PAK-2102

PRELIMINARY MANUAL

DOC No. : NA
Rev. : NA
Date : 1, 1997
Part No. : NA

Table of Contents

Chapter 1 Overview

Main Features 2

Chapter 2 Installation Procedures

Mainboard Layout 6
1). Set System Jumpers 7
Jumpers 7
Clear Password: CPW 8
Flash EPROM Type Selection: EP1, EP2 8
2). Install RAM Modules 9
DRAM Memory 9
RAM Module Configuration 10
Install SIMMs 12
Remove SIMMs 13
Cache Memory 14
Onboard Cache RAM (256KB/512KB) 15
Onboard Cache RAM and RAM Module Mixture (512KB/1MB) 16
RAM Module 17
3). Install the CPUs 18
CPU External Clock (Bus) Frequency: CLK1, CLK2 20
CPU to Bus Frequency Ratio: FREQ1, FREQ2 20
Intel Pentium CPUs 21
Frequency 21
Voltage 22
AMD-K5 CPUs 23
Frequency 23
Voltage 24
Cyrix 6x86 CPUs 25
Frequency 25
Voltage 26
IBM 6x86 CPUs 27
Frequency 27
Voltage 28
Installation of Cyrix (or IBM) 6x86 CPU Fan 29
4). Install Expansion Cards 30

5). Connect Cables and Power Supply..... 31
Audio-In Connector: CD-IN 31
Serial Port Connectors: COM1, COM2 31
CPU Fan Connectors: FAN..... 32
Hardware MPEG Card Connector: FC, LPB..... 32
Floppy Diskette Drive Connector: FLOPPY..... 33
Front Panel Block Connector: F_PNL 34
Audio and Game Connector: AUDIO&GAME..... 35
Infrared Connector: IR 35
Power Connector: POWER..... 36
IDE HDD Device Connectors:
PRIMARY and SECONDARY..... 37
Printer Connector: PRINTER..... 37
PS/2 Keyboard Connector: PS2_KB..... 38
PS/2 Mouse Connector: PS2_MS 38
Remote Power Connector: RPW_CON..... 39
Universal Serial Bus Connector: USB1 and USB2
(Reserved For Future Upgrade)..... 39
VGA Connector: VCA 40
VGA Subsystem..... 40
Display 41
The Connector..... 42
Wave Table Connector: WAVE 42

Overview

Congratulations on your decision to adopt the PAK-2102 mainboard. The mainboard combines the advanced capabilities of the VIA Apollo 580VP® chipset with a high-performance concurrent PCI local bus architecture to provide the ideal platform for unleashing the unsurpassed speed and power of the Intel Pentium processor. This highly-flexible mainboard is designed to run a full range of Intel Pentium™, Cyrix 6x86™, IBM 6x86™, and AMD-K5™ processors; and can be easily upgraded using its 321-pin ZIF socket. The processor's advanced performance is complemented by a second level write back Pipeline Burst SRAM cache of up to 1MB and main memory of up to 512MB RAM. The main memory is installed using the board's six 72-pin SIMM sockets that accept an unrivaled choice of high-speed EDO and standard Fast Page Mode DRAM.

The PAK-2102 integrates a full set of I/O features onboard, including two 16550 UART compatible serial ports, one EPP/ECP capable parallel port, and one Floppy Disk Drive controller. It also comes with a built-in Enhanced IDE controller that provides convenient, high-speed PCI Bus Master connections with up to four IDE devices, including Hard Disk and CD-ROM drives. An extended slot allows you to install a riser card providing ample room for further expansion. The mainboard also features support for the state-of-the-art Universal Serial Bus (USB) that provides ease-of-use and high-speed Plug & Play connections to future USB compliant peripheral devices. The IrDA compliant serial port and optional onboard SIR support further enhance system I/O connectivity. Moreover, for advanced VGA functionality, the PAK-2102 features an onboard S3 Trio64V+™ VGA subsystem that delivers up to 1024x768x256 resolutions. The Creative Lab ViBRA 16C™ onboard audio subsystem provides the audio environment.

This chapter gives you a brief overview of the PAK-2102 mainboard. In addition to basic information on the board's main components and features, it also provides advice on how to upgrade and expand it. For updated BIOS, drivers, or product release information, please visit FIC's home page at: http://www.fic.com.tw.

Main Features

The PAK-2102 mainboard comes with the following high-performance features:

- Easy Installation
  Phoenix BIOS with support for Plug and Play, auto detection of Hard Drive and IDE features, and MS Windows 95™.

- Flexible Processor Support
  The onboard 321-pin ZIF socket supports Intel Pentium (P54C) CPU speed 75/90/100/120/133/150/166/200 MHz processors / P54CS / P54CTB / P55C.
  Cyrix 6x86-P120+ (100 MHz) / 6x86-P133+ (110 MHz) / 6x86-P150+ (120 MHz) / 6x86-P166+ (133 MHz) / M2 seris processors.
  IBM 6x86-P120+ (100 MHz) / 6x86-P133+ (110 MHz) / 6x86-P150+ (120 MHz) / 6x86-P166+ (133 MHz) / M2 seris processors.
  AMD K5-PR75 (75 MHz) / K5-PR90 (90 MHz) / K5-PR100 (100 MHz) / K5-PR120 (90 MHz) / K5-PR133 (100 MHz) / K5-PR150 (105 MHz) / K5-PR166 (116 MHz) / K5-PR200 (133 MHz) processors.

- Leading Edge Chipset
  VIA 580VP chipset, including a CPU interface controller, advanced cache controller, integrated DRAM controller, synchronous ISA bus controller, PCI local bus interface, integrated power management unit.

- Ultra-fast Level II Cache
  Supports onboard Pipeline Burst SRAM that can be expanded to 1MB using a cache module.

- Versatile Main Memory Support
  Accepts up to 512MB RAM in threebanks using six SIMMs of 4, 8, 16, 32, 64, 128MB with support for FPM and EDO DRAM.

