

EP-KL21

Motherboard of

Pentium II with MMX™

User's Manual

Order Number 41010005

December 1997

EC-Conformity Declaration



(EC conformity marking)

FOR THE FOLLOWING EQUIPMENT:

Product Name : MOTHERBOARD

Model : EP-KL21

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-KL21

Motherboard
for
Compatible PC

User Manual Rev 1.1

Related Motherboard: EP-KL21 P.C.B. Rev 1.X

Date: Dec. 1997

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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 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 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
- Bus Master IDE Drivers Diskette x 1 (Option)
- Rear Panel Shielding (Option)
- IrDA Module x 1 (Option)
- LDCM Diskette x 1 (Option)

Note:

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 MHz CPU Bus speed configuration.
- **Chipset:** Intel® 82443LX System Controller
Intel® 82371AB PCI/ISA IDE Accelerator
- **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:** 3 x 168-pin DIMM Slots Support Mixed Memory Technologies: Extended Data Output (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

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
- **ATX Stack 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
- **Expansion Slots:** 3 x 16-bit ISA Slots with 100% ISA Compatible Functions
4 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
LM78 Hardware Monitor Circuit Design and LM75 CPU Temperature reading, LDCM for system Voltage, System Temperature, Fan Speed detect.

Chapter 1 INTRODUCTION

- **Extended Features:** Advanced Configuration and Power Interface (ACPI) ready
 CPU Temperature detect
 Support System Power Monitor
 Support Win95 Soft Power Off (For ATX Power only)
 Support SM-Bus
- **Dimension:** 305 mm x 195 mm
- **Form Factor:** ATX Form Factor

Chapter 2 INSTALLATION

2-1 Motherboard Description

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

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

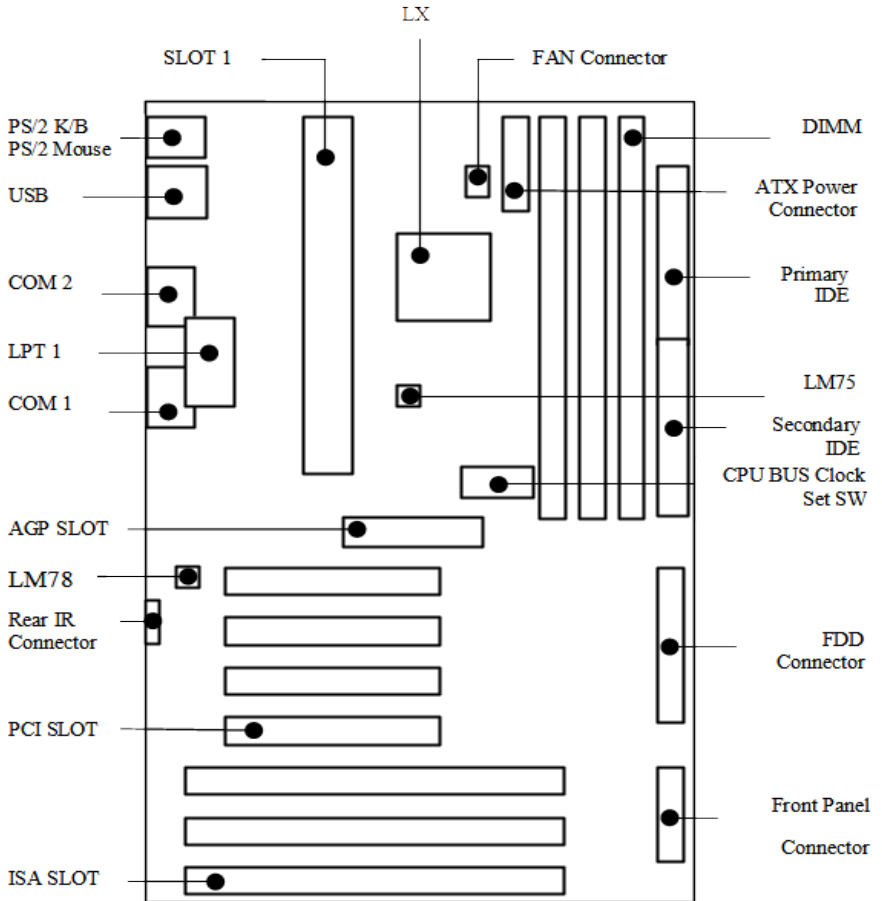
The motherboard supports minimum of 8MB of system memory and a maximum of 512MB SDRAM, 1GB EDO RAM.

