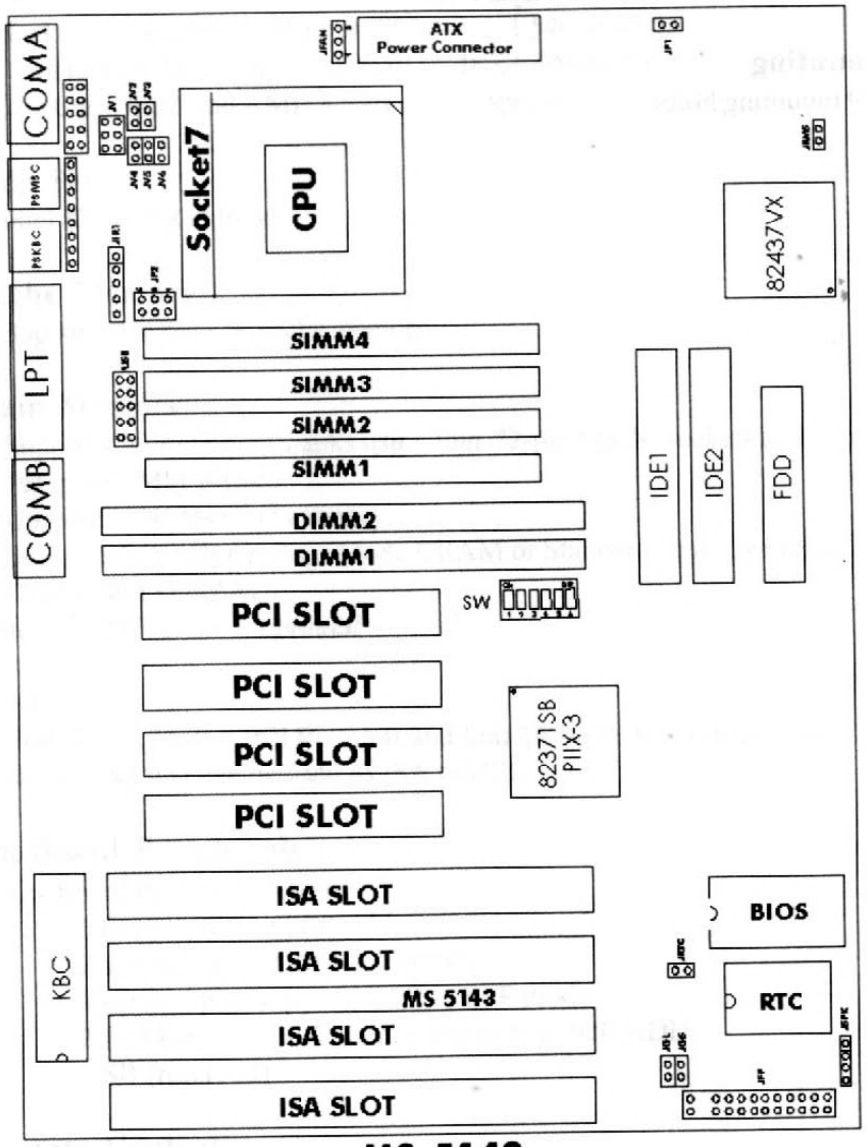
1.2 System Board Layout



MS-5143

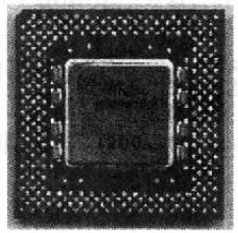
Chapter 2

Hardware Installation

2.1 Central Processing Unit: CPU

The **MS-5143** motherboard operates with **Intel® P54C/P55C, Cyrix® 6x86** and **AMD® 5K86** processors. It could operates 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.

INTEL®

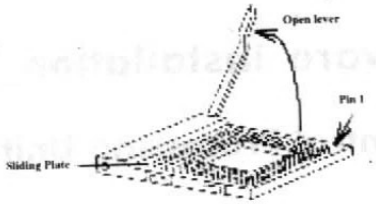


AMD®

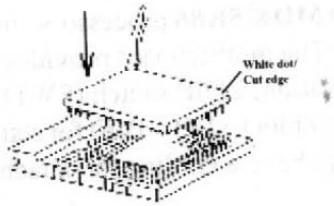
CYRIX®

2.1-1A CPU Installation Procedure

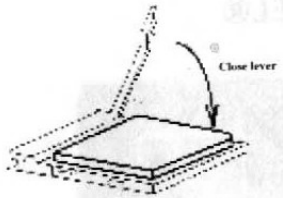
1. Pull the lever sideways away from the socket then raise the lever up to a 90-degree angle.



