

EP-KE21

Motherboard of

Pentium II with MMX™

User's Manual

Order Number 41010017

User Manual Rev 1.0

Related Motherboard: P.C.B. Rev 1.0

Date: MAY 1998

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1-1 About this Manual

This manual is arranged to help you set up and run this Motherboard of Pentium II 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 enclosed with a diagram showing the layout of the motherboard.

Chapter 2

INSTALLATION

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

Chapter 3

SPECIAL FEATURE

Describes this motherboard special feature of "Security Keyboard and Mouse Power On", "Modem Ring/LAN Wake-Up", "Hardware Monitoring".

Chapter 4

APPENDIX

This appendix describes what the AGP is and presents the ISO9002 certificate.

Chapter 1 INTRODUCTION

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
- CPU Retention Mechanism Kit x 1
- Audio Software Drivers Diskette x 1
- Winbond W83781 Hardware Monitoring Detection Drivers Diskette x 2
- Bus Master IDE/Ultra DMA-33 Drivers Diskette x 1 (Option)
- IrDA Module x 1 (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.

Chapter 1 INTRODUCTION

1-3 Specifications

- **Processor:** Slot 1 support Intel® Pentium II with MMX™ Series CPU's, CPU Clock Select support for 66, 75, 83 MHz CPU Bus speed configuration.
- **Chipset:** Intel® 82443EX System Controller
Intel® 82371EB PCI/ISA IDE Accelerator
3D Audio High Performance Chips
Ultra I/O Chip with security Keyboard/Mouse Power On, Modem/LAN Wake-Up
- **BIOS** Award BIOS With Flash ROM, support PnP, PCI 2.1, CD-ROM, ATAPI, LS-120, and any IDE Device Bootable, Virus Protection, DMI Ready
- **System Memory:** 2 x DIMMs Slots Support Mixed Memory Technologies: Extended Data Output (EDO), 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

Chapter 1 INTRODUCTION

- **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
- **I/O Connector:** 2 x USB Ports, 1 x PS/2 Keyboard Port, 1 x PS/2 Mouse Port, 1 x Parallel Port, 2 x Com Port, 1 x MIDI/Game Port, 1 x Audio Line in Port, 1 x Audio Line Out Port, 1 x Audio Mic. In Port, 1 x CD-IN port
- **Expansion Slots:** 1 x 16-bit ISA Slots with 100% ISA Compatible Functions
3 x 32-bit PCI Slots supporting PCI BUS Master Slots Conform with PCI Specifications Version 2.1
1 x AGP Slot supported.
- **Options:** 2 x Infrared (IrDA) Wireless Interface Kit (Front & Rear)
Universal Serial Bus (USB) Connector Kit
W83781 Hardware Monitor Circuit Design and CPU Temperature reading, LDCM for system Voltage, System Temperature, Fan Speed detected.

- Extended Features:** Advanced Configuration and Power Interface (ACPI) ready
CPU Temperature detect
Support System Power Monitor
Support Win95 Soft Power Off
Surround 3D Audio with LINE-IN, LINE-OUT, MIC-IN and MIDI/GAME port
Compliant with PC97
Support SM-Bus
- Dimension:** 244 mm x 200 mm
- Form Factor:** Micro ATX Form Factor

Chapter 2 INSTALLATION

2-1 Motherboard Description

The motherboard is designed with the Intel 82440EX PCI chipset which is developed by Intel Corporation to fully support the

Pentium II Processor PCI/ISA system. The Intel 82440EX 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.

