

EP-PT11

*Motherboard for
Pentium MMX™
User's Manual*

Order Number 41010009
November, 1997

EC-CONFORMITY DECLARATION



(EC conformity marking)

FOR THE FOLLOWING EQUIPMENT:

Product Name : MOTHERBOARD
Model: EP-PT11
Manufacturer: ENPC TECHNOLOGY CORP.
Manufacturer Address: 6FL., No. 19, Wu Chuan 6 Rd.,
Wu-Ku Industrial Park, Taipei, Taiwan.

IS HEREWITH CONFIRMED TO COMPLY WITH THE EQUIPMENTS SET UP IN THE COUNCIL DIRECTIVE ON THE APPROXIMATION OF THE LAW OF MEMBER 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 above mentioned product with the actual required safety standards in accordance with LVD 73/23 EEC.

Manufacturer/Importer

Date: May 16, 1997

Signature: _____

Name: JEFF CHANG

(Project Leader)

Signature: _____

Name: PETER CHEN

(President)

EP-PT11

Motherboard
for
Compatible PC

User Manual Rev 1.5

Related Motherboard: EP-PT11 P.C.B. Rev 1.5

Date: October, 1997

1. Introduction

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.

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.

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1. Introduction

1.1 *About this Manual*

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

Information is presented in the following three chapters:

Chapter 1.

Introduction: This chapter presents the features of the motherboard; what components and accessories should be included with it; and describes the specifications of this product, including a diagram of the motherboard layout.

Chapter 2.

Installation: This chapter shows how to install the motherboard, and how to configure its various features and functions.

Chapter 3.

CPU Settings: This chapter contains all the technical information you need to set the type, voltage, and clock speed of your CPU.

1. Introduction

1.2 *Item Checklist*

This product comes with the following components:

- ☒ Motherboard x 1
- ☒ 9-pin serial port & 25-pin parallel port flat cable with bracket x 1
- ☒ Bracket with 25-pin serial port and PS/2 Mouse ribbon cable x 1
- ☒ 40-pin IDE connector flat cable x 1
- ☒ 34-pin floppy disk drive flat cable x 1
- ☒ User's Manual x 1
- ☐ Quick Setting Label x 1
- ☐ Bus Master IDE Driver Diskette x 1
- ☐ USB Connection Cable with bracket x 1 (Optional)
- ☐ IrDA Module (Optional)

1. Introduction

1.3 Specifications

- Processor:

ZIF socket 7 support for **intel**® Pentium (P54C & P55C);
Cyrix 6x86 (M1 & M2), and AMD K5/K6 Series processors
and CPU speeds up to 233MHz. .
- Chipset:

intel® 82430TX System Controller, **intel**® 82371AB PCI
ISA IDE Xcelerator, ITE 8679/8687 (Giga I/O Controller)
- BIOS:

Award/AMI BIOS with DMI support, 1 to 2Mb Flash ROM
with Green PC, Plug-and-Play, ACPI, and PC97
- System Memory:

4 x 72-pin SIMM / 2 x 168-pin DIMM Slots support up to
256MB. The system supports mixed memory technologies:
Extended Data Out (EDO), Fast Page (FP) DRAM, and
Synchronous DRAM (SDRAM).
- On-board Multi-I/O:

1 x FDD Port support up to 2.88MB
1 x Parallel Port (LPT) support ECP/EPP
2 x High Speed Serial (16550 UART) Ports
2 x Universal Serial Bus (USB) Port
1 x AT Keyboard Port
1 x PS/2 Mouse Port
1 x Real Time Clock (RTC)
2 x IrDA
- PCI Bus Master IDE:

2 x PCI Bus Master IDE Controllers
Support PIO Mode 3/4 EIDE Devices (HDD, CD-ROM, LS-
120 FDD, etc.);

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Ultra DMA/33 mode; and HDD Auto-Detect

- Expansion Slots:
4 x 32-bit PCI Bus Master Slots, 3 x 16-bit ISA Slots
2 x DIMM Connectors for SDRAM or EDO RAM
- Cache Onboard:
512KB Pipeline Burst SRAM Cache
- Options:
Infrared (IrDA) Wireless Interface Kit
Universal Serial Bus (USB) Connector Kit
- Dimensions:
220mm x 250mm (8.7" x 10")
- Form Factor:
Baby AT Form Factor

1. Introduction

1.4 Notes On Installation

This motherboard has been designed with the Intel 82430TX, PCI chipset, which was developed by Intel Corporation to fully support the Pentium Processor PCI/ISA system. The Intel 82430TX PCI chipset provides increased integration and improved performance. 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 ITE 8679/8687 Super I/O controller provides standard I/O functions: floppy interface, two serial ports with 16-Byte FIFO buffers, and an EPP/ECP-capable parallel port.

