SUPER●

SUPER P6DLH
SUPER P6DLF

USER'S MANUAL

Revision 1.1

Preface

About This Manual

This manual is written for system houses, PC technicians and knowledgeable PC end users. It provides information for the installation and use of SUPER P6DLH/P6DLF motherboard. SUPER P6DLH/P6DLF supports Pentium II 233/266/300/333 MHz.

The Pentium II processor with the Dual Independent Bus Architecture is housed in a new package technology called the Single Edge Contact (S.E.C.) cartridge. This new cartridge package and its associated "Slot 1" infrastructure will provide the headroom for future high-performance processors.

Manual Organization

Chapter 1, Introduction, describes the features, specifications and performance of the SUPER P6DLH/P6DLF system board, provides detailed information about the chipset, and offers warranty information.

Refer to Chapter 2, Installation, for instructions on how to install the Pentium II processor, the retention mechanism, and the heat sink support. This chapter provides you with the instructions for handling static-sensitive devices. Read this chapter when you want to install or remove SIMM/DIMM memory modules and to mount the system board in the chassis. Also refer to this chapter to connect the floppy and hard disk drives, IDE interfaces, parallel port, serial ports, as well as the cables for the power supply, reset cable, Keylock/Power LED, speaker and keyboard.

If you encounter any problem, please see Chapter 3, Troubleshooting, which describes troubleshooting procedures for video, memory, and the setup configuration stored in memory. Instructions are also included on contacting a technical assistance support representative and returning merchandise for service and the BBS# for BIOS upgrades.

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Quick Reference

Chapter 1
Introduction

1-1 Overview

SUPER P6DLH and P6DLF support dual Pentium® II 233/266/300/333 MHz processors. They are based on Intel's 440 LX chipset which enables Accelerated Graphics Port (AGP), Wake-on-LAN™, SDRAM, concurrent PCI, and Ultra DMA 33 MB/s burst data transfer rate. SUPER P6DLH is I_2O-ready™ with a 66 MHz i960® RD I/O processor built-in. AGP is disabled on SUPER P6DLH.

Both motherboards are Full AT size (13.2" x 12.2"). SUPER P6DLF provides 5 PCI slots, 3 ISA slots and an Accelerated Graphics Port. It accommodates a total of 1 GB EDO or 512 MB SDRAM memory with 8 72-pin SIMMs or 4 168-pin DIMM sockets.

SUPER P6DLH provides 9 PCI slots and 3 ISA slots. It accommodates a total of 1 GB EDO or 512 MB SDRAM. The I_2O architecture of SUPER P6DLH consists of a 66 MHz i960 RD I/O processor, an 8 Mb Flash I/O BIOS, and local IOP memory of up to 64 MB. The I_2O architecture provides a standard way to off-load the I/O functions from the CPU, creating a direct I/O pipeline that no longer passes through the host processor. Besides delivering increased system performance, the I_2O specification eliminates the need for different drivers for each combination of operating system and SCSI or Network Interface Card. Because the drivers may be standardized, and not re-written for new operating system releases, drivers can become more highly optimized and robust, improving performance and reliability in mission-critical enterprise computing.

To attain portability across multiple operating systems and host platforms, I_2O drivers are divided into the OS Services Module (OSM), and Hardware Device Module (HDM). The first module interfaces with the host operating system. The second interfaces with the particular device, media or server managed by the driver. The

two modules interface with each other through a two-layered communications system. A Message Layer sets up a communications session. A Transport Layer defines how information will be shared. The Message Layer resides on the Transport Layer.

The i960 RD I/O processor (IU20) is a highly integrated intelligent I/O subsystem on a chip. Mode 3 is the default setting for its normal operation. The i960 RD has two main functions. As a local processor, it offloads interrupt-intensive I/O tasks from the host CPU. Its architecture is composed of a RISC core surrounded by peripherals essential to the I/O function. The on-board PCI-to-PCI bridge enables designers to connect I/O components directly to the PCI bus and also add additional PCI slots. The bridge improves overall system performance by reducing bus traffic.

AGP reduces contention with the CPU and I/O devices by broadening the bandwidth of graphics to memory. It delivers a maximum of 532 MB/s 2x transfer mode which is quadruple the PCI speed!

Wake on LAN allows remote network management and configuration of the PC, even in off-hours when the PC is turned off. This reduces the complexity of managing the network.

Other features that maximize simplicity in managing the computer are PC 98-ready and support for Advanced Configuration and Power Interface (ACPI). With PC Health Monitoring, you can protect your system from problems before they even occur.

Included I/O are 2 EIDE ports, a floppy port, an ECP/EPP parallel port, a PS/2 mouse port, 2 serial ports, an infrared port and 2 USB ports. The boards come with a CD with software utilities such as: SUPERMICRO PIIX4 Upgrade Utility for Windows® 95, BIOS Flash Upgrade Utility, DMI Browser for Windows 95, DMI Wizard, SUPERMICRO SUPER Doctor Utility ver 1.20b, and Intel® LANDesk® Client Manager for Windows NT® and Windows 95 (optional).

SUPER P6DLH

Figure 1-1. SUPER P6DLH Motherboard Picture

SUPER P6DLF

Figure 1-2. SUPER P6DLF Motherboard Picture
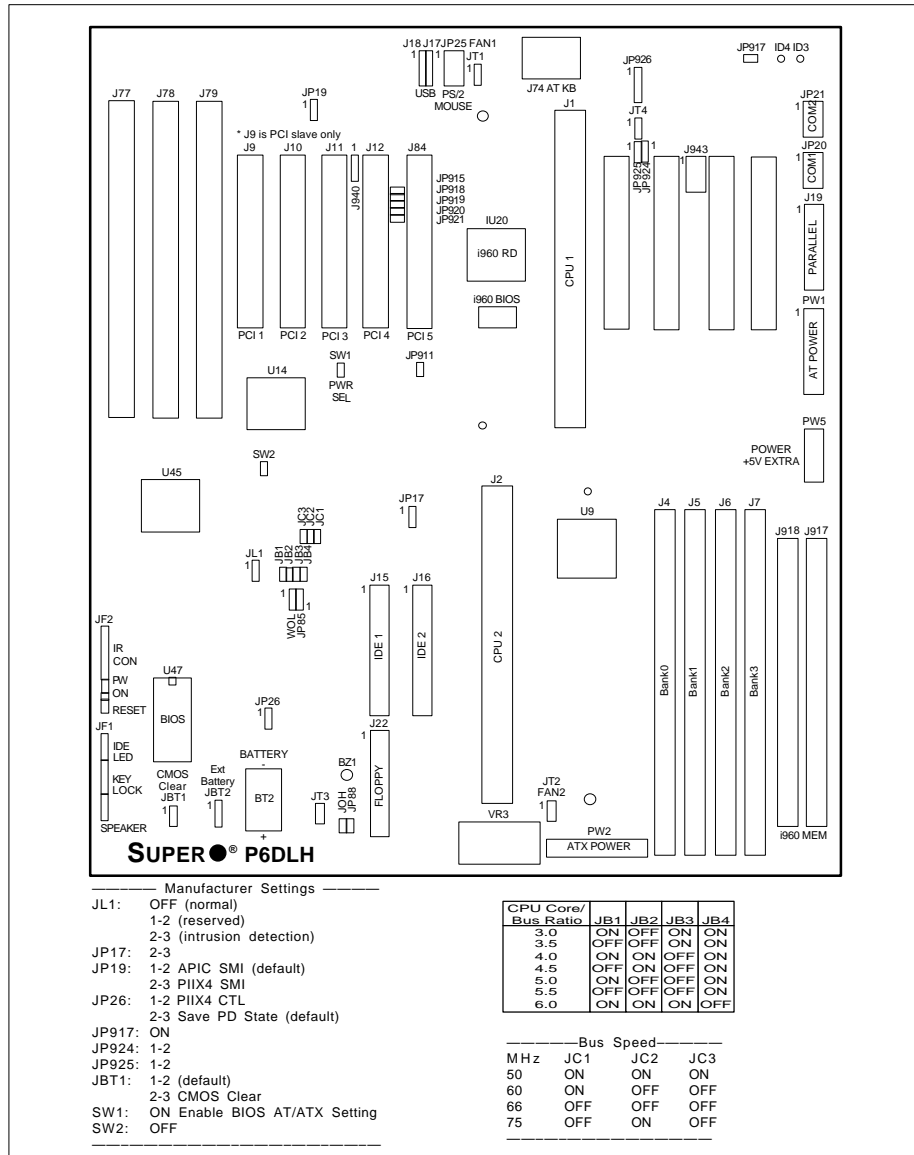
Figure 1-3. P6DLH Motherboard Layout

