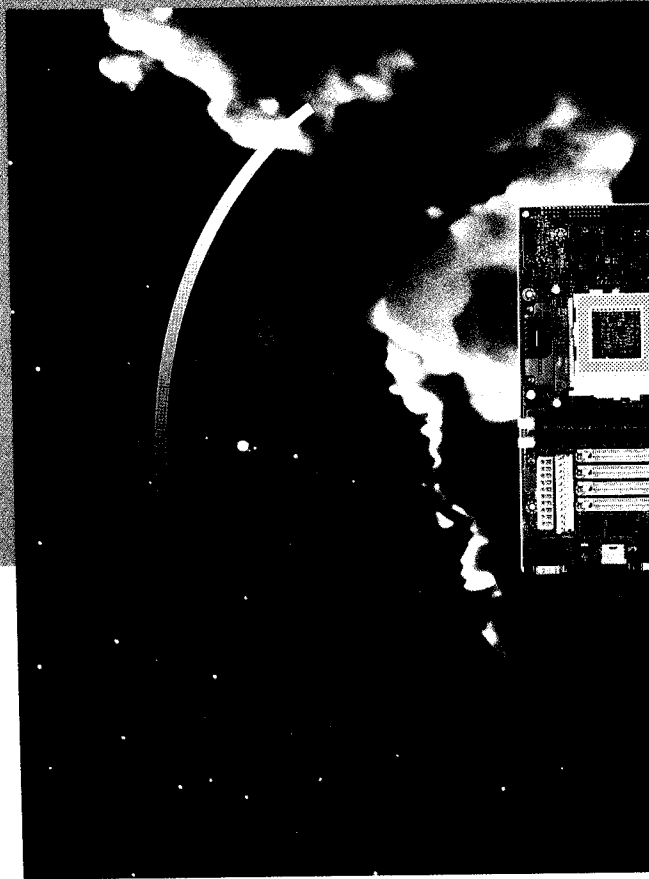


**PENTIUM®
MAINBOARD**



USER'S MANUAL

PCI PENTIUM® MAINBOARD



USER'S MANUAL

PART NO. YM5147
MODEL NO. MS-5147
PRINTED IN TAIWAN

CHAPTER 1 INTRODUCTION

Chapter 1

Introduction

The PCI Pentium™ SI13 system board is a high-performance personal computer system board based on a 3.3V or 2.8V version of the Pentium™ microprocessor -- the P54 & P55 microprocessor. The system board supports the Peripheral Component Interconnect (PCI 2.1) Local Bus standard and provides four 32-bit PCI bus master slots and four 16-bit ISA bus Slots.

A cache subsystem can be configured for 256k or 512K cache memory to improve overall throughput. The system board uses the highly integrated SIS 5571 Trinity to support the PCI/ISA, Green Standards and PCI IDE controller.

1.1 System Board Features**CPU**

- Socket 7 supports Intel Pentium™ family -- P54C and P55C (MMX) 75MHz/90MHz/100MHz/120MHz/133MHz/150MHz/166MHz/200MHz/233MHz
- The Cyrix 6x86 & 6x86L and AMD K5 & K6 are also supported.

Chip Set

- SIS 5571 Trinity

Cache Memory

- Supports 256K/512K cache memory.

Main Memory

- Supports four memory banks using four 72-pin SIMM sockets and two 168-pin DIMM sockets.
- Up to 384 Mbytes main memory.
- Supports EDO Hyper Page Mode DRAM, Standard Fast Page mode DRAM and SDRAM.

Slots

- Four 32-bit Master PCI Bus slots and four 16-bit ISA bus slots. One shared slot that can be used as ISA or PCI.

