Chapter 3

## Hardware Installation

3.1 Central Processing Unit: CPU

The **LPX VI15** mainboard operates with **Intel® Pentium® processor w/ MMX™ technology**, **Cyrix®/IBM 6x86L/6x86MX**, **AMD® K5/K6/K6-2/K6-III** and **IDT™ Winchip** processors**.** It could operate with 1.8V to 3.52V processors. The mainboard provides a 321-pin ZIF Socket 7 for easy CPU installation. The CPU should always have a cooling fan attached to prevent overheating.
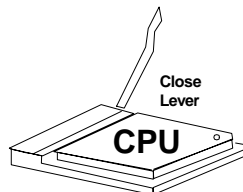
3.1-1 CPU Installation Procedures

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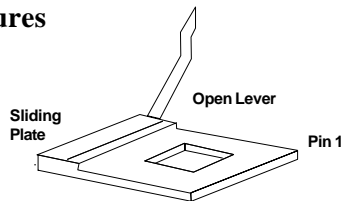
2. Locate Pin 1 in the socket and look for the white dot or cut edge in the CPU. Match Pin 1 with the white dot/cut edge. Then, insert the CPU. It should insert easily.
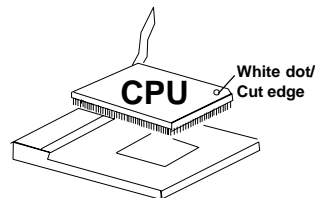
3. Press the lever down to complete the installation.

3.1-2   CPU Core Speed Derivation Procedures

1. The DIP Switch SW1 (1, 2, and 3) are 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	=	3.5
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	66MHz x 3.5
		=	233MHz

SW1			CPU
1	**2**	**3**	**Core/Bus Ratio**
ON	OFF	OFF	2
ON	ON	OFF	2.5
OFF	ON	OFF	3
OFF	OFF	OFF	3.5
ON	OFF	ON	4
ON	ON	ON	4.5
OFF	ON	ON	5
OFF	OFF	ON	5.5

2. The DIP Switch SW1 (5, 6, 7, and 8) are used to adjust the CPU clock frequency.

SW1				Clock
5	6	7	8	CPU
OFF	OFF	OFF	OFF	60
ON	OFF	OFF	OFF	66
OFF	OFF	OFF	ON	75
ON	OFF	ON	OFF	83.3
OFF	ON	ON	OFF	95
ON	ON	ON	OFF	100

3.1-3 Processor Voltage Setting

The Jumper Switch JV1 is used to set the processor voltage setting.

JV1
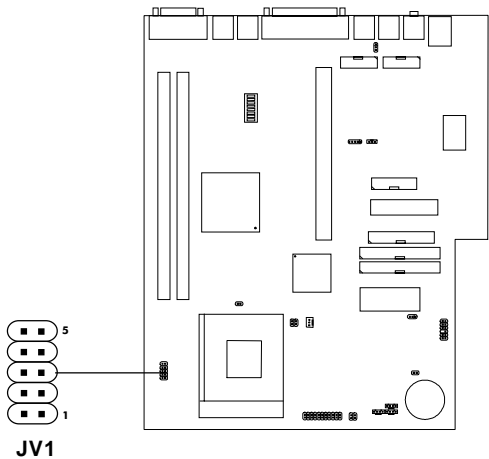
JV1					
1	**2**	**3**	**4**	**5**	**Vcore**
OPEN	SHORT	OPEN	OPEN	OPEN	2.2
SHORT	SHORT	OPEN	OPEN	OPEN	2.3
OPEN	OPEN	SHORT	OPEN	OPEN	2.4
OPEN	SHORT	SHORT	OPEN	OPEN	2.5
OPEN	OPEN	OPEN	SHORT	OPEN	2.8
SHORT	OPEN	OPEN	SHORT	OPEN	2.9
OPEN	OPEN	SHORT	SHORT	OPEN	3.2
SHORT	SHORT	SHORT	SHORT	OPEN	3.5

Note: Always consult vendor for proper CPU specification, before setting the processor voltage (Vcore/Vio). Improper setting may damage the processor and other components.

