

Chapter 2

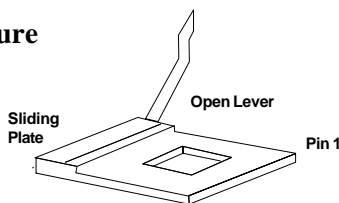
Hardware Installation

2.1 Central Processing Unit: CPU

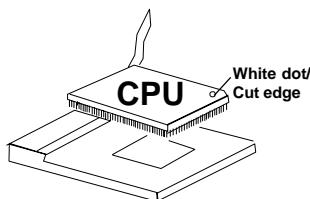
The **MSI LPX SI15** mainboard operates with **Intel® Pentium®/Pentium® with MMX™ technology**, **Cyrix® 6x86/6x86L/6x86MX**, **AMD® K5/K6** and **IDT C6™** processors. It could operate with 2.8V to 3.52V processors. The mainboard provides a 321-pin ZIF Socket 7 for easy CPU installation, a DIP switch (SW1) to set the proper speed for the CPU. The CPU should always have a cooling fan attached to prevent overheating.

2.1-1 CPU Installation Procedure

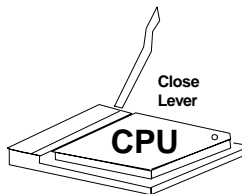
1. Pull the lever sideways away from the socket. Then raise the lever up to a 90-degree angle.



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.



2.1-2 CPU Core Speed Derivation Procedure

1. The DIP Switch SW1 (4, 5, and 6) is used to adjust the CPU Clock Frequency. See the following chart to set the different Host Clock Frequencies.

SW 1			CPU
4	5	6	Clock
ON	ON	OFF	50MHz
OFF	ON	ON	55MHz
ON	OFF	OFF	60MHz
OFF	OFF	OFF	66MHz
ON	OFF	ON	75MHz

2. The DIP Switch SW1 (1,2, and 3) 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 = 66MHz
 Core/Bus ratio = 1.5
then CPU core speed = Host Clock x Core/Bus ratio
 = 66MHz x 1.5/2
 = 100MHz

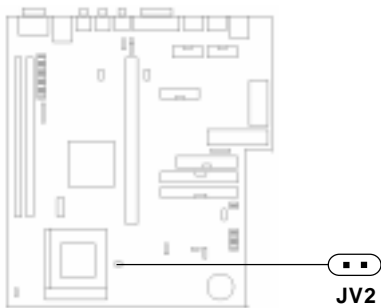
SW 1			CPU
1	2	3	Core/Bus Ratio
OFF	OFF	OFF	1.5 /3.5
ON	OFF	OFF	2
ON	ON	OFF	2.5/1.75
OFF	ON	OFF	3

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

2.1-3 CPU Jumperless Voltage Setting: JV1(reserved)/JV2

This mainboard provides a jumperless voltage setting. The moment you change your CPU, the BIOS will auto-detect and enter BIOS Setup menu. Press “F10” or select “Save and Exit”. The system will reboot.

JV2 is short, if you’re using an Intel®Pentium®Overdrive®processor.



2.1-4 CPU Speed Setting: SW1

To adjust the speed of the CPU, you must know the specification of your CPU (*always ask the vendor for CPU specifcation*). Then look at **Table 2.1 (Intel®Pentium®/Pentium®with MMX™ technology processor)**, **Table 2.2 (Cyrix®6x86/6x86L/6x86MX processor)**, **Table 2.3 (AMD®K5/K6 processor)** and **Table 2.4 (IDT C6™ processor)** for proper setting.