On-Board Peripherals

- On-Board Peripherals include:
 - 1 floppy port supports 2FDD
 - 2 serial ports (COMA + COMB)
 - 1 parallel port supports ECP or EPP mode
 - 2 PCI Bus Master IDE ports (up to four IDE HDD)
 - USB (reserved)

Remote Control

- Supports Remote Control Power ON/OFF operations

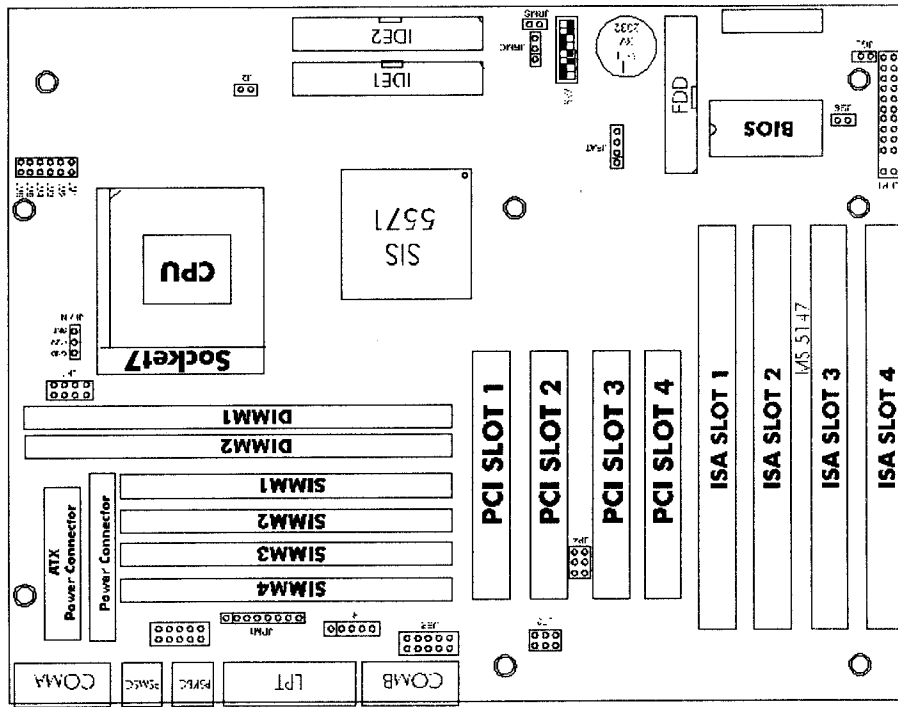
Dimensions

- Standard ATX form factor
- 22cm(L) x 30.5cm(W) x 4 layer PCB

Mounting

- 8 mounting holes

1.2 System Board Layout



MS-5147

Chapter 2

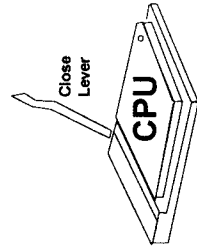
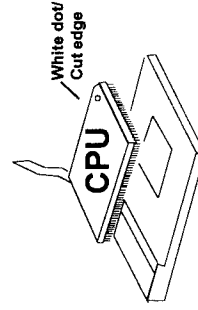
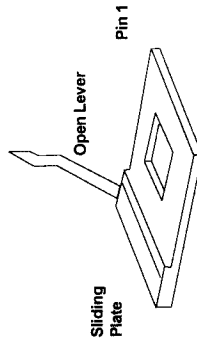
Hardware Installation

2.1 Central Processing Unit: CPU

The MS-5147 motherboard operates with Intel® P54C/P55C, Cyrix® 6x86 and AMD® 5K86 processors. It could operate with 2.5V to 3.52V processors. The motherboard provides a 321-pin ZIF Socket 7 for easy CPU installation, a DIP switch (SW1) to set the proper speed for the CPU and a Jumper block (JV1 - JV6) for setting the CPU voltage. The CPU should always have a cooling fan attached to prevent overheating.

2.1-1 CPU Installation Procedure

1. Pull the lever sideways away from the socket then raise the lever up to a 90-degree angle.
2. Locate Pin 1 in the socket and look for the white dot or cut edge in the CPU, match Pin 1 with the white dot/cut edge then insert the CPU. It should insert easily.
3. Press the lever down to complete the installation.