The diagram contains the following labels:

J18 J17 JP25 FAN1 — JT1 — USB PS/2 MOUSE — J74 AT KB — JP926 — JP917 ID4 ID3 — JP21 COM2 — JP20 COM1

J77 J78 J79 — JP19 — J1 — JT4 — JP925 JP924 — J943 — J19 PARALLEL

* J9 is PCI slave only

J9 J10 J11 J12 J84 — JP915 JP918 JP919 JP920 JP921 — IU20 i960 RD — CPU 1 — PW1 AT POWER

J940 — i960 BIOS

PCI 1 PCI 2 PCI 3 PCI 4 PCI 5 — JP911 — PW5 POWER +5V EXTRA

SW1 PWR SEL — U14

SW2 — JP17 — J2 — U9 — J4 J5 J6 J7 — J918 J917

U45 — JC3 JC2 JC1 — JL1 JB1 JB2 JB3 JB4 — WOL JP85 — J15 J16 — Bank0 Bank1 Bank2 Bank3

JF2 IR CON — U47 BIOS — JP26 — IDE 1 IDE 2 — CPU 2

PW ON RESET

JF1 IDE LED — CMOS Clear JBT1 — Ext Battery JBT2 — BATTERY — BZ1 — J22 FLOPPY — JT2 FAN2

KEY LOCK — BT2 — JT3 JOH JP88 — VR3 — PW2 ATX POWER — i960 MEM

SPEAKER

SUPER● ® P6DLH

————— Manufacturer Settings —————
JL1:   OFF (normal)
        1-2 (reserved)
        2-3 (intrusion detection)
JP17:   2-3
JP19:   1-2 APIC SMI (default)
        2-3 PIIX4 SMI
JP26:   1-2 PIIX4 CTL
        2-3 Save PD State (default)
JP917: ON
JP924: 1-2
JP925: 1-2
JBT1:   1-2 (default)
        2-3 CMOS Clear
SW1:   ON Enable BIOS AT/ATX Setting
SW2:   OFF

CPU Core/ Bus Ratio	JB1	JB2	JB3	JB4
3.0	ON	OFF	ON	ON
3.5	OFF	OFF	ON	ON
4.0	ON	ON	OFF	ON
4.5	OFF	ON	OFF	ON
5.0	ON	OFF	OFF	ON
5.5	OFF	OFF	OFF	ON
6.0	ON	ON	ON	OFF

—————Bus Speed—————

MHz	JC1	JC2	JC3
50	ON	ON	ON
60	ON	OFF	OFF
66	OFF	OFF	OFF
75	OFF	ON	OFF

Figure 1-4. SUPER P6DLF Motherboard Layout

————— Manufacturer Settings —————
JL1:   OFF (normal)
        1-2 (reserved)
        2-3 (intrusion detection)
JP17:   2-3
JP19:   1-2 APIC SMI (default)
        2-3 PIIX4 SMI
JP26:   1-2 PIIX4 CTL
        2-3 Save PD State (default)
JBT1:   1-2 (default)
        2-3 CMOS Clear
        To clear the CMOS completely,
        disconnect the power source.
JP85:   Wake-on-LAN
SW1:   ON Enable BIOS AT/ATX Setting

CPU Core/Bus Ratio	JB1	JB2	JB3	JB4
3.0	ON	OFF	ON	ON
3.5	OFF	OFF	ON	ON
4.0	ON	ON	OFF	ON
4.5	OFF	ON	OFF	ON
5.0	ON	OFF	OFF	ON
5.5	OFF	OFF	OFF	ON
6.0	ON	ON	ON	OFF

—————Bus Speed—————

MHz	JC1	JC2	JC3
50	ON	ON	ON
60	ON	OFF	OFF
66	OFF	OFF	OFF
75	OFF	ON	OFF

SUPER P6DLH Features

The following list covers the general features of SUPER P6DLH:

CPU
- Dual Pentium II processor 233/266/300/333 MHz

I$_2$O-Ready
- 66 MHz i960 RD IO processor
- up to 64 MB Local IOP memory
- 8 Mb Flash I/O BIOS

Memory
- 1 GB EDO or 512 MB SDRAM
- Error Checking and Correction and Parity Checking support

Chipset
- Intel 440LX

Expansion Slots
- 9 PCI slots
- 3 ISA slots

BIOS
- 2 Mbit AMI® Flash BIOS
- DMI 2.0, Plug and Play (PnP)

PC Health Monitoring (LM78)
- Seven on-board voltage monitors for CPU cores, CPU I/O, +3.3V, ±5V, and ±12V
- Three-fan status monitors with firmware/software control on/off
- Chassis temperature monitor and control
- CPU fan auto-off in sleep mode
- System overheat control and alarm
- Chassis intrusion detection
- System resource alert
- Hardware BIOS virus protection
- Switching voltage regulators for the CPU core
- SUPERMICRO SUPER Doctor and Intel LANDesk Client Manager (LDCM) support

ACPI/PC 98 Features
- Microsoft® OnNow
- Slow blinking LED for sleep-state indicator
- BIOS support for USB keyboard
- Real time clock wake-up alarm (ATX power only)
- Main switch override mechanism
- External modem ring-on if system is in SoftOff state

On-Board I/O
- 2 EIDE Bus Master interfaces support Ultra DMA/33 and Mode 4
- 1 floppy interface
- 2 Fast UART 16550 serial ports
- EPP (Enhanced Parallel Port) and ECP (Extended Capabilities Port) parallel port
- PS/2 mouse port
- Infrared port
- 2 USB ports

Dimensions
- Full AT size (13.2" x 12.2")

SUPER P6DLF Features

The following list covers the general features of SUPER P6DLF:

CPU
• Dual Pentium II processor 233/266/300/333 MHz

Memory
• 1 GB EDO or 512 MB SDRAM
• Error Checking and Correction and Parity Checking support

Chipset
• Intel 440LX

Expansion Slots
• 5 PCI slots
• 3 ISA slots
• 1 AGP slot

BIOS
• 2 Mbit AMI Flash BIOS
• DMI 2.0, Plug and Play (PnP)

PC Health Monitoring (LM78)
• Seven on-board voltage monitors for CPU cores, CPU I/O, +3.3V, ±5V, and ±12V
• Three-fan status monitors with firmware/software control on/off
• Chassis temperature monitor and control
• CPU fan auto-off in sleep mode
• System overheat control and alarm
• Chassis intrusion detection
• System resource alert
• Hardware BIOS virus protection
• Switching voltage regulators for the CPU core
• SUPERMICRO SUPER Doctor and Intel LANDesk Client Manager (LDCM) support

ACPI/PC 98 Features

- Microsoft OnNow
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On-Board I/O

- 2 EIDE Bus Master interfaces support Ultra DMA/33 and Mode 4
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- PS/2 mouse port
- Infrared port
- 2 USB ports

Dimensions

- Full AT size (13.2" x 12.2")

1-2   PC Health Monitoring

This section describes the PC health monitoring features of SUPER
P6DLH/P6DLF.   They have an on-board LM78 System Hardware
Monitor chip which supports PC health monitoring.