The motherboard supports standard Fast Page (FP), EDO (Extended Data Output), or SDRAM (Synchronous DRAM). The motherboard provides three 168-pin DIMM. 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.

Chapter 2 INSTALLATION

2-2 Motherboard Layout



Chapter 2 INSTALLATION

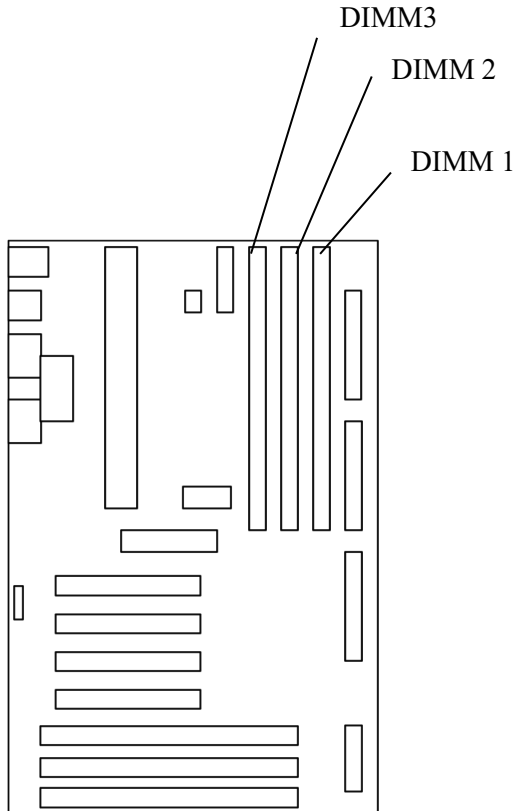
2-3 System Memories

This motherboard supports three 168-pin DIMM. The SDRAM can be either 60ns.

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	8~256MB
2	DIMM 1, 2	8~256MB
3	DIMM 1, 2, 3	8~256MB

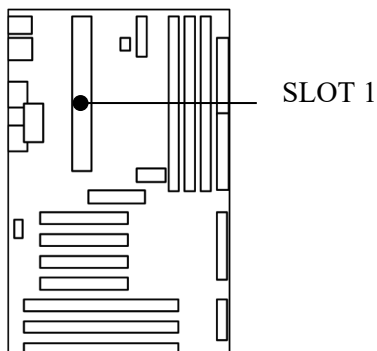


Chapter 2 INSTALLATION

2-4 Central Processing Unit (CPU)

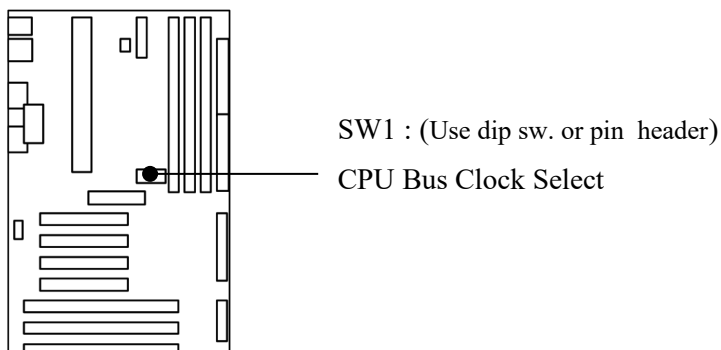
The motherboard provides a SLOT 1 for Pentium II CPU. The CPU should have a fan attached to it to prevent overheating. If your CPU did not come with a fan, then purchase a fan before you turn on your system.