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

2.1-1B CPU Core Speed Derivation Procedure

1. The 4 CPU clock frequencies that the system supports are 50 MHz, 55MHz, 60MHz and 66.6MHz (To adjust SW1 pin 3, 4, 5 and 6). See the following chart to set the different Host Clock Frequencies.

SW1				CPU
3	4	5	6	CLOCK
ON	ON	OFF	OFF	50MHz
OFF	ON	OFF	OFF	55MHz
ON	OFF	OFF	OFF	60MHz
OFF	OFF	OFF	OFF	66.6MHz

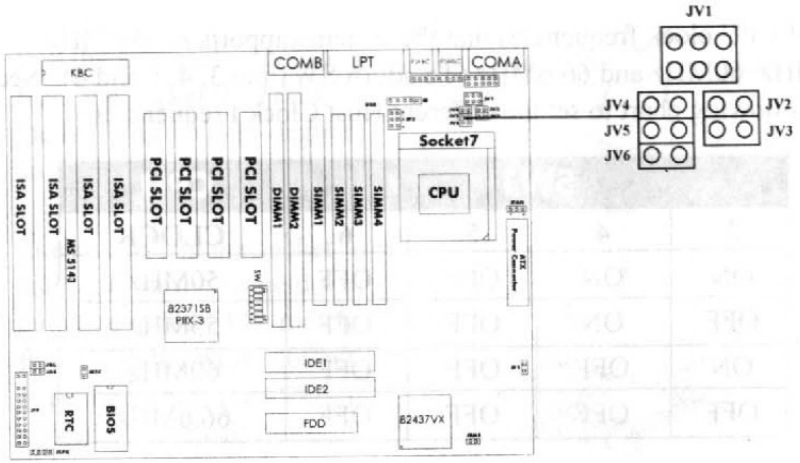
2. The DIP Switch SW1 (1,2) is used to set the Core/Bus (Fraction) ratio of the CPU. The actual core speed of the CPU is the Host Clock Frequency multiplied by the Core/Bus ratio. For example:

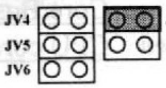
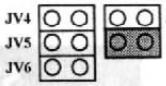
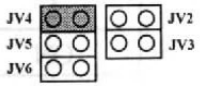
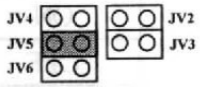
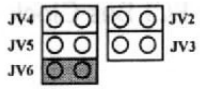
If CPU Clock = 66.6MHz
Core/Bus ratio = 3/2
then CPU core speed = Host Clock x Core/Bus ratio
= 66.6MHz x 3/2
= 100MHz