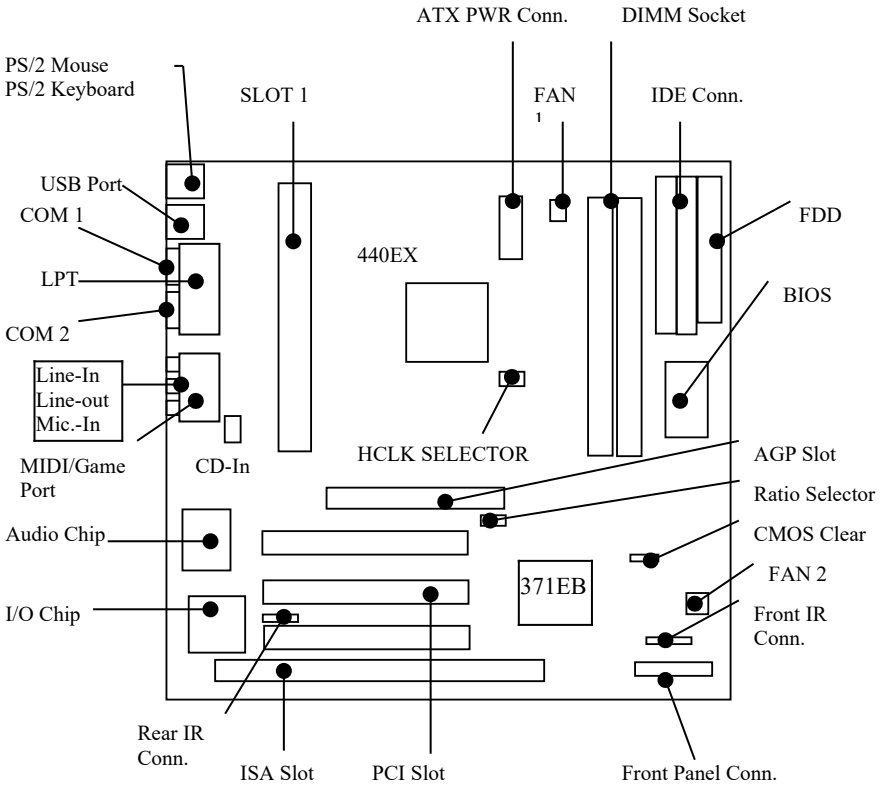
The motherboard supports minimum of 8MB of system memory and a maximum of 256 MB SDRAM.

The motherboard supports EDO (Extended Data Output), or SDRAM (Synchronous DRAM). The motherboard provides two 168-pin DIMM sockets.

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

Chapter 2 INSTALLATION

2-2 Motherboard Layout



Chapter 2 INSTALLATION

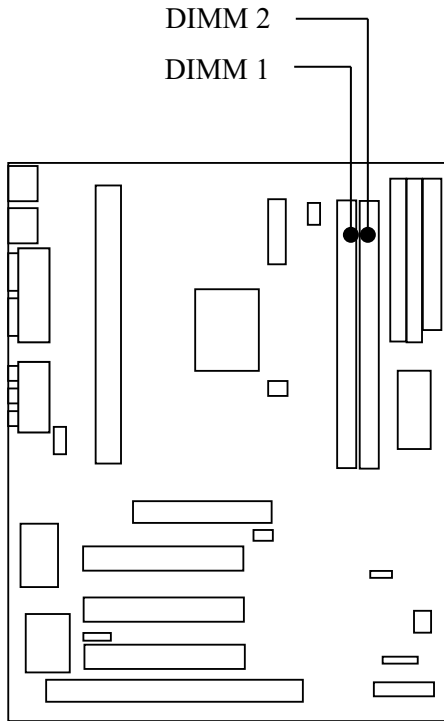
2-3 System Memories

This motherboard only supports Dual Inline Memory Modules (DIMM'S), The Dual Inline Memory Module (DIMM) must be 3.3 Volt Unbuffered Synchronous DRAM (SDRAM) of either 8, 16, 32, 64, or 128MB to form a memory size between 8MB to 256MB.

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

Chapter 2 INSTALLATION

Item	Bank	Memory Module
1	DIMM 1	8~128MB
2	DIMM 1, 2	8~128MB



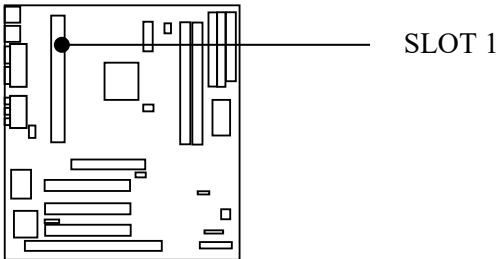
Chapter 2 INSTALLATION

2-4 Central Processing Unit (CPU)

The motherboard provides a SLOT 1 for Pentium II CPU. 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.