NOTE: 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.



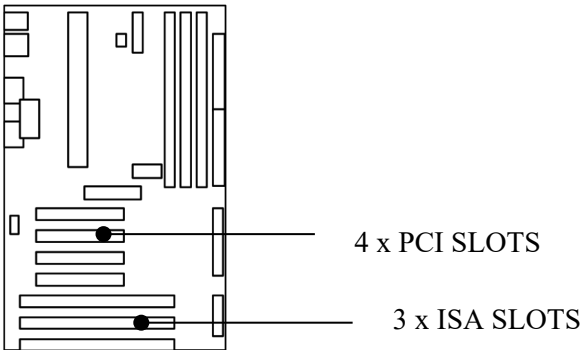
Chapter 2 INSTALLATION

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.

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.

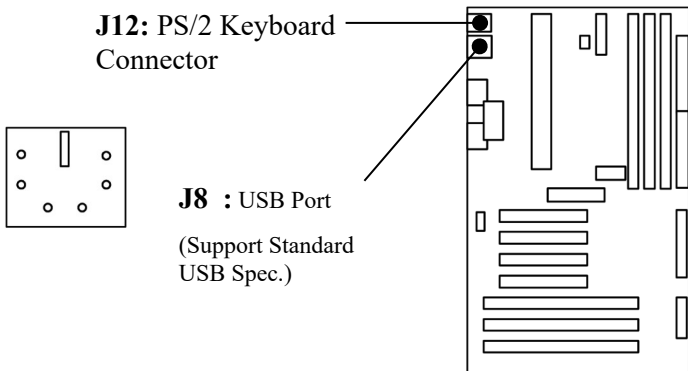


Chapter 2 INSTALLATION

2-6 External Connectors

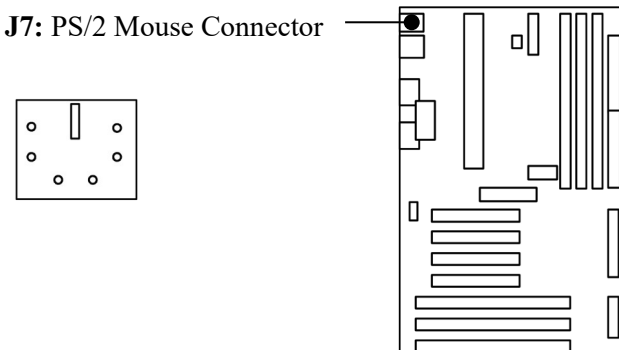
1. **PS/2 Keyboard Connector and USB Port (J12, 6-pin Female and J8, USB Connector)**

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.



2. **PS/2 Mouse Connector (J7, 6-pin Female)**

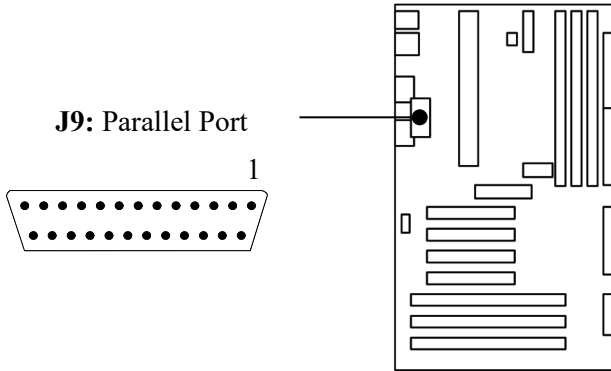
The system will direct IRQ12 to the PS/2 mouse if one is detected. If not detected, expansion cards can use IRQ12.