- ISA & PCI Expansion Slots
  An extend slot allows a riser card for further expansion.

- USB Support (Reserved for Future Upgrade)
  Two Unniversal Serial Bus plug-in connectors integrated into rear I/O panel.

- Enhanced PCI Bus Master IDE Controller
  Integrated Enhanced PCI local bus IDE controller with two connectors supports up to four IDE devices such as Hard Disk, CD-ROM or Tape Backup drives via two channels for high speed data throughput. This controller supports PIO Modes 3 and 4, and DMA Mode 2 for optimized system performance.

- Super Multi I/O
  Integrated NS PC87336VLJ Multi I/O chipset features two 16550A UART compatible serial ports, one EPP/ECP capable parallel port, one IR port, an and one Floppy Disk Drive connector.

- Compact Audio Onboard Subsystem
  Integrated Creative Lab ViBRA 16C onboard audio system controller and Yamaha OPL ¾ FM music synthesizer fully compatible with Sound Blaster®, Sound Blaster Pro, Microsoft Windows Sound system, and Roland MPU401 standard.

- High-Resolution Onboard VGA Subsystem
  Onboard S3 Trio64V+ VGA subsystem offers up to 1280x1024x256 resolution.

This Page Intentionally Left Blank

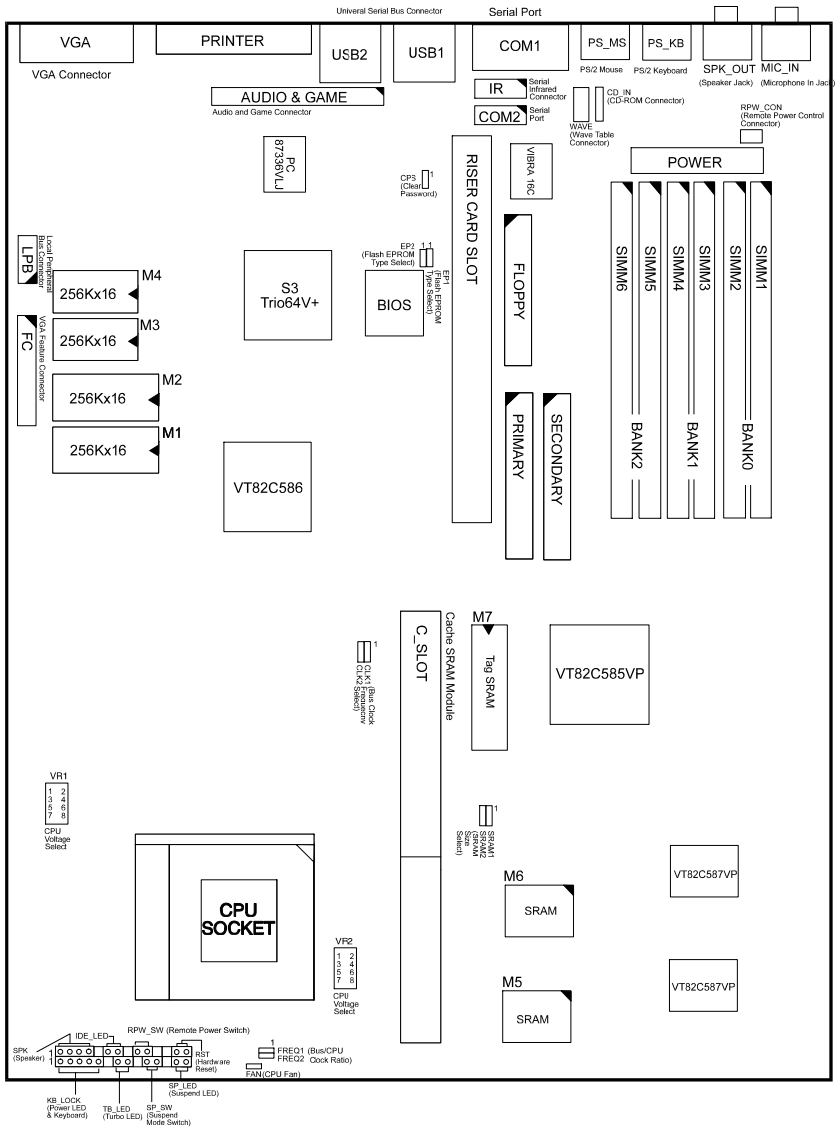
Installation Procedures

The PAK-2102 has several user-adjustable jumpers on the board that allow you to configure your system to suit your requirements. This chapter contains information on the various jumper settings on your mainboard.

To set up your computer, you should follow these installation steps:

- Step 1 -
  Set system jumpers
- Step 2 -
  Install System RAM modules
- Step 3 -
  Install the CPU
- Step 4 -
  Install expansion cards
- Step 5 -
  Connect cables and power supply