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

The motherboard requires a minimum of 4MB of system memory, and can support a maximum of 256MB.

The onboard L2 Cache comprises 256KB or 512KB of synchronous SRAM to increase system performance.

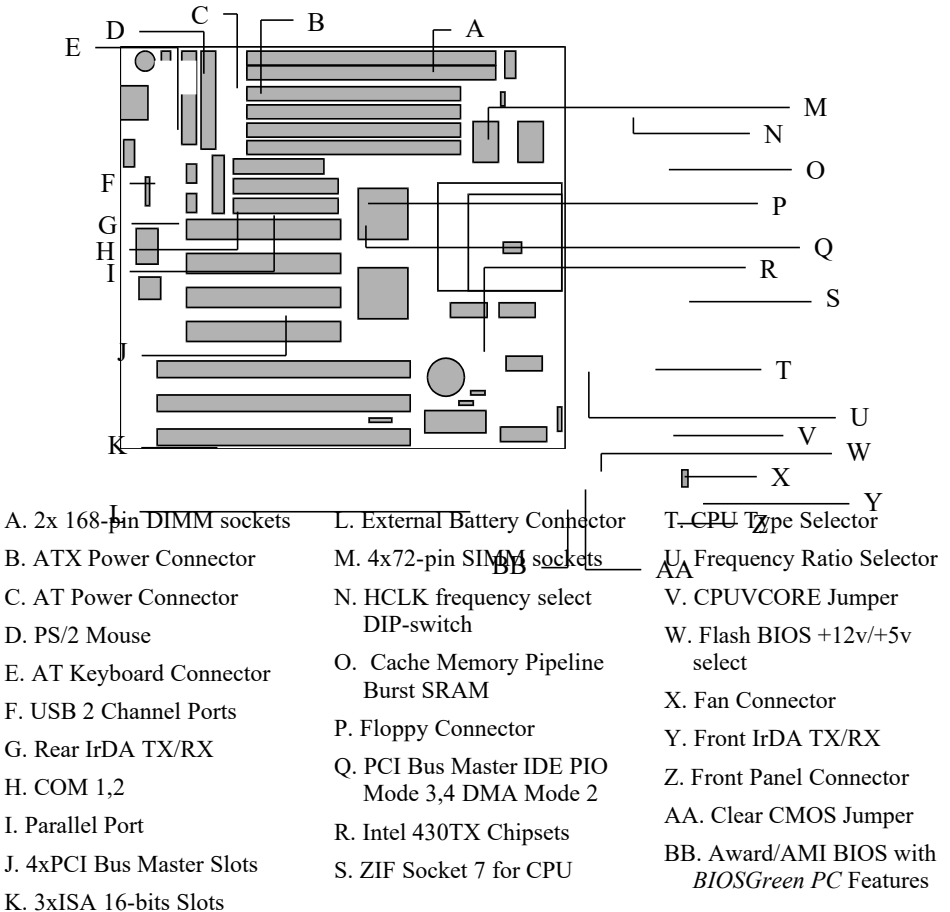
The motherboard supports standard Fast Page (FP), EDO (Extended Data Out), or SDRAM (Synchronous DRAM) memory, and provides four 72-pin SIMMs and two 168-pin DIMMs. The sockets support 1Mx32(32MB) single-sided or double-sided memory modules.