-
3. **Parallel Port (J9, 25-pin Female)**

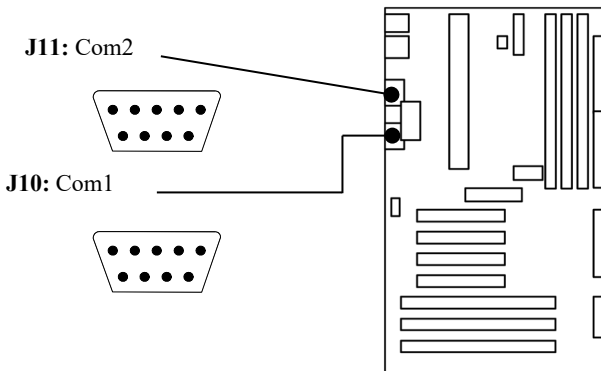
Chapter 2 INSTALLATION

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



4. Serial Ports (J10: COM1, J11: COM2, 9-pin Male).

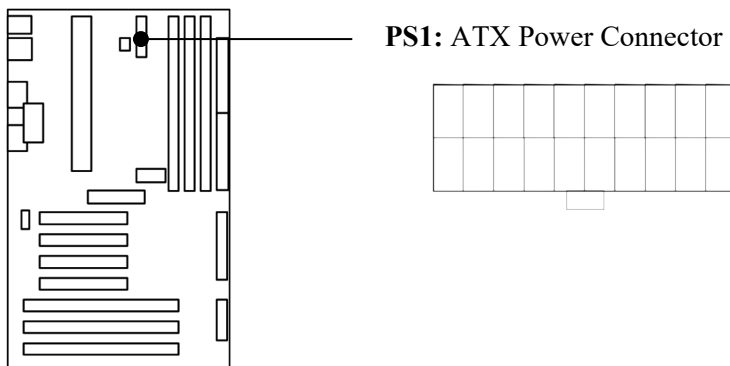
The two serial (COM1 & COM2) ports can be used for pointing devices or other serial devices. See “Onboard Serial Port” in Chipset Features Setup of the BIOS Software.



Chapter 2 INSTALLATION

5. ATX Power Connector (PS1, 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.



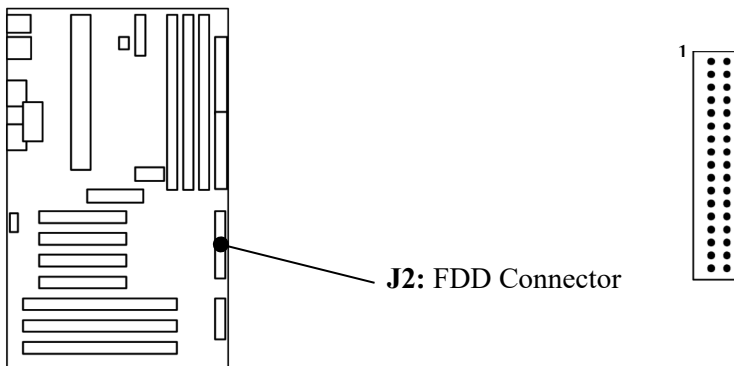
NOTE:

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.

Chapter 2 INSTALLATION

6. Floppy Drive Connector (J2, 34-pin block)

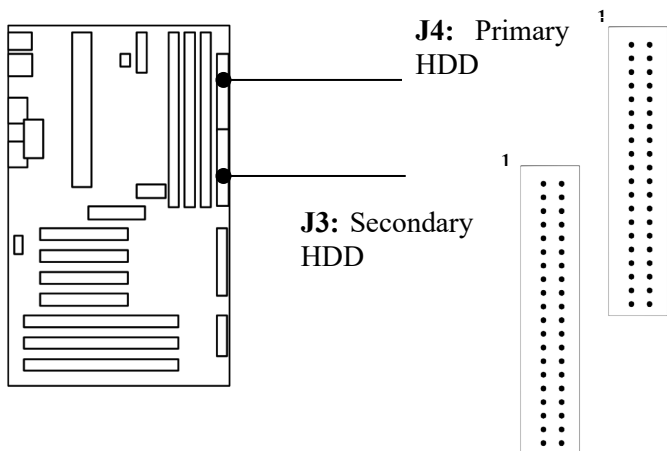
This connector supports the provided floppy disk drive ribbon cable. After connecting the single end to the board, connect the plugs on the other end to one or two floppy drives.