CHAPTER 2 HARDWARE INSTALLATION

2.1-1 CPU Core Speed Derivation Procedure

- The 4 CPU clock frequencies that the system supports are 50 MHz, 60MHz, 66MHz and 75MHz (To adjust SW1 pin 3, 4, 5, 6, 7, and 8). See the following chart to set the different Host Clock Frequencies.

SW1		CPU				
3	4	5	6	7	8	CLOCK
	ON	OFF	ON	OFF	ON	50MHz
	OFF	ON	ON	OFF	ON	55MHz
	ON	OFF	OFF	ON	OFF	60MHz
	OFF	OFF	OFF	ON	OFF	66MHz
	ON	OFF	ON	ON	OFF	75MHz

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

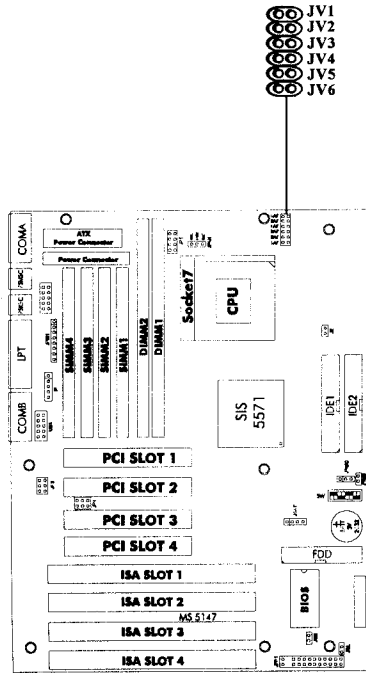
$$\begin{aligned}
 \text{If } \frac{\text{CPU Clock}}{\text{Core/Bus ratio}} &= 66\text{MHz} \\
 \text{then } \frac{\text{CPU core speed}}{\text{Core/Bus ratio}} &= 2 \\
 &= \frac{\text{Host Clock} \times \text{Core/Bus ratio}}{66\text{MHz} \times 2} \\
 &= 133\text{MHz}
 \end{aligned}$$

SW1		CPU _(core/bus ratio)	
1	2	Intel	
ON	ON	5/2(2.5)	
OFF	ON	3/1(3)	
ON	OFF	2/1(2)	
OFF	OFF	3/2(1.5)	

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

CHAPTER 2 HARDWARE INSTALLATION

2.1-2 CPU Voltage Setting: JV1 - JV6

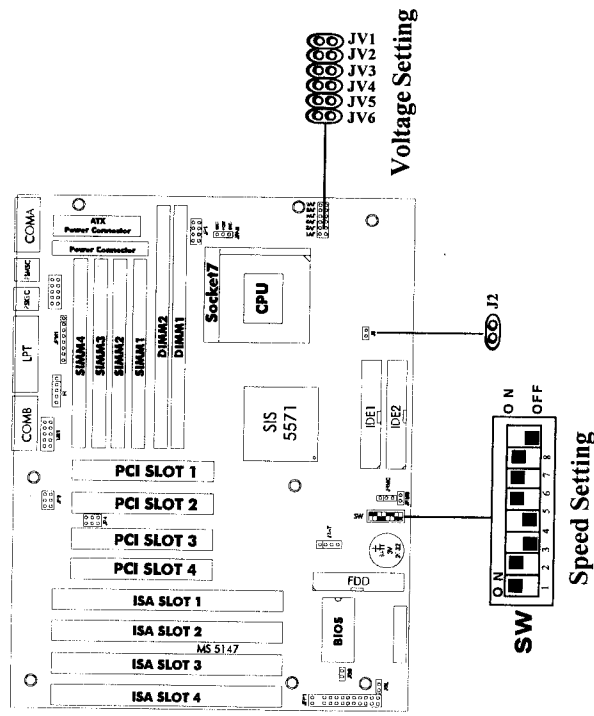


Vcore	JV1 ~ JV6
3.52	
3.38	
3.2	
2.9	
2.8	
2.5	

CHAPTER 2 HARDWARE INSTALLATION

2.1-3 CPU Speed and Voltage Setting: SW1 & JV1-JV6

To adjust the speed and voltage of the CPU, you must know the specification of your CPU (*always ask the vendor for CPU specification*) then look at Table 2.1 (Intel® P54C/P55C), Table 2.2 (Cyrix® 6x86) and Table 2.3 (AMD® 5K86) for proper setting.