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

2. Installation

2.1 Motherboard Layout



2. Installation

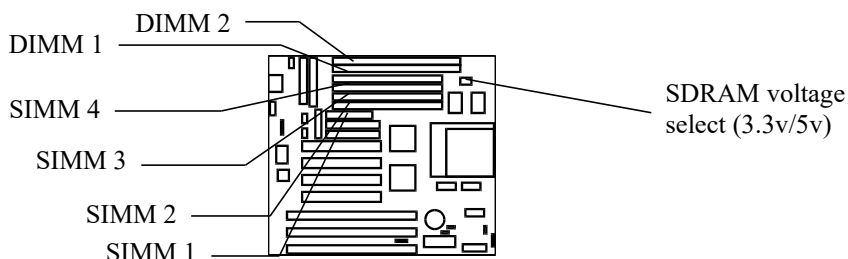
2.2 *Installation Steps*

1. Install SIMM (and DIMM) memory modules
2. Install the CPU
3. Install Expansion Card(s)
4. Install the External Connectors
5. Power On Procedures
6. Set jumpers for CPU type and speed.

2. Installation

2.3 System Memory (SIMM and DIMM)

This motherboard supports four 72-pin SIMMs (Single Inline Memory Modules) of 4MB, 8MB, 16MB, 32MB, and/or 64MB to form a memory size between 8MB to 256MB. 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 in any combination as shown in the table below:

Item	Bank	Memory Module
1	DIMM 1	8-128MB
2	DIMM 1, 2	8-128MB
3	DIMM 2 SIMM 3, 4	8-128MB
4	DIMM 1 SIMM 1, 2	8-128MB 4-32MB
5	SIMM 1, 2	4-32MB
6	SIMM 3, 4	4-32MB
7	SIMM 1, 2, 3, 4	4-32MB

NOTE: You cannot mix two *types* (FPM, EDO, or SDRAM) or sizes of memory in a single bank. After installing any memory modules, setup is required using "Auto Configuration" in the Chipset Features section of BIOS setup.

2. Installation

2.3.1 SIMM/DIMM Memory Installation Procedures:

1. The SIMM memory modules will only fit in one orientation because of a plastic *Safety Tab* on one end of the SIMM socket which exactly fits the *notched* end of the SIMM module.
2. Press the SIMM into its socket at a 45-degree angle to the motherboard, making sure that all the contacts are aligned with the socket.
3. With you finger tips, gently push the memory module into a vertical position so that it clicks into place.
4. The plastic guides should go through the two mounting holes on the sides and the metal clips should snap on the other side.
5. To remove a memory module, squeeze both metal clips outwards and rock the module back to a 45-degree angle, then lift it out of the socket.
6. This motherboard is optimized for SDRAM performance: It supports the new generation *Synchronous Dynamic Random Access Memory* (SDRAM), and allows combined usage of SIMM and DIMM memory modules.

2.4 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 the 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 can overheat and cause damage to both the CPU and the motherboard.

2.4.1 Installing the CPU

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-

2. Installation

degree angle. Insert the CPU with the correct orientation. The ZIF socket has a square pattern of pinholes, but there is one hole missing from the pattern in one corner. On the CPU, there is a white dot printed near one corner, on the top face. Be sure that the white dot on the CPU lines up with the *odd* corner of the socket. **If you try to insert the CPU in the wrong orientation, you could damage it!** 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* according to the type of CPU you install.

(See chapter 3 *CPU Settings* for more information.)

2.4.2 Expansion Cards

Both ISA and PCI expansion cards may need an assigned IRQ. System IRQs are available to cards installed in the ISA expansion bus first, and any remaining IRQs are then used by PCI cards. Currently, there are two types of ISA cards. The original ISA expansion card design, now referred to as *Legacy ISA*, requires that you configure the card's jumpers manually and then install it in any available slot on the ISA bus. You may use Microsoft's Diagnostic (MSD.EXE) utility to see a map of your used and free IRQs. For Windows 95 users, open the "Control Panel" icon in "My Computer", and double-click on the "System" icon, then click on the "Device Manager" tab. Double clicking on a specific device gives you "Resource" tab which shows the Interrupt number and address. Make sure that no two devices use the same IRQs or your computer will experience problems when those two devices are in use at the same time.

To simplify this process this motherboard has complied with the Plug and Play (PnP) specification, which was developed to allow automatic system configuration whenever a PnP-compliant card, is added to the

2. Installation

system. For PnP cards, IRQs are assigned automatically from those currently available.

