides a distributed DMA connector for PCI sound card with this feature, such as Creative® PCI 3D sound card.

JSOUND
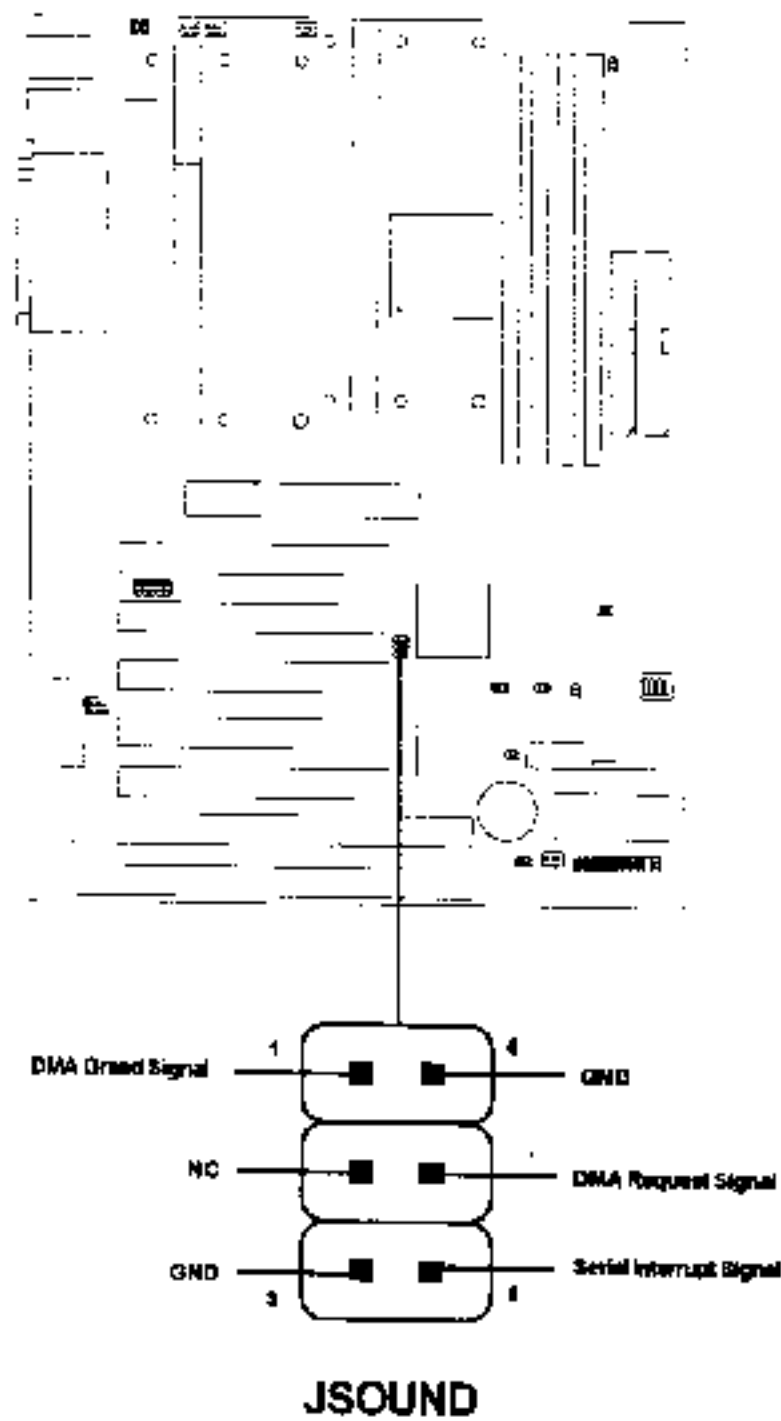
Chapter 3

AMI® BIOS USER GUIDE

The system configuration information and chipset register information is stored in the CMOS RAM. This information is retained by a battery when the power is off. Enter the BIOS setup (if needed) to modify this information.

The following pages will describe how to enter BIOS setup, and all about options.

3.1 Enter BIOS Setup

Enter the AMI® setup Program's Main Menu as follows:

1. Turn on or reboot the system. The following screen appears with a series of diagnostic check.

```
AMIBIOS (C) 1996 American Megatrends Inc.
AGIOMS VXXX XXXXXX

Hit <DEL> if you want to run setup








(C) American Megatrends Inc.
61-XXXX-001169-00111111-071592-i82440FX-H
```