NOTE 1 : You must set the CPU External Clock (BUS) Frequency Selection” and “CPU to BUS Frequency Ratio” depending on the CPU that you install.

2 : Without a fan, the CPU can overheat and cause damage to both the CPU and the motherboard.



Chapter 2 INSTALLATION

To install a CPU, locate the SLOT 1. Insert the CPU with the correct orientation. you should have a CPU fan that will cover the face of the CPU.



JP4 : (Use pin header)
CPU Host Clock Select

Note : The JP4 is CPU Speed Select Utilize Pin Header, See The Page [25](#), [26](#) For Detailed Description.

Chapter 2 INSTALLATION

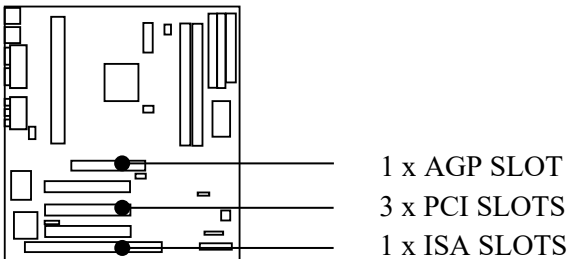
2-5 Expansion Cards & Slots

Assigning DMA Channels for ISA Cards:

Some ISA cards, both Legacy and PnP may also need to use a DMA (Direct Memory Access) channel. DMA assignments for this motherboard are handled the same way as the IRQ assignment process . You can select a DMA channel in the PCI and PnP configuration section of the BIOS Setup utility.

This motherboard provides an **AGP** (Accelerated Graphics Port) slot to support a new generation of graphics cards with ultra-high memory bandwidth. (Note : For the detail of **AGP** to see appendix)

NOTE: Choose “Legacy ISA” for those IRQ’s and DMA’s you wish to reserve for Legacy (Non-PnP) ISA expansion cards in “IRQ xx Used by ISA” and “DMA x Used By ISA” of the PnP and PCI Setup in the BIOS Software section, otherwise conflicts may occur.

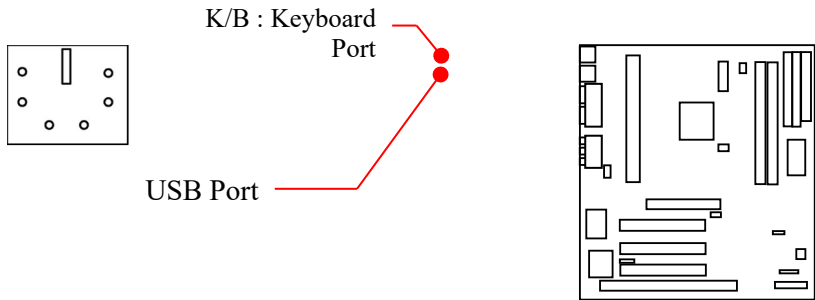


Chapter 2 INSTALLATION

2-6 External Connectors

1. **Keyboard Connector and USB Port** (K/B, 6-pin Mini DIN connector and USB, standard stack connector)

This K/B connection is for a PS/2 Keyboard connector, which is on lower stack connector.

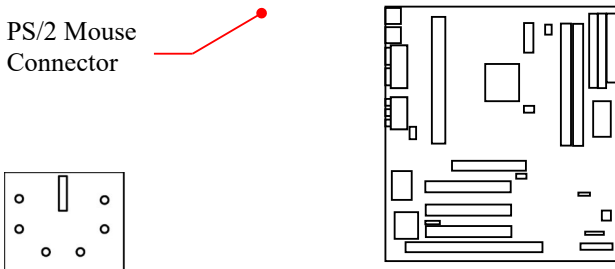


Note : The USB Port Support Standard USB Spec.

2. **PS/2 Mouse Connector** (PS/2, 6-pin Mini DIN Connector)

This Mouse connection is for a PS/2 Mouse connector, which is on upper stack connector.