The J2 jumper must be short when using Cyrix CPU. When using other CPUs, this must be opened.

CHAPTER 2 HARDWARE INSTALLATION

Table 2.1 Intel® P54C CPU

CPU Type	CPU Voltage		CPU Speed
	Vcore	JV1-JV6	
P54C-75			
P54C-90			
P54C-100	3.38		
P54C-120			
P54C-133			
P54C-150			
P54C-166			
P55C-166	2.8		
P54C-200	3.52		
P55C-200			
P55C-233	2.8		

Note: If you encounter a CPU with different Voltage, just go to page 2-3 and look for the proper voltage settings.

CHAPTER 2 HARDWARE INSTALLATION

Table 2.2 Cyrix® 6x86 & 6x86L CPU

Cyrix® 6x86 & 6x86L CPU uses P to rate the speed of there processor base on Intel® CPU core speed, for example P120+ (100MHz) has 120MHz core speed of Intel but has 100MHz core speed in Cyrix®. Cyrix® 6x86 CPU should always use a more powerful fan (ask vendor for proper cooling fan).

CPU Type	CPU Voltage		CPU Speed	
	Core	J1-J6	SW1	SW2
P120 (100MHz)	3.52	 J1 J2 J3 J4 J5 J6		
P133 (110MHz)				
P150 (120MHz)				
P166 (133MHz)	2.8	 J1 J2 J3 J4 J5 J6		
P200 (150MHz)				

Note 1: When using Cyrix® CPU, J2 must be short.

Note 2: If you encounter a CPU with different Voltage, just go to page 2-3 and look for the proper voltage settings.

CHAPTER 2 HARDWARE INSTALLATION

Table 2.3 AMD® CPU

AMD® 5K86 CPU uses PR to rate the speed of there processor base on Intel® CPU core speed, for example P133+ (100MHz) has 133MHz core speed of Intel but has 100MHz core speed in AMD® 5K86 CPU.

AMD 5K86 CPU

CPU Type	CPU Voltage		CPU Speed	
	Core	J1-J6	SW1	SW2
PR75	3.52	 J1 J2 J3 J4 J5 J6		
PR90 (90MHz)				
PR100 (100MHz)				
PR133 (100MHz)				
PR166 (100MHz)				

AMD K6 (MMX)

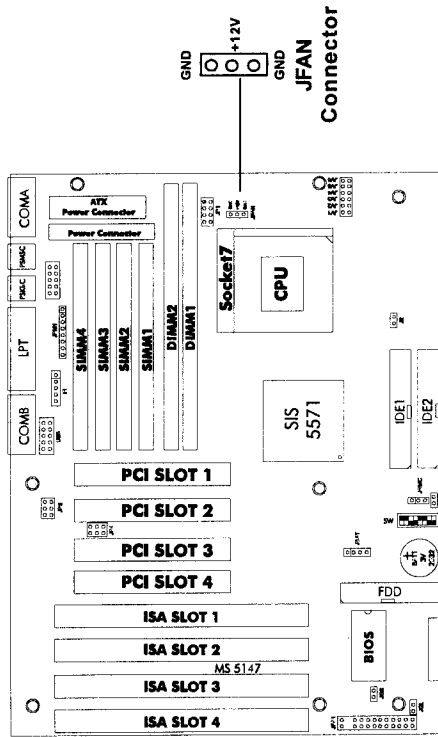
PR166 (166MHz)	2.8	 J1 J2 J3 J4 J5 J6		
PR200 (200MHz)				
PR233 (233MHz)				

Note: If you encounter a CPU with different voltage, just go to page 2-3 and look for the proper voltage settings.

