# EP-PT22
# Motherboard of
# Pentium with MMX™
# User's Manual

Order Number 4101003
November 1997

# EC-Conformity Declaration

CE (EC conformity marking)

FOR THE FOLLOWING EQUIPMENT:

| | | |
|---|---|---|
| Product Name | : | MOTHERBOARD |
| Model | : | EP-PT22 |
| Manufacturer Address: | | 6FL., No. 19, Wu Chuan 6 Rd., Wu-Ku Industrial Park, Taipei, Taiwan, R.O.C. |

IS HEREWITH CONFIRMED TO COMPLY WITH THE EQUIPMENTS SET UP IN THE COUNCIL DIRECTIVE ON THE APPROXIMATION OF THE LAW OF MEMER STATES RELATING TO ELECTROMAGNETIC COMPATIBILITY (89/336/EEC) AND LOW VOLTAGE DIRECTIVE 78/28/EEC. FOR THE EVALUATION REGARDING THE ELECTROMAGNETIC COMPATIBILITY AND SAFETY, THE FOLLOWING STANDARDS WERE APPLIED:

- EN50081-1 (1992): GENERIC EMISSION STANDARDS
  EN550022 (1994): EMISSION
  EN60555-2 (1987): HARMONICS
  EN60555-3 (1987): VOLTAGE FLUCTUATIONS
- EN50082-1 (1992): GENERIC IMMUNITY STANDARD
  IEC 801-2 (1984): ELECTROSTATIC DISCHARGE IMMUNITY
  IEC 801-3 (1984): RADIATED IMMUNITY
  IEC 801-4 (1988): ELECTRICAL FAST TRANSIENT

The manufacturer also declares the conformity of the above mentioned product, with the actual required safety standards in accordance with LVD 73/23 EEC.

Manufacturer/Importer

Date:

Signature:_____ Signature:_____.

Name : JEFF CHANG . Name : KUNNAU CHEN .

(Project Leader) (President)

# EP-PT22

Motherboard

for

Compatible PC

| |
|---|
| User Manual Rev 1.0 |
| Related Motherboard: EP-PT22 P.C.B. Rev 1.2 and up |
| Date: Nov. 1997 |

# TABLE OF CONTENTS

# FCC & DOC COMPLIANCE

## Federal Communications Commission Statement

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**Warning:** The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

## Federal Communications Commission (Continued...)

### Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out the Radio Interference Regulations for the Canadian Department of Communications.

# Chapter 1. INTRODUCTION

## 1-1 About this Manual

This manual is arranged to help you set up and run this Motherboard of Pentium with MMX™ as soon as possible.

The information is presented in the following two chapters:

**Chapter 1** **Introduction:**

Presents what you should receive with your motherboard, the features and specifications of the product. This chapter is enclosed with a diagram showing the layout out of the motherboard.

**Chapter 2** **Installation:**

Motherboard Installation includes detailed information on how to install and configure the motherboard.

## 1-2 Item Checklist

This product comes with the following components:

- ☑ Motherboard x 1
- ☑40-pin IDE Connector Flat Cable x 1
- ☑34-pin Floppy Disk Drive Flat Cable x 1
- ☑User's Manual x 1
- □ Bus Master IDE Drivers Diskette x 1 (Option)
- □ Rear Panel Shielding (Option)
- □ IrDA Module x 1 (Option)
- □ 50-Pin SCSI Connection Flat Cable x 1 (Option)
- □ Sound Driver Diskette x 1 (Option)
- □ SCSI Driver Diskette x 1 (Option )
- □ 50 Pin SCSI Connection Cable Ribbon for Bracket (Option)
- □ LDCM Diskette x 1 (Option)

Option : Components will be included upon customer ordering instructions per Proforma Invoice & additional external procurement cost will be included.

## 1-3 Specifications

- **Processor:** ZIF Socket 7 support Intel® Pentium with MMX™ up to 233MHz, Intel® P54C + PPMT (P55C) + Cyrix M1/M2 + AMD K5/K6 Series CPU's, CPU Clock Select support for 50, 55, 60, 66, 75 and 83MHz CPU Bus speed configuration.
- **Chipset:** Intel® 82439TX System Controller

  Intel® 82371AB PCI/ISA IDE Accelerator
- **BIOS:** Award/AMI BIOS with PnP, Onboard SCSI Support (Optional), CD-ROM, ATAPI, LS-120, and any IDE Device Bootable, Virus Protection.
- **Cache Onboard:** 512KB Pipeline Burst SRAM Cache
- **System Memory:** 4 x 72-pin SIMM/2 x 168-pin DIMM Slots support up to 256MB. Support Mixed Memory Technologies: Extended Data Out (EDO), Fast Page (FP) DRAM, Synchronous DRAM (SDRAM)
- **Multi-I/O Onboard:** 1 x FDD Port support up to 2.88MB

  1 x Parallel Port (LPT) support ECP/EPP

  2 x High Speed Serial (16C550 UART) Ports

  2 x Universal Serial Bus (USB) Ports

  1 x PS/2 Keyboard Port

  1 x PS/2 Mouse Port

  2 x IrDA Infrared Interfaces

  2 x SCSI Port Support SCSI I, II, Specification

- **PCI Bus Master IDE:** PCI Enhanced IDE Interface with 4 IDE Devices
  Support HDD Auto-Detect
  Support up to PIO Mode 4, DMA Mode 2
  Support Ultra DMA/33 mode
  Fully compatible with PCI Local Bus Specifications V2.1
- **ATX Stack Connector:** 2 x USB Ports, 1 x Game Port, 1 x PS/2 Keyboard Port, 1 x PS/2 Mouse Port, 1 x Parallel Port, 2 x Com Port, 1 x Audio Line in Port 1 x Audio Line Out Port, 1 x Audio Mic In Port
- **Expansion Slots:** 3 x 16-bit ISA Slots with 100% ISA Compatible Functions
  4 x 32-bit PCI Slots supporting PCI Master
  Conform with PCI Specifications Version 2.1
- **Options:** Infrared (IrDA) Wireless Interface Kit (Front & Rear)
  Universal Serial Bus (USB) Connector Kit
  LM78 Hardware Monitor, LM75 thermal detect Circuit Design