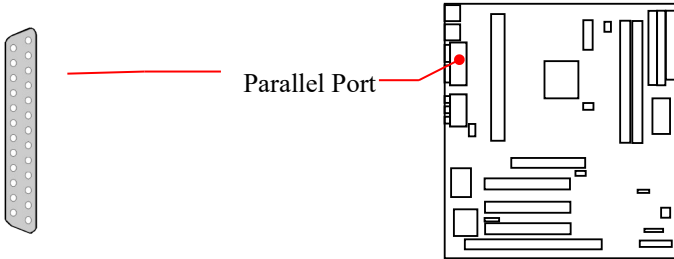
If you are not using a PS/2 mouse, you must disable the PS/2 port in the BIOS Setup. <default is enable>



Chapter 2 INSTALLATION

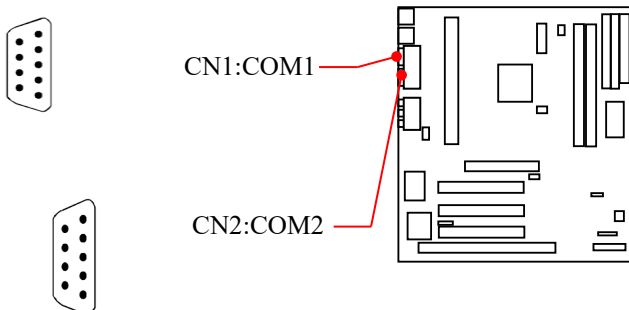
3. Parallel Port (CN7, 25-pin D-SUB connector)

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



4. Serial Ports (COM1, COM2, 9-pin D-SUB connector).

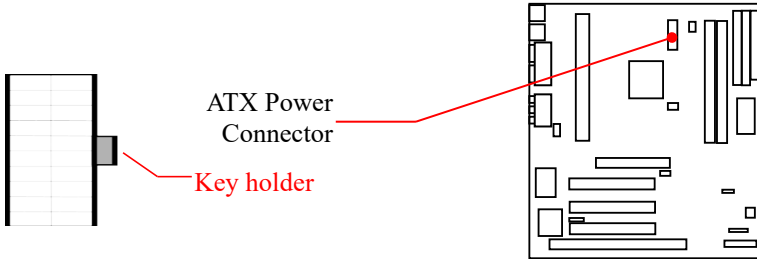
The two serial (COM1 & COM2) ports can be used for pointing devices or other serial devices. See “Onboard Serial Port” in Chipset Features Setup of the BIOS Software.



Chapter 2 INSTALLATION

5. ATX Power Supply Connectors (ATXPWR1:20-pin block)

ATX is a standard ATX-type power connector. (The ATX power connector can *only* be inserted the correct way.)



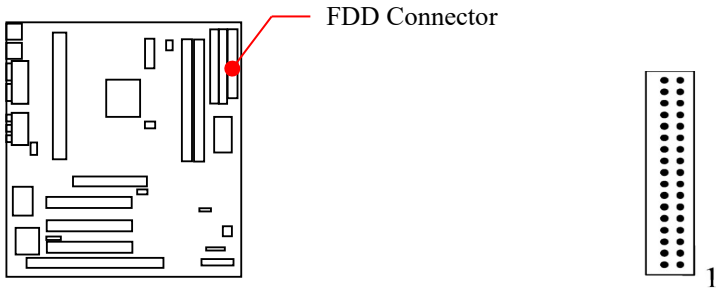
NOTE:

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 that can damage electrical components.