Seven On-Board Voltage Monitors for the CPU Cores, CPU I/O, +3.3V, ±5V, and ±12V

The on-board voltage monitors will scan the seven monitored volt-
ages every second.   Once a voltage becomes unstable, it will report
a warning or an error message on the screen.   Users can adjust
the threshold of the monitored voltage to determine the sensitivity of
the voltage monitor.

Three-Fan Status Monitors with Firmware/Software Control On/Off

The PC health monitor can check the RPM status of the cooling
fans.   The on-board 3-pin CPU fans are controlled by the ACPI BIOS
and the ACPI enabled operating system.   The thermal fan is con-
trolled by the overheat detection logic.

Chassis Temperature Control

The thermal control sensor will monitor the real-time chassis tem-
perature.   It will turn on the back-up fan whenever the chassis tem-
perature goes over the user-defined threshold.   The overheat cir-
cuitry runs independently from the CPU.   It can still monitor the
overheat condition even if the CPU is in sleep mode.   Once it de-
tects that the chassis temperature is too high, it will automatically
turn on the back-up fan, trigger the overheat LED (JOH) and the
overheat buzzer (BZ1).   The on-board chassis thermal circuitry can
monitor the overall system temperature and alert users when the
chassis temperature gets too high.

CPU Fan Auto-Off in Sleep Mode

The CPU fan will turn on when the power is on. It can be turned off when the CPU is in sleep mode. When the CPU is in sleep mode, it means that it will not run at full power, thereby generating less heat. For power saving purposes, the user can have the option to shut down the CPU fan.

System Overheat Alarm and LED

This feature is available when used with SUPERMICRO's SUPER Doctor Utility. The program will generate a beep sound via the speaker when it detects system overheat condition. The overheat condition can be configured by the user. The program can also give an indication on the screen when the system overheats.

Chassis Intrusion Detection

The chassis intrusion circuitry can detect unauthorized intrusion to the system. The chassis intrusion connector is located on JL1. Attach a micro-switch to JL1. When the micro-switch is close, it means that the chassis has been opened. The circuitry will then alert the user with a warning message when the system is turned on. The circuitry uses the on-board battery to power up. Even if the whole system is powered off, the detection can still work properly.

System Resource Alert

This feature is available when used with Intel LANDesk Client Manager. The user can be notified of certain system events. For example, if the system is running low on virtual memory, the hard drive space is not enough to save the data. LDCM will then send an alert of the potential problems.

Hardware BIOS Virus Protection

The system BIOS is protected by hardware so that no virus can infect the BIOS area. The user can only change the BIOS content through the flash utility provided by SUPERMICRO. This feature can prevent viruses from infecting the BIOS area and from losing your valuable data.

Switching Voltage Regulator for the CPU Core

The switching voltage regulator for the CPU core can support up to 20A current, with auto-sensing voltage ID ranging from 1.3V to 3.5V. This will allow the regulator to run cooler and to make the system more stable.

Intel LANDesk Client Manager (LDCM) Support

As the computer industry grows, PC systems have become more complex and harder to manage. Historically, only experts have been able to fully understand and control these complex systems. Today's users want manageable systems that interact automatically with the user. Client Manager enables both administrators and clients to:

• Review system inventory

• View DMI-compliant component information

• Back-up and restore system configuration files

• Troubleshoot

• Receive notification for system events

• Transfer files to and from client workstations

• Remotely reboot client workstations

1-3   ACPI/PC 98 Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives, and printers. This also includes consumer devices connected to the PC such as VCRs, TVs, phones, and stereos.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with both Windows 95 and Windows NT.

Microsoft OnNow

The OnNow design initiative is a comprehensive, system-wide approach to system and device power control. OnNow is a term for a PC that is always on but appears off and responds immediately to user or other requests.

Slow Blinking LED for Sleep-state Indicator

When the CPU goes into a sleep state, the power LED will start blinking to indicate that the CPU is in sleep mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

BIOS Support for USB Keyboard

If the USB keyboard is the only keyboard in the system, the USB
keyboard will work like a normal keyboard during system boot-up.

Real Time Clock Wake-up Alarm (ATX power only)

The PC is perceived to be off when not in use, but is still capable of
responding to wake-up events due to a scheduled date and time of
the month. The user can set up a timer to wake-up or shutdown the
system at some predetermined time.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function
as a system suspend button. When the user press on the power
button, the system will enter a SoftOff state. The monitor will be
suspended, and the hard drive will spin down. Pressing the power
button again will cause the whole system to wake-up. During the
SoftOff state, the ATX power supply provides power to keep the re-
quired circuitry on the system alive. In case the system malfunc-
tions and you want to turn off the power, just press down on the
power button for approximately 4 seconds. The power will turn off
and no power is provided to the motherboard.

External Modem Ring-on if System is in SoftOff State

Wake-up events can be triggered by a device such as the external
modem ringing when the system is in SoftOff state.

1-4   Chipset Overview

The 440LX chipset is developed by Intel as the ultimate Pentium II
processor platform targeted for emerging 3D graphics and multi-
media applications. Along with System-to-PCI bridge integrated
with optimized DRAM controller and data path, the chipset intro-

duces the Accelerated Graphics Port (AGP) interface. AGP is a high performance, component level interconnect targeted at 3D applications and is based on a set of performance enhancements to PCI. The I/O subsystem portion of the 440LX platform is based on the PIIX4, a highly integrated version of Intel's PCI-to-ISA bridge family.

The 440LX PCI/AGP Controller (PAC) system bus interface supports up to two Pentium II processors. It provides an optimized 72-bit DRAM interface (64-bit data plus ECC). This interface supports 3.3V DRAM technologies. The PAC provides the interface to a PCI bus operating at 33 MHz. This interface implementation is compliant with the PCI Rev 2.1 Specification. The AGP interface is based on the AGP Specification Rev 1.0. It can support up to 133 MHz (532 MB/s) data transfer rates.

1-5   Wake-On-LAN (WOL)

Wake on LAN is defined as the ability of a management application to remotely power up a computer which is powered off. Remote PC setup, updates, and asset tracking can occur after hours and on weekends so daily LAN traffic is kept to a minimum and users are not interrupted.

The motherboard has a 3-pin header (WOL) used to connect to the 3-pin header on the Network Interface Card (NIC) which has WOL capability.

1-6   Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for high CPU clock rates like 300, 266, 233 MHz Pentium II processors.

SUPER P6DLH/P6DLF accommodates AT and ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some power supplies are not adequate. To

obtain the highest system reliability, be certain that your AT power supply provides +5 VDC with a voltage range between +4.95 VDC (minimum) and +5.25 VDC (maximum).

It is highly recommended that you use a high quality power supply. Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to separate noise from the computer. You can also install a power surge protector to help avoid problems caused by power surges.

1-7 National Semiconductor Super I/O Controller

The National Semiconductor 87307 Super I/O Controller incorporates an IDE control logic, two full function serial ports, an IEEE 1284 parallel port, industry standard floppy disk controller with 16 byte FIFO, Real Time Clock and an 8042 compatible keyboard controller all in one chip.

The IDE interfaces provide up to Mode 4 support. The two serial ports are software compatible with the Fast UART 16550. The parallel port is EPP (Enhanced Parallel Port) and ECP (Extended Capabilities Port) compatible, including level 2 support. It includes a protection circuit against damage caused when the printer is powered up. EPP mode provides for greater throughput than Compatible or Extended modes by supporting faster transfer rates and a mechanism that allows the host to address peripheral device registers directly. Faster transfers are achieved by automatically generating the address and data strobes. EPP is compatible with both Compatible and Extended mode parallel-port devices.