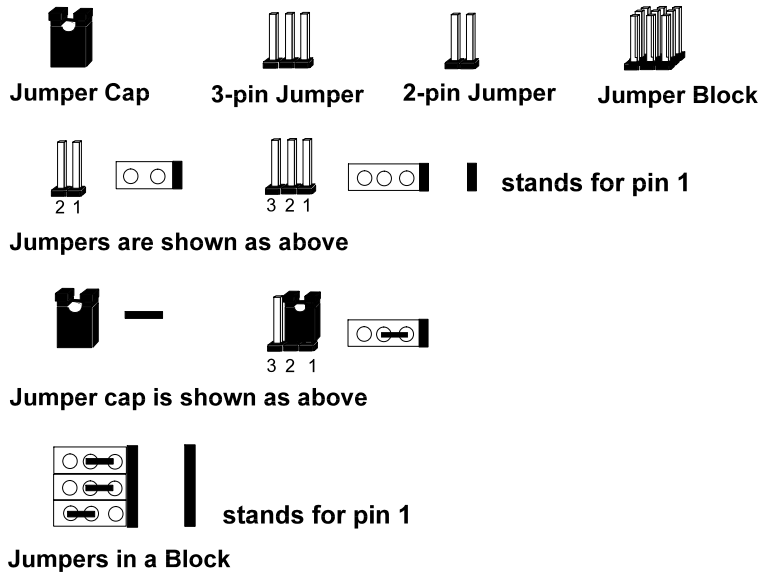
Mainboard Layout



1). Set System Jumpers

Jumpers

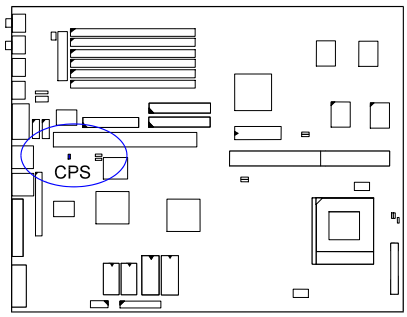
Jumpers are used to select the operation modes for your system. Some jumpers on the board have three metal pins with each pin representing a different function. To **set** a jumper, a black cap containing metal contacts is placed over the jumper pins according to the required configuration. A jumper is said to be **shorted** when the black cap has been placed on one or two of its pins. The types of jumpers used in this manaul are shown below:

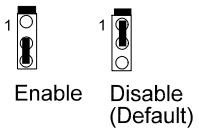


NOTE : Users are not encouraged to change the jumper settings not listed in this manual. Changing the jumper settings improperly may adversely affect system performance.

Clear Password: CPW

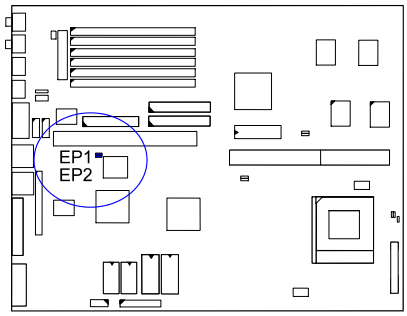
This jumper allows you to set the password configuration to **Enabled** or **Disabled**. You may need to enable this jumper if you forget your password.





Flash EPROM Type Selection: EP1, EP2

This jumper allows you to configure the Flash EPROM chip.



	EP1	EP2
ATMEL AT29C020 SST 29EE020	1	1
MXIC MX28F2000P	1	1
AMD Am29F002T	1	1

2). Install RAM Modules

DRAM Memory

The working space of the computer is the Random Access Memory (RAM). The system cannot act upon data unless it is loaded into RAM. The system RAM is comprised of industry-standard 72-pin Single In-line Memory Modules (SIMMs).

The PAK-2102 is able to support standard **FPM (Fast Page Mode) and EDO (Extended Data Out) DRAM**; and can accommodate onboard memory from 8 to 512MB using SIMMs. The mainboard has three memory banks: Bank 0, Bank 1, and Bank 2. Each bank has two SIMM sockets which can accept either a pair of **4MB, 8BM, 16MB, 32MB, 64MB, or 128*MB** SIMM in each socket. The three banks allow different memory sizes of SIMMs (e.g. 4MB or 16MB); however, you must populate each memory bank with the same memory size (e.g. 4MB & 4MB) of SIMM.

NOTE :
1. All memory banks use 72-pin memory modules.
2. * A SIMM of this size was not available for testing when this manual was printed.

RAM Module Configuration

TOTAL MEMORY	SIMM 1 & 2 (Bank 0)	SIMM 3 & 4 (Bank 1)	SIMM 5 & 6 (Bank 2)
8MB	4MB & 4MB		
16MB	8MB & 8MB		
	4MB & 4MB	4MB & 4MB	
24MB	4MB & 4MB	4MB & 4MB	4MB & 4MB
	8MB & 8MB	4MB & 4MB	
32MB	8MB & 8MB	8MB & 8MB	
	8MB & 8MB	4MB & 4MB	4MB & 4MB
	16MB & 16MB		
40MB	8MB & 8MB	8MB & 8MB	4MB & 4MB
	16MB & 16MB	4MB & 4MB	
48MB	16MB & 16MB	8MB & 8MB	
	8MB & 8MB	8MB & 8MB	8MB & 8MB
	16MB & 16MB	4MB & 4MB	4MB & 4MB
64MB	16MB & 16MB	8MB & 8MB	8MB & 8MB
	16MB & 16MB	16MB & 16MB	
	32MB & 32MB		
72MB	32MB & 32MB	4MB & 4MB	
80MB	32MB & 32MB	8MB & 8MB	
	32MB & 32MB	8MB & 8MB	
96MB	32MB & 32MB	16MB & 16MB	
	32MB & 32MB	8MB & 8MB	8MB & 8MB
	16MB & 16MB	16MB & 16MB	16MB & 16MB

(continued on the next page)

TOTAL MEMORY	SIMM 1 & 2 (Bank 0)	SIMM 3 & 4 (Bank 1)	SIMM 5 & 6 (Bank 2)
128MB	32MB & 32MB	32MB & 32MB	
	64MB & 64MB		
	32MB & 32MB	16MB & 16MB	16MB & 16MB
136MB	64MB & 64MB	4MB & 4MB	
144MB	64MB & 64MB	4MB & 4MB	4MB & 4MB
	64MB & 64MB		
160MB	64MB & 64MB	8MB & 8MB	8MB & 8MB
	64MB & 64MB	16MB & 16MB	
192MB	64MB & 64MB	32MB & 32MB	
	64MB & 64MB	16MB & 16MB	16MB & 16MB
	32MB & 32MB	32MB & 32MB	32MB & 32MB
256MB	64MB & 64MB	32MB & 32MB	32MB & 32MB
	64MB & 64MB	64MB & 64MB	
	128MB* & 128MB*		
264MB	128MB* & 128MB*	4MB & 4MB	
272MB	128MB* & 128MB*	4MB & 4MB	4MB & 4MB
	128MB* & 128MB*	8MB & 8MB	
288MB	128MB* & 128MB*	8MB & 8MB	8MB & 8MB
	128MB* & 128MB*	16MB & 16MB	
320MB	128MB* & 128MB*	16MB & 16MB	16MB & 16MB
	128MB* & 128MB*	32MB & 32MB	
384MB	64MB & 64MB	64MB & 64MB	64MB & 64MB
	128MB* & 128MB*	64MB & 64MB	
512MB	128MB* & 128MB*	64MB & 64MB	64MB & 64MB
	128MB* & 128MB*		