Chapter 2 INSTALLATION

7. Primary/Secondary IDE connectors (J3 & J4: Two 40-pin Blocks)

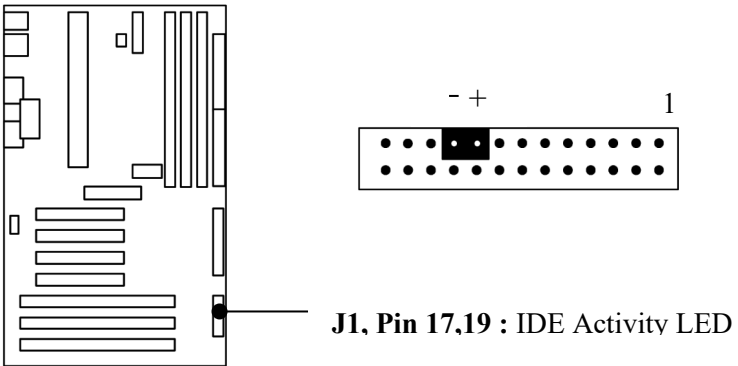
These connectors support the provided IDE hard disk ribbon cable. After connecting the single end to the board, connect the two plugs at the other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumper accordingly. Please refer to the documentation of your hard disk for the jumper settings.



Chapter 2 INSTALLATION

8. a. IDE Activity LED (J1, Pin 17,19)

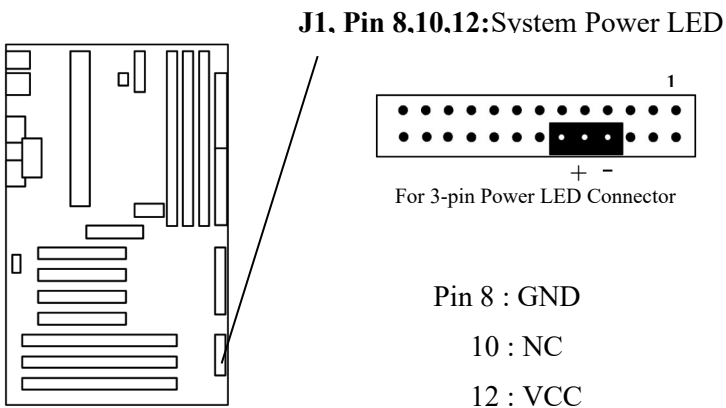
This connector connects to the IDE (hard disk) activity indicator light on the system cabinet.



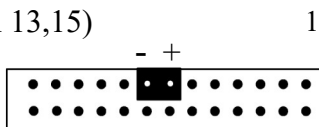
Chapter 2 INSTALLATION

b. System Power LED (J1, Pin 8,10,12)

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



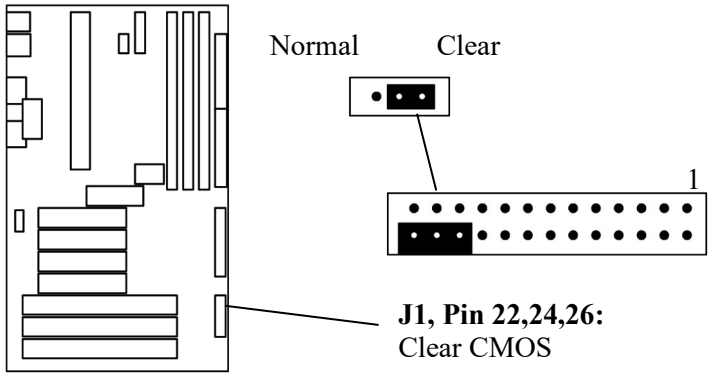
c. Turbo LED (J1, Pin 13,15)



If the cabinet provide 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 (J1, Pin 22,24,26)