Chapter 2 INSTALLATION

6. Floppy Drive Connector (FDD1, 34-pin Pin header)

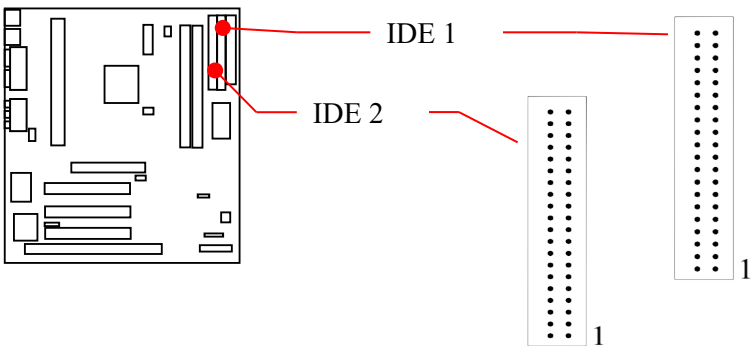
This connector supports the provided floppy disk drive ribbon cable. After connecting the single end to the board, connect the plugs on the other end to one or two floppy drives. The motherboard provides a standard floppy disk (FDD) connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. You can attach a floppy disk cable directly to this connector.



Chapter 2 INSTALLATION

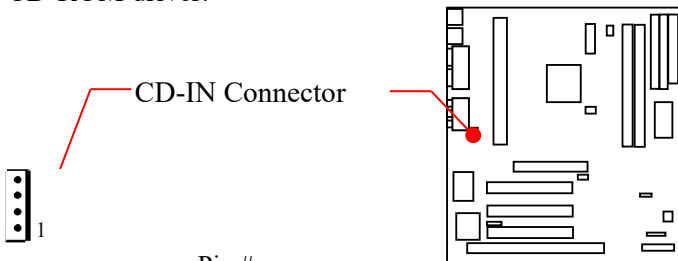
7. Primary/Secondary IDE connectors (IDE1 & IDE2: Two 40-pin Pin header)

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.



8. CD-IN Connector (JP1: 4-pin Connector)

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



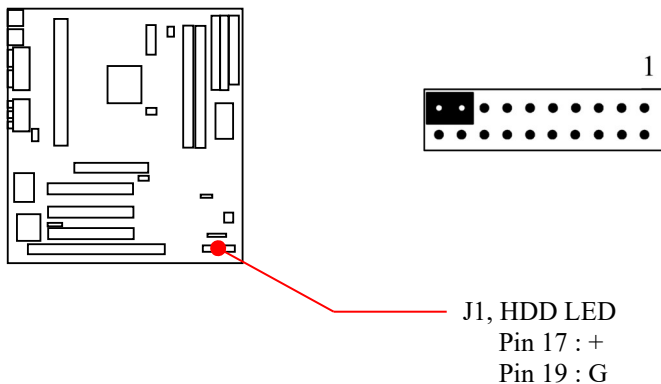
Pin # :

1. L-IN
2. GND
3. R-IN
4. GND

Chapter 2 INSTALLATION

9. a. IDE Activity LED (J1, Pin 2, 4)

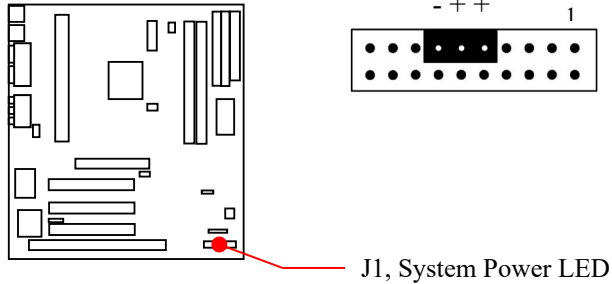
This connector connects to the IDE (hard disk) activity indicator light on the system cabinet.



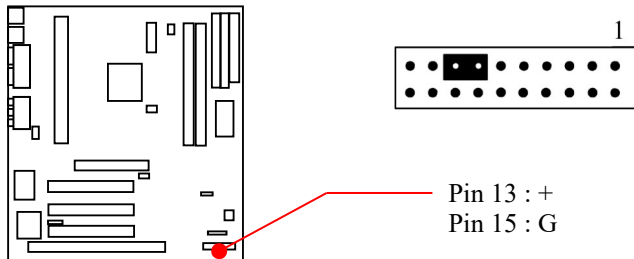
Chapter 2 INSTALLATION

b. System Power LED (J1, Pin 9, 11, 13)

This 3-pin connector lights the system power LED when the motherboard has power.



c. Turbo LED (J1, Pin 13, 15)



If the cabinet provides the turbo LED cable, connect the cable to this two pin connector to turn on the LED on the front panel.