- **Extended Features:** Advanced Configuration and Power Interface (ACPI) ready

  Surround 3D Audio with Enhanced Wave Table Support (Optional)

  SCSI Support (Optional)

  Support Power Monitor with Alarm

  Support Modem Ring Wake Up

  Compliant with PC97

  Support Win95 Soft Power Off (For ATX Power only)

  Support SM-Bus

- **Dimension:** 305mm x 210mm
- **Form Factor:** ATX Form Factor

# Chapter 2 INSTALLATION

## 2-1 Motherboard Layout

The motherboard is designed with the Intel 82430TX, PCI chipset which is developed by Intel Corporation to fully support the Pentium Processor PCI/ISA system. The Intel 82430TX PCI chipset provides increased integration and improved performance designs. The chipset provides an integrated IDE controller with two high performance IDE interfaces for up to four IDE devices (hard devices, CD-ROM device, etc). The Super I/O controller provides the standard PC I/O function: floppy interface, two 16Byte FIFO serial ports and EPP/ECP capable parallel port.

Care must be taken when inserting memory modules, inserting CPU or even plugging PCI card into associated slots to avoid damaging any circuits or sockets on board. A cooling fan is strongly recommended when installing P54C/P54CTB/P55C/ K5/K6/6x86/M2 due to possible overheat.

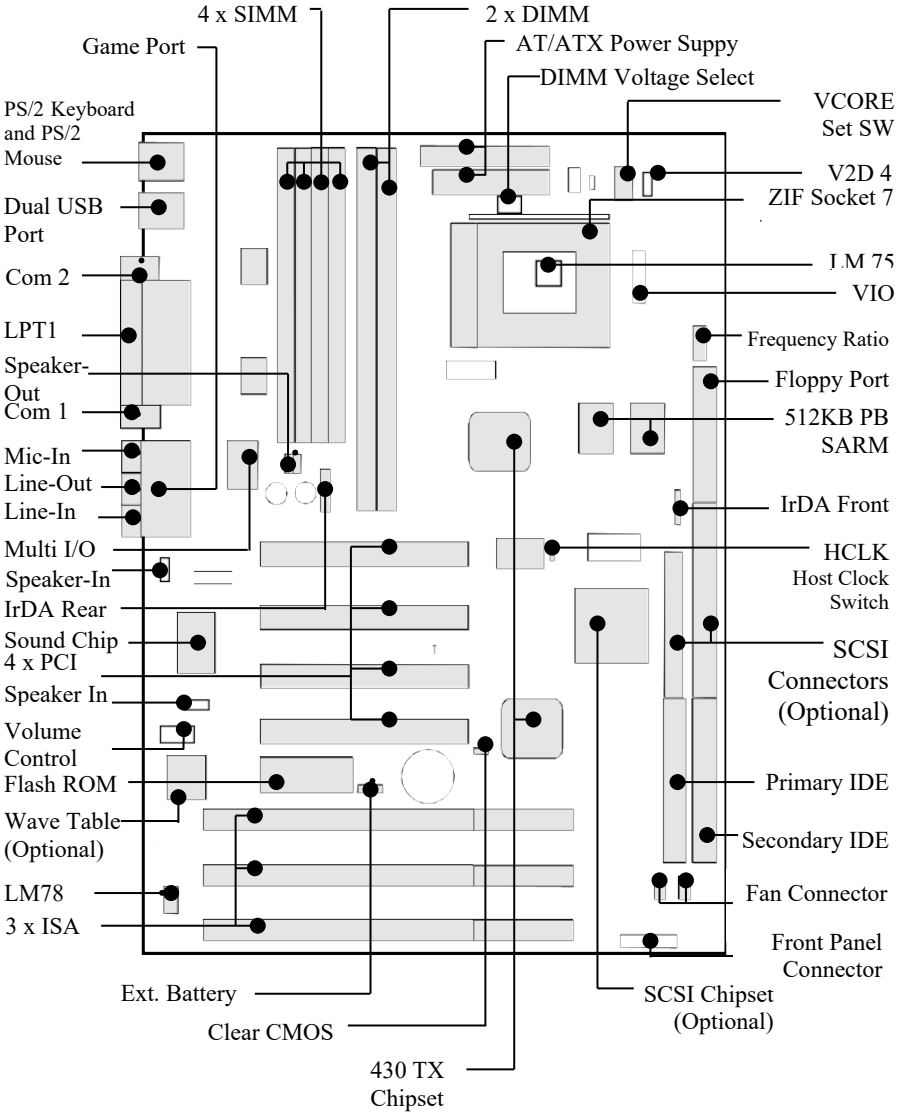
The motherboard supports minimum of 8 MB of system memory and a maximum of 256MB.

The onboard L2 Cache is 512KB SRAM to increase system performance.