2. When the "Hit <DEL>" message appears, press <DEL> key to enter the BIOS setup screen.

3. After pressing <DEL> key, the BIOS setup screen will appear.

```
AMIBIOS HIFLEX SETUP UTILITIES - VERSION 1.07
(C) 1996 American Megatrends, Inc. All Rights
                    Reserved

             Standard CMOS Setup
             Advanced CMOS Setup
             Advanced Chipset Setup
             Power Management Setup
             PCI/Plug and Play Setup
                Peripheral Setup
             Hardware Monitor Setup
             Auto-Detect Hard Disks
              Change User Password
          Change Supervisor Password
      Change Keyboard Wake-Up Password
            Change Language Setting
    Auto Configuration with Optimal Settings
    Auto Configuration with Fail Safe Settings
             Save Settings and Exit
              Exit without Saving


 Standard CMOS setup for changing time, hard disk type, etc.
```

4. Use the <Up> and <Down> key to move the highlight scroll up or down.

5. Use the <ENTER> key to select the option.

6. To exit, press <ESC>. To save and exit, press <F10>.

7. Section 3.2 to 3.8 will explain the option in more details.

3.2 Standard CMOS Setup

1. Press <ENTER> on "Standard CMOS Setup" of the main menu screen .

```
                AMIBIOS  SETUP  -  STANDARD  CMOS  SETUP
       (C)1996  American  Megatrends,Inc.All  Rights  Reserved

       Date  (mm/dd/yyyy):  Mon Jul 28, 1997
       Time  (hh/mm/ss):    17:09:25

       Floppy Drive A:              1.44 MB 3 1/2
       Floppy Drive B:              Not Installed

                                                    LBA    Blk    PIO    32Bit
                  Type  Size  Cyln  Head  WPcom Sec  Mode   Mode   Mode   Mode
       Pri Master :Auto                               ON     ON     AUTO   ON
       Pri Slave  :Auto                               ON     ON     AUTO   ON
       Sec Master :Auto                               ON     ON     AUTO   ON
       Sec Slave  :Auto                               ON     ON     AUTO   ON

       Boot Sector Virus Protection Disabled


       Month     : Jan-Dec                    ESC:Exit  :Sel
       Day       : 01-31                       PgUp/PgDn:Modify
       Year      : 1901-2099                   F2/F3:Color
```

2. Use <Up> and <Down> to choose the item and <PgUp> and <PgDn> keys to modify the highlighted item.

3. After you have finished with the Standard CMOS Setup, press <ESC> to go back to the main menu.

3.3 Advanced CMOS Setup

1. Press <ENTER> on "Advanced CMOS Setup" of the main menu

```
          AMIBIOS  SETUP  -  ADVANCED  CMOS  SETUP
      (C)  1996  American  Megatrends,  Inc.  All  Rights
                            Reserved

   Quick Boot                      Enabled      Available Options:
   1st Boot Device                 FLOPPY       Enabled
   2nd Boot Device                 IDE-0        Disabled
   3rd Boot Device                 CD-ROM
   Try Other Boot Devices          Yes
   Floppy Access Control           Read-Write
   Hard Disk Access Control        Read-Write
   S.M.A.R.T. for Hard Disks       Disabled
   BootUp Num-Lock                 On
   Floppy Drive Swap               Disabled
   Floppy Drive Seek               Disabled
   PS/2 Mouse Support              Enabled
   Password Check                  Setup
   Boot to OS/2 > 64MB             No
   Cache Bus ECC                   Disabled
   System BIOS Cacheable           Enabled
   C000, 16k Shadow                Enabled
   C400, 16k Shadow                Enabled
   C800, 16k Shadow                Disabled
   CC00, 16k Shadow                Disabled
   D000, 16k Shadow                Disabled
   D400, 16k Shadow                Disabled    ESC:Exit  :Sel
   D800, 16k Shadow                Disabled    PgUp/PgDn:Modify
   DC00, 16k Shadow                Disabled    F2/F3:Color
```

2. Use <Up> and <Down> to choose the item and <PgUp> and <PgDn> keys to modify the highlighted item.

3. After you have finished with the Advanced CMOS Setup, press <ESC> to go back to the main menu.

Description of the item on screen follows:

Quick Boot

Set this option to Enabled to permit AMI® BIOS to boot within 8 seconds. This option replaces the old ABOVE 1 MB Memory Test option. The Optimal default setting is Enabled. The Fail-Safe default setting is Disabled.

1st Boot Device/2nd Boot Device/3rd Boot Device

This option sets the sequence of boot drives.

The settings are:

IDE0	The system will boot from the first HDD.
IDE1	The system will boot from the Second HDD.
IDE2	The system will boot from the Third HDD.
IDE3	The system will boot from the Fourth HDD.
F(optical)	The system will boot from LS-120(120M Floppy).
SCSI	The system will boot from the SCSI.
Network	The system will boot from the Network drive.
CD-ROM	The system will boot from the CD-ROM.
Disable	Disable this sequence.

Try other Boot Devices

This option sets the boot device, if all the Four Boot Devices failed.

Floppy Access Control

This option sets the Floppy to Read-only or Read-Write.