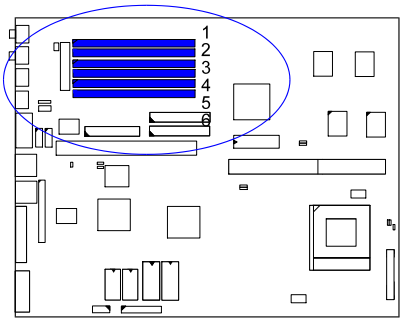
NOTE : * A SIMM of this size was not available for testing when this manual was printed.

Install SIMMs

Complete the following procedures to install SIMMs:

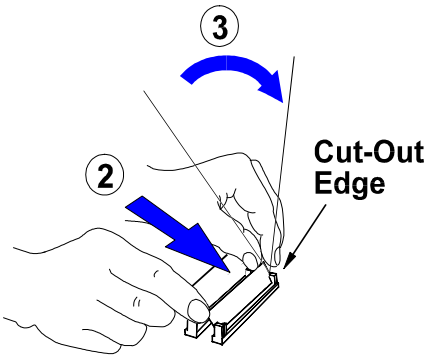
CAUTION :
1. Always turn the system power off before installing or removing any device.
2. Always observe static electricity precautions.
   See “Handling Precautions” at the start of this manual.

1. Locate the SIMM slots on the mainboard. (See figure below.)



NOTE : SIMMs in each bank must be of the same type; and the BIOS automatically configures the memory size.

2. Carefully fit a SIMM at a 45 degree angle into each empty socket to be populated. All the SIMMs must face the same direction.



3. Swing each SIMM into its upright, locked position.
When locking a SIMM in place, push on each end of the SIMM - do not push in the middle, as shown above.

Remove SIMMs

To remove the SIMMs, pull the retaining latch on both ends of the socket and reverse the procedure above.

Cache Memory

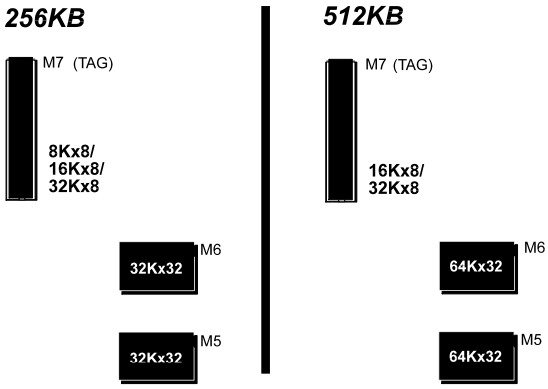
Cache memory access is very fast compared to main memory access. The cache holds data for imminent use. Since cache memory is from five to more than ten times faster than main memory, the CPU's access time is reduced, giving you better system performance.

Pentium mainboards may implement various types of L2 cache SRAMs. Pipeline Burst SRAM is one of them, delivering the best price performance ratio. They perform much better than asynchronous SRAMs.

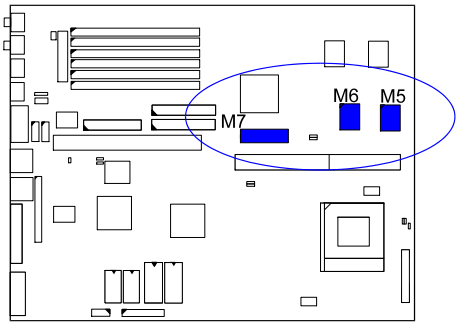
The PAK-2102 comes with onboard 256KB/512KB synchronous 3V Pipeline Burst SRAMs or a 256KB/512KB cache RAM module (FIC's PC512K-3.0 is recommended) that can be installed on the cache RAM module slot.

NOTE : Use the correct chips for the amount of cache memory you want to add. Install both the correct SRAM module and tag SRAM.

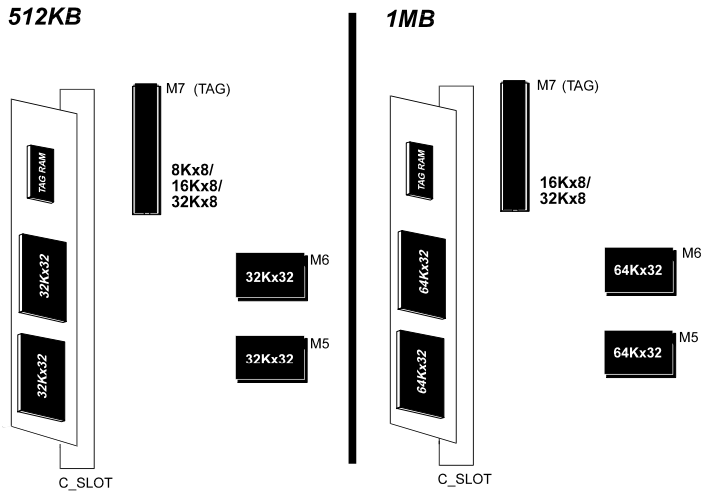
Onboard Cache RAM (256KB/512KB)