The motherboard supports standard Fast Page (FP), EDO (Extended Data Out), or SDRAM (Synchronous DRAM). The motherboard provides four 72-pin SIMM. The socket supports 1Mx32 (32MB) single-sided or double-sided memory modules. The memory timing requires 70ns Fast Page devices or 60ns EDO RAM. Memory parity generation and checking is not supported. (DRAM Modules may be parity (x36) or non-parity (x32).

The board also supports onboard two PCI IDE connectors, and detects the IDE hard disk type by the BIOS utility which is automatic. The system also supports Award Plug & Play BIOS for the ISA and PCI cards.

## 2-2 Motherboard Layout



## 2-3 System Memories

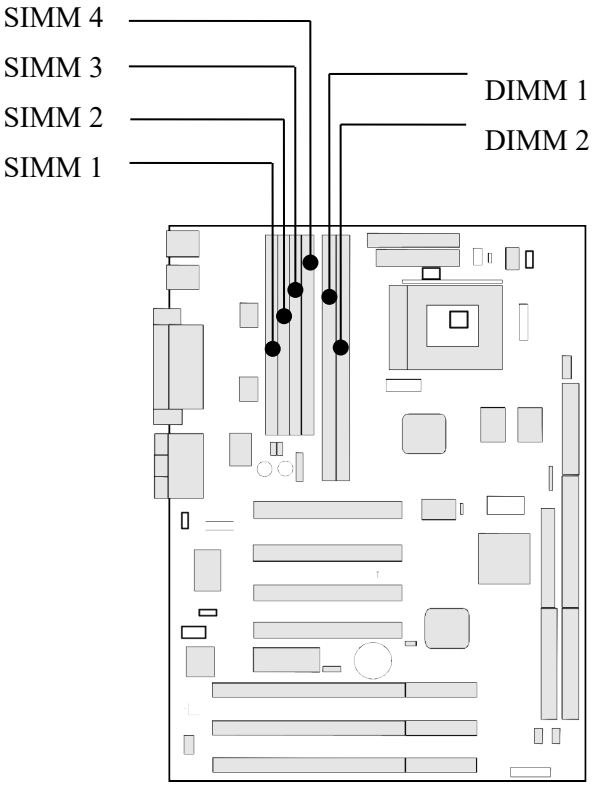
This motherboard supports four 72-pin SIMM (Single Inline Memory Modules) of 4MB, 8MB, 16MB, 32MB, 64MB to form a memory size between 8MB to 256MB. The motherboard also supports two 168-pin DIMM. The DRAM can be either 60ns or 70ns Fast Page Mode (FPM, Asymmetric or Symmetric), Extended Data Output (EDO). SIMMs must be installed in pairs so that each bank contains two of the same size memory modules.

Install memory in any or all of the banks at any combination as the following page:

NOTE: Each bank must have the same size and type (FPM, EDO) of memory installed in pairs. Memory setup is required “Auto Configuration” in Chipset Features Setup of the BIOS Software section.

## 2-4 System Memories (Continued…)

| Item | Bank | Memory Module |
|---|---|---|
| 1 | DIMM 1 | 8~128MB |
| 2 | DIMM 1, 2 | 8~128MB |
| 3 | DIMM 1<br>SIMM 1, 2 | 8~128MB<br>4 ~ 64MB |
| 4 | DIMM 2<br>SIMM 3, 4 | 8~128MB<br>4 ~ 64MB |
| 5 | SIMM 1, 2 | 4 ~ 64MB |
| 6 | SIMM 3, 4 | 4 ~ 64MB |
| 7 | SIMM 1, 2, 3, 4 | 4 ~ 64MB |

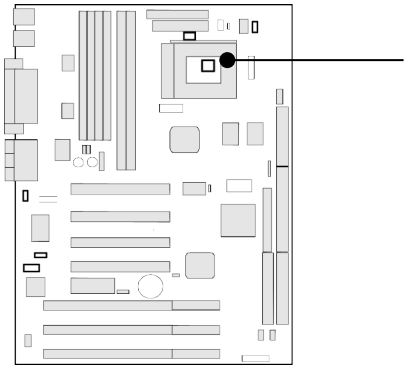


## 2-5 Central Processing Unit (CPU)

The motherboard provides a 321-pin ZIF Socket 7. The CPU should have a fan attached to it to prevent overheating. If your CPU did not come with a fan, then purchase a fan before you turn on your system. Apply thermal jelly to the CPU top and then install the fan onto the CPU.

NOTE: Without a fan, the CPU will overheat and cause damage to both the CPU and the motherboard. To install a CPU, locate the ZIF socket and open it by first pulling the lever sideways away from the socket's "Lock" then upwards to a 90-degree right angle. Insert the CPU with the correct orientation. Look to see that the pins are denser on one half compared to the other half. The picture is for reference only, you should have a CPU fan that will cover the face of the CPU. With the added weight of the CPU fan, no force is required to insert the CPU. Once completely inserted, hold down the fan and close the socket's lever.

NOTE: You must set the CPU External Clock (BUS) Frequency Selection" and "CPU to BUS Frequency Ratio" depending on the CPU that you install.





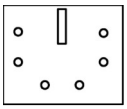

ZIF Socket 7

2-6 External Connectors

**1. PS/2 Keyboard Connector and USB Port (J26, 6-pin Female and J25, 4-pin Female)**

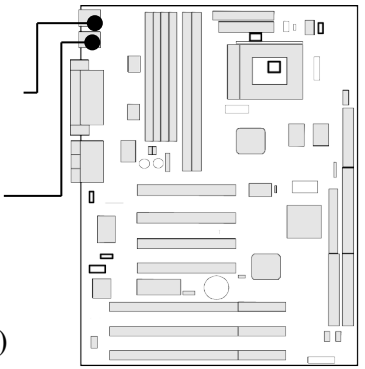
This connection is for a standard keyboard using PS/2 plug (mini DIN). This connector will not allow standard AT size (large DIN) keyboard plugs. You may use a DIN to mini DIN adapter on standard AT keyboard.