If the system has both Legacy and PnP ISA card installed, IRQs are assigned to PnP cards from those not used by Legacy cards. The *PCI and PnP Configuration* section of the BIOS setup utility can be used to indicate which IRQs are being used by Legacy cards. For older Legacy cards that do not work with the BIOS, you can contact your vendor for an ISA configuration utility. An IRQ number is automatically assigned to PCI expansion cards after those used by Legacy and PnP ISA cards. In the PCI bus design, the BIOS automatically assigns an IRQ to any PCI slot which has a card that requires an IRQ. To install a PCI card, you need to set something called the INT (interrupt) assignment. Since all the PCI slots on this motherboard use an INTA#, be sure that the jumpers on your PCI cards are set to INTA.

2.4.2.1 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 described above. You can select a DMA channel in the PCI and PnP configuration section of the BIOS Setup utility.

NOTE: Choose "Yes" 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" under *PnP and PCI Setup* in the BIOS Setup, otherwise conflicts may occur.

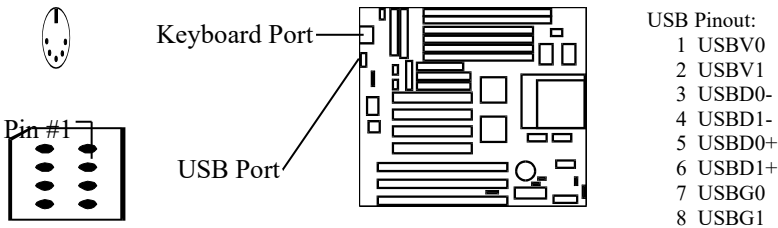
2. Installation

2.5 External Connectors

NOTE: Please refer to the diagram on page 6 and to the markings on the motherboard to be sure that connectors and jumper caps are placed correctly. Placing jumper caps on *connector* pin-blocks can cause damage to your motherboard.

2.5.1 Keyboard Connector and USB Port

(J16, 5-pin Female and J13, 8-pin Female)



2.5.2 PS/2 Mouse Connector (J18)

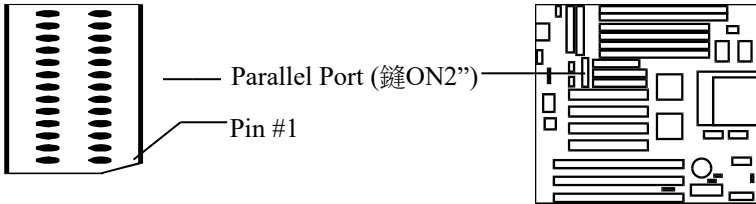
If you are using a PS/2 mouse, you must enable the PS/2 port in the BIOS Setup.



2. Installation

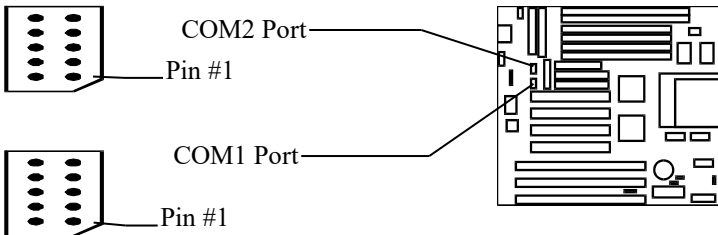
2.5.3 Parallel Printer Port (CON2, 25-pin Female)

You can enable or disable the parallel port (LPT1) and choose its IRQ number in the BIOS setup.