a. Processor Single/Dual Voltage Setting: JV2/JV3

CPU comes with single or dual voltage. Ask vendor for CPU setting and set accordingly.
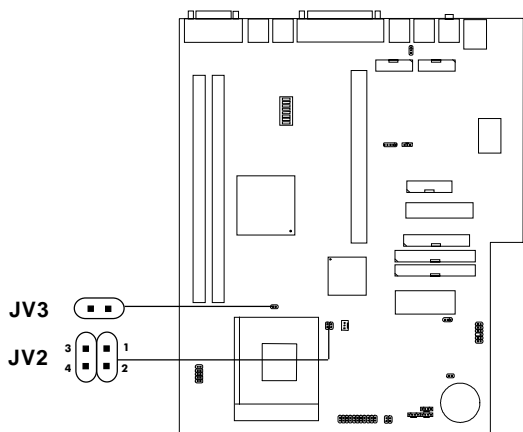
JV3	JV2	Voltage
		Single Voltage
		Dual Voltage (default)

3.1-4 CPU Speed and Voltage Setting: SW1 & JV1

To adjust the speed and voltage of the CPU, you must know the specifications of your CPU (*always ask the vendor for CPU specifications*). Then refer to **Table 2.1 (Intel® processors)**, **Table 2.2 (Cyrix® processors)** and **Table 2.3 (AMD® processors)** for proper setting.
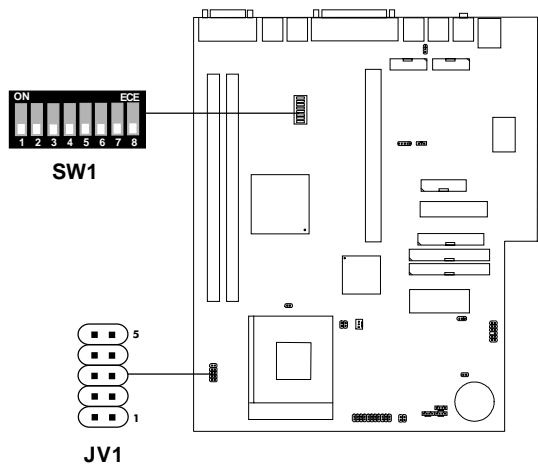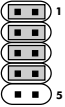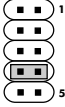
Table 3.1 Intel® processors

Intel® Pentium® processors

CPU Type	CPU Speed & Voltage					
	VI/O	Vcore	JV1	JV2	JV3	SW1
100MHz						
133MHz	3.5					
166MHz						
200MHz						

Intel® Pentium® processors with MMX™ technology
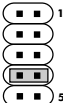
166MHz						
200MHz	3.3	2.8				
233MHz						

Note: If you encounter a CPU with different voltage, just go to Section 2.1-3 and look for the proper voltage settings.

Table 3.2 Cyrix® processors
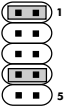
Cyrix® 6x86 processor uses PR to rate the speed of their processors based on Intel® Pentium® processor core speed. For example PR150 (120MHz) has 150MHz core speed of Intel® Pentium® processor but has 120MHz core speed in Cyrix®. Cyrix® 6x86 processor should always use a more powerful fan (ask vendor for proper cooling fan).

Cyrix® 6x86L processors

CPU Type	CPU Speed & Voltage					
	VI/O	Vcore	JV1	JV2	JV3	SW1
6x86L PR166	3.4	2.8				
6x86L PR200						

Cyrix® 6x86MX Processor

CPU Type	CPU Voltage					CPU Speed
	VI/O	Vcore	JV1	JV2	JV3	SW1
PR200 (66 x 2.5)	3.3	2.9				ON ... ECE 1 2 3 4 5 6 7 8
PR233 (75 x 2.5)						ON ... ECE 1 2 3 4 5 6 7 8
(66 x 3)						ON ... ECE 1 2 3 4 5 6 7 8
(83 x 2)			JV1 (1-5)	JV2 (1-4, 1-2)	JV3	ON ... ECE 1 2 3 4 5 6 7 8
PR266 (75 x3)						ON ... ECE 1 2 3 4 5 6 7 8
(66 x 3.5)						ON ... ECE 1 2 3 4 5 6 7 8
(83 x 2.5)						ON ... ECE 1 2 3 4 5 6 7 8
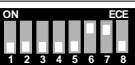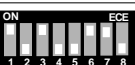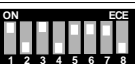
Cyrix® MII Processor

CPU Type	CPU Voltage					CPU Speed
	VI/O	Vcore	JV1	JV2	JV3	SW1
PR300 (66 x 3.5)	3.3	2.9				ON ... ECE 1 2 3 4 5 6 7 8
(75 x 3)			JV1 (1-5)	JV2 (3-4, 1-2)	JV3	ON ... ECE 1 2 3 4 5 6 7 8
PR333 (83 x 3)						ON ... ECE 1 2 3 4 5 6 7 8

Note: If you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.