**J26:** PS/2 Keyboard Connector



**J25:** USB Port

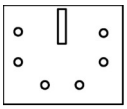
(Support Standard USB Specification)

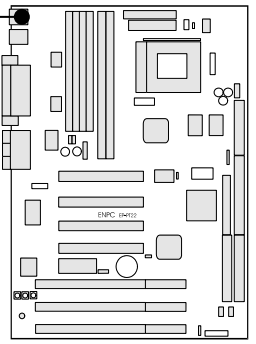


**2. PS/2 Mouse Connector (J26, 6-pin Female)**

The system will direct IRQ12 to the PS/2 mouse if one is detected. If not detected, expansion cards can use IRQ12.

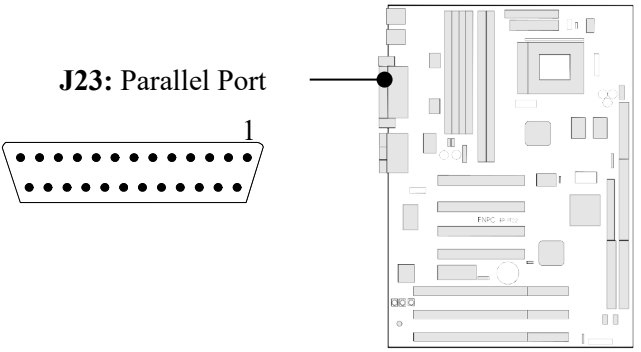
**J26:** PS/2 Mouse Connector





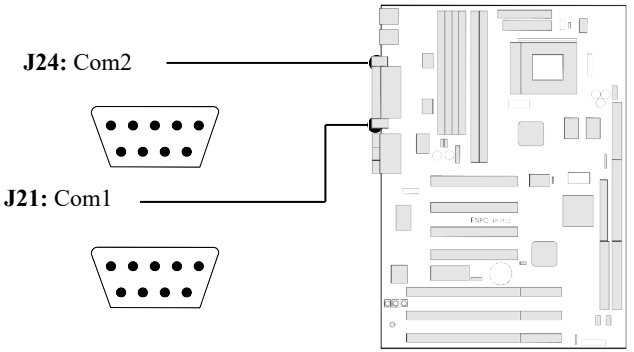
### 3. Parallel Printer Port (J23, 25-pin Female)

You can enable the parallel port (LPT1) and choose the IRQ through BIOS Setup on "Onboard Parallel Port".



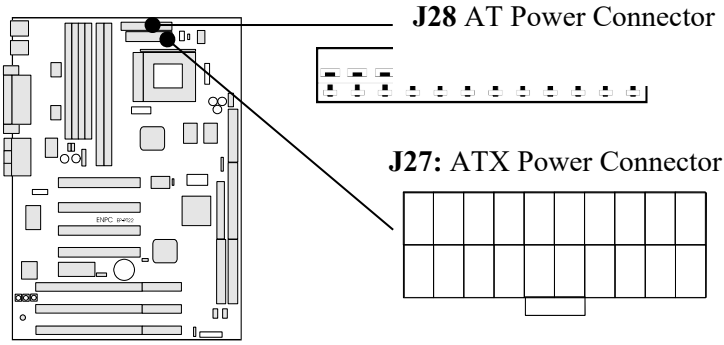

### 4. Serial Ports (J24: COM2, J21: COM1, 9-pin Male).

The two serial (COM1 & COM2) ports can be used for pointing devices or other serial devices. See "Onboard Serial Port" in Chipset Features Setup of the BIOS Software.



### 5. ATX Power Connector (J27, 20-pin block)

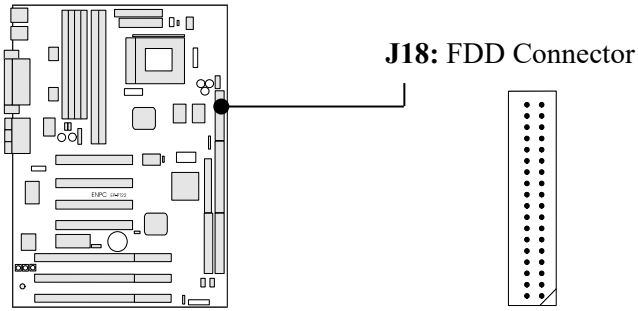
This connector connects to an ATX power supply. The plug from the power supply will only insert in one orientation because of the different hole sizes. Find the proper orientation and pushed down firmly making sure that it is locked in place.




NOTE: To prevent electrical spikes, make sure that the power supply is not connected to an outlet when making or removing connections. Power supplies contain power reserves which can damage electrical components.