CHAPTER 2 HARDWARE INSTALLATION

2.1-4 CPU Fan Power Connector: JFAN

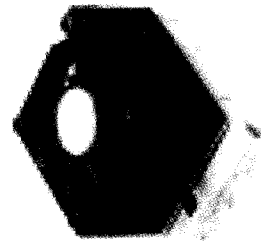
This connector supports CPU cooling fan with +12V. It supports both two and three pin head connector. When connecting the wire to the connector, always take note that the red wire is the positive and should be connected to the +12V.



Recommended CPU cooling fan specification:

- Metallic Clip
- RPM 5000
- CFM 10
- +12V
- 52x52x10mm
- Ball Bearing

Note: Always consult vendor for proper CPU cooling fan.

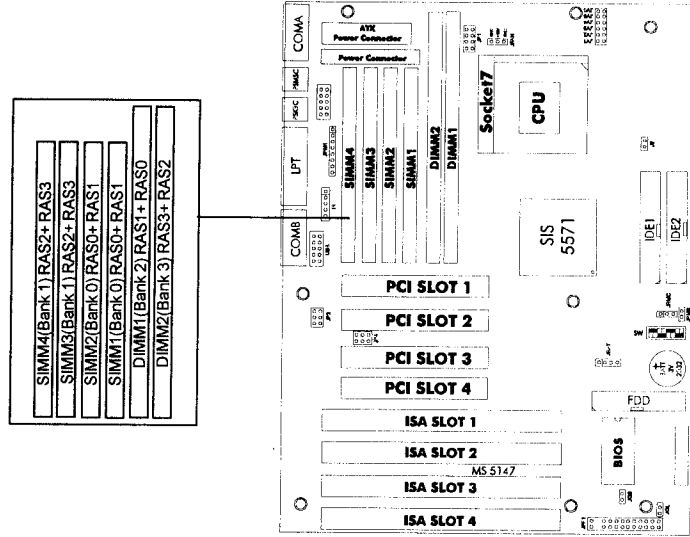


CHAPTER 2 HARDWARE INSTALLATION

2.2 Memory Installation

2.2-1 Memory Bank Configuration

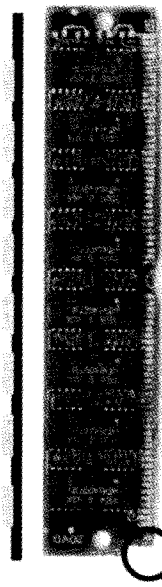
The system board supports a maximum of 384MB of memory. It provides four 72-pin SIMMs (Single In-Line Memory Module) and two 168-pin DIMM sockets. A Bank always has a pair of SIMM or a single DIMM. For example Bank 0 consist of SIMM1 & SIMM2. Each bank supports 4M, 8M, 16M and 32M. The 2MB is the minimum and the 16MB is the maximum for one 72-pin single sided memory module. This board supports 4 RAS. Each RAS supports memory ranging from 4MB to 32MB.



CHAPTER 2 HARDWARE INSTALLATION

2.2-2 Memory Installation Procedures:

A. How to install a SIMM Module



Notched End
Single Sided SIMM



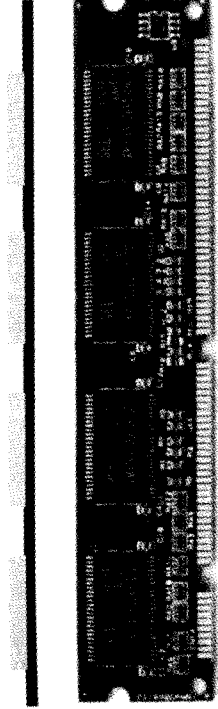
Double Sided SIMM

1. The SIMM slot has a "Plastic Safety Tab" and the SIMM memory module has a "Notched End", so the SIMM memory module can only fit in one direction.
2. Insert the SIMM memory modules into the socket at 45-degree angle, then push into a vertical position so that it will snap into place.
3. The Mounting Holes and Metal Clips should fit over the edge and hold the SIMM memory modules in place.