Table 3.3 AMD® Processor

AMD® K6/K6-2/K6-3 Processor

CPU Type	CPU Voltage					CPU Speed
	VI/O	Vcore	JV1	JV2	JV3	SW1
166MHz	3.3	2.9	(JV1 diagram)	(JV2 diagram)	(JV3 diagram)	ON ... ECE 1 2 3 4 5 6 7 8
200MHz						ON ... ECE 1 2 3 4 5 6 7 8
233MHz	3.3	3.2	(JV1 diagram)	(JV2 diagram)	(JV3 diagram)	ON ... ECE 1 2 3 4 5 6 7 8
266MHz	3.3	2.2	(JV1 diagram)	(JV2 diagram)	(JV3 diagram)	ON ... ECE 1 2 3 4 5 6 7 8
300MHz						ON ... ECE 1 2 3 4 5 6 7 8
K6-2 300MHz						ON ... ECE 1 2 3 4 5 6 7 8
K6-2 333MHz						ON ... ECE 1 2 3 4 5 6 7 8
K6-2 350MHz						ON ... ECE 1 2 3 4 5 6 7 8
K6-2 380MHz						ON ... ECE 1 2 3 4 5 6 7 8
K6-2 400MHz						ON ... ECE 1 2 3 4 5 6 7 8
K6-2 450MHz	3.3	2.4	(JV1 diagram)	(JV2 diagram)	(JV3 diagram)	ON ... ECE 1 2 3 4 5 6 7 8
K6-III 400MHz						ON ... ECE 1 2 3 4 5 6 7 8
K6-III 450MHz						ON ... ECE 1 2 3 4 5 6 7 8

3.1-5 CPU Fan Connector: CFAN1

This connector supports 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 and the black one to GND.
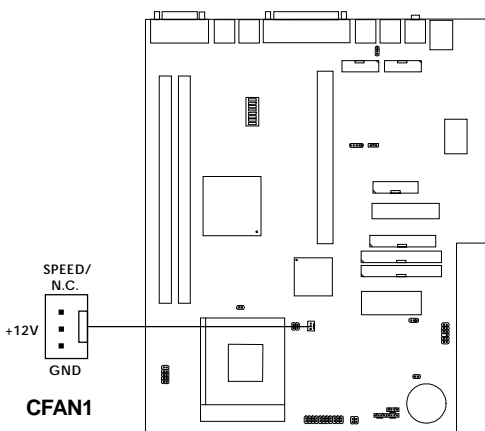
Note: Always consult vendor for proper CPU cooling fan.

3.2 Clear CMOS Jumper: JBAT1

A battery must be used to retain the mainboard configuration in CMOS RAM. To retain the on-board battery you must always short pins 1-2 of JBAT1.
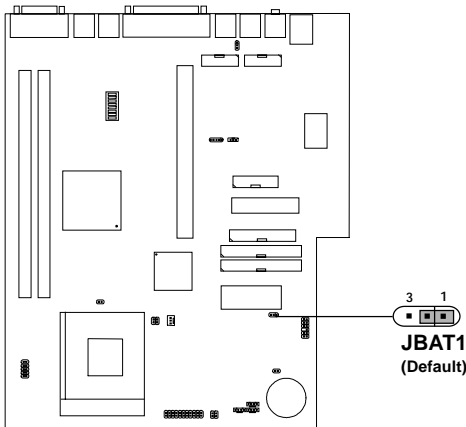
JBAT1
(Default)

JBAT1	Function
3 1 ⊡ ▪	**Keep Data**
3 1 ▪ ⊡	**Clear Data**

Note: You can clear CMOS by shorting 2-3 pin, while the system is off.   Leave for about 5 to 10 seconds. Then, return to 1-2 pin position. Avoid clearing the CMOS while the system is on for it will damage the mainboard. Always unplug the power cord from the wall socket.