SW1		CPU
1	2	CORE/BUS RATIO
ON	ON	5/2
OFF	ON	3/1
ON	OFF	2/1
OFF	OFF	3/2

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

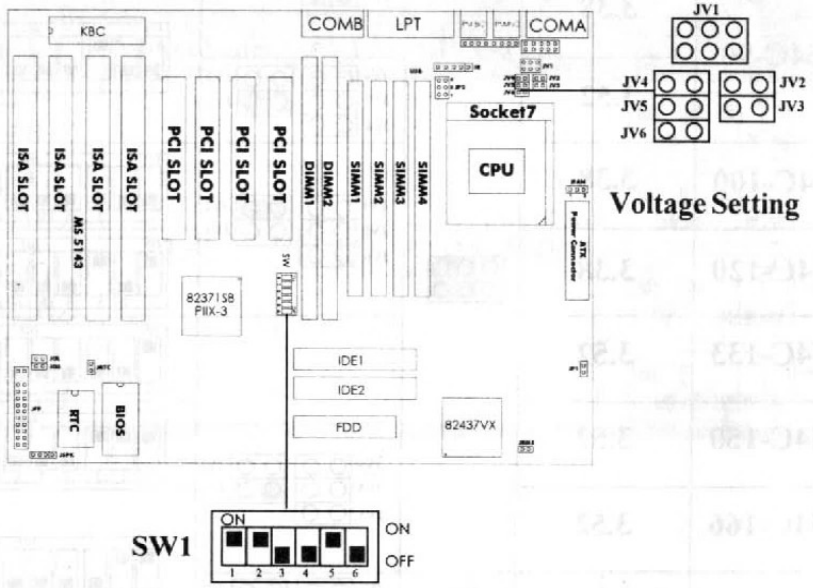
2.1-2 CPU Voltage Setting: JV1 - JV6



V I/O	Vcore	JV1	JV2~JV6
3.38	3.38		JV2 short 
3.52	3.52		JV3 short 
3.3	2.5		JV4 short 
3.3	2.8		JV5 short 
3.3	2.9		JV6 short 

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

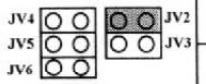
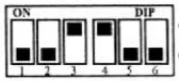
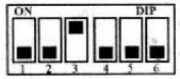
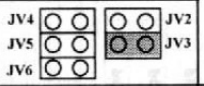
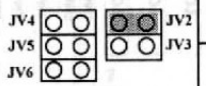
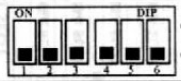
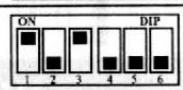
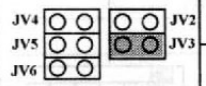
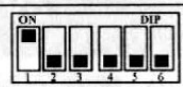
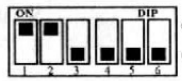
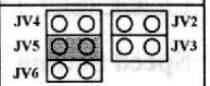
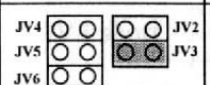
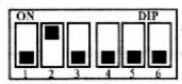
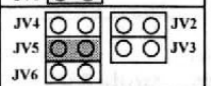
To adjust the speed and voltage of the CPU, you must know the specification of your CPU (*always ask the vendor for CPU specification*) then look at **Table 2.1 (Intel® P54C/P55C)**, **Table 2.2 (Cyrix® 6x86)** and **Table 2.3 (AMD® 5K86)** for proper setting.



Voltage Setting

Speed Setting

Table 2.1 Intel® P54C CPU

CPU Type	CPU Voltage				CPU Speed
	VI/O	Vcore	JV1	JV2~JV6	SW1
P54C-75	3.38				
P54C-90	3.38				
	3.52				
P54C-100	3.38				
P54C-120	3.38				
P54C-133	3.52				
P54C-150	3.52				
P54C-166	3.52				
P55C-166	3.33	2.8			
P54C-200	3.52				
P55C-200	3.33	2.8			

CHAPTER 2 HARDWARE INSTALLATION

Table 2.2 Cyrix® 6x86 CPU

Cyrix® 6x86 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® 6x86b CPU should always uses a more powerful fan (ask vendor for proper cooling fan).

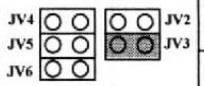
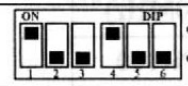
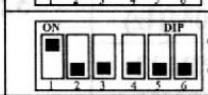
CPU Type	CPU Voltage				CPU Speed
	VI/O	Vcore	JV1	JV2~JV6	SW1
P120+ (100MHz)	3.52				
P133+ (110MHz)					
P150+ (120MHz)					
P166+ (133MHz)					

Table 2.3 AMD® 5K86 CPU

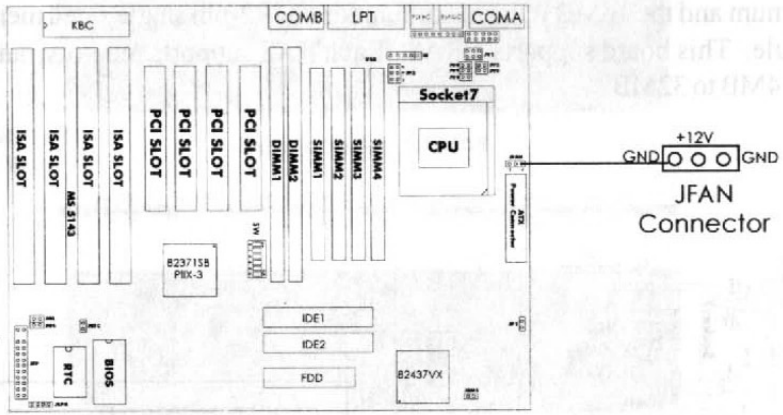
AMD® 5K86 CPU uses PR to rate the speed of there processor base on Intel® CPU core speed , for example P133+ (100MHz) has 133MHz core speed of Intel® but has 100MHz core speed in AMD® 5K86 CPU.