1-8   Warranty, Technical Support, and Service

The manufacturer will repair or exchange any unit or parts free of charge due to manufacturing defects for one year (12 months) from the original invoice date of purchase.

Parts

Defective parts will be exchanged or repaired within one year (12 months) from the manufacturer's original invoice purchase date.

BIOS

The manufacturer will exchange the BIOS (shipping and handling excluded) due to existing incompatibility issues within one year from the manufacturer's original invoice purchase date.

Labor

Mail-in or carry-in service is available for one year (12 months) from the manufacturer's original invoice purchase date.

Returns

If you must return products for any reason, refer to Chapter 3 in this manual, "Returning Merchandise for Service."

Chapter 2
Installation

2-1   Pentium II Processor Installation

1. Check the Intel boxed processor kit for the following items: the processor with the fan heatsink attached, two black plastic pegs, two black plastic supports, and one power cable.

2. Install the retention mechanism attach mount under the motherboard. Do this before mounting the motherboard into the chassis. Do not screw too tight. Mount the two black plastic pegs onto the motherboard (Figure 2.1). These pegs will be used to attach the fan heatsink supports. Notice that one hole and the base of one peg are larger than the other hole and peg base. Push each peg into its hole firmly until you hear it "click" into place.

Figure 2-1. Mounting the Pegs

Retention
Mechanism

Large peg and hole
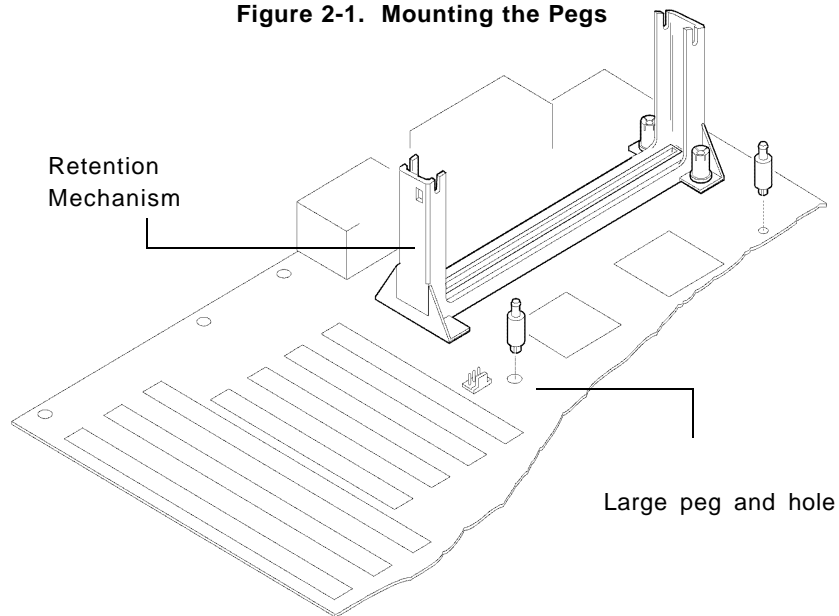
3. Slide a black plastic support onto each end of the fan heatsink, making sure that the hole and clip are on the outside edge of the support. If the supports are reversed, the holes will not line up with the pegs on the motherboard. Slide each support toward the center of the processor until the support is seated in the outside groove in the fan housing.

Figure 2-2. Support for Fan Heatsink

Top of processor

Groove in fan housing

Hole and clip on outside edge
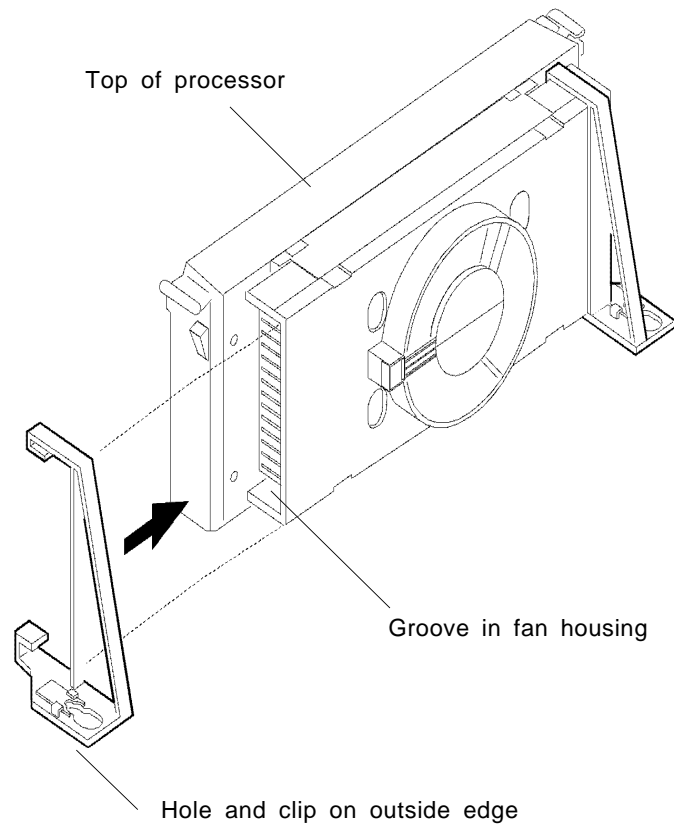
4. Slid the clip (A) on each support toward the processor, exposing the hole that will fit over the peg on the motherboard. Push the latches (B) on the processor toward the center of the processor until they click into place.

5. Hold the processor so that the fan shroud is facing toward the pegs on the motherboard. Slide the processor (C) into the retention mechanism and slide the supports onto the pegs. Ensure that the pegs on the motherboard slide into the holes in the heatsink support and that the alignment notch in the SEC cartridge fits over the plug in Slot 1. Push the processor down firmly, with even pressure on both sides of the top, until it is seated.

Figure 2-3. Retention Mechanism

B

C

A

Do not screw too tight!
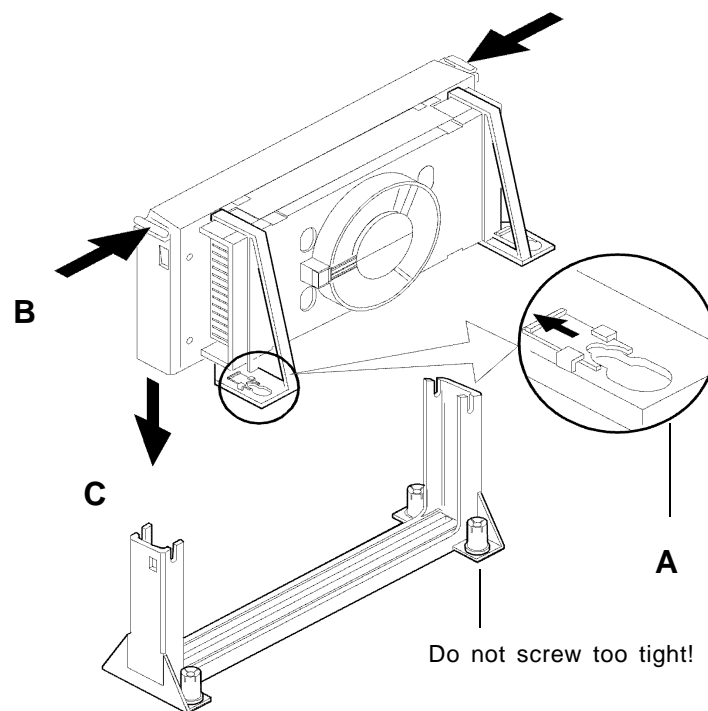
6. Slide the clips on the supports (A) forward until they click into place to hold the pegs securely. Apply slight pressure on the peg and push the peg toward the clip while pushing the clip forward. Push the latches on the processor (B) outward until they click into place in the retention mechanism. The latches must be secured for proper electrical connection of the processor.