3.3 Memory Installation

3.3-1 Memory Bank Configuration

The mainboard provides two unbuffered 168-pin DIMM(Double In-Line Memory) sockets. It supports four memory banks for a maximum of 256MB memory. Each bank supports up to 128MB memory. You can use DIMM from 8, 16, 32, 64, to128MB.
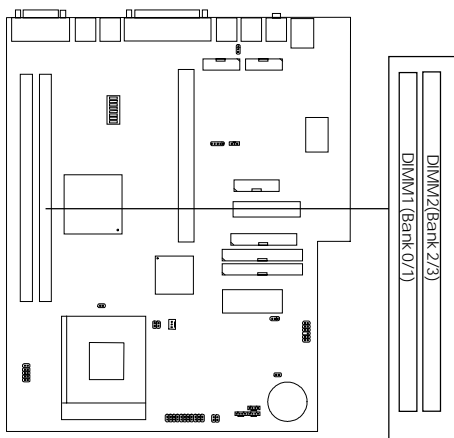
⚠ WARNING!	There are two kinds of DIMM specification supported by this mainboard: PC100 and PC66. 100Mhz CPU Bus Frequency processor can only be used with PC100 or Higher(PC133) DIMM.

3.3-2   Memory Installation Procedures:

b. How to install a DIMM Module
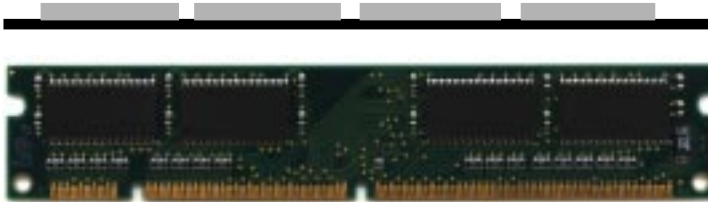
Single Sided DIMM
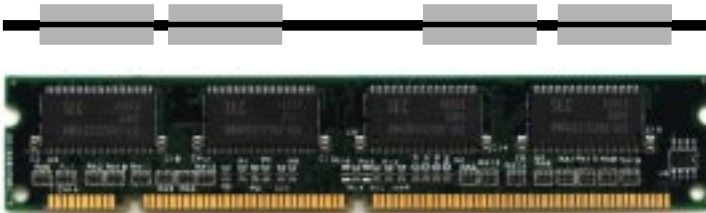
Double Sided DIMM

1. The DIMM slot has 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.


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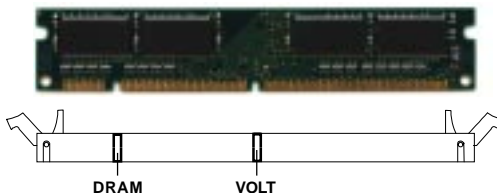
3. Close the plastic clip at the side of the DIMM slot.

3.3-3   Memory Population Rules

1. To operate properly, at least one 168-pin DIMM module must be installed.

2. This mainboard supports Table Free memory, so memory can be installed on (DIMM1) or (DIMM2) in any order.

3. Use only 3.3v DIMM memory module.

3.4 Case Connector: JFP1

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

JFP1
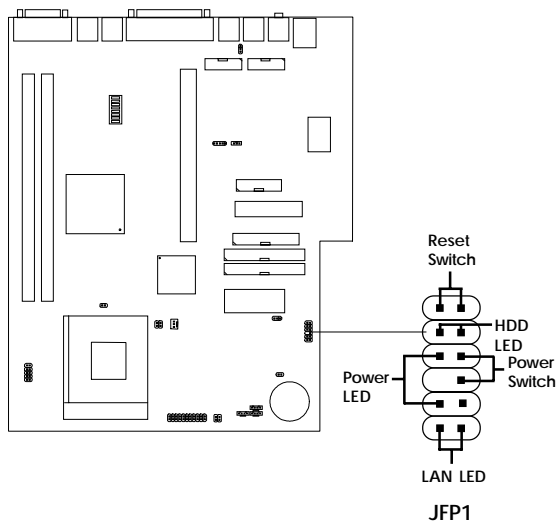
3.4-1 Power Switch
Connect to a 2-pin push button switch. This switch had the same feature with JRMS1.

3.4-2 Reset Switch
Reset switch is used to reboot the system rather than turning the power ON/ OFF. Avoid rebooting while the HDD LED is lit. You can connect the Reset switch from the system case to this pin.

3.4-3 Power LED
The Power LED is lit while the system power is on. You can connect the Power LED from the system case to this pin. When the system enters suspend mode, the power LED will blink. (see Power Saving LED Connector: JGL1)

3.4-4 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.

3.4-5 LAN LED
This can be connected with LED that will shows any activity on your network.