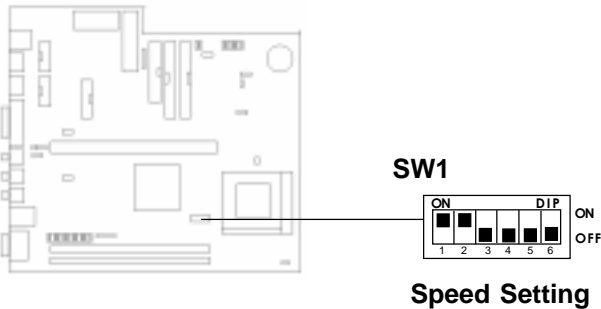

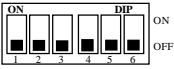
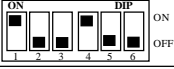






Table 2.1 Intel® Processor

Intel® Pentium® Processors

CPU Type	CPU Speed SW1
90MHz	
100MHz	
120MHz	
133MHz	
150MHz	
166MHz	
200MHz	

Intel® Pentium® Processors with MMX™ Technology

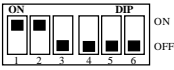

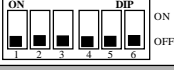


166MHz	
200MHz	
233MHz	

Table 2.2 Cyrix® Processor

Cyrix® processor uses PR to rate the speed of their processor based on Intel®Pentium®processor core speed. For example, P150 (120MHz) has 150MHz core speed of Intel®Pentium®processor but has 120MHz core speed in Cyrix®processor. Cyrix®processor should always uses a more powerful fan (ask vendor for proper cooling fan).

Cyrix® 6x86 Processors

CPU Type	CPU Speed SW1
PR166	 ON OFF
PR200	 ON OFF

Cyrix® 6x86MX Processors with MMX™ Technology
(reserved)














CPU Type	CPU Speed SW1
PR166 (60 x 2.5)	 ON OFF
PR200 (66 x 2.5)	 ON OFF
PR200 (75 x 2)	 ON OFF
PR233 (66 x 3)	 ON OFF
PR233 (75 x 2.5)	 ON OFF
PR266 (66 x 3.5)	 ON OFF
PR266 (75 x 3)	 ON OFF

Table 2.3 AMD® Processor

AMD® processor uses PR to rate the speed of there processor based on Intel®Pentium®processor core speed. For example, PR133 (100MHz) has 133MHz core speed of Intel®Pentium®processor but has 100MHz core speed in AMD® processor.

AMD® K5 Processors

CPU Type	CPU Speed SW1
PR90	 ON OFF
PR100	 ON OFF
PR120	 ON OFF
PR133	 ON OFF
PR150	 ON OFF
PR166	 ON OFF

AMD® K6 Processors with MMX™ Technology


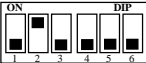
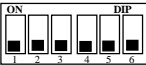
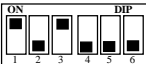
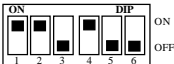

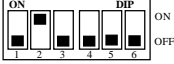
PR166 (166MHz)	 ON OFF
PR200 (200MHz)	 ON OFF
PR233 (233MHz)	 ON OFF
PR266 (266MHz)	 ON OFF

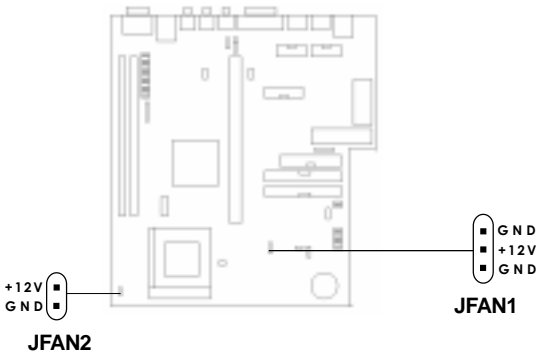
Table 2.4 IDT Processor

IDT C6™ Processors

CPU Type	CPU Speed SW1
150MHz	 ON OFF
180MHz	 ON OFF
200MHz	 ON OFF

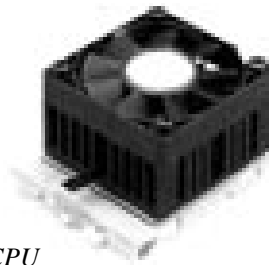
2.1-5 CPU Fan Connectors: JFAN1/JFAN2

These connectors support fan with +12V. When connecting the wire to the connector, always take note that the red wire is the positive and should be connected to the +12V pin. The black wire should be connected to GND. We recommend on using the JFAN2, for easy installation.