CPU Type	CPU Voltage				CPU Speed
	VI/O	Vcore	JV1	JV2~JV6	SW1
PR75 (75MHz)	3.52		JV1	JV4 JV5 JV6 JV2 JV3	
PR90 (90MHz)					
PR100 (100MHz)					
PR120 (90MHz)					
PR133 (100MHz)					
PR150 (105MHz)					
PR166 (116.7MHz)					

CHAPTER 2 HARDWARE INSTALLATION

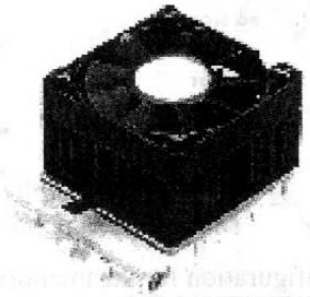
2.1-4 CPU Fan Power Connector: JFAN

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

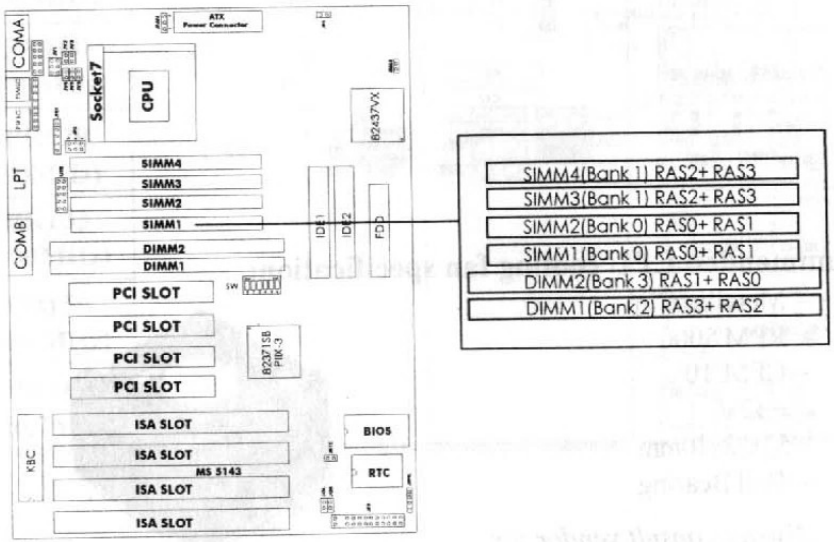


Note: *Always consult vendor for proper CPU cooling fan.*

2.2 Memory Installation

2.2-1 Memory Bank Configuration

The system board supports a maximum of 128M of memory, and provides four 72-pin SIMMs (Single In-Line Memory Module) and two 168-pin DIMM sockets. 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.



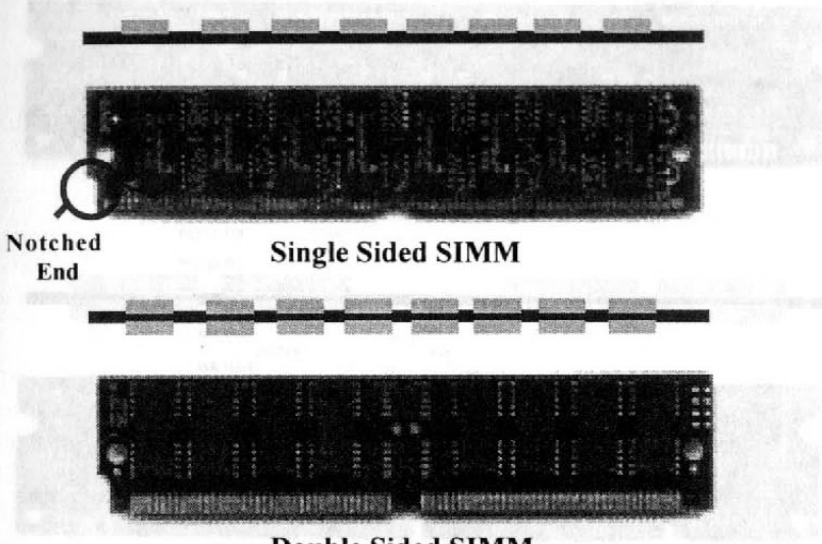
The configuration for the memory banks is in the table on the next page.