HDD Access Control

This option sets the HDD to Read-only or Read-Write. During Read-only, if you try to write on the HDD, the system will halt.

S.M.A.R.T. for Hard Disks

This option sets the SMART Function for the Hard Disk. The Hard Disk has to have SMART function for this feature to take effect.

Boot up Num Lock

When this option is set to Off, AMI® BIOS turns off the Num Lock key when the system is powered on. The end user can then use the arrow keys on both the numeric keypad and the keyboard. The settings are On or Off. The optimal default and Fail-Safe default settings are On.

Floppy Drive Swap

Set this option to Enabled to specify that floppy drives A: and B: are swapped. The setting are Enabled and Disabled. The Optimal and Fail-Safe default settings are Disabled.

Floppy Drive Seek

When this option is set to Enabled, AMI® BIOS performs a Seek command on floppy drive A: before booting the system. The settings are Enabled and Disabled. The Optimal and Fail-Safe default settings are Disabled.

PS/2® Mouse Support

When this option is set to Enabled, AMI® BIOS supports a PS/2® mouse. The settings are Enabled and Disabled. The Optimal and Fail-Safe default settings are Enabled.

Password Check

This option specifies the type of AMI® BIOS password protection that is implemented. The Optimal and Fail-Safe default settings are Setup.

Boot to OS/2 > 64MB

Set this option to Enabled to permit the BIOS to run properly, if OS/2® is to be used with > 64MB of DRAM. The settings are Enabled or Disabled. The Optimal and Fail-safe default settings are Disabled.

Cache Bus ECC

The newer version of Pentium® II processor has a built-in cache ECC function. Choose Enabled, if your Pentium® II processor has a built-in cache ECC function. Pentium® II processor higher than 333MHz always has a built-in cache ECC function.

System BIOS Cacheable

AMI® BIOS always copies the system BIOS from ROM to RAM for faster execution. Set this option to Enabled to permit the contents of the F0000h RAM memory segment to be written to and read from cache memory. The settings are Enabled or Disabled. The Optimal default setting is Enabled.

C000, 16K Shadow/C400, 16k Shadow

These options specify how the contents of the video ROM are handled. The settings are:

Disabled - the Video ROM is not copied to RAM.

Cached -the contents of the video ROM from C0000h - C7FFFh are not only copied from ROM to RAM; it can also be written to or read from cache memory.

Shadow - the Contents of the video ROM from C0000h - C7FFFh are copied(shadowed) from ROM to RAM for faster execution.

The Optimal and Fail-Safe default setting is Cached.

C800, 16k Shadow/CC00, 16k Shadow/D000, 16K Shadow/ D400, 16k Shadow/D800, 16k Shadow/DC00, 16K Shadow

These options specify how the contents of the adaptor ROM named in the option title are handled. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards. The settings are;

Disabled - The specified ROM is not copied to RAM.

Cache - The contents of the ROM area are not only copied from ROM to RAM for faster execution, it can also be written to or read from cache memory.

Shadow - The contents of the ROM area are copied from ROM to RAM for faster execution.

The Optimal and Fail-Safe default settings are Disabled.

3.4 Advanced Chipset Setup

1. Press <ENTER> on "Advanced Chipset Setup" of the main menu screen.

```
           AMIBIOS  SETUP  -  ADVANCED  CHIPSET  SETUP
        (C)  1996  American  Megatrends,  Inc.  All  Rights
                             Reserved

Auto Configure EDO DRAM Timing   Enabled      Available Options:
EDO DRAM Speed (ns)              60           Enabled
   EDO Read Burst Timing         x222         Disabled
   EDO Write Burst Timing        x222
   EDO RAS Precharge Timing      3 clocks
   EDO RAS to CAS Delay          3 clocks
   MA wait State                 Fast
***** SDRAM Timing *****
   SDRAM RAS to CAS Delay        2 Clks
   SDRAM CAS Latency             3 Clks
   SDRAM RAS Precharge Time      2 Clks
DRAM Integrity Mode              Non ECC
VGA Frame Buffer USWC            Disabled
PCI Frame Buffer USWC            Disabled
Fixed Memory Hole               Disabled
CPU To PCI IDE Posting           Enabled
USWC Write I/O Post              Disabled
AGP Aperture Size                64 MB
USB Passive Release              Enabled
PIIX4 Passive Release            Enabled
PIIX4 Delayed Transaction        Enabled
USB Function                     Enabled
USB Keyboard Legacy Support      Disabled
                                              ESC:Exit :Sel
                                              PgUp/PgDn:Modify
                                              F2/F3:Color
```

2. Use <Up> and <Down> to choose the item and <PgUp> and <PgDn> keys to modify the highlighted item.

3. After you have finished with the Advanced Chipset Setup, press <ESC> to go back to the main menu.

Description of the item on screen follows:

Auto Configure EDO DRAM Timing

Choose Enabled(default) will automatically configure the DRAM timing depending on the "DRAM Speed" selection. Choose disable to customize setup.