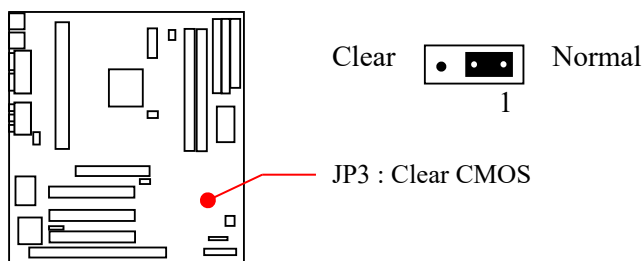
Chapter 2 INSTALLATION

d. CMOS Clear (JP3)

The CMOS RAM is powered by the onboard button cell battery.

You can follow process to clear the RTC data :

- (a) Turn-off power of computer
- (b) To put the pin cap locate at “Clear” for a while
- (c) Reput the pin cap locate at “Normal”, and turn-on computer power
- (d) Hold down key during the system booting and enter BIOS setup screen to re-keyin the users setting.



Normal : Pin 1,2 (Default)

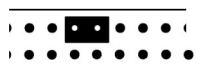
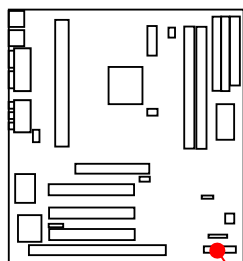
Clear : Pin 2,3

Chapter 2 INSTALLATION

e. **ATX Power Switch Lead (J1, Pin 9, 11)**

The system power is controlled by a push-switch, connected to this lead. Pushing the button once will turn on the power and pushing again will turn off the power. 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 interrupted 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.



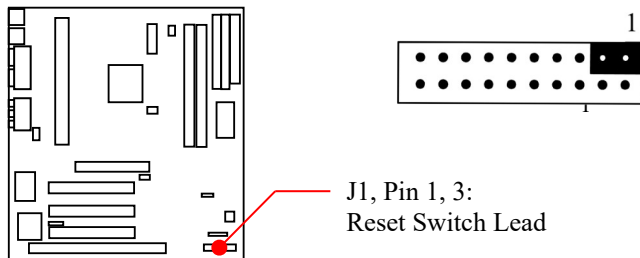
J1, Pin 9, 11:

ATX Power Switch On/ Off
Lead

Chapter 2 INSTALLATION

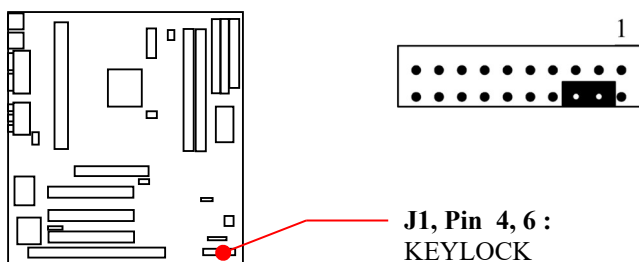
f. Reset Switch Lead (J1, Pin 1, 3)

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.



**g. Keyboard Lock Switch Lead
(J1, Pin 4, 6)**

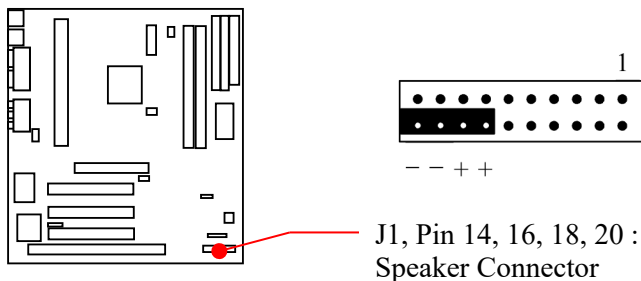
This 2-pin connector connects to the case-mounted keyboard lock switch for locking the keyboard.