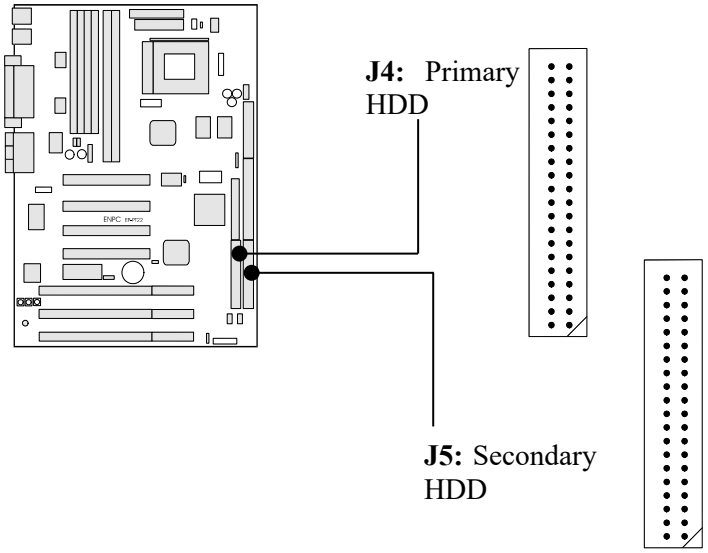
### 6. Floppy Drive Connector (J18, 34-pin block)

This connector supports the provided floppy disk drive ribbon cable. After connecting the single end to the board, connect the plugs on the other end to one or two floppy drives.



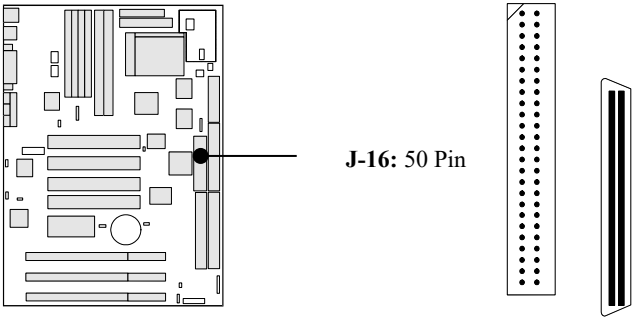
### 7. Primary/Secondary IDE connectors (J4 & J5: Two 40-pin Blocks)

These connectors support the provided IDE hard disk ribbon cable. After connecting the single end to the board, connect the two plugs at the other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumper accordingly. Please refer to the documentation of your hard disk for the jumper settings. BIOS now supports SCSI device or IDE CD-ROM boot-up (see "Boot Sequence" in the BIOS Features Setup of the BIOS Software).



## 8. SCSI Connectors (Optional J16, CON1)

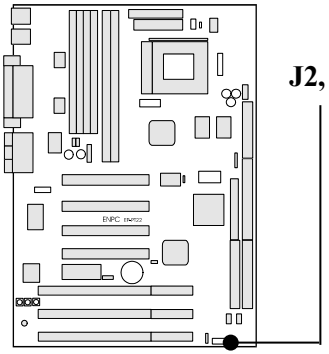
This 50 Pin connector and flat cable allows connection of several SCSI devises. The SCSI devices can be chained together and the last device must be Termination Enabled. All other devices in the chain must be Termination Disabled. The SCSI Driver Diskette provided with this option contains the configuration utility.



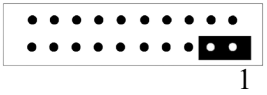

**Con1**

## 9. a. IDE Activity LED (J2, Pin 2-4)

This connector connects to the IDE (hard disk) activity indicator light on the system cabinet.

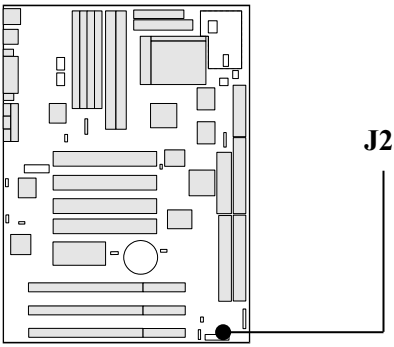


**J2, Pin 2-4:** HDD Activity LED

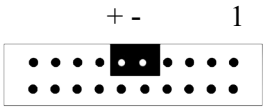


**b. System Power LED (J2, Pin 9-11, Pin 9-13)**
This 2-pin connector lights the system power LED when the motherboard has power.

NOTE: For case housing with 2-pin connector, connect direct pin-to-pin to J2, 9-11. For case housing with 3-pin connector, connect direct pin-to-pin to J2, 9-13 of motherboard.

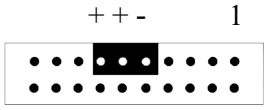


**J2, Pin 9-11**




Pin 9-11, for 2-pin connector

**J2, Pin 9-13**

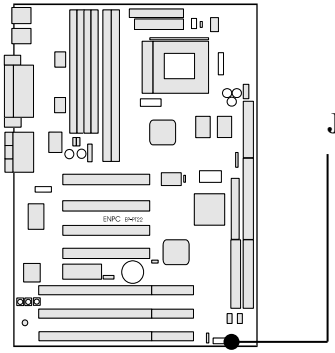



Pin 9-13, for 3-pin connector

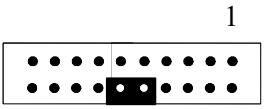
**c. ATX Power Switch (PWR SW, J2, Pin 10-12)**

The system power is controlled by a push button switch, connected to this lead. Pushing the button once will turn on the system and pushing another time will turn off the system. The system power LED shows that status of the system's power. This connection does not have a function when a standard power supply is used.

NOTE: If the power to the ATX power supply is interrupt while the motherboard is on, standby power will remember that the motherboard should be on and boot the computer when power is reapplied to the ATX power supply.

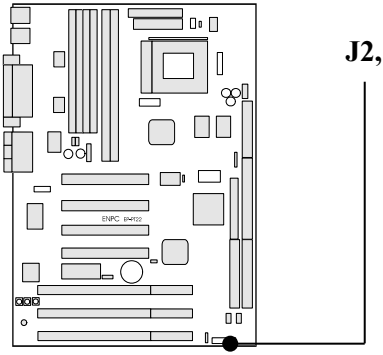


**J2 Pin10-12:**ATX Power Switch

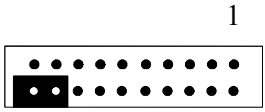


### d. Reset Switch Lead (J2, Pin 18-20, RESET)

This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch. This is a preferred method of rebooting in order to prolong the life of the system's power supply.