Clear : Pin 22,24

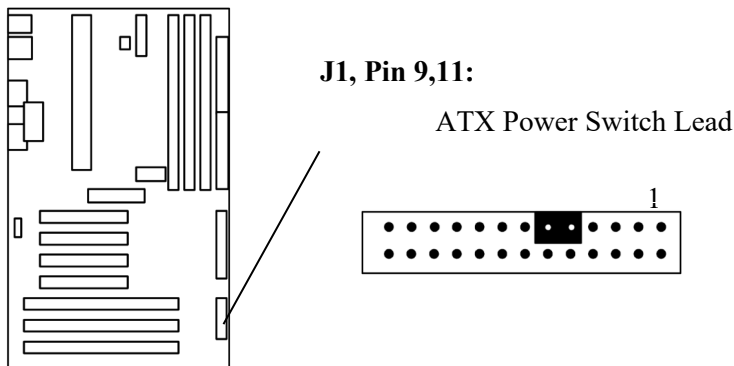
Normal : Pin 24,26 (Default)

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.

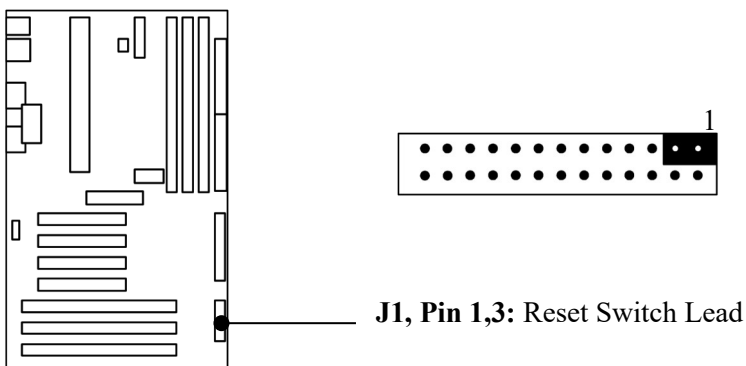
NOTE: If the power to the ATX power supply is interrupted while the motherboard is on, standby power will remember that the motherboard should be on and boot the computer when power is reapplied to the ATX power supply.



Chapter 2 INSTALLATION

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

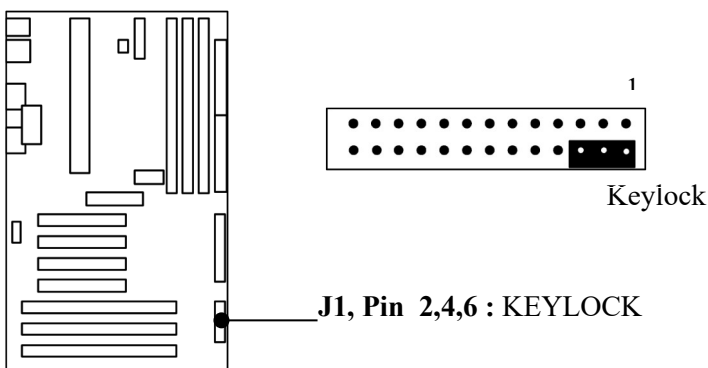
This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch. This is a preferred method of rebooting in order to prolong the life of the system's power supply.



g. Keyboard Lock Switch Lead

(J1, Pin 2,4,6)

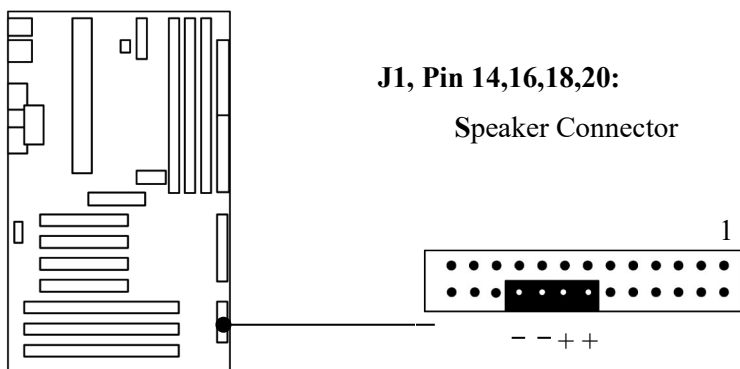
This 3-pin connector connects to the case-mounted keyboard lock switch for locking the keyboard.