3.5 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.
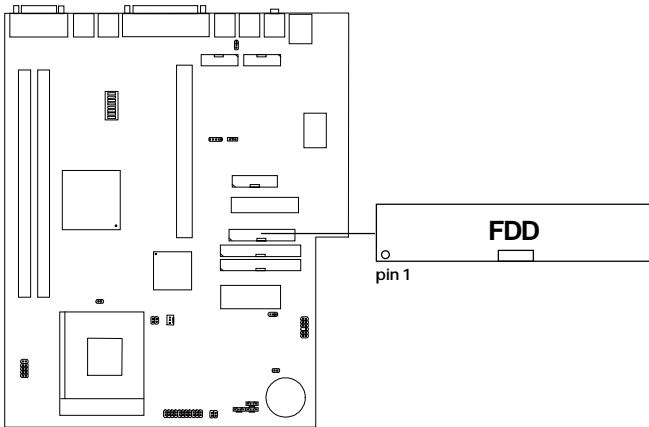
3.6 Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE Controller that provides for two HDD connectors IDE1 (primary) and IDE2 (secondary). You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices to IDE1 and IDE2.
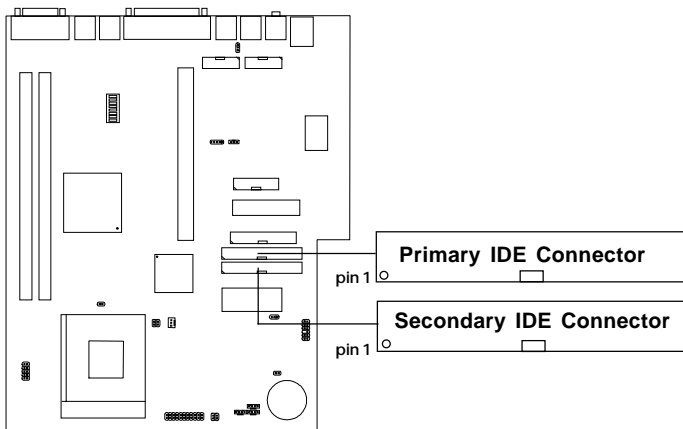
IDE1 (primary IDE connector)

> The first hard disk should always be connected to IDE1. IDE1 can connect a Master and a Slave drive.

IDE2 (secondary IDE connector)

> IDE2 can connect a Master and a Slave drive.

3.7 ATX 20-pin Power Connector

This type of connector already supports the remote ON/OFF function.
However, you need to connect the **Remote Power On/OFF switch (JRMS1).**

ATX
Power Connector
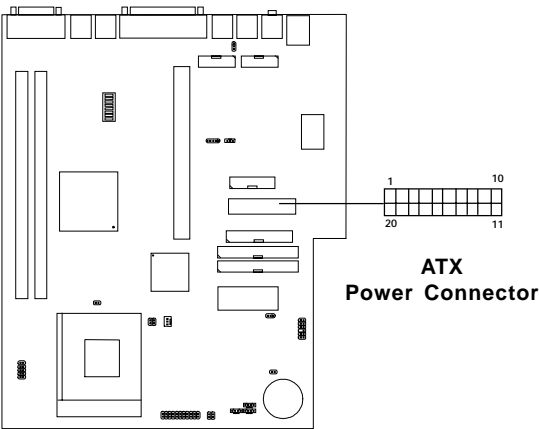
PIN DEFINITION

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

3.7-1 Remote Power On/Off Switch: JRMS1

Connect to a 2-pin push button switch. During OFF state, press once and the system turns on. **During ON stage, push once and the system goes to sleep mode: pushing it more than 4 seconds will change its status from ON to OFF**. If you want to change the setup, you could go to the BIOS Power Management Setup. This is only used for ATX type power supply.

JRMS1
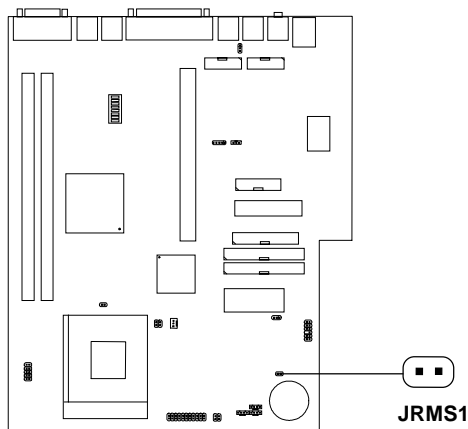
3.8 Serial Port Connectors: COM 1 & COM 2