Warning! Memory bank 0 & 1's SIMM power level is 5 volts. Memory bank 2 & 3's DIMM power level is 3.3 volts or 5 volts depending on the JP2 setting. If you want to install both SIMM & DIMM slot, you must use a 3.3 volt DIMM with 5 volt I/O signal tolerance, otherwise it may cause damage to the DIMM.

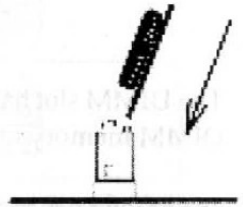
CHAPTER 2 HARDWARE INSTALLATION

2.2-2 Memory Installation Procedures:

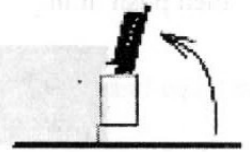
A. How to install a SIMM Module



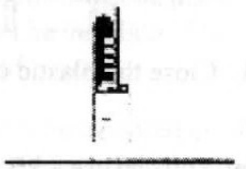
1. The SIMM slot has a "*Plastic Safety Tab*" and the SIMM memory module has a "Notched End", so the SIMM memory module can only fit in one direction.



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.

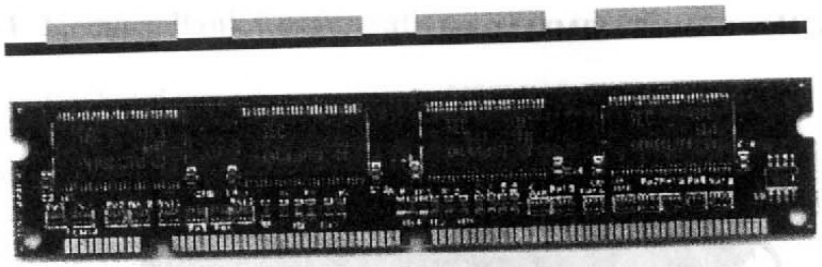


3. The Mounting Holes and Metal Clips should fit over the edge and hold the SIMM memory modules in place.

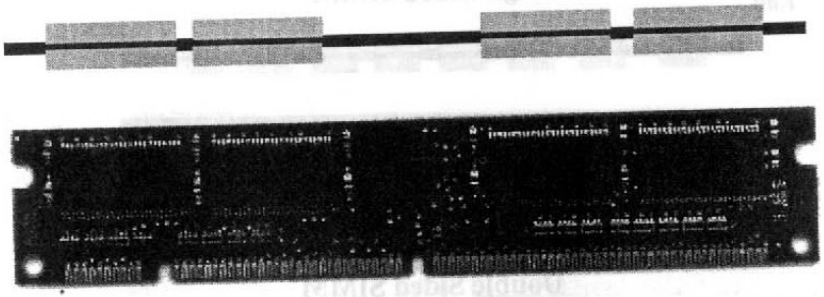


Note: Always use a 5 volts SIMM with 70 ns or above(Fast Page or EDO)