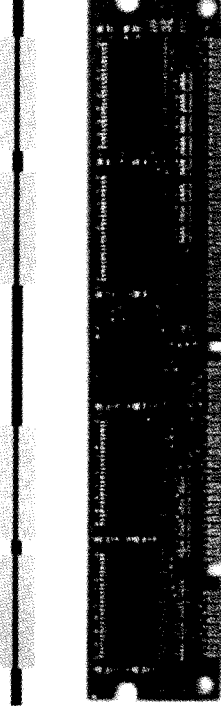
Note: Always use a 5 volts SIMM with 70 ns or above(Fast Page or EDO)

CHAPTER 2 HARDWARE INSTALLATION

B. How to install a DIMM Module

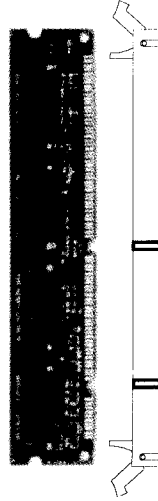


Single Sided DIMM



Double Sided DIMM

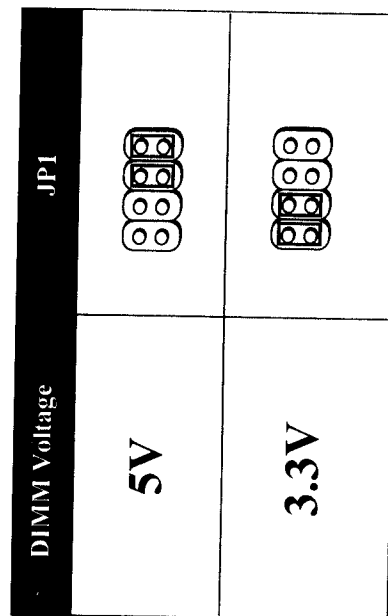
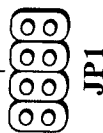
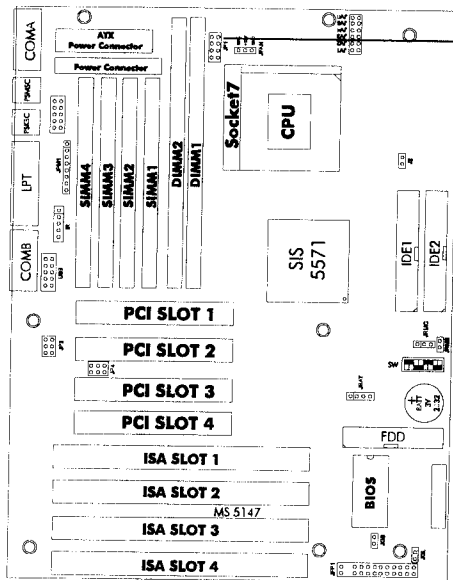
1. The DIMM slot has a two key mark "VOL.T and DRAM", so the DIMM memory module can only fit in one direction.
2. Insert the DIMM memory module vertically into the DIMM slot then push it in.
3. Close the plastic clip at the side of the DIMM slot.



Note: You can use a 3.3 volt DIMM with 5 volt I/O signal tolerance or a full 5 volt DIMM module (EDO, FP or SDRAM)

CHAPTER 2 HARDWARE INSTALLATION

A.1 DIMM Power Voltage Selector : JP1



DIMM Power Level : 3.3V or 5V

CHAPTER 2 HARDWARE INSTALLATION

2.2-3 Memory Population Rule

1. Make sure that the SIMM banks are using the same type and equal size density memory.
2. To operate properly at least two 72-pin SIMM module must be installed in the same bank or one 168-pin DIMM module must be installed. The system cannot operate with only one 72-pin SIMM module.
3. This mainboard supports Table Free so memory can be installed on Bank 0 (SIMM1 + SIMM2), Bank 1 (SIMM3 + SIMM4), Bank 2 (DIMM1) or Bank3 (DIMM2).