Chapter 2 INSTALLATION

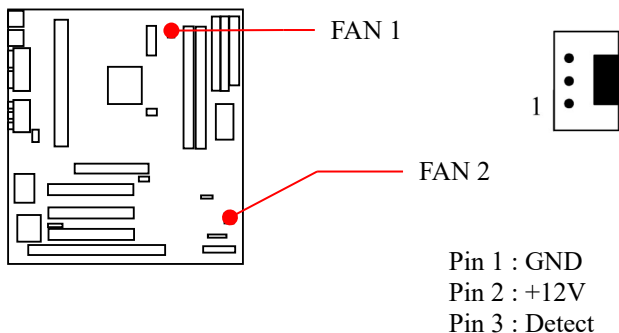
10. Speaker Connector (J1, Pin 14, 16, 18, 20)

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



11. CPU Cooling Fan Connector (FAN1&FAN2 : support fan detect)

This connector supports a CPU cooling fan of 500 mA (6WATT, +12V) or less. Orient the fan so that the heat sink fins allow airflow to go across the onboard heat sink(s). 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.

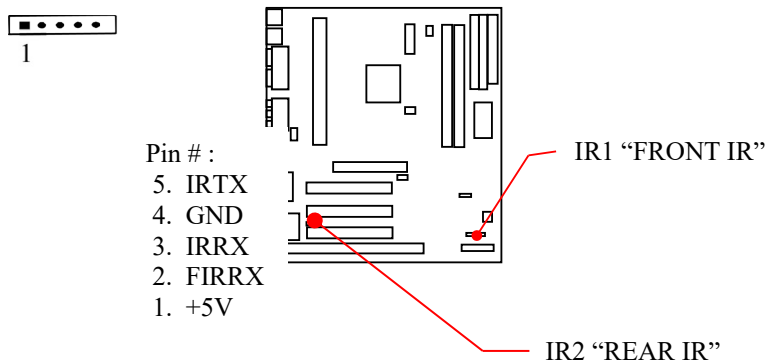


Chapter 2 INSTALLATION

NOTE: The CPU and/or motherboard will overheat if there is no airflow across the CPU. 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.

12. IrDA Compliant Infrared Module Connector (IR1, IR2)

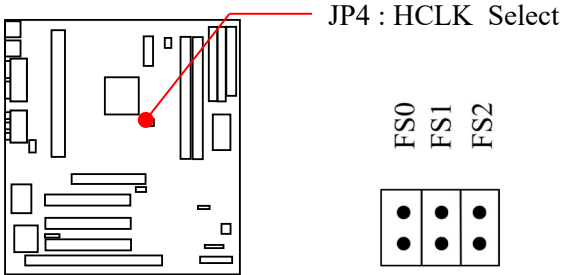
This connector supports the optional wireless transmitting and receiving infrared module. This module mounts to a small opening on system cases that support this feature. You must also configure UART 2. Use Infrared in Chipset Features Setup to select whether UART 2 is directed for use with COM2 or IrDA.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



Chapter 2 INSTALLATION

2-7 Hardware Jumper Setup

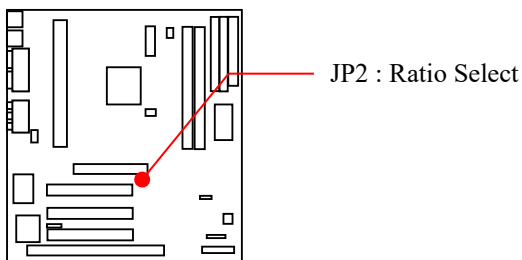
8. External HCLK Frequency Select



	FS0	FS1	FS2
68.5MHz	OFF	OFF	ON
75 MHz	OFF	ON	OFF
83.3MHz	ON	OFF	ON

Chapter 2 INSTALLATION

9. Frequency Ratio Select Table (JP2)



RATIO	JP2			
	1	2	3	4
X3.5	ON	OFF	OFF	ON
X4.0	OFF	ON	ON	ON
X4.5	OFF	ON	OFF	ON
X5.0	OFF	OFF	ON	ON
X5.5	OFF	OFF	OFF	ON

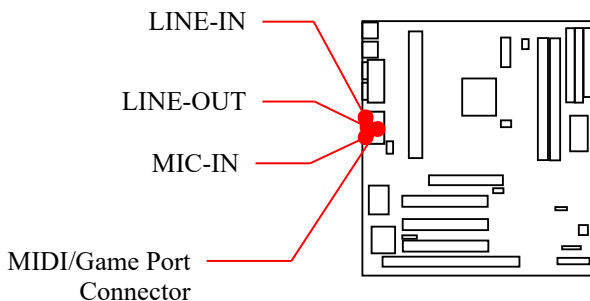
NOTE :