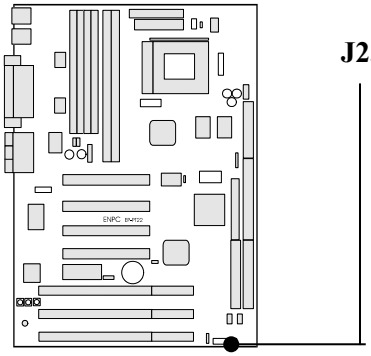


**J2, Pin18-20:** Reset Switch Lead

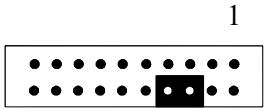



### e. Turbo LED (J2, Pin 6-8)

The motherboard's *turbo* mode is always on, so an LED attached to this connector will always be lit while system power is on. You may wish to connect the Power LED of your system case to this connector.



**J2, Pin 6-8 : Turbo LED**



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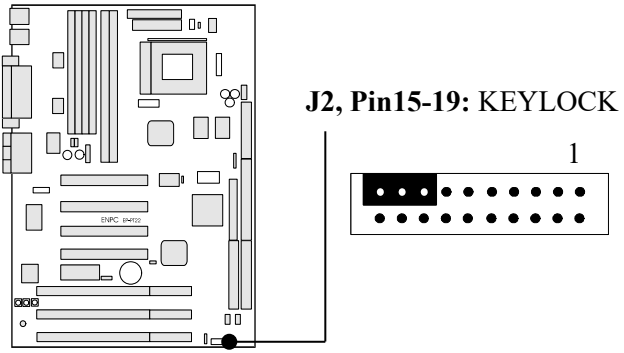
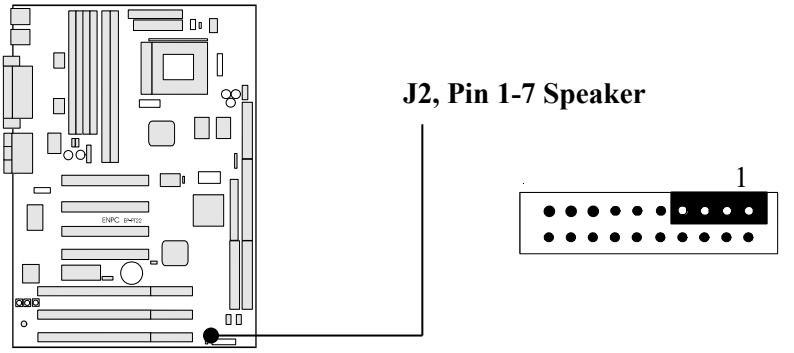
### f. Keyboard Lock Switch Lead (J2, Pin 15-19)

This 3-pin connector connects to the case-mounted keyboard lock switch for locking the keyboard and also to connect the system power LED. The system power LED lights when the system is powered on.



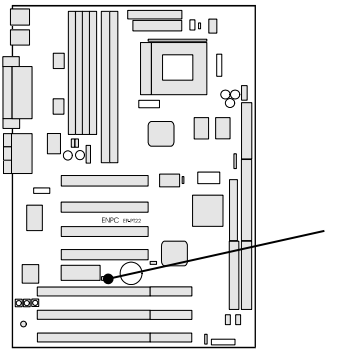

### g. Speaker Connector (J2, Pin 1-7 : SPEAKER)

This 4-pin connector connects to the case-mounted speaker.



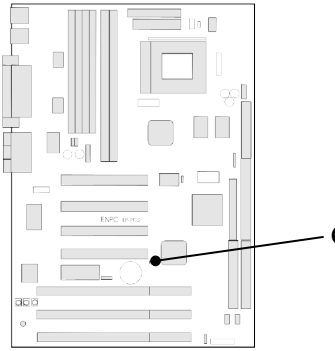
**10. External Battery Connector (J7)**

When using the external battery connector, be very careful of the polarity . Also, be sure to use only batteries rate at 4.5 ~ 6.0 V.



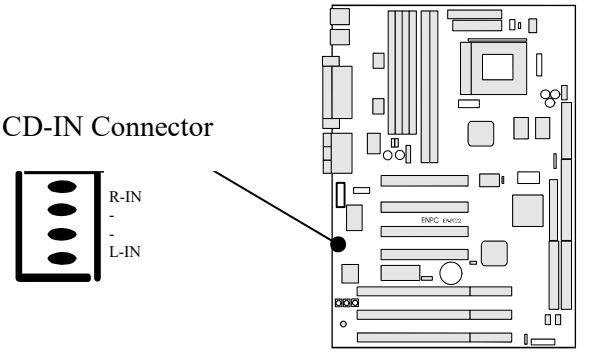

**11. Clear CMOS Connector (J8)**

Temporarily placing a jumper across pins 1-2 of this pin block will erase all user-defined BIOS setting[• • • •]egular use, the jumper can be stored on pins 2-3, which is marked as NORMAL. Be certain that system power is OFF before using this feature!