Recommended CPU cooling fan specification:

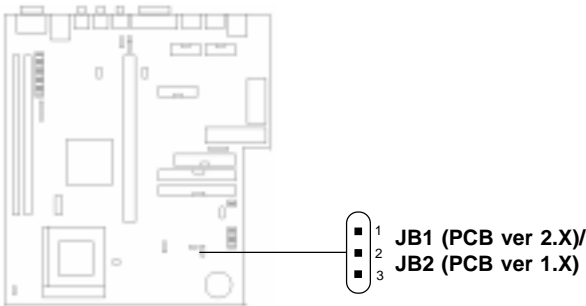
- Metallic Clip
- RPM 6000
- CFM 10
- +12V
- 52x52x10mm
- Ball Bearing
- Maximum HeatSink is 3cm.



Note: Always consult vendor for proper CPU cooling fan.

2.2 External Battery Connector: JB1/ JB2

A battery must be used to retain the system board configuration in CMOS RAM. If you use the on-board battery, you must short pins of JB1 to keep the CMOS data.

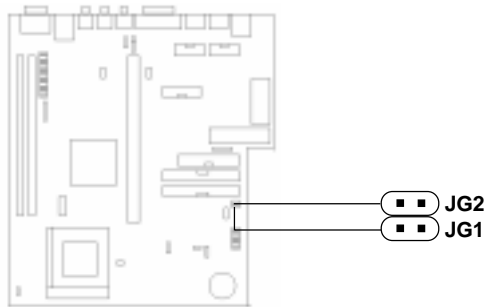


KEEP DATA	<p>1 2 3</p>
CLEAR DATA	<p>1 2 3</p>

2.3 Power Saving Switch Connector: JG1/ Power Saving LED Connector: JG2

Attach a power saving switch to JG1. When the switch is pressed, the system immediately goes into suspend mode. Press any key and the system wakes up. JG2 can be connected with LED to monitor the JG1.

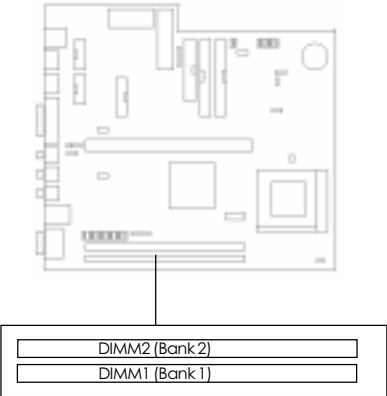
When you use an ATX power supply, shorting JG1 more than 4 sec will turn off the system.



2.4 Memory Installation

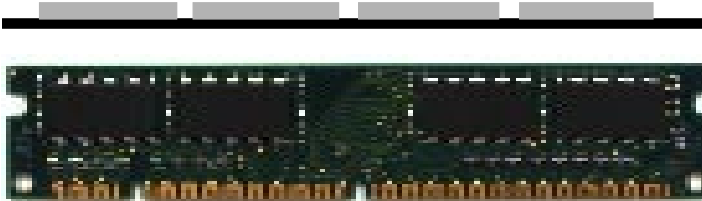
2.4-1 Memory Bank Configuration

The mainboard provides two 168-pin unbuffered DIMM(Double In-Line Memory) sockets to support a maximum of 128MB memory. You can use DIMM from 8MB, 16MB, 32MB, to 64MB.