EDO DRAM Speed (ns)

This option specifies the RAS access time (in nanoseconds) for the DRAM used in the computer. The settings are 50,60 or 70. The Optimal default setting is 60 and the Fail-Safe default setting is 70.

EDO DRAM Read Burst Timing

Choose DRAM read burst timing for the customize setup. B stand for BEDO DRAM, E stand for EDO DRAM and F stand for FAST PAGE DRAM.

EDO DRAM Write Burst Timing

Choose DRAM write burst timing for the customize setup.

EDO RAS Precharge Timing

This option defines the RAS# precharge requirements for the EDO memory type in 66MHz clocks.

EDO RAS to CAS Delay

This operation decide the delay in assertion of CAS#(SCAS#) from assertion of RAS#(SRAS#) in 66MHz.

MA Wait State

This option selects Fast or Slow MA bus timing. The Slow timing is equal to Fast+1, in term of clock number for EDO DRAM.

SDRAM RAS to CAS Delay

This operation decide the delay in assertion of CAS#(SCAS#) from assertion of RAS#(SRAS#) in 66MHz.

SDRAM CAS Latency

This option determines the CAS latency time parameter of SDRAM. The settings are 2 clks or 3 clks.

SDRAM RAS Precharge Time

This option defines the RAS# precharge requirements for the SDRAM memory type in 66MHz clocks.

DRAM Integrity Mode

During ECC, this will enable the DRAM ECC mechanism that allows detection of single-bit and multiple-bit errors and recovery of single-bit errors. During EC, the ECC logic will calculate 8-bit pattern written along with 64-bit data into the main memory. During Read operation, 8-bit ECC code is read along with 64-bit data and error checking is performed. No correction of data will take place in this operation mode. During Disabled. this will disable the ECC mechanism.

Note: If you choose ECC or EC modes, you must use a DIMM with ECC byte.

VGA Frame Buffer USWC

The Pentium® II processor supports the Uncacheable Speculatable Write-Combining (USWC) memory type. The processor provides a write-combining with buffering strategy for write operation. This is useful for frame buffering. Writing to USWC memory can be buffered and combined in the processors write-combining buffer (WCB). The WCBs are viewed as a special purpose outgoing write buffers, rather than a cache. The WCBs are written into memory to allocate a different address, or after executing a serializing, locked, or I/O instructions.

During Enabled, this will enable the processor memory location A000 and B000 segment as USWC memory type.

PCI Frame Buffer USWC

The Pentium® II processor supports the Uncacheable Speculatable Write-Combining (USWC) memory type. The processor provides a write-combining with buffering strategy for write operation. This is useful for frame buffering. Writing to USWC memory can be buffered and combined in the processors write-combining buffer (WCB). The WCBs are viewed as a special purpose outgoing write buffers, rather than a cache. The WCBs are written into memory to allocate a different address, or after executing a serializing, locked, or I/O instructions.

During Enabled, this will enable the processor memory location C000 and DFFF segment as USWC memory type.

DRAM Refresh Queue

Choose Enabled, the system will provide 4-deep refresh queue. All refresh request are queued, with the 4th refresh request being the priority request. All refresh requests are priority when the refresh queue is Disabled.

Fixed Memory Hole

This option allows the end user to specify the location of a memory hole. The cycle matching the selected memory hole will be passed to the ISA bus. If Enabled, the selected hole is not remapped.

CPU To PCI IDE Posting

Set this option to Enabled to enable posted messages from the CPU to the PCI bus or IDE controller. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Enabled.

USWC Write I/O Post

Set this option to Enabled to use USWC(Uncacheable, Speculatable, Write-Combined) memory. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Disabled.

AGP Aperture Size

This option determines the effective size of the graphics aperture used in the particular PAC configuration. The AGP aperture is memory-mapped, while graphics data structure can reside in a graphics aperture. The aperture range should be programmed as not cacheable in the processor cache, accesses with the aperture range are forwarded to the main memory, then PAC will translate the original issued address via a translation table that is maintained on the main memory. The option allows the selection of an aperture size of 4MB, 8MB, 16MB, 32MB, 64MB, 128MB, and 256MB.

USB Passive Release

During Enabled, this will allow the PIIX4® to use passive release(look at PIIX4® Passive Release) while transferring control information or data for USB transaction. During Disabled, PIIX4® will perform PCI accesses for USB without using passive release.