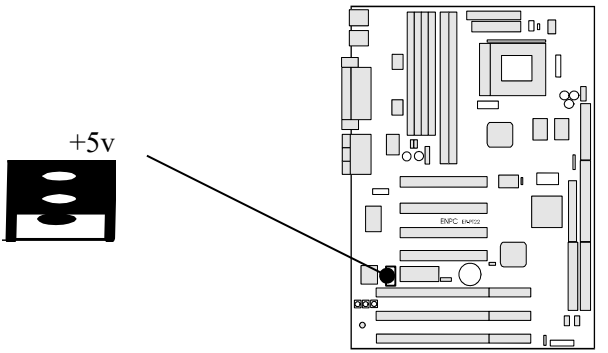
### 12. CD-IN connector (J11)

This connector supports CD-ROM Audio signal input from CD-ROM driver.



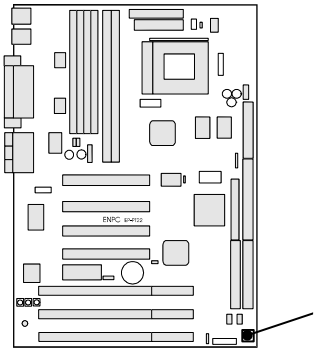

### 13. Flash ROM Vpp Select Jumper (J6)

This jumper selects Vpp for the Flash ROM. By default, it's set to +5V (pins 1-2). Moving the jumper cap to pin 2-3 sets the Vpp to +12V. If you change the ROM chips, you should check the specifications to be sure you set the right value.



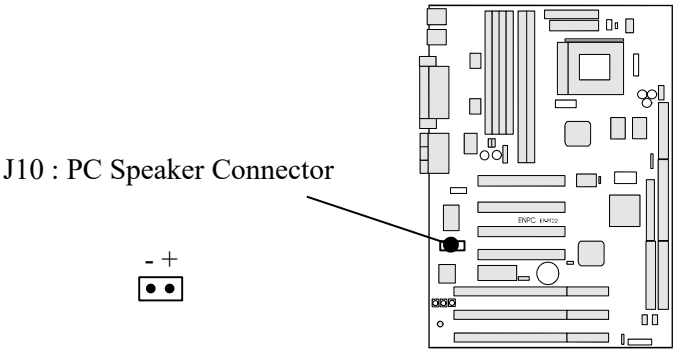
### 14. SCSI Device Activity LED (LED1)

When SCSI device is accessing the LED be light.




### 15. PC Speaker connector (J10)

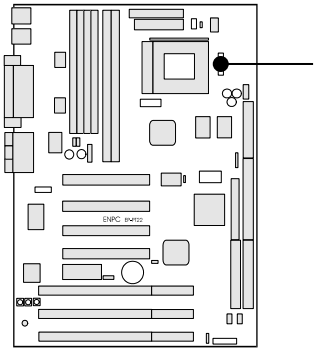
This connector can output the audio signal to PC Speaker at inner case of PC.



## 16. Setting CPU Type (J3)

Pin block J20 selects the CPU type. Since this also affects the power supply to the CPU, it is important to be very careful with this setting, to avoid damage to the CPU.

For P55C, K6, and M2 type CPUs, set jumper caps on the two pin-pairs which are closest to the center of the motherboard.



Setting CPU Type (J3)

1

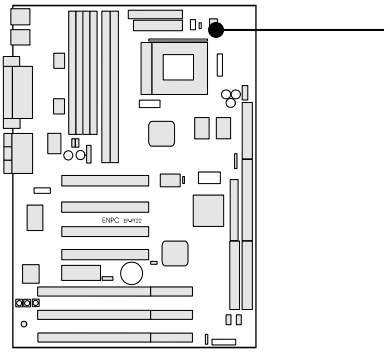
P55C, K6, M2

1

P54C, K5, M1

## 17. CPU Vcore Jumper Setting (SW2 & VID4)

Pin block JP1 is selects the CPU core voltage. Since this affects the power supply to the CPU, it is important to be very careful when setting this jumper, to avoid damaging the CPU. The various settings are shown in the table in the next section.

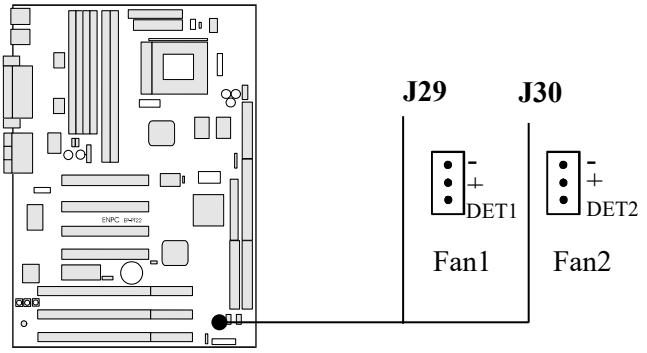



**SW2**


VID4

### 18. CPU Cooling Fan Connector (J29, J30)

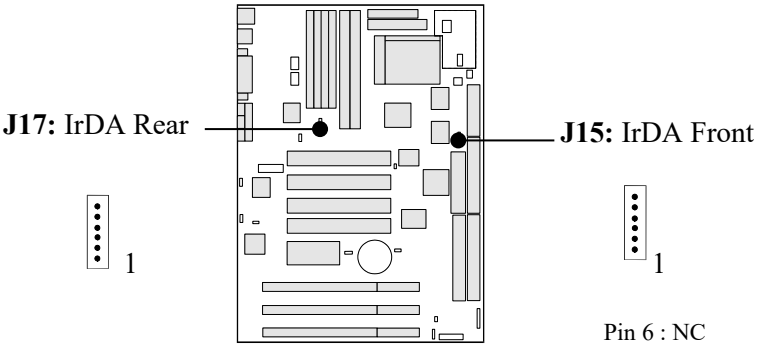
These connector support a CPU cooling fan of 500 mAmp. (6Watt, +12V) or less. Orient the fan so that the heat sink fins allow airflow to go across the onboard heat sink(s) instead of the expansion slots. Depending on the fan manufacturer, the wiring and plug may be different. The red wire should be positive, while the black should be ground. Connect the fan's plug to the board taking into consideration the polarity of the connector.