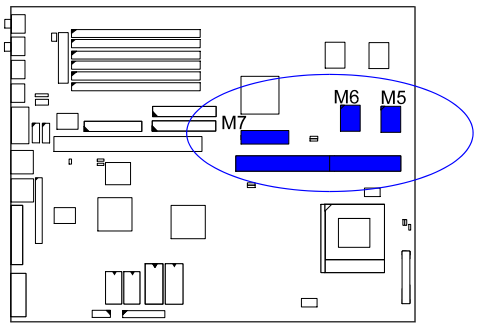
Cache Size	SRAM 1	SRAM 2
256K		
512K		



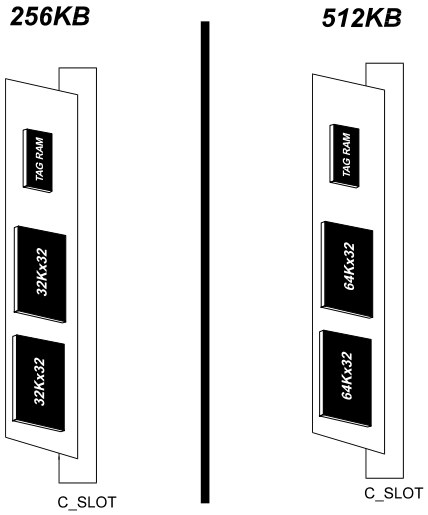
Onboard C ache RAM and RAM Module Mixture (512KB/1MB)



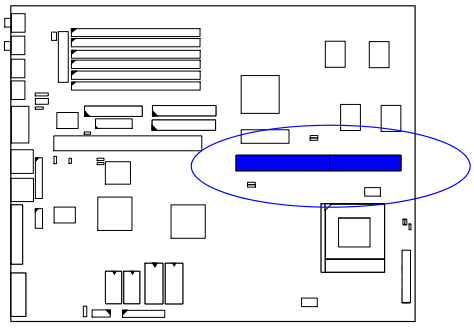
Cache Size	SRAM 1	SRAM 2
512K		
1M		



RAM Module (256KB/512KB)

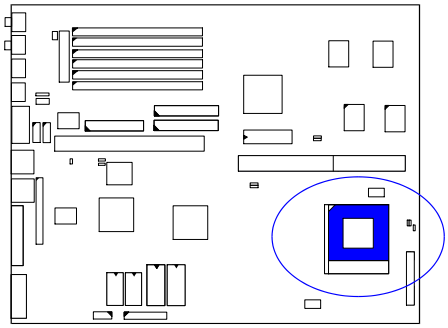


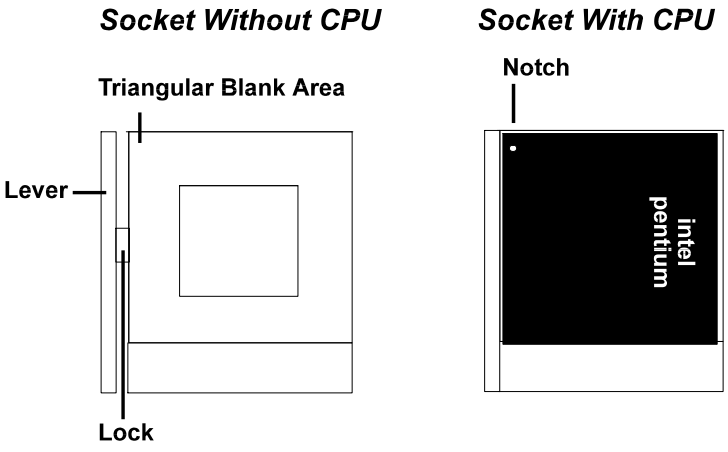
Cache Size	SRAM 1	SRAM 2
256K		
512K		



3). Install the CPU

The CPU module resides in the Zero Insertion Force (ZIF) socket on the mainboard.



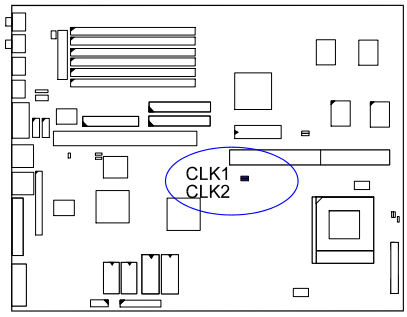


CAUTION :
1. Always turn the system power off before installing or removing any device.
2. Always observe static electricity precautions.
   See “Handling Precautions” at the start of this manual.
3. Inserting the CPU chip incorrectly may damage the chip.

To install the CPU, do the following:
1. Lift the lever on the side of the CPU socket.
2. Handle the chip by its edges and try not to touch any of the pins.
3. Place the CPU in the socket. The chip has a notch to correctly orientate the chip. Align the notch with pin one of the socket. Pin one is located in the blank triangular area. Do not force the chip. The CPU should slide easily into the socket.
4. Swing the lever to the down position to lock the CPU in place.
5. See the following sections for information on the CPU jumpers settings.

CPU External Clock (BUS) Frequency: CLK1, CLK2

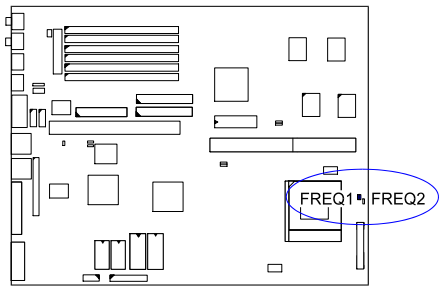
The table below shows the jumper settings for the different CPU speed configurations.



	CLK1	CLK2
66 MHz	1	1
60 MHz	1	1
55 MHz	1	1
50 MHz	1	1

CPU to Bus Frequency Ratio: FREQ1, FREQ2

These two jumpers are used in combination to decide the ratio of the internal frequency of the CPU to the bus clock.