PIIX4® Passive Release

The PIIX4® ISA bridge support GAT (Guaranteed Access Time) mode, which will now violate the spirit of the PCI specification. The systems provides a programmable passive release mechanism to meet the required master latencies. During Enabled, ISA masters may see long delays in accessing PCI memory, including the main DRAM array. The ISA GAT mode is also not supported during enable. ISA masters must honor IOCHRDY.

PIIX4® Delayed Transaction

During Enabled, the PIIX4® delay transaction mechanism is enabled when the PIIX4® is the target of a PCI transaction. A read cycle from Host to PCI is immediately retrived due to any pending PCI to DRAM cycle. During Disabled, a read cycle from Host to PCI is waited until time-out due to any pending PCI to DRAM cycle.

USB Function

Set this option to Enabled or Disabled the on-chip USB controller.
The Optional and Fail-Safe default settings are Disabled.

USB Keyboard Legacy Support

Set this option to Enabled or Disabled USB keyboard/mouse.
The Optional and Fail-Safe default settings are Disabled.

3.5 Power Management Setup

1. Press <ENTER> on "Power Management Setup" of the main menu screen.

```
          AMIBIOS  SETUP  -  POWER  MANAGEMENT  SETUP
       (C)  1996  American  Megatrends,  Inc.  All  Rights
                              Reserved

Power Management / APM          Enabled      Available Options:
Green PC Monitor Power State     Off         Enabled
Video Power Down Mode            Disabled    Disabled
Hard Disk Power Down Mode        Disabled
Hard Disk Time Out (Minute)      Disabled
Standby Time Out                 Disabled
Suspend Time Out                 Disabled
Throttle Slow Clock Ratio        50-62.5%
Modem Use IO Port                N/A
Modem Use IRQ                    N/A
Display Activity                 Ignore
Device 6(Serial Port 1)          Monitor
Device 7(Serial Port 2)          Monitor
Device 8(Parallel Port)          Ignore
Device 5(Floppy Disk)            Monitor
Device 0(Primary master IDE)     Monitor
Device 1(Primary slave IDE)      Ignore
Device 2(Secondary master IDE)   Monitor
Device 3(Secondary slave IDE)    Ignore
System Thermal                   Ignore
Thermal Slow Clock Ratio         50-62.5%
CPU Critical Temperature         40°c/104°f   ESC:Exit :Sel
Power Button Function            ON/OFF       PgUp/PgDn:Modify
Ring Resume From Soft-Off        Disabled     F2/F3:Color
```

```
LAN Resume From Soft Off         Disabled
RTC Alarm Resume From Soft-Off   Disabled
RTC Alarm Date                   15
RTC Alarm Hour                   12
RTC Alarm Minute                 50
RTC Alarm Second                 30
```

2. Use <Up> and <Down> to choose the item and <PgUp> and <PgDn> keys to modify the highlighted item.

3. After you have finished with the Power Management Setup, press <ESC> to go back to the main menu.

Description of the item on screen follows:

Power Management/APM

Set this option to Enabled to enable the Intel® 82440LX ISA power management features and APM(Advanced Power Management). The settings are Enabled, Inst-On(instant-on) or Disabled. The Optimal and Fail-Safe default settings are Disabled.

Green PC Monitor Power State

This option specifies the power state that the green PC-compliant video monitor enters when AMI® BIOS places it in a power savings state after the specified period of display inactivity has expired. The settings are Off, Standby, Suspend or Disabled. The Optimal and Fail-Safe default settings are Standby.

Video Power Down Mode

This option specifies the power conserving state that the VESA VGA video subsystem enters after the specified period of display inactivity has expired. The settings are Disabled, Standby or Suspend. The Optimal and Fail-Safe default settings are Standby.

Hard Disk Power Down Mode

This option specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired. The settings are Disabled, Standby or Suspend. The Optimal and Fail-Safe default settings are Disabled.

Hard Disk Time Out (minute)

This option specifies the length of a period of system inactivity while in Full power on state. When this length of time expires, the computer enters Standby power state. The settings are Disabled, 1 min, 2 min, 3 min, 4 min, 5 min, 6 min, 7 min, 8 min, 9 min, 10 min, 11 min, 12 min, 13 min, 14 min or 15 min. The Optimal and Fail-Safe default settings are Disabled.

Standby Time Out

This option specifies the length of a period of system inactivity while in Full power on state. When this length of time expires, the computer enters Standby power state. The settings are Disabled, 1 min, 2 min, 3 min, 4 min, 5 min, 6 min, 7 min, 8 min, 9 min, 10 min, 11 min, 12 min, 13 min, 14 min or 15 min. The Optimal and Fail-Safe default settings are Disabled.

Suspend Time Out

This option specifies the length of a period of system inactivity while in Standby state. When this length of time expires, the computer enters Suspend power state. The settings are Disabled, 1 min, 2 min, 3 min, 4 min, 5 min, 6 min, 7 min, 8 min, 9 min, 10 min, 11 min, 12 min, 13 min, 14 min or 15 min. The Optimal and Fail-Safe default settings are Disabled.