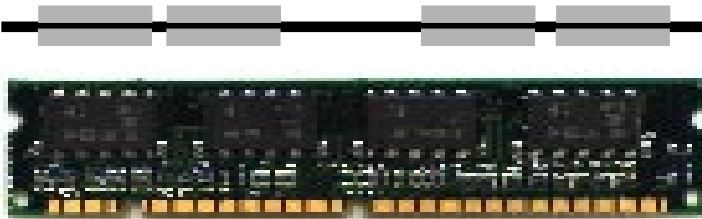


2.4-2 Memory Installation Procedures

A. How to install a DIMM Module

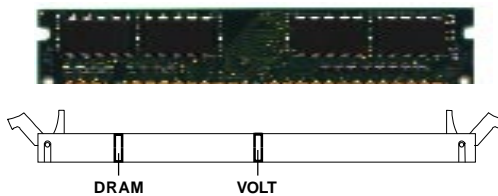


Single Sided DIMM



Double Sided DIMM

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



3. This will automatically close the plastic clip at the side of the DIMM slot.

2.4-3 Memory Population Rule

1. You can only use a 3.3v EDO and SDRAM DIMM.
2. You can only used an unbuffered DIMM.
3. To operate properly, at least one 168-pin DIMM module must be installed.
4. DIMM1 must be populated first.
5. You can mixed EDO and SDRAM.
6. The DRAM addressing and the size supported by the mainboard is shown below.

Memory Mapping Options

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

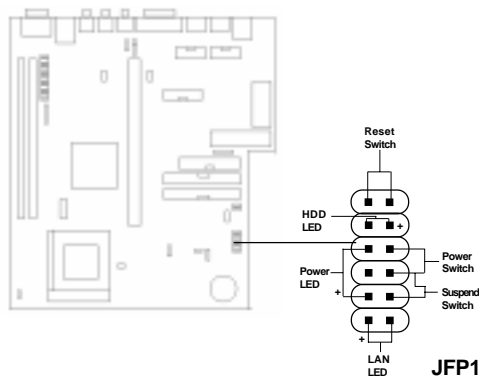


WARNING!

There are some SDRAM DIMM's that will not function properly with this mainboard. Please refer to Chapter 8: Memory Compatibility Test for more information.

2.5 Case Connector: JFP1

The Reset Switch, Power Switch, Power LED, Suspend Switch, LAN LED, and HDD LED all are connected to the JFP1 connector block.



2.5-1 Reset Switch

Reset switch are used to reboot the system rather than turning the power ON/OFF. You can connect the Reset switch from the system case to this pin. But avoid rebooting while the HDD LED is lit.

2.5-2 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.

2.5-3 Power Switch

If you are using an ATX power supply, this will allow you to turn the system from on to off and vice-versa. This connector have the same function with JRM1.

2.5-4 Suspend Switch

The Suspend Switch can be set in the BIOS Power Management Setup. When used as a Suspend Switch, this allows the user to suspend the system when not in use. It also has the same function as JG1.

2.5-5 HDD LED

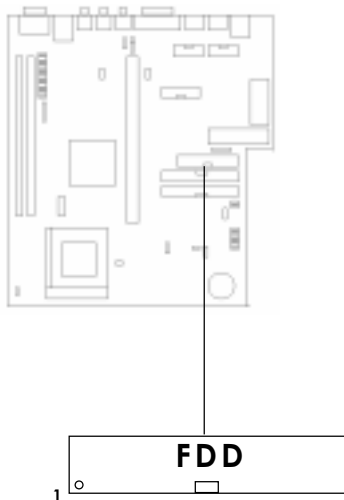
HDD LED shows the activity of a hard disk drive. Avoid turning the power off while the HDD led is lit. You can connect the HDD LED from the system case to this pin.

2.5-6 LAN LED

LAN LED will shows any activity on your network.

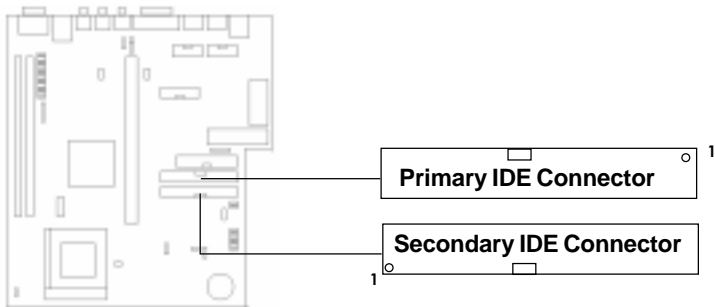
2.6 Floppy Disk Connector: FDD

The mainboard also provides a standard floppy disk connector FDD that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. You can attach a floppy disk cable directly to this connector.