2.5.4 Serial Ports (COM1, COM2, 9-pin Male Connector)

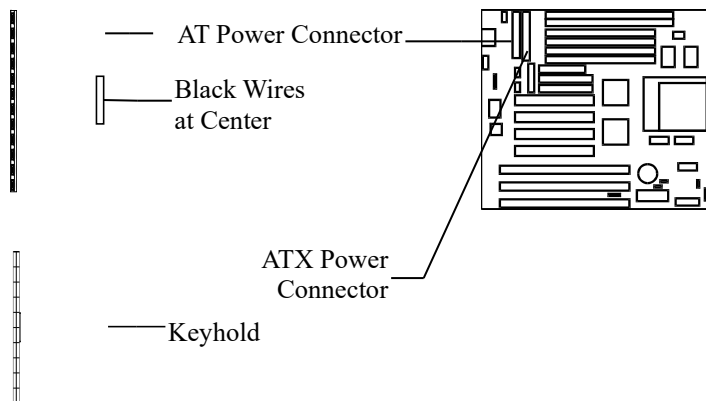
The two serial ports (COM1 & COM2) can be used for pointing devices or other serial devices. See *Onboard Serial Port* in *Chipset Features Setup* in the BIOS setup software to configure.



2. Installation

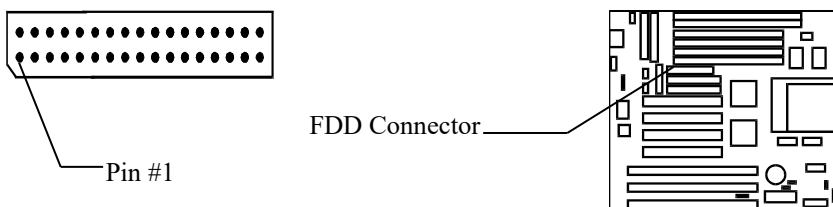
2.5.5 AT & ATX Power Supply Connectors

J14 is a standard 12-pin AT-type or PS/2 type socket. Be sure to attach the two connectors with the two black wires next to each other, at the centre. J15 is a standard ATX-type power connector. (The ATX power connector can *only* be inserted the correct way.)



2.5.6 Floppy Drive Connector (J12, 34-pin block)

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.

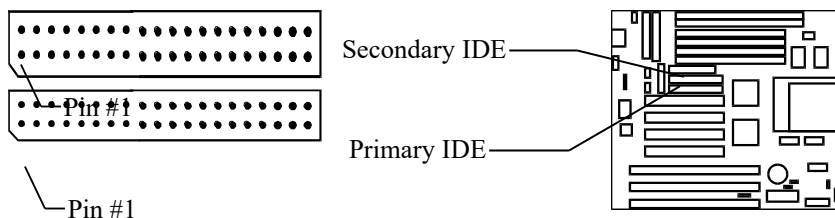


2.5.7 Primary/Secondary IDE connectors. (J9 & J11: 40-pin blocks)

These connectors support the provided IDE hard disk ribbon cable. After connecting the single end to the board, connect the plug(s) at the

2. Installation

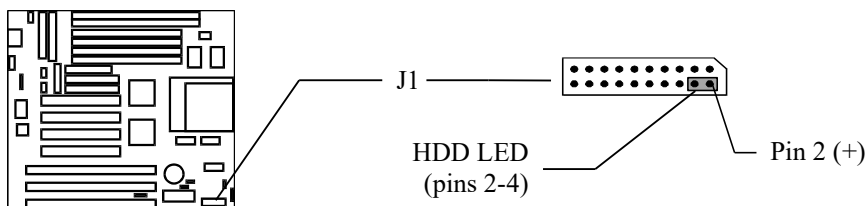
other end to your hard disk drive(s). If you install two hard disks, you must configure the second drive to *slave mode* by setting its jumper accordingly. Please refer to your hard disk documentation for the jumper settings. The BIOS now supports SCSI device or IDE CD-ROM boot-up (see "Boot Sequence" in the BIOS Features Setup of the BIOS Software)



2.5.8 Front Panel Connector

2.5.8.1 IDE Activity LED (J1, pins 2-4)

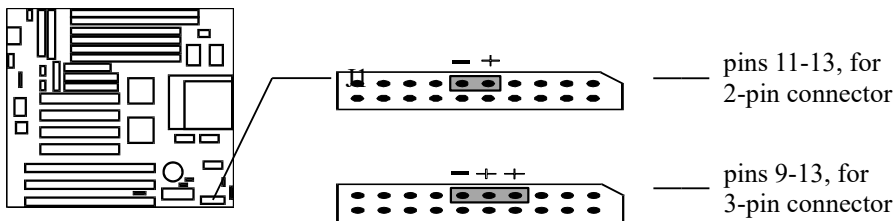
These pins connect to the IDE (hard disk) activity indicator light on the system cabinet.