Throttle Slow Clock Ratio

This option specifies the speed at which the system clock runs in power saving states. The settings are expressed as a ratio between the normal CPU clock speed and the CPU clock speed when the computer is in the power-conserving state.

Modem Use IO Port

This indicates which IO port will be used by the Modem(if there is a Modem).

Modem Use IRQ

This indicates which IRQ no. will be used by the Modem(if there is a Modem).

Display Activity/Device 6/Device 7/Device 8/Device 5/Device 0/Device 1/Device 1/Device 2/Device 3/System Thermal

When set to Monitor, these options enable event monitoring on the specified hardware interrupt request line. If set to Monitor and the computer is in a power saving state, AMI® BIOS watches for activity on the specified IRQ line. The computer enters the full on power state if any activity occurs.

AMI® BIOS reloads the Standby and Suspend timeout timers if activity occurs on the specified IRQ line.

Power Button Function

During Suspend, if you push the switch one time, the system goes into suspend mode and if you push it more than 4 seconds, the system will be turned off. During On/Off, the system will turn off once you push the switch.

Ring Resume from Soft-Off

During Disabled, the system will ignore any incoming call from the modem. During Enabled, the system will boot up if there's an incoming call from the modem.

Note: If you have change the setting, you must let the system boot up until it goes to the operating system. Then, power off the system. This function will work the next time you power on.

LAN Resume From Soft-Off

To use this function, you need a LAN add-on card which support power on functions. It should also support the wake-up on LAN jumper(JWOL).

RTC Alarm Resume From Soft-Off

This function is for setting the Date, Hour, Minute, and Second for your computer to boot up. During Disabled, you cannot use this function. During Enabled, Choose the Date, Hour, Minute, and Second:

RTC Alarm Date	Choose which day the system will boot up.
RTC Alarm Hour	Choose which hour the system will boot up.
RTC Alarm Minute	Choose which minute the system will boot up.
RTC Alarm Second	Choose which second the system will boot up.

Note: If you have change the setting, you must let the system boot up until it goes to the operating system. Then, power off the system. This function will work the next time you power on.

3.6 PCI/Plug and Play Setup

1. Press <ENTER> on "PCI/Plug and Play Setup" of the main menu screen.

```
        AMIBIOS  SETUP  -  PCI/PLUG  AND  PLAY  SETUP
     (C)  1996  American  Megatrends,  Inc.  All  Rights
                            Reserved

 Plug and Play Aware O/S            No        Available Options:
 Reset NVRAM                        No        Enabled
 PCI Latency Timer (PCI Clocks)     64        Disabled
 PCI VGA Palette Snoop              Disabled
 Allocate IRQ to PCI VGA            Yes
 PCI IDE Busmaster                  Disabled
 OffBoard PCI IDE Card              Auto
 OffBoard PCI IDE Primary IRQ       Disabled
 OffBoard PCI IDE Secondary IRQ     Disabled
 DMA Channel 0                      PnP
 DMA Channel 1                      PnP
 DMA Channel 3                      PnP
 DMA Channel 5                      PnP
 DMA Channel 6                      PnP
 DMA Channel 7                      PnP
 IRQ3                               PCI/PnP
 IRQ4                               PCI/PnP
 IRQ5                               PCI/PnP
 IRQ7                               PCI/PnP
 IRQ8                               PCI/PnP
 IRQ9                               PCI/PnP
 IRQ10                              PCI/PnP    ESC:Exit  :Sel
 IRQ11                              PCI/PnP    PgUp/PgDn:Modify
 IRQ12                              PCI/PnP    F2/F3:Color
```

```
 IRQ14                              PCI/PnP
 IRQ15                              PCI/PnP
 Reserved Memory Size               Disabled
 Reserved Memory Address            C8000
```

2. Use <Up> and <Down> to choose the item and <PgUp> and <PgDn> keys to modify the highlighted item.

3. After you have finished with the PCI/Plug and Play Setup, press <ESC> to go back to the main menu.

Description of the item on screen follows:

Plug and Play Aware O/S

Set this option to Yes if the operating system in this computer is aware of and follows the Plug and Play specification. Currently, only Windows 95® is PnP-aware. The settings are Yes or No. The Optimal and Fail-Safe default settings No.

Reset NVRAM

During Enabled, this option will reset the NVRAM on every boot.

PCI Latency Timer (PCI Clocks)

This option specifies the latency timings (in PCI clocks) for all PCI devices on the PCI bus. The settings are 32, 64, 96, 128, 160, 192, 224 or 248. The Optimal and Fail-Safe default settings are 64.