S = Single D = Double

SIMM1 + SIMM2 Bank 0	SIMM3 + SIMM4 Bank 1	DIMM1 Bank 2	DIMM2 Bank 3
S	-	-	-
S	S	-	-
S	D	-	-
D	-	-	-
D	S	-	-
D	D	-	-
-	S	-	-
-	-	S	-
-	D	-	-
-	-	D	-
-	-	-	S
-	-	-	S
-	-	-	D
-	-	-	D

CHAPTER 2 HARDWARE INSTALLATION

2.3 Case Connector (JFP1)

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

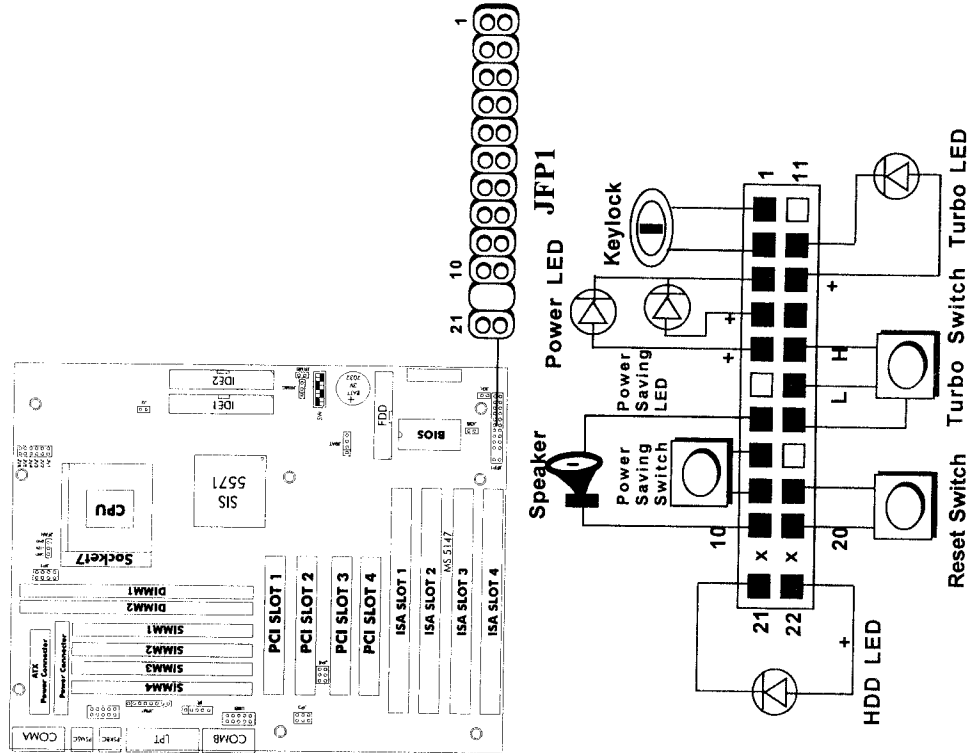


Figure 2.1

CHAPTER 2 HARDWARE INSTALLATION

2.3-1 Turbo LED

The Turbo LED are use to monitor if the turbo switch is ON/OFF. You can connect the Turbo LED from the system case to this pin. (See Figure 2.1)

2.3-2 Hardware Reset

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

2.3-3 Keylock

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

2.3-4 Power LED

The Power LED is always lit while the system power is on. You can connect the Power LED form the system case to this pin. (See Figure 2.1)

2.3-5 Suspend Switch

The Turbo switch or Suspend switch allows the user to suspend the system will not in use. It can be controlled by BIOS power management setup switch function. You can connect the Turbo Switch from the system case to this pin. (See Figure 2.1)