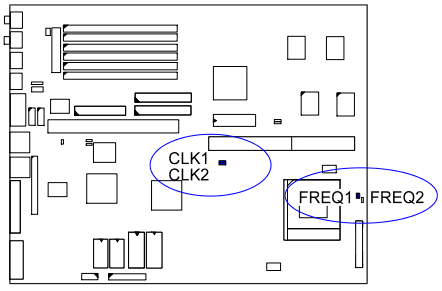


FREQ1	FREQ2	Ratio		
		Intel	Cyrix	AMD
1	1	3 x	3 x	
1	1	2.5 x	2.5 x	1.75 x
1	1	2 x	2 x	2 x
1	1	1.5 x	3 .5 x	1.5 x

Intel Pentium CPUs

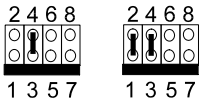
Frequency

CPU Speed	External (CPU/CLK)	CLK1	CLK2	CPU Clock Rate		
				Internal	FREQ1	FREQ2
200 MHz	66 MHz			3 x		
166 MHz	66 MHz			2.5 x		
150 MHz	60 MHz			2.5 x		
133 MHz	66 MHz			2 x		
120 MHz	60 MHz			2 x		
100 MHz	66 MHz			1.5 x		
90 MHz	60 MHz			1.5 x		
75 MHz	50 MHz			1.5 x		

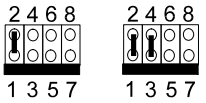


Voltage

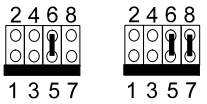
VR1 VR2



Core : 3.384V
IO : Same
P54C - STD, VR

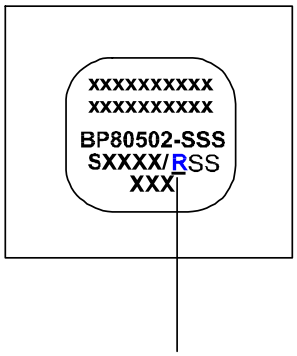


Core : 3.4V-3.6V
IO : Same
P54C - VRE



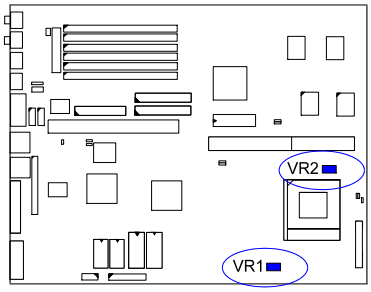
Core : 2.7V-2.9V
IO : 3.3V
P55C

Intel Pentium CPU
Bottom Side Marking



R (Identifier for Voltage Range) :

V for VRE Voltage Range
or
S for Standard Voltage Range

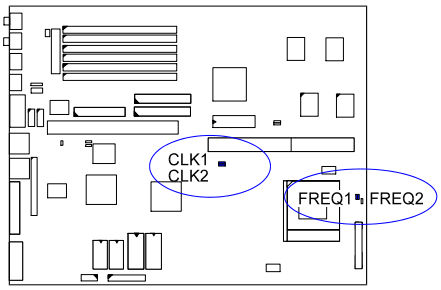


AMD-K5 CPUs

Frequency

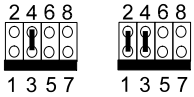
Model Name	CPU Speed	External (CPU/CLK)	CLK1	CLK2	CPU Clock Rate			Remark
					Internal	FREQ1	FREQ2	
K5-PR200*	133 MHz	66 MHz			2 x			*Newly released models*
K5-PR166*	116 MHz	66 MHz			1.75 x**			
K5-PR150	105 MHz	60 MHz			1.75 x**			
K5-PR133	100 MHz	66 MHz			1.5 x			*Currently available models*
K5-PR120	90 MHz	60 MHz			1.5 x			
K5-PR100	100 MHz	66 MHz			1.5 x			
K5-PR90	90 MHz	60 MHz			1.5 x			
K5-PR75	75 MHz	50 MHz			1.5 x			

NOTE :
* This CPU had not been tested when this manual was printed.
** For AMD CPUs only, jumper FREQ1/FREQ2 can be set for 1.75x bus ratio.

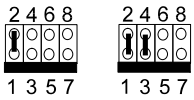


Voltage

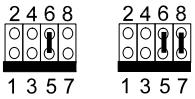
VR1 VR2



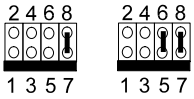
Core : 3.384V
IO : Same
AMD K5 - C, F



Core : 3.4V-3.6V
IO : Same
AMD K5 - B

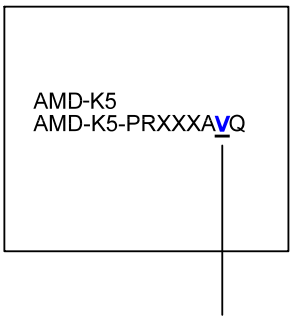


Core : 2.7V-2.9V
IO : 3.3V
AMD K5 - H, J



Core : 2.5V
IO : 3.3V
AMD K5 - K

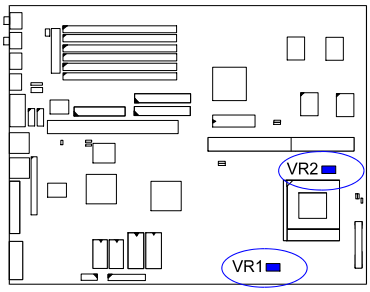
AMD-K5 CPU
Top Side Marking



V (Identifier for Operation Voltage) :

B
C
F
H
J
K

Please refer to
the left-hand-side table

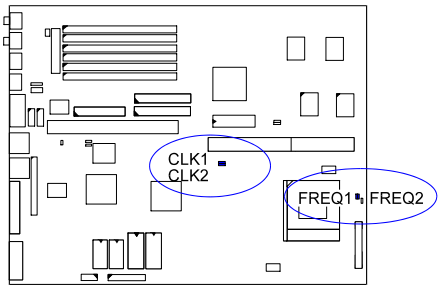


Cyrix 6x86 CPUs

Frequency

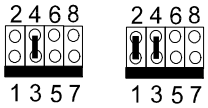
Model Name	CPU Speed	External (CPU/CLK)	CLK1	CLK2	CPU Clock Rate		
					Internal	FREQ1	FREQ2
M2*	200 MHz	66 MHz			3.5 x**		
M2*	180 MHz	60 MHz			3 x		
M2*	166 MHz	66 MHz			2.5 x		
M2*	150 MHz	60 MHz			2.5 x		
6x86-P166+ 6x86L-P166+	133 MHz	66 MHz			2 x		
6x86-P150+ 6x86L-P150+	120 MHz	60 MHz			2 x		
6x86-P133+ 6x86L-P133+	110 MHz	55 MHz			2 x		
6x86-P120+ 6x86L-P120+	100 MHz	50 MHz			2 x		

NOTE :
* This CPU had not been tested when this manual was printed.
** For Cyrix/IBM CPUs only, FREQ1/2 can be set for 3.5x bus ratio.