The mainboard provides two serial port (COM 1 and COM 2) connectors. These two connectors 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.
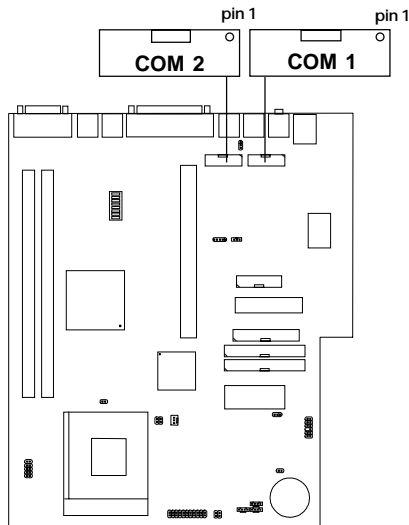
3.9 VGA DB 15 Pin Connector

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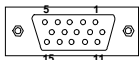
VGA

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

3.10 S-Out and AV-Out Connector

The mainboard provides two TV-Out Connector: S-Out and AV-Out. This mainboard can only support one monitor, either PC monitor or TV-Out at a time, but not at the same time.
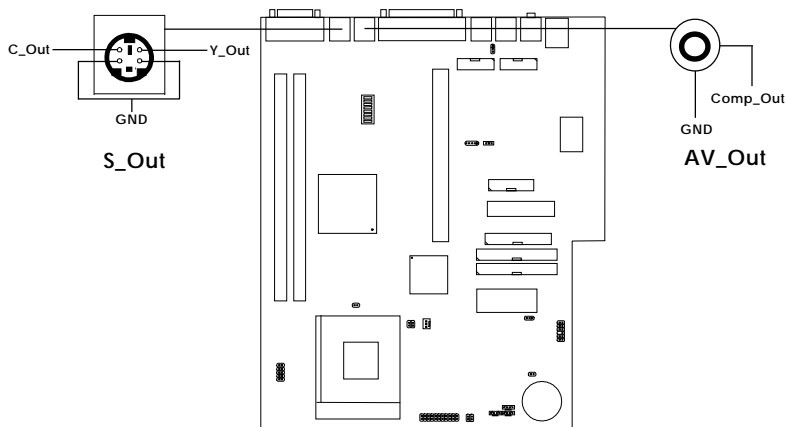
Note: If you want to use TV-Out, you need to remove the PC monitor cable and connect the TV before turning on the system. If not, then the PC Monitor will still be your monitor.

3.11 Parallel Port Connector: LPT

The mainboard provides a 25 pin female centronic connector for LPT. A parallel port is a standard printer port that also supports Enhanced Parallel Port(EPP) and Extended capabilities Parallel Port(ECP). See connector and pin definition below:
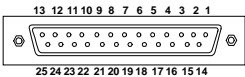
LPT

PIN DEFINITION

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

3.12 Mouse Connector: JMS1

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:

Pin6
NC

Pin5
Mouse Clock

Pin3
GND

Pin4
VCC

Pin1
Mouse DATA

Pin2
NC

PS/2® Mouse (6-pin Female)
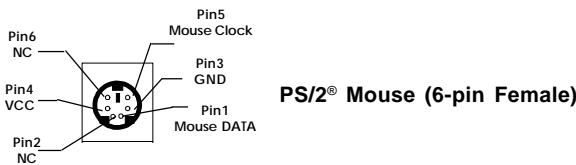
3.13 Keyboard Connector: JKB1

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.

Pin5
KBD Clock

Pin6
NC

Pin4
VCC

Pin2
NC

Pin1
KBD DATA

Pin3
GND

PS/2® Keyboard (6-pin Female)

3.14 Audio Port Connector

Speaker is a connector for Speakers or Headphones.

Line Out

1/8" Stereo Audio Connector

3.15 LAN Connector

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

**RJ-45
Connector**
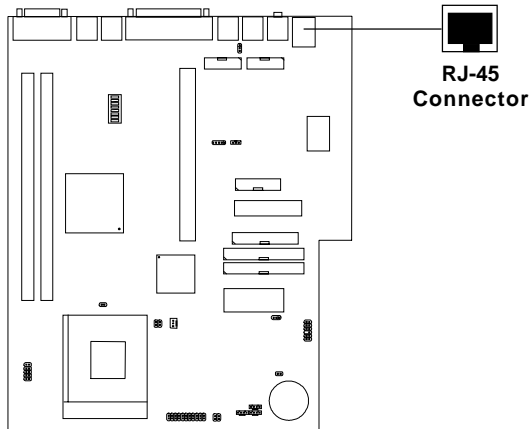
3.16 Infrared Module Connector: IR (Sound1)

The mainboard provides a 4-pin infrared connector(IR) for IR module. This connector is for optional wireless transmitting and receiving infrared module. If you want to use this function, you must configure the setting through BIOS setup.