NOTE: The CPU and/or motherboard will overheat if there is no airflow across the CPU and onboard heat sinks. Damage may occur to the motherboard and/or the CPU fan if these pins are incorrectly used. These are not jumpers, do not place jumper caps over these pins.

**19. IrDA Infrared Connector (J15, Front IrDA; J17, Rear IrDA)**

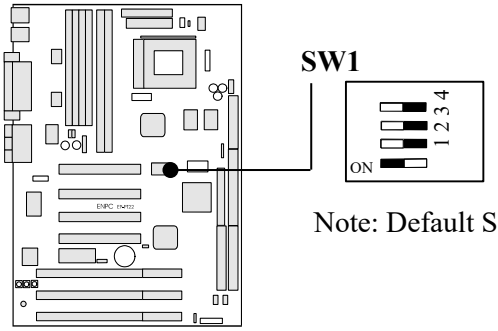
These connectors support the optional wireless transmitting and receiving infrared module. This module mounts to a small opening on system cases that support this feature. You must also configure USRT 2 Use Infrared in Chipset Features Setup to select whether UART2 is directed for use with COM2 or IrDA. When IrDA is selected in BIOS, COM2 will be disabled. Use the five pins as shown on the Back View and connect a ribbon cable from the module to the motherboard to the pin definitions.




Pin 6 : NC
5 : IRTX
4 : GND
3 : IRRXL
2 : IRRXH
1 : +5V

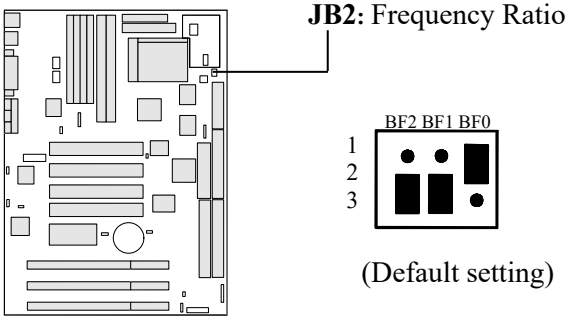
## 2-7 Hardware Jumper/Switch Setup

1. External HCLK Frequency **(SW1, refer APPENDIX)**




Note: Default Setup is OFF

**2. Frequency Ratio (JB2, Refer APPENDIX))**




(Default setting)

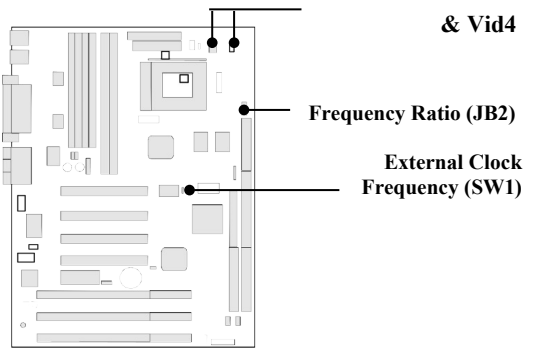
### 3. CPU VCORE Setup (refer Appendix)

Note:

| | |
|---|---|
| Intel P54C: | CORE & I/O Voltage 3.3V |
| Intel P55C: | CORE Voltage 2.8V (+/- 3.57%)I/O Voltage 3.3V (-5%, +9.09%) |
| Cyrix 6x86-PRXX+: | CORE & I/O Voltage (016): 3V, (028): 3.52V (3.15V-3.70V) |
| Cyrix 6x86L-PRXX+: | CORE Voltage 2.8V & I/O Voltage 3.3V |
| AMD K5-PRXX: | CORE & I/O Voltage 3.52V (3.45V-3.6V) |
| AMD K6-PR166/200: | CORE Voltage 2.9V (+/- 0.145V) I/O Voltage 3.3V (+0.3V -0.165V) |

## APPENDIX

# Voltage/ Frequency Settings For EP-PT22




| FREQUENCY RATIO | | | | | |
|---|---|---|---|---|---|
| AMD | CYRIX | INTEL | BF0 | BF1 | BF2 |
| 1.75X | 2/M1, 2.5/M2 | 2.5 | 2-3 | 2-3 | 1-2 |
| 2.0X | 3 | 3 | 1-2 | 2-3 | 1-2 |
| 1.5X | 2 | 2 | 2-3 | 1-2 | 1-2 |
| 1.5X | 3/M1, 3.5/M2 | 1.5/P54C,3.5/P55C | 1-2 | 1-2 | 1-2 |
| | | AMD-K6/PR 166 | 2-3 | 2-3 | 1-2 |
| | | AMD-K6/PR 200 | 1-2 | 2-3 | 1-2 |
| | | AMD-K6/PR 233 | 1-2 | 1-2 | 1-2 |

SW1

| 3 | 2 | 1 | HCLK |
|---|---|---|---|
| OFF | ON | ON | 55.0M |
| OFF | ON | OFF | 75.0M |
| OFF | OFF | ON | 60.0M |
| OFF | OFF | OFF | 66.6M |
| ON | ON | ON | 83.3M |
| ON | ON | OFF | 33.3M |
| ON | OFF | ON | 50.0M |
| ON | OFF | OFF | 68.5M |

100

POST-CONSUMER
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# EP-PT22
# User's Manual