PCI VGA Palette Snoop

When this option is set to Enabled, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two VGA devices in the computer (one PCI and ISA) and the Bit settings are:

> **Disabled** - Data read and written by the CPU is only directed to the PCI VGA device's palette registers.
>
> **Enabled** - Data read and written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device palette registers, permitting the palette registers of both devices to be identical.

This option must be set to Enabled if an ISA adapter card requires VGA palette snooping. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Disabled.

Allocate IRQ to PCI VGA

Choose the IRQ to be assigned to the PCI VGA display adapter card. The Optimal and Fail-Safe default setting is No.

PCI IDE BusMaster

Set this option to Enabled to specify that the IDE controller on the PCI local bus includes a bus mastering capability. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Disabled.

Offboard PCI IDE Card

This option specifies if an offboard PCI IDE controller adapter card is installed in the computer. You must specify the PCI expansion slot on the mainboard where the offboard PCI IDE controller is installed. If an offboard PCI IDE controller is used, the onboard IDE controller is automatically disabled. The settings are Auto(AMI® BIOS automatically determines where the offboard PCI IDE controller adaper card is installed), Slot1, Slot2, Slot3 or Slot4. The Optimal and Fail-Safe settings are Auto.

If an offboard PCI IDE controller adapter card is installed in the computer, you must also set the Offboard PCI IDE Primary IRQ and Offboard PCI IDE Secondary IRQ options.

Offboard PCI IDE Primary IRQ/
Offboard PCI IDE Secondary IRQ

These options specify the PCI interrupt used by the Primary (or Secondary) IDE channel on the offboard PCI IDE controller. The settings are Disabled, Hardwired, INTA, INTB, INTC or INTD. The Optimal and Fail-Safe default settings are Disabled.

DMA Channel 0/1/3/5/6/7

These options specify the bus that the specified DMA channel is used. These options allow you to reserve DMAs for legacy ISA adapter cards.

These options determine if AMI® BIOS should remove a DMA from the available DMAs passed to devices that are configurable by the system BIOS. The available DMA pool is determined by reading the ESCD NVRAM. If more DMAs must be removed from the pool, the end user can use these options to reserve the DMA by assigning an ISA/EISA setting to it.

IRQ3/IRQ4/IRQ5/RQ7/IRQ9/IRQ10/IRQ11/IRQ14/IRQ15

These options specify the bus that the specified IRQ line is used on. These options allow you to reserve IRQs for legacy ISA adapter cards.

These options determine if AMI® BIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use these options to reserve the IRQ by assigning an ISA/EISA setting to it. Onboard I/O is configured by AMI® BIOS. All IRQs used by onboard I/O are configured as PCI/PnP. If all IRQs are set to ISA/EISA and IRQ14 and 15 are allocated to the onboard PCI IDE, IRQ9 will still be available for PCI and PnP devices, because at least one IRQ must be available for PCI and PnP devices. The settings are ISA/EISA or PCI/PnP. The Optimal and Fail-Safe default settings are IRQ3 through 7 are ISA/EISA. The Optimal and Fail-Safe default settings PCI/PnP.

Reserved Memory Size/Reserved Memory Address

Some ISA cards have ROM at 0C000h~0D000h segments, but in a non-standard format. So Plug & Play BIOS can't detect it. The end user needs to set it up manually. Setting these options under this condition, will inform the BIOS which location and how many location is occupied.

3.7 Peripheral Setup

1. Press <ENTER> on "Peripheral Setup" of the main menu screen.

```
        AMIBIOS  SETUP  -  PERIPHERAL  SETUP
   (C)  1996  American  Megatrends,  Inc.  All  Rights
                        Reserved

OnBoard  FDC                      Auto      Available Options:
OnBoard  Serial  PortA            Auto      Enabled
OnBoard  Serial  PortB            Auto      Disabled
IR  Port  Support                 Disabled
  IR  Mode  Select                SIR
  IR  Base  Address  Select       2E8
  IR  IRQ  Select                 1C
  IR  DMA  Select                 Disabled
OnBoard  Parallel  Port           Auto
  Parallel  Port  Mode            EPP
  EPP  Version                    N/A
  Parallel  Port  IRQ             7
  Parallel  Port  DMA  Channel    N/A
Onboard  IDE                      Both




                                            ESC:Exit  :Sel
                                            PgUp/PgDn:Modify
                                            F2/F3:Color

```

2. Use <up> and <down> to choose the item and <PgUp> and <PgDn> keys to modify the highlighted item.

3. After you have finished with the Peripheral Setup, press <ESC> to go back to the main menu.

Description of the item on screen follows:

Onboard FDC

Choose Auto, for the BIOS to automatically detect the device

If the ISA add-on card has	Onboard FDC to be set at
FDC exist	Disabled
none FDC exist	Enabled

Choose Enabled, Enabling onboard FDC.
Choose Disabled, Disabling onboard FDC.
The Optimal and Fail-Safe default settings are Auto.