IR (Sound 1)
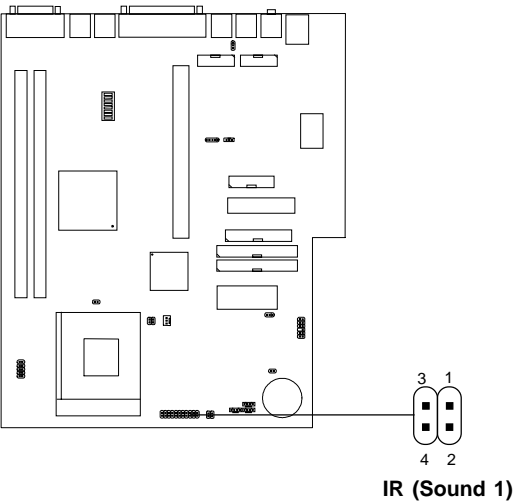
PIN	SIGNAL	DESCRIPTION
1	IRRX	IRRX
2	IRTX	IRTX
3	CIR	Consumer IR
4	5VSB	5V Stand By

3.17 USB Connector: USB1

Connect a USB cable to support USB device, such as keyboard and mouse.

USB1

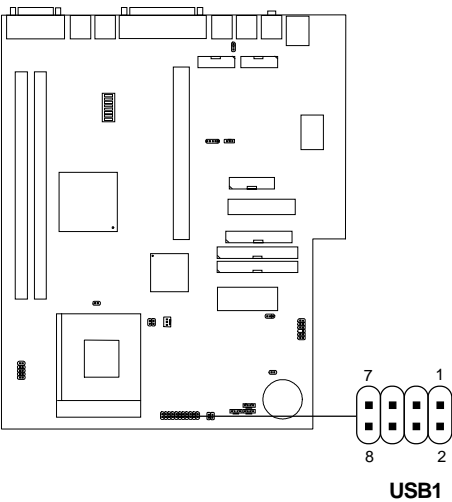| PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	VCC	+5V
3	-Data 0	Negative Data Channel 0
4	-Data 1	Negative Data Channel 1
5	+Data 0	Positive Data Channel 0
6	+Data 1	Positive Data Channel 1
7	GND	Ground
8	GND	Ground

USB Port Description

3.18 Wake-Up on LAN Connector: JWOL1

The JWOL1 connector is for use with LAN add-on cards that supports
Wake Up on LAN function.
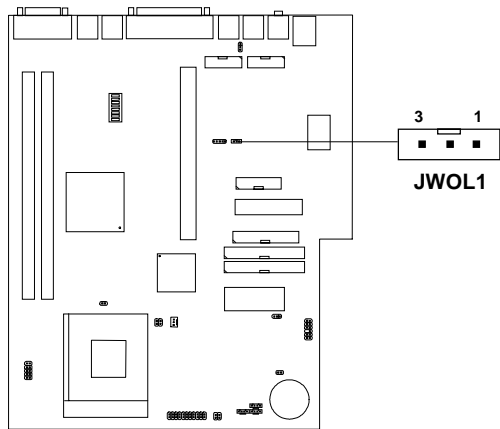
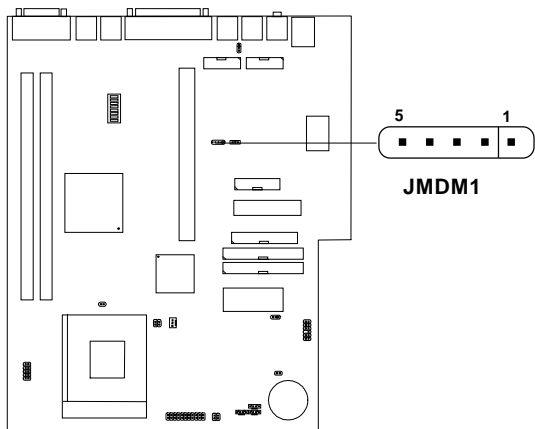| PIN	SIGNAL
1	5VSB
2	GND
3	MP_WAKEUP

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

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

3.19 Modem Wake Up Connector: JMDM1

The JMDM1 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".