2.7 Hard Disk Connector: HDD1 & HDD2

The mainboard has a 32-bit Enhanced PCI IDE Controller that supports PIO mode 4 and Ultra DMA33 speed. It has two HDD connectors, HDD1 (primary) and HDD2 (secondary). You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices to HDD1 and HDD2.



HDD1(primary IDE connector)

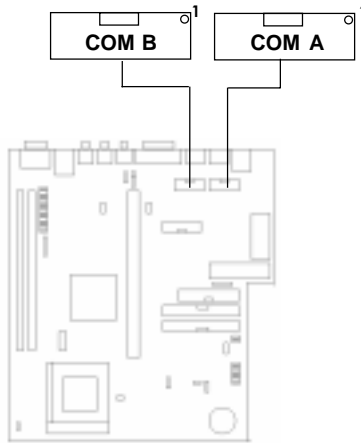
The first hard disk should always be connected to HDD1. HDD1 can connect a Master and a Slave drive.

HDD2(secondary IDE connector)

HDD2 can also connect a Master and a Slave drive.

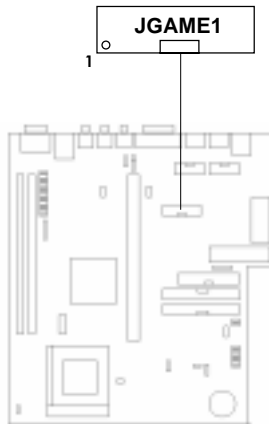
2.8 Serial Port Connectors: COM A & COM B

The mainboard has two 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.



2.9 MIDI/Joystick Connector: JGAME1

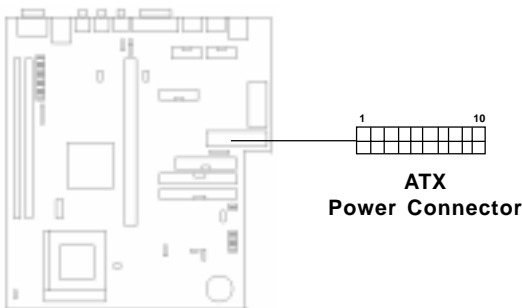
The mainboard provided a MIDI/Joystick connector for connecting the joystick port.



2.10 Power Supply

2.10-1 ATX 20-pin Power Connector: JATX1

This type of connector already supports the remote ON/OFF function.
However, you need to connect the **Remote Power On/OFF switch (JRM1)**.

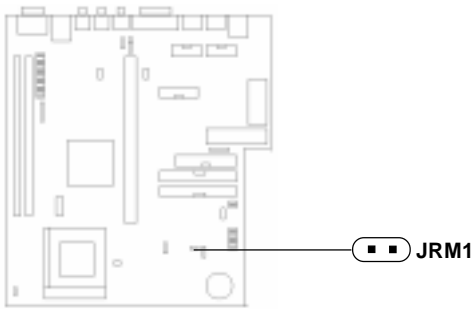


ATX Power Connector Pin Description

20	19	18	17	16	15	14	13	12	11
5V	5V	-5V	GND	GND	GND	PS_ON	GND	-12V	3.3V
12V	5V_SB	PW_Ok	GND	5V	GND	5V	GND	3.3V	3.3V
10	9	8	7	6	5	4	3	2	1

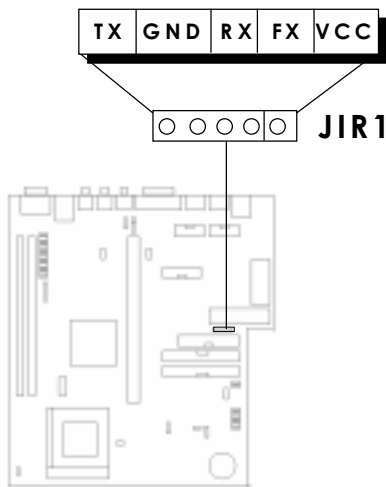
2.10-2 ATX Power On/Off Switch: JRM1

Connect to a 2-pin push button switch. Every time the switch is shorted by pushing it once, the power supply will change its status from OFF to ON or vice-versa.