7. Attach the small end of the power cable (C) to the three-pin connector on the processor, then attach the large end to the three-pin connector on the motherboard.

Figure 2-4. Attaching the Power Cable
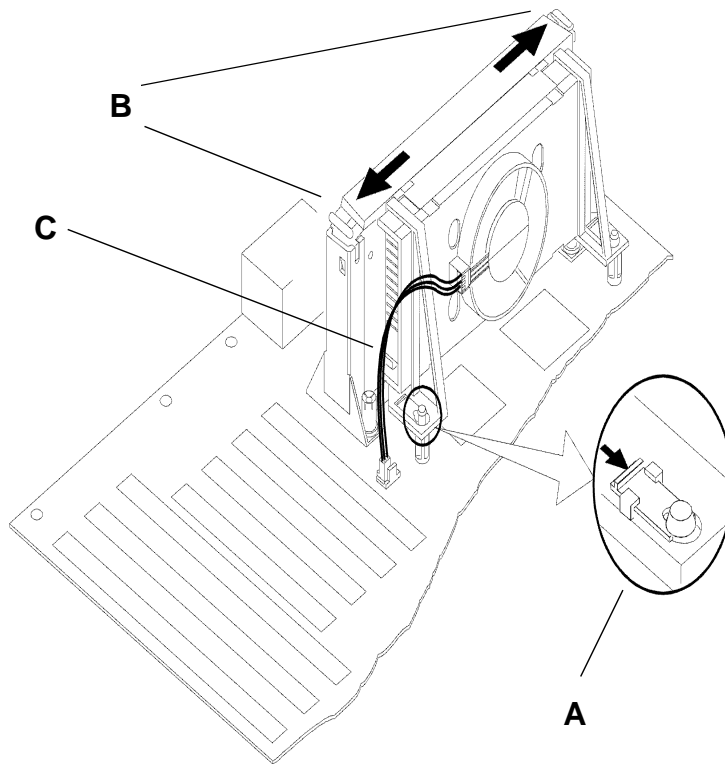
OEM Pentium II and Heat Sink Support

The heat sink support shown on Figure 2-5 consists of a top bar, a base bar, four posts on the top bar and two posts on the base bar. The two posts on the base snaps into the motherboard.   Install the two pins into the base bar.   Insert the Pentium II with the heat sink on it into Slot 1.   Install the top support bar.   The four top posts should be close to Slot 1.   The bottommost row of fins in the heat sink should fit between the top support bar and the bottom support bar as shown in Figure 2-6.

Figure 2-5. Heat Sink Support
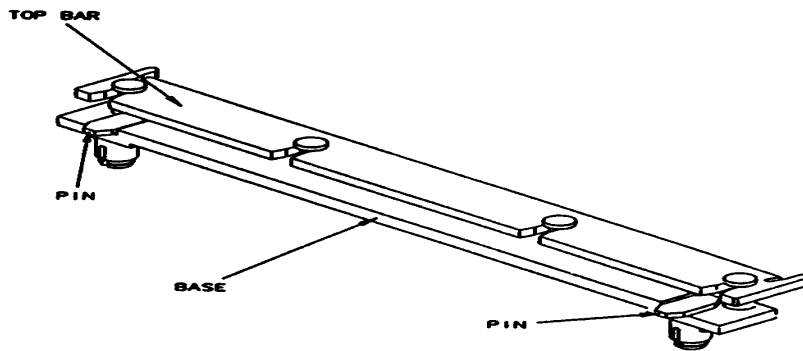
Figure 2-6. Pentium II Heat Sink
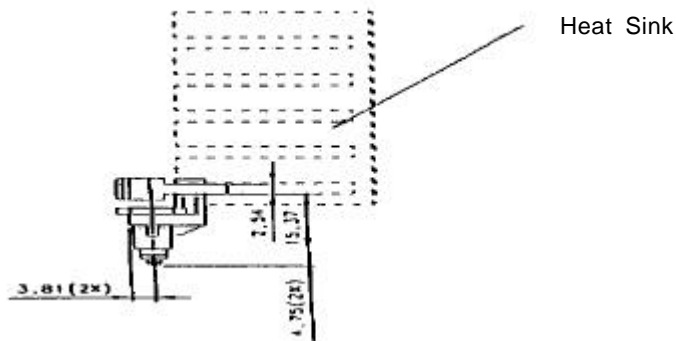
Removing the Pentium II Processor

To remove the Pentium II processor from the motherboard, follow these steps (the reverse of the installation process).

1. Disconnect the fan power cable from the motherboard. It is recommended to leave the cable connected to the processor.

2. Slide the clips on the supports backward to release the pegs in the motherboard. Push the latches on the processor toward the center of the processor until they click into place.

3. Lift one end of the processor until it is freed from Slot 1. Lift the other end of the processor until it is freed from Slot 1. Lift the entire processor (with the fan heatsink supports attached) until it is free from the retention mechanism.

4. Remove the heatsink support pegs from the motherboard and discard them. With one hand, squeeze together the two halves of the peg on the bottom side of the motherboard. With the other hand, pull the peg out of the hole in the motherboard. Do not reuse the pegs.

When handling the Pentium II processor, avoid placing direct pressure on the label area of the fan.

When removing the Pentium II processor, avoid pressing down on the motherboard or components. Instead, press down on the plastic connectors.

2-2   Static-Sensitive Devices

Static-sensitive electric discharge can damage electronic com-
ponents. To prevent damage to your system board, it is important
to handle it very carefully. The following measures are generally
sufficient to protect your equipment from static discharge.

Precautions

- Use a grounded wrist strap designed for static discharge.
- Touch a grounded metal object before you remove the board
  from the anti-static bag.
- Handle the board by its edges only; do not touch its compo-
  nents, peripheral chips, memory modules, or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the system board and peripherals back into their anti-static
  bags when not in use.
- Be sure your computer system's chassis allows excellent
  conductive contacts between its power supply, case, mounting
  fasteners, and the system board for grounding purposes.

Unpacking

The system board is shipped in anti-static packaging to avoid static
damage. When unpacking the board, be sure the person handling
the board is static-protected.

2-3   Changing the CPU Speed

To change the CPU speed for a Pentium II processor, change the
jumpers shown on Table 2-1. Refer to Table 2-2 for the external
bus speed jumper settings. The default bus speed is 66 MHz. The
following example will show you which CPU Core/Bus Ratio to use.
The general rule is to divide the CPU speed by the bus speed (66
MHz). If you have a 266 MHz CPU, dividing it by 66 will give you a

CPU Core/Bus Ratio of 4. After determining the CPU Core/Bus Ratio, refer to Table 2-1 for the jumper settings of JB1, JB2, JB3 and JB4.

$$\text{CPU Core/Bus Ratio} = \frac{\text{CPU Speed}}{\text{Bus Frequency}}$$

$$\text{CPU Core/Bus Ratio} = \frac{266 \text{ MHz}}{66 \text{ MHz}} = 4.0$$

Table 2-1. Pentium II Speed Selection

CPU Core/ Bus Ratio	JB1	JB2	JB3	JB4
3.0	ON	OFF	ON	ON
3.5	OFF	OFF	ON	ON
4.0	ON	ON	OFF	ON
4.5	OFF	ON	OFF	ON
5.0	ON	OFF	OFF	ON
5.5	OFF	OFF	OFF	ON
6.0	ON	ON	ON	OFF

Table 2-2. External Bus Speed Selection

MHz	JC1	JC2	JC3
50	ON	ON	ON
60	ON	OFF	OFF
66	OFF	OFF	OFF
75	OFF	ON	OFF

2-4 Mounting the Motherboard in the Chassis

SUPER P6DLH/P6DLF has standard mounting holes to fit different types of chassis. Chassis may come with a variety of mounting fasteners, made of metal or plastic. Although a chassis may have both metal and plastic fasteners, metal fasteners are the most

highly recommended because they ground the system board to the chassis.   Therefore, use as many metal fasteners as possible for better grounding.