B. How to install a DIMM Module



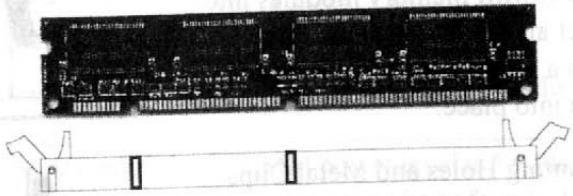
Single Sided DIMM



Double Sided DIMM

1. The DIMM slot has a two key mark "VOLT and DRAM" , so the DIMM memory module can only fit in one direction.

2. Insert the DIMM memory module vertically into the DIMM slot then push it in.

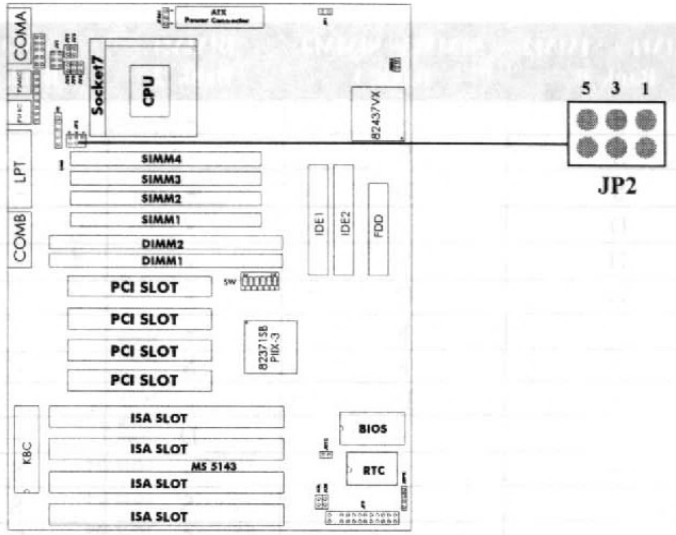


3. Close the plastic clip at the side of the DIMM slot.

Note: You can use a 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

B.1 DIMM Power Voltage Selector : JP2



DIMM Voltage	JP2
5V	5 3 1
3.3V	5 3 1

SIMM Power Level : 5 Volts DIMM Power Level : 3.3V or 5V

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 (DIMM 2).

S = Single D = Double Shaded = See Warning

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	S
-	-	S	D
-	-	D	S
-	-	-	D
-	-	D	D
S	-	-	S
S	-	S	-
S	-	S	S
S	-	D	-
S	-	D	S
-	S	-	S
-	S	S	-
-	S	S	S
-	S	-	D
-	S	S	D
S	S	-	S
S	S	S	-
S	S	S	S
D	-	S	-
D	-	D	-
D	S	S	-
-	D	-	S
-	D	-	D
S	D	-	S

2.3 Case Connector (JFP)

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.

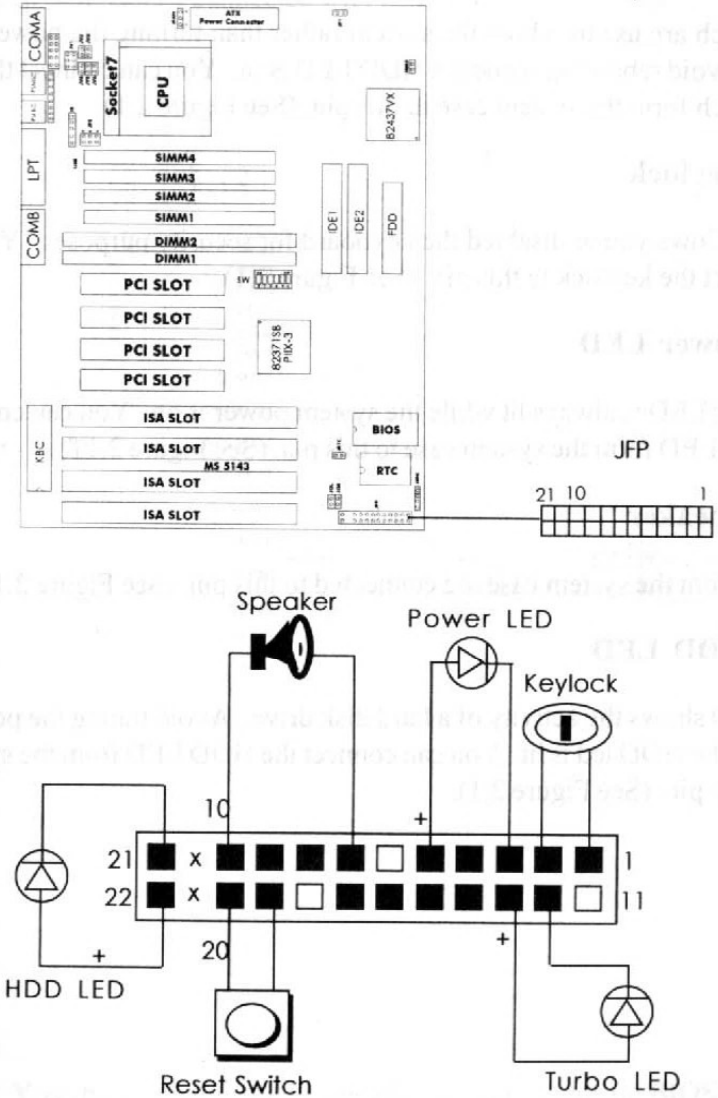


Figure 2.1