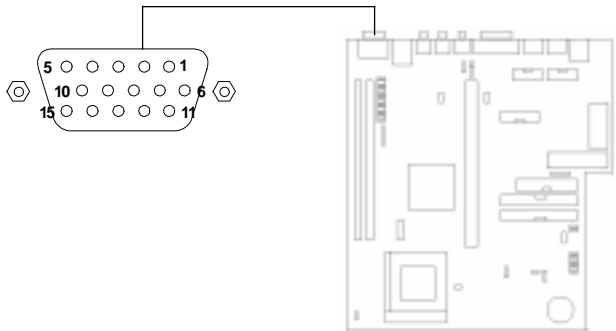
2.11 IrDA Infrared Module Connector: JIR1

The mainboard provides 5-pin infrared (IR) connectors for IR modules. This connector is for optional wireless transmitting and receiving infrared module. You must configure the setting through the BIOS setup.



2.12 VGA DB 15 Pin Connector

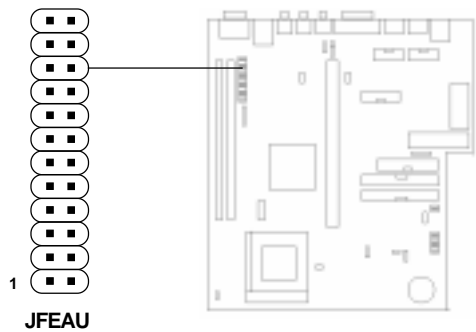
The mainboard provides a DB 15-pin connector to connect to a VGA monitor.



Analog Video Display Connector(DB15-S)	
Pin	Signal Description
1	Red
2	Green
3	Blue
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Not used
10	Ground
11	Not used
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

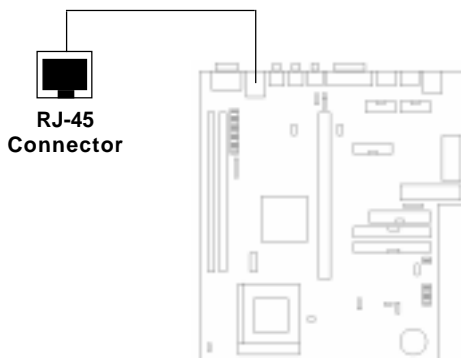
2.13 VGA Feature Connector: JFEAU

This is a standard 26-pin VGA feature connector use for TV-Tuner card and MPEG card.



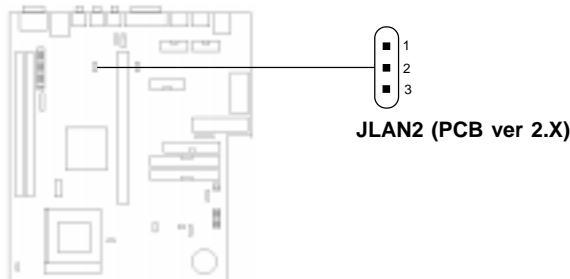
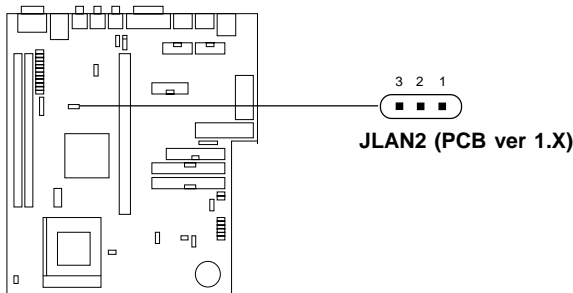
2.14 LAN Connector

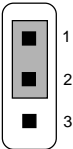
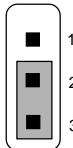
The mainboard provides a RJ-45 connector for your network need.



2.15 LAN Feature Connector: JLAN2

This connector is used to Enable/Disable the on-board LAN chip.