2.3-6 Speaker

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

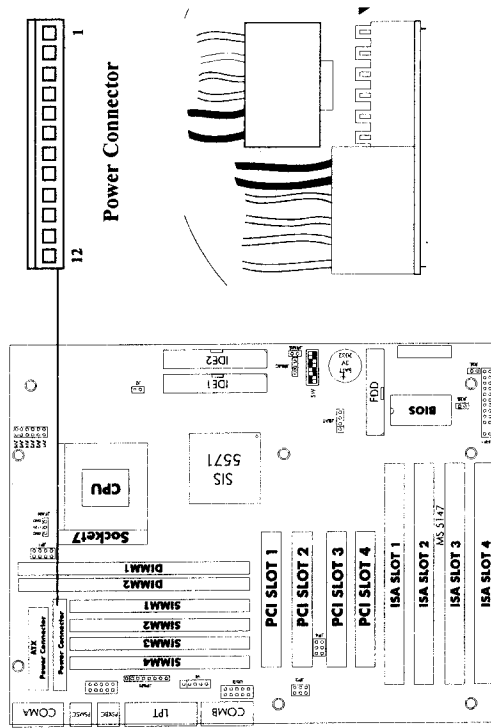
2.3-7 HDD LED

HDD LED shows the activity of a hard disk drive. Avoid tuning the power off while the HDD led is lit. You can connect the HDD LED from the system case to this pin. (See Figure 2.1).

CHAPTER 2 HARDWARE INSTALLATION

2.9-2 Power Supply Connector: PWR12

PWR12 is a standard 12-pin AT-type or PS/2 type power supply connector. PS/2 type power supply has two kind one with a power switch and the other without power switch. For the one without the power switch you need to use the **Remote Power Connector (JRMC)**. Be sure to attach the connectors with the two black wires at the centre.

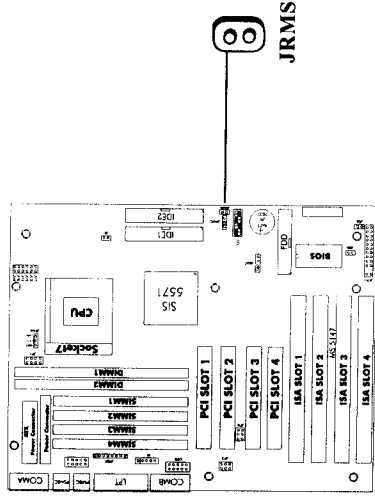


Pin	Description	Pin	Description
1	Power Good	7	Ground
2	+5V DC	8	Ground
3	+12V DC	9	-5V DC
4	-12V DC	10	+5V DC
5	Ground	11	+5V DC
6	Ground	12	+5V DC

CHAPTER 2 HARDWARE INSTALLATION

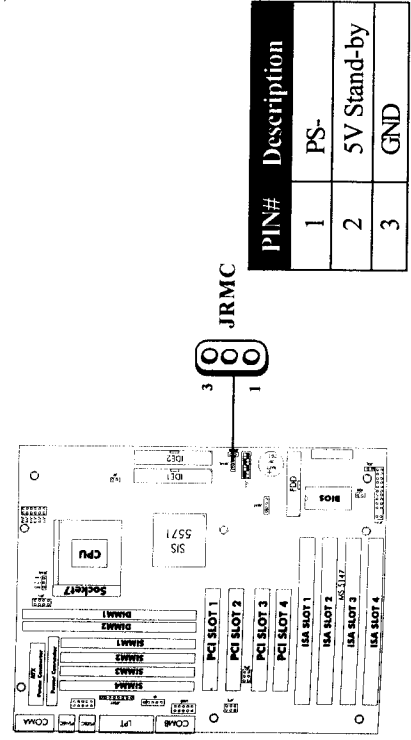
2.9-3 Remote Power On/Off Switch: JRMS(J10)

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



2.9-4 Remote Power Connector: JRMC

If the power supply supports a remote ON/OFF function for PS/2 type with remote control power supply, use the 3-pin remote power connector "JRMC" to connect it.



PIN#	Description
1	PS-
2	5V Stand-by
3	GRND