1. On : Install Pin Cap,
2. Off : Uninstall Pin Cap

Chapter 2 INSTALLATION

10. Audio Jack & Game Port

This jack and MIDI/Game port is stack connector to support LINE-IN, LINE-OUT, MIC-IN and 15-pin D-SUB Connector for joy stick or MIDI player



Chapter 3 SPECIAL FEATURE

3-1. Security Keyboard and Mouse Power On

The Winbond W83977TF-AW is a new IC whose keyboard and mouse controller (KBC) is enhanced with “Programmable OnNow / Security Wake-Up” feature. It provides the function that users can wake up a shutdown PC system simply by a keystroke or a click of mouse button. This is a perfect implementation of OnNow. Users are able to program a combination of 1-5 characters as the password. By choosing the "**INTEGRATED PERIPHERALS**" option from the CMOS SETUP UTILITY Menu to enable or disable the following features :

- 1, Password. 2, Hot KEY. 3, BUTTON ONLY
4, Mouse Left. 5, Mouse Right.

3-2. Modem Ring / LAN Wake-Up

This feature is able to wake-up the system from Modem or LAN when the PC system is suspended to memory through ACPI but not powered off. You have to choose "POWER MANAGEMENT SETUP" option from the CMOS SETUP UTILITY Menu to enable or disable this feature.

3-3. Hardware Monitoring

This motherboard provided a hardware status monitoring IC for personal computers to monitor several critical hardware parameters of the system, including power supply voltages, fan speeds, and temperatures. The users can read all the monitored parameters of system from time to time. The application software could be the popular Intel™ LDCM (LANDesk Client Management) or Winbond's application software. Also the users can setup the upper and lower limits of these monitored parameters and to activate two programmable and maskable interrupts. An optional beep tone could be used as warning signal when the monitored parameters are out of the preset ranges.

Chapter 4 APPENDIX

A, What is **AGP** (Accelerated Graphics Port) ?

The Accelerated Graphics Port (**AGP**) is a new port on the Host-To-PCI bridge device that supports an **AGP** port. The main purpose of the **AGP** port is to provide fast access to system memory.

The **AGP** port can be used either as fast PCI port (32-bits at 66MHz VS. 32-bits at 33MHz) or as an **AGP** port which supports 2x data rate, a read queue, and side band addressing. When the 2x data is used the port can transmit data at 533MB/sec. ($66.6 * 2 * 4$). The read-queue can be used to pipeline reads removing the effects of the reads latency. Side band addressing can be used to transmit the data address on a separate line in order to further speed the transaction.

Chapter 3 SPECIAL FEATURE

B, ISO-9002 QA CERTIFICATE



CERTIFICATE

The **TÜV CERT Certification Body**
of **TÜV Rheinland**
Anlagentechnik GmbH

hereby certifies in accordance with TÜV CERT
procedures that

ENPC Technology Corp.
6 Fl., No. 19, Wu Chuan 6 Rd.,
Wu-Ku Industrial Park,
Taipei, Taiwan, R.O.C.

has established and applies a quality system for

Manufacturing and Sales of PC Mainboards

An audit was performed,

Report No. **79129**

Proof has been furnished that the requirements according to

DIN EN ISO 9002 : 1994

are fulfilled.

The certificate is valid until **2001 January**

Certificate Registration No. **09 100 79129**



Cologne, 1990-02-05

TÜV Rheinland/
Berlin-Brandenburg



B. Niebe

TÜV CERT Certification Body of
TÜV Rheinland
Anlagentechnik GmbH

Chapter 4 APPENDIX

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**POST-CONSUMER
RECYCLED PAPER**

EP-KE21

User's Manual