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

3.20 Modem-In: JTAD1

The connector is for Modem with internal voice connector.
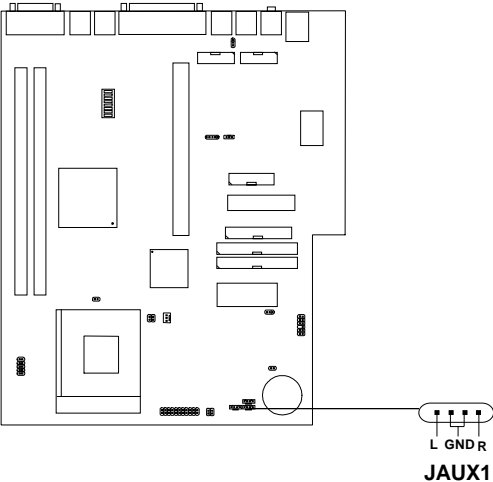

JTAD1
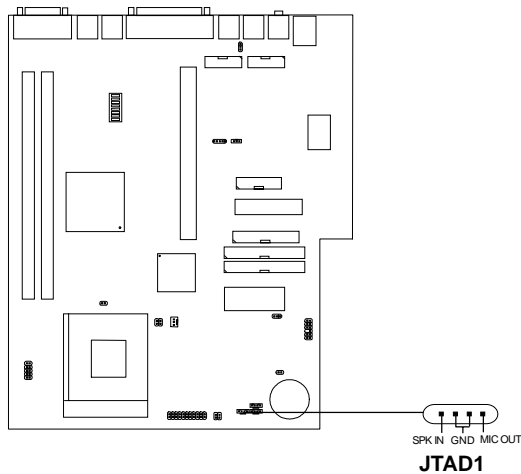
SPK_IN is connected to the Modem Speaker Out connector.
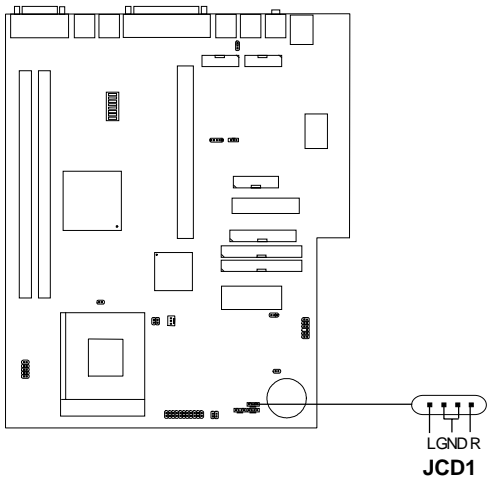MIC_OUT is connected to the Modem Microphone In connector.

3.21 AUX Line In Connector: JAUX1

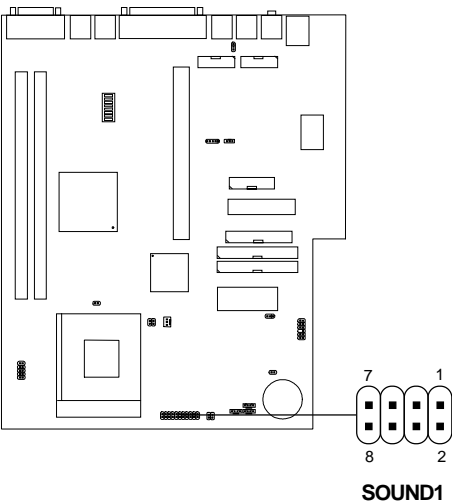This connector is used for DVD Add on Card with Line In connector.

JAUX1

3.22 CD-In Audio Connector: JCD1

This connector is for CD-ROM with internal voice connector.

LGND R

JCD1

3.23 Front Panel Sound Connector: SOUND1

Connect the Front Panel Bezel audio into this connector.

SOUND1

PIN	SIGNAL	DESCRIPTION
1	Line-In L	Line-In Left side
2	MIC In	Microphone In
3	Line-In R	LIne-In Right side
4	NC	No Connection
5	Line-Out L	LIne-Out Left side
6	Speaker L	Speaker Left side
7	Line-Out R	Line-Out Right side
8	Speaker R	Speaker Right side

3.24 Case Speaker Connector: JSPL/JSPR

These connectors are used for case with built-in speaker. JSPL is left side speaker connector, while JSPR is right side speaker connector.