2.5.8.2 System Power LED (J1, pins 9/11-13)

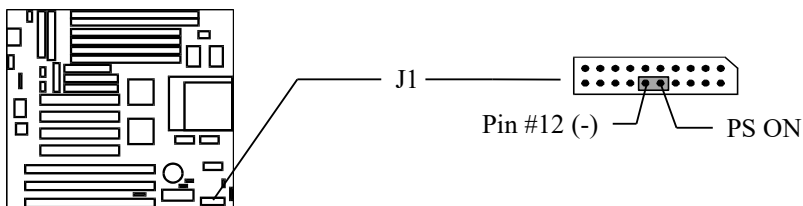
This connector accepts both 2-pin and 3-pin plugs. It lights the system power LED when the motherboard has power.

2. Installation



2.5.8.3 SMI Suspend Switch & ATX Power Switch (J1, pins 10-12)

Marked as "PS-ON" on the motherboard, this switch supports different modes of operation, in conjunction with a standard ATX-type power supply.



A momentary switch connected to this lead controls the system power. Pushing the button once will turn on the system and pushing another time will turn it off. The system power LED shows the system's on/off power status. If Power Management is enabled under BIOS setup, this allows the user to manually place the system into a suspend mode (often called "green mode") where system activity will be instantly decreased to save electricity and prolong the life of certain components when the system is not in use. In this case, the user must press and hold the Power Switch for a preset *delay period* to turn the system power off completely. The *delay* and other Power Management parameters are determined in BIOS Setup.

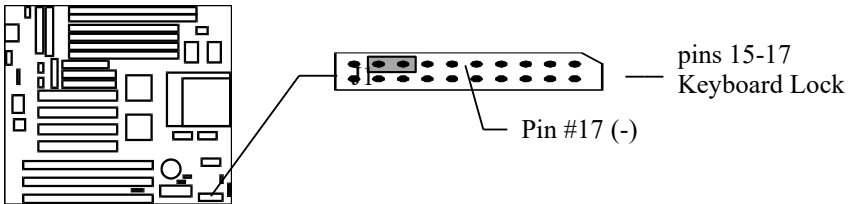
This connection does not have a function when a standard power supply is used

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.

2. Installation

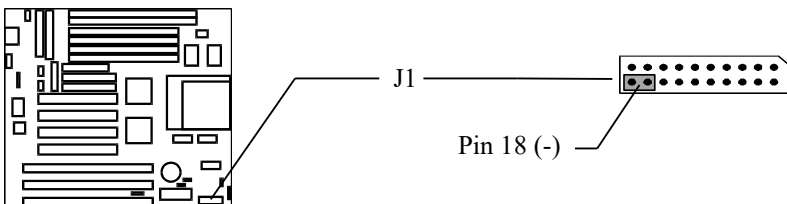
2.5.8.4 Keyboard Lock Switch (J1, pins 15-17)

This 2-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.



2.5.8.5 Reset Switch Lead (J1-J, pins 18-20)

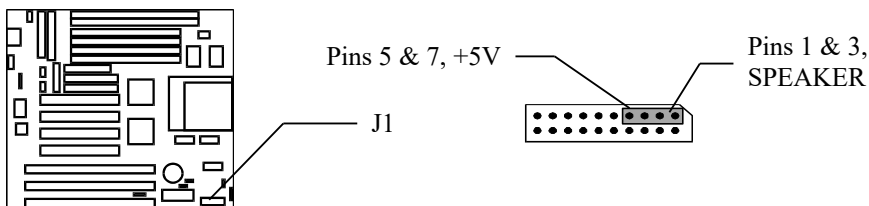
This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off power switch. This method of *cold-rebooting* is preferred in order to prolong the life of the system's power supply.