2-5 Connecting Cables

Power Supply Connector

After you have securely mounted the motherboard to the chassis, you are ready to connect the cables. Attach power supply cables to PW1 for a 5V power supply or PW2 for ATX power supply. Do not force the cables, but make sure they are fully seated. The two black wires on each power cable for PW1 sit next to each other when correctly installed. See Table 2-3 for pin definitions of an ATX power supply. See Table 2-4 for pin definitions of a 5V power supply. See Table 2-5 for pin definitions of the extra 5V power supply.

Table 2-3. ATX Power Supply Connector Pin Definitions

Connector Number	Pin Number	Function	Pin Number	Function
PW2	1	3.3V	11	3.3V
	2	3.3V	12	-12V
	3	COM	13	COM
	4	5V	14	PS-ON
	5	COM	15	COM
	6	5V	16	COM
	7	COM	17	COM
	8	PW-OK	18	-5V
	9	5VSB	19	5V
	10	12V	20	5V

Table 2-4. 5V AT Power Supply Connector Pin Definitions

Connector Number	Pin Number	Function
PW1	1	Power Good (Power on reset, TTL signal)
	2	+5 VCC
	3	+12 VCC
	4	-12 VCC
	5	Ground (Black wire to be connected)
	6	Ground (Black wire to be connected)
	7	Ground (Black wire to be connected)
	8	Ground (Black wire to be connected)
	9	-5 VCC
	10	+5 VCC
	11	+5 VCC
	12	+5 VCC

Table 2-5. Extra 5V Power Supply Connector Pin Definitions

Connector Number	Pin Number	Function
PW5	1	+5 VCC
	2	+5 VCC
	3	+5 VCC
	4	Ground (Black wire to be connected)
	5	Ground (Black wire to be connected)
	6	Ground (Black wire to be connected)

PW_ON Connector

The PW_ON connector is located on pins 9 and 10 of JF2. Momentary contacting both pins will power on/off the system. To turn off the power, hold down the power button for at least 4 seconds. In order to have the "4 seconds" feature, you need to enable the Power Management/APM in the BIOS and set the Power Button Function to Suspend. See Table 2-6 for pin definitions.

Table 2-6. PW_ON Connector Pin Definitions

Pin Number	Definition
9	PW_ON
10	Ground

Infrared Connector

The infrared connector is located on pins 1-8 of JF2. See Table 2-7 for pin definitions.

Table 2-7. Infrared Pin Definitions

Pin Number	Definition
1	+5V
2	Key
3	IRRX
4	Ground
5	IRTX
6	IRSEL0
7	IRSEL1
8	IRSEL2

Reset Connector

The reset connector is located on pins 12 and 13 of JF2. This connector attaches to the hardware Reset switch on the computer case. See Table 2-8 for pin definitions.

Table 2-8. Reset Pin Definitions

Pin Number	Definition
12	Reset
13	Ground

Keylock/Power LED Connector

The keylock/power LED connector is located on pins 5 to 9 of JF1. See Table 2-9 for pin definitions. Pins 5 and 7 are for the power LED. Pins 8 and 9 are for the keylock.

Table 2-9. Keylock/Power LED Pin Definitions

Pin Number	Function	Definition
5	+	Red wire, LED power
6	Key	No connection
7	GND	Black wire
8		Keyboard inhibit
9	GND	Black wire

Hard Drive LED

The hard drive LED is located on pins 1 to 4 of JF1. Attach the hard drive LED cable onto pins 1 and 2. See Table 2-10 for pin definitions.

Table 2-10. Hard Drive LED Pin Definitions

Pin Number	Definition
1	+5V
2	Key
3	HD Active
4	+5V

Speaker Connector

The speaker connector is located on pins 10 to 13 of JF1. See Table 2-11 for pin definitions.

Table 2-11. Speaker Connector Pin Definitions

Pin Number	Function	Definition
10	+	Red wire, speaker data
11	Key	No connection
12	VCC	Speaker data
13	GND	Black wire

AT Keyboard Connector

The keyboard connector J74 has five pins. See Table 2-12 for pin definitions.

Table 2-12. Keyboard Connector Pin Definitions

Pin Number	Function
1	Keyboard clock
2	Keyboard data
3	Spare
4	Ground
5	+5 VDC

Universal Serial Bus

The Universal Serial Bus is located on J17 and J18. See Table 2-13 for pin definitions.

Table 2-13. USB Pin Definitions

Pin Number	J17 Function	Pin Number	J18 Function
1	+5V	1	+5V
2	P0-	2	P0-
3	P0+	3	P0+
4	GND	4	GND
5	N/A	5	Key

PS/2 Mouse Port

The PS/2 Mouse port is located on JP25. See Table 2-14 for pin definitions.

Table 2-14. PS/2 Mouse Pin Definitions

Pin Number	Function	Pin Number	Function
1	NC	2	NC
3	NC	4	CLK
5	NC	6	VCC
7	Data	8	NC
9	GND	10	NC (key)

Serial Ports

Serial port COM1 is located on JP20 and serial port COM2 is located on JP21. See Table 2-15 for pin definitions.

Table 2-15. Serial Ports Pin Definitions

Pin Number	Function	Pin Number	Function
1	DCD	6	CTS
2	DSR	7	DTR
3	Serial In	8	RI
4	RTS	9	GND
5	Serial Out	10	NC

Power On/Off State

Refer to Table 2-16 on how to set JP26. Save Power Down (PD) State is the default and is used when you want the system to be in power off state the first time you apply power to the system or when the system comes back from AC power failure. PIIX4 control is used if you want the system to be in power on state the first time you apply power to the system or when the system comes back from AC power failure.

Table 2-16. Power On/Off State Pin Definitions

Connector Number	Jumper Position	Function
JP26	1-2	PIIX4 Ctrl
	2-3	Save PD State

SMI

Refer to Table 2-17 for instructions on how to use JP19. This jumper should normally be set to 1-2 APIC SMI.

Table 2-17. SMI Pin Definitions

Connector Number	Jumper Position	Function
JP19	1-2	APIC SMI
	2-3	PIIX4 SMI

CMOS Clear

Refer to Table 2-18 for instructions on how to clear the CMOS. **For ATX power supply, you need to completely shut down the system, then use JBT1 to clear the CMOS.** Do not use the PW_ON connector to clear the CMOS.

Table 2-18. CMOS Clear Pin Definitions

Connector Number	Jumper Position	Function
JBT1	1-2	Normal
	2-3	CMOS Clear

External Battery

Refer to Table 2-19 to connect an external battery to JBT2.

Table 2-19. External Battery Pin Definitions

Pin Number	Function
1	+3 V
2	NC
3	NC
4	Ground

Overheat LED

Refer to Table 2-20 to connect an LED to JOH for overheat warning.

Table 2-20. Overheat LED Pin Definitions

Pin Number	Function
1	+12 V
2	Signal

Buzzer Overheat Notification

Refer to Table 2-21 for instructions on how to use JP86 (P6DLF) or JP88 (P6DLH) to enable or disable the buzzer BZ1.

Table 2-21. Buzzer Selection Pin Definitions

Jumper Position	Function
ON	Enable Buzzer
OFF	Disable Buzzer

Chassis Intrusion Connector

Refer to Table 2-22 for the chassis intrusion located on JL1.