Chapter 2 INSTALLATION

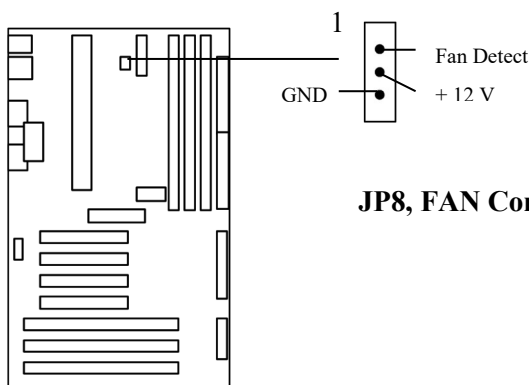
9. Speaker Connector (J1, Pin 14,16,18,20)

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



10. CPU Cooling Fan Connector (JP8 support fan detect)

This 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). 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.

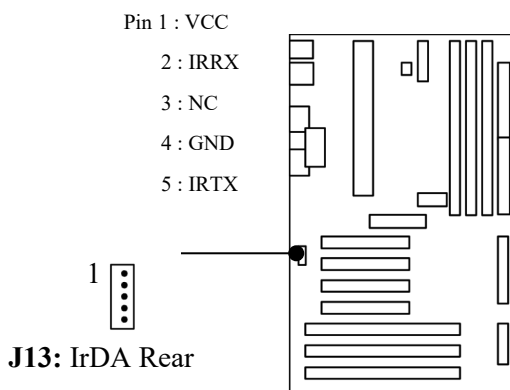


Chapter 2 INSTALLATION

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

11. IrDA Compliant Infrared Module Connector (J13, Rear IrDA)

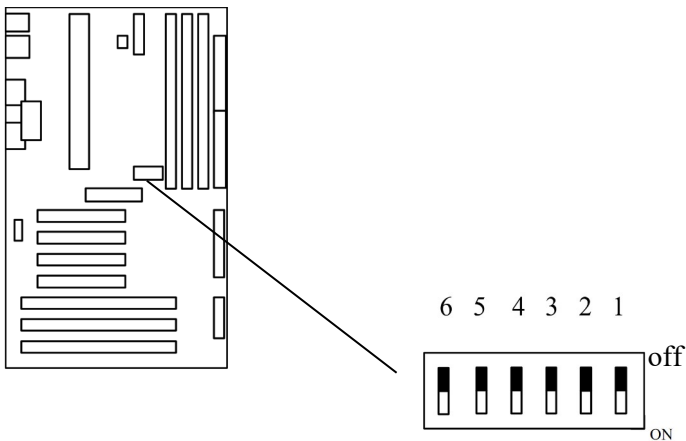
These connectors support the optional wireless transmitting and receiving infrared module. This module mounts to a small opening on system cases that support this feature. You must also configure UART 2. Use Infrared in Chipset Features Setup to select whether UART 2 is directed for use with COM2 or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



Chapter 2 INSTALLATION

2-7 Hardware Jumper/Switch Setup

12. External HCLK Frequency Setup (Fixed to 66 MHz)



Default setting :

SW1: 1~4 Fixed to off position

SW1 : 5~6 Fixed to off

Chapter 2 INSTALLATION

13. Frequency Ratio Select Table (SW1)

CPU SPEED	SW 1					
	1	2	3	4	5	6
233	ON	OFF	OFF	ON	OFF	OFF
266	OFF	ON	ON	ON	OFF	OFF
300	OFF	ON	OFF	ON	OFF	OFF
333	OFF	OFF	ON	ON	OFF	OFF

(NOTE : The CPU Speed is in MHz)

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**POST-CONSUMER
RECYCLED PAPER**

EP-KL21

User's Manual