Onboard Serial Port A/Onboard Serial Port B

Choose 3F8, for the BIOS to automatically detect the device.

If the ISA add-on card has				Onboard Serial port to be set at			
COM1 (I/O:3F8H)	COM2 (I/O:3F8H)	COM3 (I/O:3E8H)	COM4 (I/O:2E8H)	PORT1	IRQ ASSIGNED	PORT2	IRQ ASSIGNED
✓	✓	✓	✓	DISABLED	X	DISABLED	X
✓	✓	X	X	COM3	4	COM4	3
X	X	✓	✓	COM1	4	COM2	3
✓	X	X	✓	COM2	3	COM3	4
X	✓	✓	X	COM1	4	COM4	3
✓	✓	✓	X	COM4	3	DISABLED	X
✓	✓	X	✓	COM3	4	DISABLED	X
✓	X	✓	✓	COM2	3	DISABLED	X
X	✓	✓	✓	COM1	4	DISABLED	X
X	X	X	X	COM1	4	COM2	3
✓	X	X	X	COM2	3	COM3	4
X	✓	X	X	COM1	4	COM3	4
X	X	✓	X	COM1	4	COM2	3
X	X	X	✓	COM1	4	COM2	3

Note: If the onboard serial port interrupt and ISA add-on card interrupt are in conflict, the serial port will not work properly. Please disable one of the devices.

IR Port Support

Choose Auto, the BIOS will automatically assigned onboard port for IR.

IR Mode Select

This option is for selecting address mode for IR.

IR Base Address Select

This option will assigned which base address will be used by IR

IR IRQ Select

This option is for selecting the IRQ for the IR.

IR DMA Select

This option is for selecting the DMA for the IR.

Onboard Parallel Port

Choose Auto, the BIOS automatically assigned onboard parallel port to the available parallel port or disabled.

If the ISA add-on card has			Onboard parallel port to be set as	
LPT1 I/O:378H	LPT2 I/O:278H	LPT3 I/O:3BCH	PORT ASSIGNED	IRQ ASSIGNED
✓	✓	✓	Disabled	X
✓	✓	X	LPT3	5
✓	X	✓	LPT2	5
X	✓	✓	LPT1	7
✓	X	X	LPT2	5
X	✓	X	LPT1	7
X	X	✓	LPT1	7
X	X	X	LPT1	7

Note: If the onboard parallel port interrupt and ISA add-on card interrupt are in conflict, the parallel port will not work properly. Please disable one of the devices.

EPP Version

This option is for setting which EPP version will be used. The settings are 1.7 and 1.9.

Parallel Port Mode

This option allows user to choose the operating mode of the onbaord parallel port. The settings are Normal, SPP/EPP or ECP mode.

Parallel Port IRQ

If the onboard parallel mode is not on auto mode, the user can select the interrupt line for onboard parallel port. We suggest that the user select the interrupt for the onboard parallel port as shown below:

Onboard parallel port set at	Parallel Port IRQ
LPT1(378H)	7
LPT2(278H)	5
LPT3(3BCH)	5

Parallel Port DMA Channel

This option allows user to choose DMA channel 1 to 3 for the onboard parallel port on ECP mode.

Keyboard to wake-up System

During Any Key, if there is any activity on the keyboard, the system will change from OFF to ON. During Specific Key, you need to set the "Change Keyboard Wake-up Password" on the BIOS setup. Then, if you punch in the password, the system will change its status from OFF to ON. During Disabled, this function will not work.

PS/2 mouse to wake-up System

During Enabled, if there is any activity on the mouse, the system will change from suspend to ON. During Disabled, this function will not work. (This is reseved for future "New Super I/O - W83977TF)

Onboard IDE

Set this option to enable or disable on board IDE controller.

3.8 Hardware Monitor Setup

The Hardware Monitor Setup is used to monitor the Current CPU temperature, CPU Fan speed, Chassis Fan Speed, Power fan speed, Vcore, and etc.

```
         AMIBIOS  SETUP  -  HARDWARE  MONITOR  SETUP
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                          Reserved

-=System Hardware Monitor=-                    Available Options:
   Current CPU Temperature      30°c/100°f     Enabled
   Current CPU Fan Speed        5273RPM        Disabled
   Current Chassis Fan Speed    0 RPM
   Current Power Fan Speed      0 RPM
   Vcore                        0.512V
   Vtt                          0.016V
   Vio                          0.032V
   +5,000V                      0.000V
   +12,000V                     0.243V
   -12,000V                     -0.222V
   -5.000V                      -0.144V






                                               ESC:Exit  :Sel
                                               PgUp/PgDn:Modify
                                               F2/F3:Color
```