2. Installation

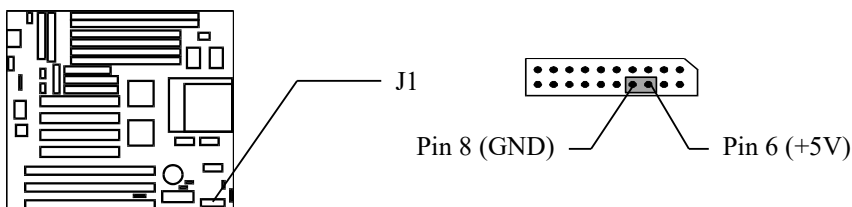
2.5.8.6 Speaker Connector (J1, pins 1-7)

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



2.5.8.7 Turbo LED (J1, pins 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.



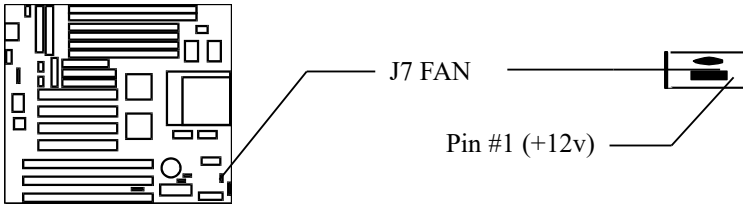
2.5.9 CPU Cooling Fan Connector (J7, FAN)

This connector supports a CPU cooling fan of 500mAMP (6WATT) 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 maybe 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. As shown below, pin #1 is positive, and should be connected with the red wire.

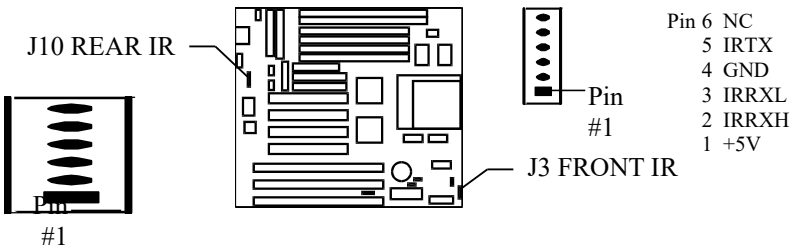
NOTE: The CPU and/or motherboard will overheat if there is no airflow across the CPU and onboard heatsinks. Damage may occur to the motherboard and/or the CPU if these pins are incorrectly used. These are not jumpers. Do not place jumper caps over these pins!

2. Installation



2.5.10 IrDA Compliant Infrared Module Connector (J3: Front IR; J10: Rear IR)

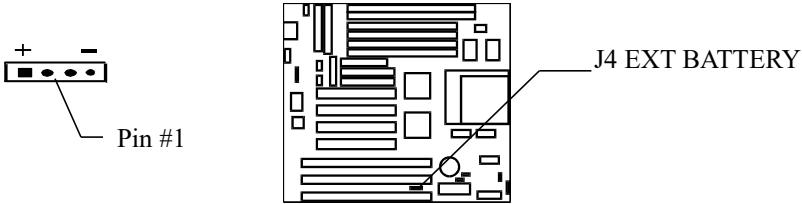
These connectors support optional wireless infrared transmit/receive modules. The IrDA module mounts to a small opening on the system cabinet. To use this feature, you must also configure UART2. to "Use Infrared" under *Chipset Features* in the BIOS Setup to select whether UART2 is directed for use with COM2 or IrDA. When IrDA is selected in BIOS, COM2 will be disabled. Use the six pins as shown on the Back View and connect a ribbon cable from the module to the motherboard to the pin definitions.



2. Installation

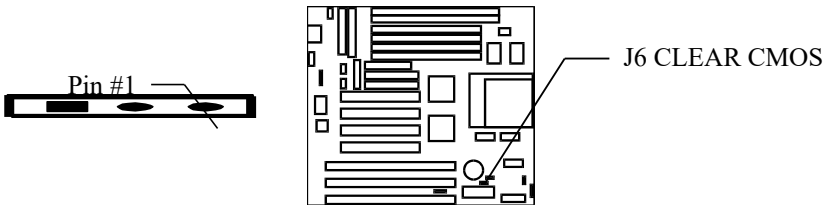
2.5.11 External Battery Connector (J4)

When using the external battery connector, be very careful of the polarity (positive and negative poles). Also, be sure to use only batteries rated at 4.5~6.0V.