Table 2-22. Chassis Intrusion Pin Definitions

Pin Number	Function
1	Standby +5V
2	Intrusion Input
3	Ground

Power Supply Selection

Use SW1 to select the type of power supply used in the system. Refer to Table 2-23 for pin definitions.

Table 2-23. SW1 Pin Definitions

Jumper Position	Function
ON	Enable BIOS AT/ATX Setting
OFF	ATX Power Supply

Wake-on-LAN

The Wake-on-LAN connector is located on JP85. Refer to Table 2-24 for pin definitions.

Table 2-24. Wake-on-LAN Pin Definitions

Pin Number	Function
1	+5V Standby
2	Ground
3	Wake up

Fan Connectors*

The CPU fans are located on JT1 and JT2. The overheat fan with tachometer sensor input is located on JT3. The overheat fan without tachometer sensor input is located on JT4 (P6DLH only). Refer to Table 2-25 for pin definitions.

Table 2-25. Fan Pin Definitions

Pin Number	Function
1	Ground
2	+12 V
3	Tachometer

* Caution: These connectors are DC direct.

Optional Keyboard Connector (P6DLH)

SUPER P6DLH has an extra keyboard header, JP926, which can be used for certain chassis that provides for a front keyboard connection. Refer to Table 2-26 for the pin definitions.

Table 2-26. Keyboard Connector Pin Definitions

Pin Number	Function
1	Keyboard clock
2	Keyboard data
3	Spare
4	Ground
5	+5 VDC

i960 Serial Port (P6DLH)

The i960 serial port is located on J943. Refer to Table 2-27 for pin definitions.

Table 2-27. i960 Serial Port Pin Definitions

Pin Number	Function	Pin Number	Function
1	CD	6	DSR
2	TXD	7	CTS
3	RXD	8	RTS
4	DTR	9	X
5	GND	10	NC

i960 Fail LED Indicator (P6DLH)

ID4 is used to determine whether Mode 3 of the i960 RD IO proces-
sor is functioning properly. Refer to Table 2-28 for the LED indica-
tions.

Table 2-28. i960 Fail LED Definitions

LED Status	Definition
OFF ON	i960 Mode 3 OK i960 Mode 3 failed i960 is in Mode 0

i960 Initialization Modes (P6DLH)

Refer to Table 2-29 for instructions on setting the mode.

Table 2-29. i960 Mode Settings

Jumper	Mode 3	Mode 0 (default)
JP915	OFF	OFF
JP918	OFF	ON
JP919	OFF	ON
JP920	OFF	OFF
JP921	ON	ON

i960 Jumper Settings (P6DLH)

Refer to Table 2-30 for more jumper settings related to the i960 IOP.

Table 2-30. i960 Jumper Settings

Jumper	Default	Definition
JP911	OFF	Enables the internal secondary arbiter
JP917	ON	Enable I/O IRQ OFF Ext. debugging mode
JP924	1-2	12V enable
JP925	1-2	Flash enable

I²C Connector (P6DLH)

The I²C connector located on J940 is for development purposes only. Refer to Table 2-31 for pin definitions.

Table 2-31. I²C Pin Definitions

Pin Number	Function
1	SDA
2	Ground
3	SCL
4	VCC

2-6   Installing/Removing the SIMM/DIMM Modules

SUPER P6DLH can accommodate a maximum of 1 GB EDO DIMMs or 512 MB SDRAM DIMMs. It has 4 168-pin unbuffered DIMM slots. It is not recommended to mix EDO DIMM modules with SDRAM DIMM modules.

SUPER P6DLF can accommodate a maximum of 1 GB EDO SIMMs or 1 GB EDO DIMMs or 512 MB SDRAM DIMMs. It has 8 72-pin SIMM slots and 4 168-pin 3.3V unbuffered DIMM slots. You can only use one type of memory at a time. That means you cannot mix SIMM modules with DIMM modules and vice versa. It is not recommended to mix EDO DIMM modules with SDRAM DIMM modules. The 5V EDO SIMM slots are provided so that users can still use their memory when they upgrade their old system to a Pentium II-based motherboard. However, it is not recommended to use 5V EDO SIMMs together with an AGP card.

There are three types of EDO and SDRAM DIMM modules: x4, x8 and x16. If you are using the x4 type, you can populate the DIMM slots with either 4 single-sided memories or 2 double-sided memories. For memory configurations of 512 MB EDO DIMMs or higher, it is recommended to use x8 or x16 type of memory.

There are no jumpers needed to configure the on-board memory. Memory timing requires 70ns or faster for EDO memory. Refer to Figure 2-7 and the instructions below for installing or removing DIMM modules.

CAUTION

Exercise extreme care when installing or removing the SIMM/DIMM modules to prevent any possible damages.

To Remove:
Use your thumb to gently push the edge of
the socket and release the module. Do this
on both sides for each module.

To Install:
Insert
vertically,
press down
until it snap
into place.
Pay attention
to the two
notches.
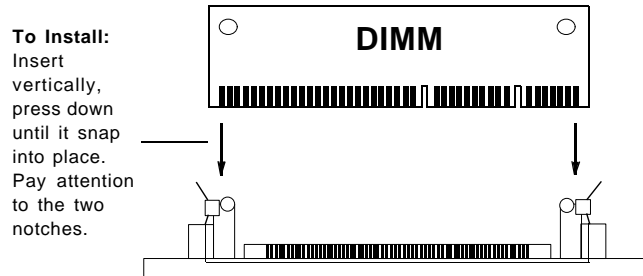
DIMM

Figure 2-7. Installing/Removing a DIMM Memory Module

SIMM/DIMM Module Installation

1. Insert SIMM/DIMM modules in Bank 0 through Bank 3 as required for the desired system memory.
2. Insert each DIMM module vertically into its socket. Pay attention to the two notches to prevent inserting the DIMM at a wrong position. The component side of the DIMM module must face the CPU socket. The latter statement is applicable for DIMMs with components on one side only. Gently press the DIMM module until it snaps upright into place in the socket.
3. Insert each SIMM module into its socket at an angle. Gently press the SIMM module until it snaps upright into place in the socket.

Removing DIMM Modules

1. Remove DIMM modules in any order.
2. Gently push the edge of the sockets to the side to release the module. Remove one side of the DIMM module first, and then the other side, to prevent breaking the socket.

Removing SIMM Modules

1. Remove SIMM modules from Bank 0 through Bank 3.
2. Gently push the edge of the sockets to the side to release the module. Remove one side of the SIMM module first, and then the other side, to prevent breaking the socket.

2-7 Connecting Parallel, Floppy and Hard Disk Drives

Use the following information to connect the floppy and hard disk drive cables.

• The floppy disk drive cable has seven twisted wires.
• A red mark on a wire typically designates the location of pin 1.
• A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have the twisted wires always connects to drive B.
• An IDE hard disk drive requires a data ribbon cable with 40 wires, and a SCSI hard disk drive requires a SCSI ribbon cable with 50 wires. A wide SCSI hard disk drive requires a SCSI ribbon cable with 68 wires.
• A single IDE hard disk drive cable has two connectors to provide for two drives. To select an IDE disk drive as C, you would normally set the drive select jumper on the drive to DS1. To select an IDE disk drive as D, you would normally set the drive select jumper on the drive to DS2. Consult the documentation that came with your disk drive for details on actual jumper locations and settings.
• A single SCSI ribbon cable typically has three connectors to provide for two hard disk drives and the SCSI adapter. (Note: most SCSI hard drives are single-ended SCSI devices.) The SCSI ID is determined by jumpers or a switch on the SCSI device. The last internal (and external) SCSI device cabled to the SCSI adapter must be terminated.
• Some drives require a special controller card. Read your disk drive manual for details.

Parallel Port Connector

The parallel port is located on J19. See Table 2-32 for pin defini-
tions.