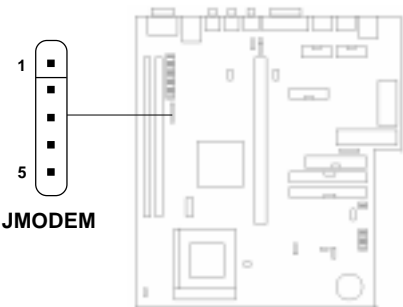


ENABLED	
DISABLED	

Note: Short pin 1-2, to enable the LAN.
Short pin 2-3 , to disable the LAN.

2.16 Modem Wake Up Connector: JMODEM

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

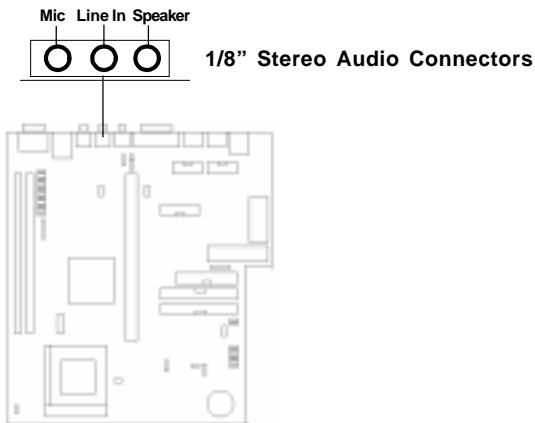


PIN	SIGNAL
1	NC
2	GND
3	MDM_WAKEUP
4	NC
5	5VSB

Note: Modem wake-up signal is active “low”.

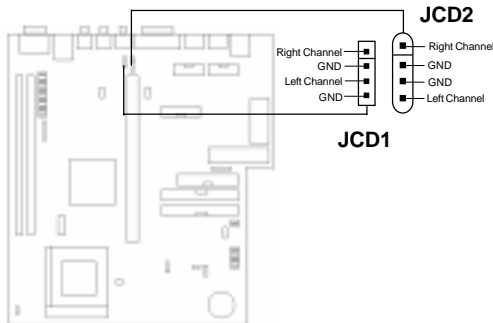
2.17 Audio Port Connectors

Speaker is a connector for Speaker or Headphone. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is used for connecting microphone.



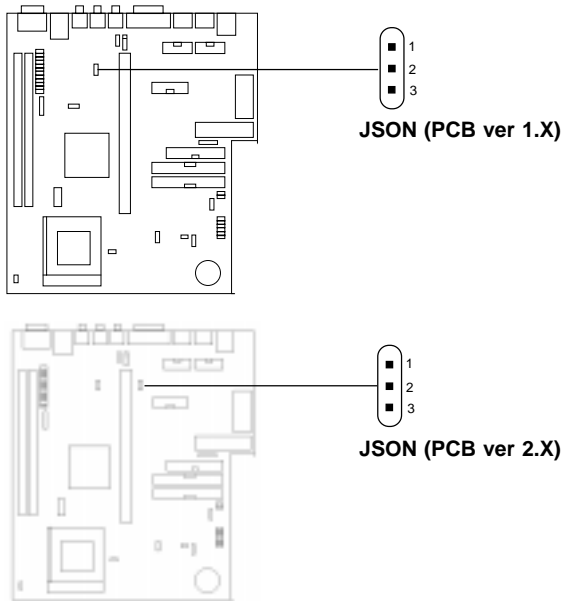
2.18 CD Audio Connectors: JCD1 & JCD2

This can be connected to the audio cable provided by the CD-ROM.



2.19 Audio Feature Connector: JSON

This connector is used to Enable/Disable the on-board audio chip.