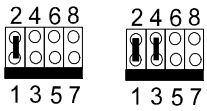


Voltage

VR1 VR2

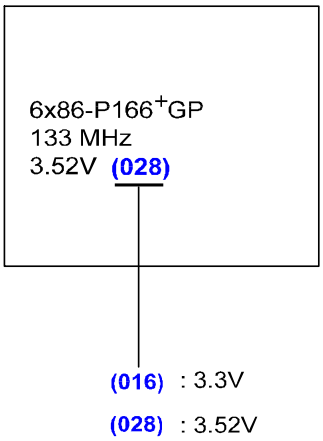


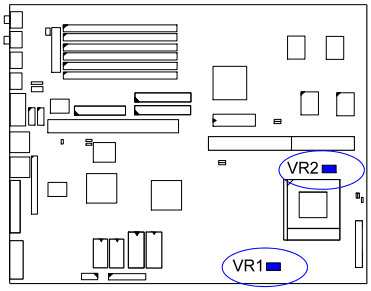
Core: 3.384V
IO : Same
Cyrix 6x86-016



Core: 3.4V-3.6V
IO : Same
Cyrix 6x86-028

Cyrix 6x86 CPU
Top Side Marking



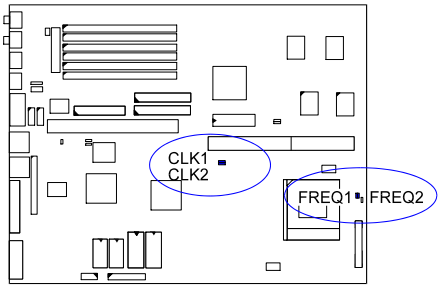


IBM 6x86 CPUs

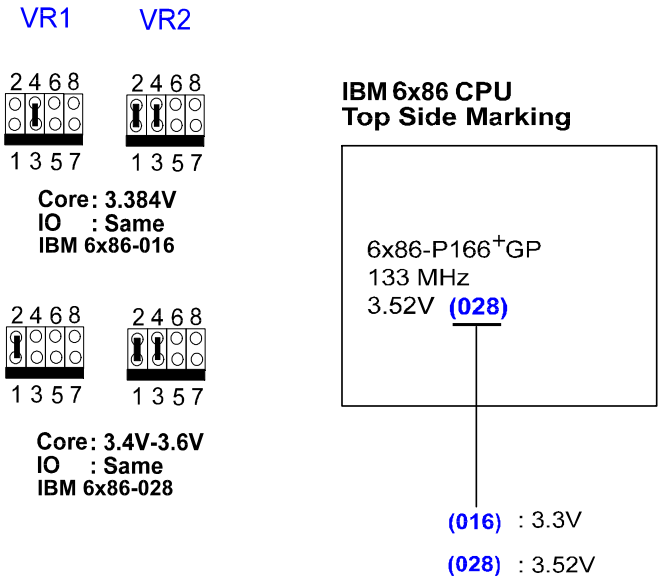
Frequency

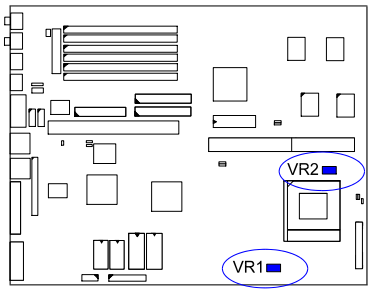
Model Name	CPU Speed	External (CPU/CLK)	CLK1	CLK2	CPU Clock Rate		
					Internal	FREQ1	FREQ2
M2*	200 MHz	66 MHz			3.5 x**		
M2*	180 MHz	60 MHz			3 x		
M2*	166 MHz	66 MHz			2.5 x		
M2*	150 MHz	60 MHz			2.5 x		
6x86-P166+ 6x86L-P166+	133 MHz	66 MHz			2 x		
6x86-P150+ 6x86L-P150+	120 MHz	60 MHz			2 x		
6x86-P133+ 6x86L-P133+	110 MHz	55 MHz			2 x		
6x86-P120+ 6x86L-P120+	100 MHz	50 MHz			2 x		

NOTE :
* This CPU had not been tested when this manual was printed.
** For Cyrix/IBM CPUs only, FREQ1/2 can be set for 3.5x bus ratio.



Voltage


VR1
VR2
2 4 6 8
1 3 5 7
Core: 3.384V
IO : Same
IBM 6x86-016
Core: 3.4V-3.6V
IO : Same
IBM 6x86-028
IBM 6x86 CPU
Top Side Marking
6x86-P166+GP
133 MHz
3.52V (028)
(016) : 3.3V
(028) : 3.52V

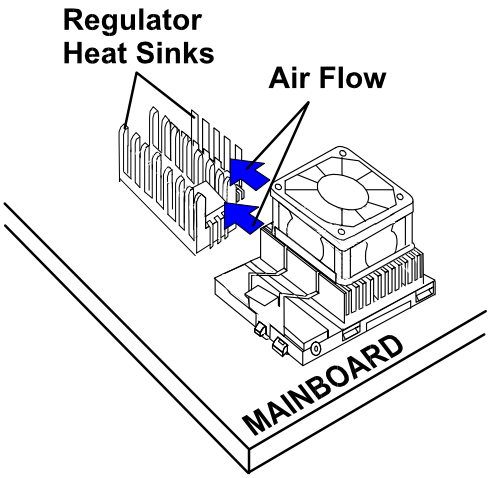

VR2
VR1

Installation of Cyrix (or IBM) 6x86 CPU Fan

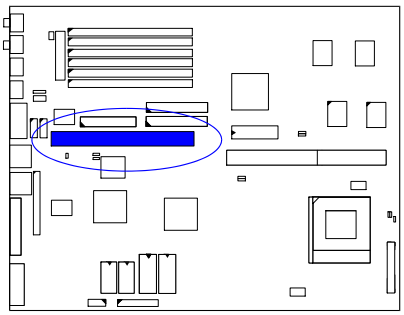
CAUTION : When you install a Cyrix (or IBM) 6x86 CPU fan, please pay attention to the direction of the air flow. Make sure that it lowers the temperature of the regulator. Otherwise, the system may overheat.