Table 2-32. Parallel Port Pin Definitions

Pin Number	Function	Pin Number	Function
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACJ-	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

Floppy Connector

The floppy connector is located on J22. See Table 2-33 for pin definitions.

Table 2-33. Floppy Connector Pin Definitions

Pin Number	Function	Pin Number	Function
1	GND	2	FDHDIN
3	GND	4	Reserved
5	Key	6	FDEDIN
7	GND	8	Index-
9	GND	10	Motor Enable
11	GND	12	Drive Select B-
13	GND	14	Drive Select A-
15	GND	16	Motor Enable
17	GND	18	DIR-
19	GND	20	STEP-
21	GND	22	Write Data-
23	GND	24	Write Gate-
25	GND	26	Track 00-
27	GND	28	Write Protect-
29	GND	30	Read Data-
31	GND	32	Side 1 Select-
33	GND	34	Diskette

IDE Interfaces

There are no jumpers to configure the on-board IDE interfaces J15 and J16. Refer to Table 2-34 for the pin definitions.

Table 2-34. IDE Connector Pin Definitions

Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	Key
21	DRQ3	22	GND
23	I/O Write-	24	GND
25	I/O Read-	26	GND
27	IOCHRDY	28	BALE
29	DACK3-	30	GND
31	IRQ14	32	IOCS16-
33	Addr 1	34	GND
35	Addr 0	36	Addr 2
37	Chip Select 0	38	Chip Select 1-
39	Activity	40	GND

AGP Port (P6DLF)

There are no jumpers to configure the AGP port J8. Refer to Table 2-35 for the pin definitions.

Table 2-35. AGP Port Pin Definitions

Pin#	B	A
1	Spare	12V
2	5.0V	Spare
3	5.0V	Reserved *
4	USB+	USB-
5	GND	GND
6	INTB#	INTA#
7	CLK	RST#
8	REQ#	GNT#
9	VCC3.3	VCC3.3
10	ST0	ST1
11	ST2	Reserved
12	RBF#	PIPE#
13	GND	GND
14	Spare	Spare
15	SBA0	SBA1
16	VCC3.3	VCC3.3
17	SBA2	SBA3
18	SB_STB	Reserved
19	GND	GND
20	SBA4	SBA5
21	SBA6	SBA7
22	KEY	KEY
23	KEY	KEY
24	KEY	KEY
25	KEY	KEY
26	AD31	AD30
27	AD29	AD28
28	VCC3.3	VCC3.3
29	AD27	AD26

30	AD25	AD24
31	GND	GND
32	AD_STB1	Reserved
33	AD23	C/BE3#
34	Vddq3.3	Vddq3.3
35	AD21	AD22
36	AD19	AD20
37	GND	GND
38	AD17	AD18
39	C/BE2#	AD16
40	Vddq3.3	Vddq3.3
41	IRDY#	FRAME#
42		
43	GND	GND
44		
45	VCC3.3	VCC3.3
46	DEVSEL#	TRDY#
47	Vddq3.3	STOP#
48	PERR#	Spare
49	GND	GND
50	SERR#	PAR
51	C/BE1#	AD15
52	Vddq3.3	Vddq3.3
53	AD14	AD13
54	AD12	AD11
55	GND	GND
56	AD10	AD9
57	AD8	C/BE0#
58	Vddq3.3	Vddq3.3
59	AD_STB0	Reserved
60	AD7	AD6
61	GND	GND
62	AD5	AD4
63	AD3	AD2
64	Vddq3.3	Vddq3.3
65	AD1	AD0
66	SMB0	SMB1

Chapter 3
Troubleshooting

3-1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter.

No Video

Use the following steps for troubleshooting your system configuration.

1. If you have no video, remove all the add-on cards and cables.

2. Check for shorted connections, especially under the motherboard.

3. Check the jumpers settings, clock speed, and voltage settings.

4. Use the speaker to determine if any beep codes exist. Refer to Appendix C of the AMI BIOS Reference Manual for details about beep codes.
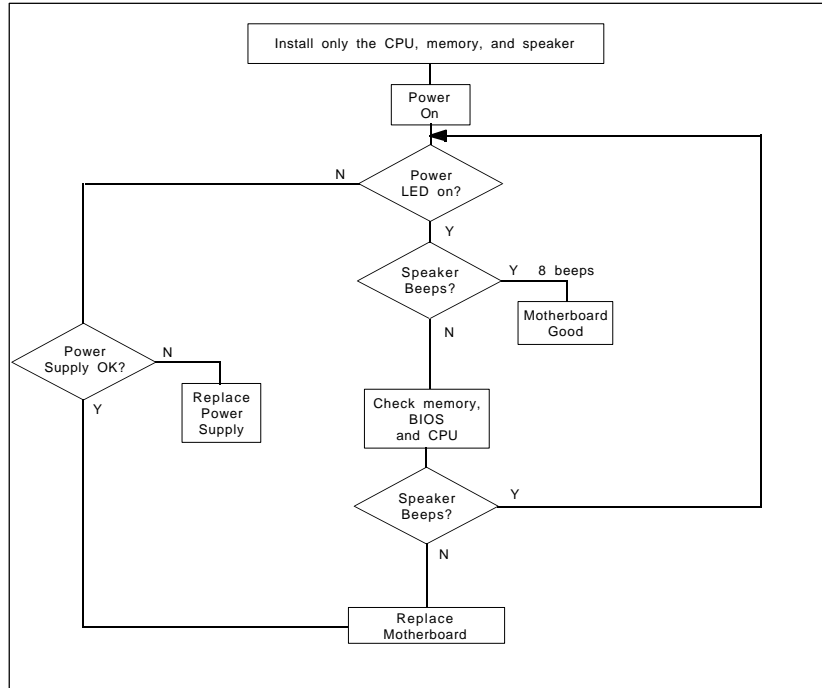
Install only the CPU, memory, and speaker

Power On

Power LED on?

N

Y

Speaker Beeps?

Y   8 beeps

Motherboard Good

N

Power Supply OK?

N

Replace Power Supply

Y

Check memory, BIOS and CPU

Speaker Beeps?

Y

N

Replace Motherboard

Figure 3-1. Troubleshooting Flowchart

NOTE

If you are a system integrator, VAR or OEM, a POST diagnostics card is recommended for port 80h codes. Refer to Appendix D.

Memory Error

If you encounter memory error, follow the procedures below.

1. Check to determine if SIMM/DIMM modules are improperly installed.
2. Make sure that different types of SIMMs have not been installed in different banks (e.g., a mixture of 2MB x 36 and 1 MB x 36 SIMMs in Banks 0).
3. Determine if different speeds of SIMMs/DIMMs have been installed in the same or different banks, and the BIOS setup is configured for the fastest speed of RAM used. It is recommended to use the same RAM speed for SIMMs/DIMMs in different banks.
4. Check for bad SIMM/DIMM modules or chips.

Losing the System's Setup Configuration

1. Ensure that you are using a high quality power supply. A poor quality power supply may cause the system to lose CMOS setup. Refer to Chapter 1 of this manual for details.
2. If the above step does not fix the Setup Configuration problem, contact your vendor for repair.

3-2   Technical Support Procedures

1. Go through the 'Troubleshooting Procedures' section in this chapter of the manual before calling Technical Support.
2. BIOS upgrades can be downloaded from the SUPER BBS# (408) 895-2022, 24 hours a day, using 1200-14400 baud, 8 data bits, 1 stop bit and no parity. BIOS upgrades can also be downloaded from our web site at http://www.supermicro.com.

    Note: Not all BIOS can be flashed depending on the modifications on the boot block code.

3. If you still cannot get the problem resolved, have the following information ready before you call for technical support:

    * BIOS release date/version
    * System board serial number
    * Product model name
    * Invoice number and date
    * System configuration

3-3   Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alternation, misuse, abuse, or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.