2.5.12 Clear CMOS Connector (J6)

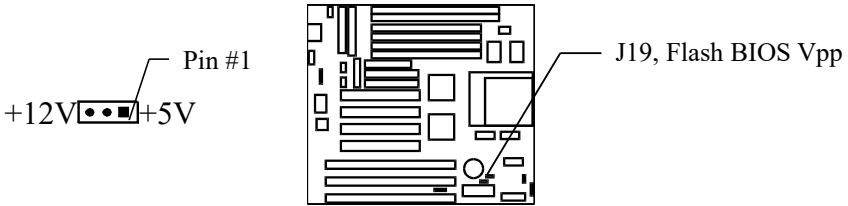
Temporarily placing a jumper across pins 1-2 of this pin block will erase all user-defined BIOS settings. For regular use, the jumper can be stored on pins 2-3, which is marked as NORMAL. Be certain that system power is OFF before using this feature!



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2.5.13 Flash ROM Vpp Select Jumper (J19)

This jumper selects Vpp for the Flash ROM. By default, it's set to +5V (pins 1-2). Moving the jumper cap to pins 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.



2. Installation

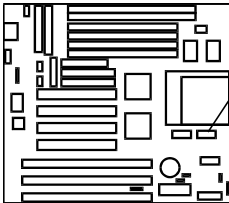
3. CPU Settings

3.1 Setting CPU Type (J20)

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.

For P54C, K5, and M1 type CPUs, set jumper caps on the two pin-pairs which are closest to the edge of the motherboard.



J20



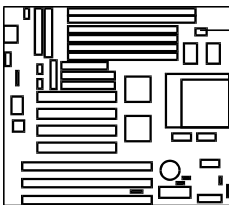
P55C, K6, M2



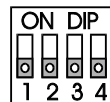
P54C, K5, M1

3.2 External Clock Frequency (SW1)

SW1 is a DIP (Dual Inline Package) switch. Switches 1, 2, and 3 control the frequency of the external clock (switch 4 is not used). The settings are shown in the tables below.



SW1



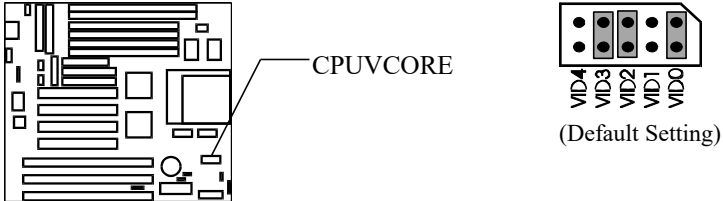
(Default Settings)

2. Installation

3	2	1	HCLK
ON	ON	ON	83.3MHz
ON	ON	OFF	Reserve
ON	OFF	ON	Reserve
ON	OFF	OFF	68.5MHz
OFF	ON	ON	55.0MHz
OFF	ON	OFF	75.0MHz
OFF	OFF	ON	60.0MHz
OFF	OFF	OFF	66.6MHz

3.3 CPUVCORE Jumper Settings (JP1)

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.



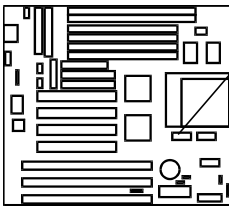
2. Installation

3.4 CPUVCORE Table (JP1)

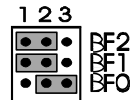
	1.3v	1.4v	1.5v	1.6v	1.7v	1.8v	1.9v	2.0v	2.1v	2.2v	2.3v	2.4v
VID4	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
VID3	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
VID2	OFF	OFF	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
VID1	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	OFF	ON	ON	OFF
VID0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
	2.5v	2.6v	2.7v	2.8v	2.9v	3.0v	3.1v	3.2v	3.3v	3.4v	3.5v	
VID4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
VID3	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON	ON	
VID2	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON	
VID1	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	
VID0	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	

3.5 Frequency Ratio Settings (JB1)

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/PR166 (BUS 66MHz)			2-3	2-3	1-2
AMD-K6/PR200 (BUS 66MHz)			1-2	2-3	1-2
AMD-K6/PR233 (BUS 66MHz)			1-2	1-2	1-2



Frequency Ratio
Jumper



(Default Setting)