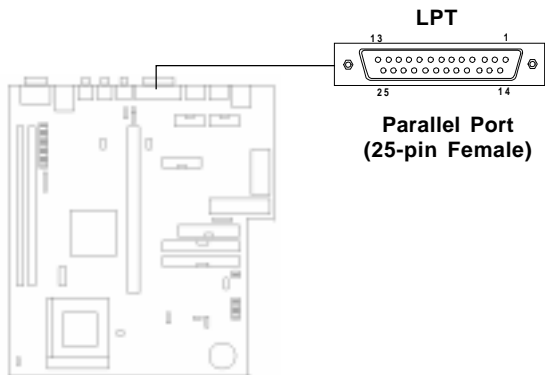


ENABLED	<p>A vertical oval representing the JSON connector. The top two pins, labeled 1 and 2, are enclosed in a shaded rectangular box, indicating they are shorted. Pin 3 is below the box and is not shorted.</p>
DISABLED	<p>A vertical oval representing the JSON connector. The bottom two pins, labeled 2 and 3, are enclosed in a shaded rectangular box, indicating they are shorted. Pin 1 is above the box and is not shorted.</p>

Note: Short pin 1-2, to enable the audio function.
Short pin 2-3 , to disable the audio function.

2.20 Parallel Port Connector: LPT

The mainboard provides a connector for LPT. A parallel port is a standard printer port that also supports Enhanced Parallel Port(EPP) and Extended capabilities Parallel Port(ECP).

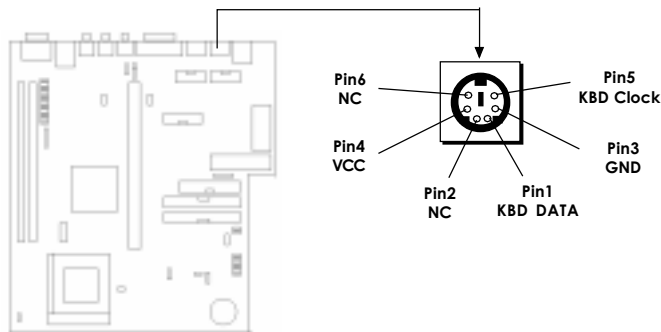


PIN DEFINITION

PIN #	DEFINITION	PIN #	DEFINITION
1	STROBE	14	AUTO FEED#
2	DATA0	15	ERR#
3	DATA1	16	INIT#
4	DATA2	17	SLIN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACK#	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SELECT		

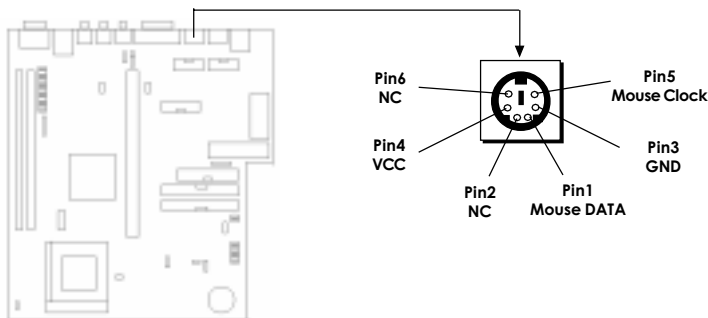
2.21 Keyboard Connector: JS2KB

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.



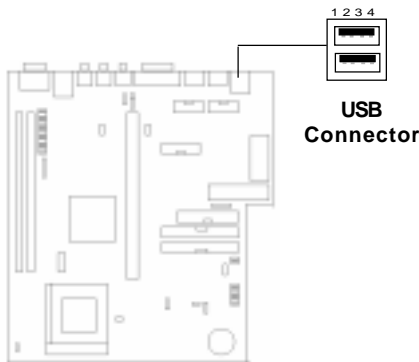
2.22 Mouse Connector: JS2MS

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:



2.23 USB Connector: USB

The mainboard provides a **USB(Universal Serial Bus)** connector for attaching a keyboard, mouse or other USB devices. You can plug it directly to this connector.



PIN1:	VCC
PIN2:	DATA-
PIN3:	DATA+
PIN4:	GND

2.24 Riser Card Slot: EISA1

The mainboard provides a riser card slot to install the MS-5926 riser card. The MS-5926 riser card provides one PCI/one ISA or two ISA slot. The PCI slot supports 3.3v add-on card.



MS-5926