We recommend that you use one of the following two CPU fans for the Cyrix (or IBM) 6x86 CPU when you install the fan on the mainboard.

1). Supplier : BIRCHTECK, Taiwan (Phone : 886-2-7935677)
Model Number - BEC6x86B2.
2). Supplier : Cyrix (or IBM). The fan comes with the Cyrix (or IBM) 6x86 CPU purchase. For the stable system performance, make sure that the air flow blow toward the regulator the temperature of the regulator.



4). Install Expansion Cards



Add-on cards are printed circuit boards that, when connected to the mainboard, increase the capabilities of your system. For example, add-on cards can provide video and sound capabilities.

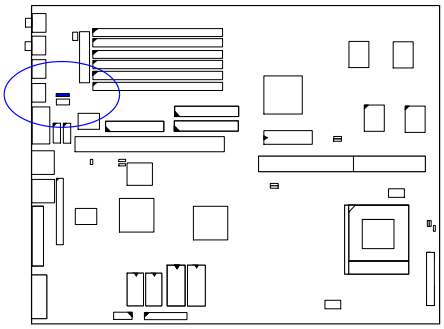
CAUTION :
1. Always turn the system power off before installing or removing any device.
2. Always observe static electricity precautions.
   See “Handling Precautions” at the start of this manual.

To install an add-on card, do the following:
1. Insert the target add-on card on the riser card.
2. Remove the chassis cover and select an available expansion slot.
3. Remove the corresponding slot cover from the chassis.
   Unscrew the mounting screw that secures the slot cover and pull the slot cover out from the chassis. Keep the slot cover mounting screw nearby.
4. Hold the edge of the riser card, carefully align the edge with the expansion slot.
5. Push the riser card firmly into the riser card slot.
6. Secure the add-on card with the mounting screw removed in Step 4. Make sure that the add-on card has been placed evenly and completely into the expansion slot.

5). Connect Cables and Power Supply

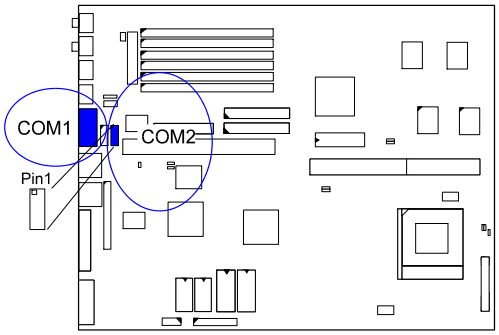
Audio-In Connector: CD-IN

This 4-pin male connector is linked to the AUDIO-OUT port of your CD-ROM device via a ribbon cable.



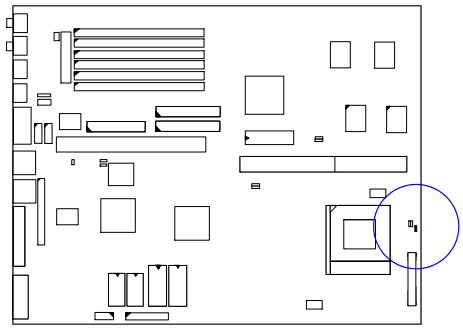
Serial Port Connectors: COM1, COM2

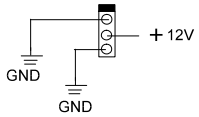
The COM1 is a 9-pin D-type male connector that allows you to connect with your devices that take serial ports, such as a serial mouse or a modem. The COM2 Port, is a 2x5 pin-head onboard connecto, can be used as an alternative IR Port. Usually, your serial mouse is connected to COM1. Your modem is linked to COM2. When you do not use the modem, you can set the BIOS to let COM2 be an IR port to save a dedicated SIR port.



CPU Fan Connector: FAN

This connector is linked to the CPU fan.



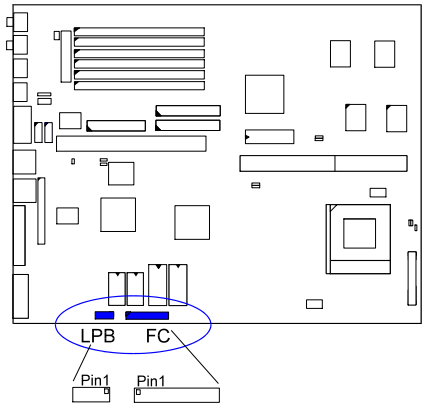


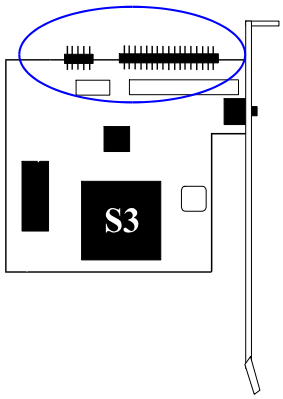
Hardware MPEG Card Connector: FC, LPB

An optional MPEG card 1stGafx-CP3™ will be installed on an available PCI slot on the mainboard to improve the visual quality.

The FC connector, a 2x17 pin male connector, are connected to the MPEG card (together with the LPB connector) via a ribbon cable for utilizing the VGA feature of the MPEG card.

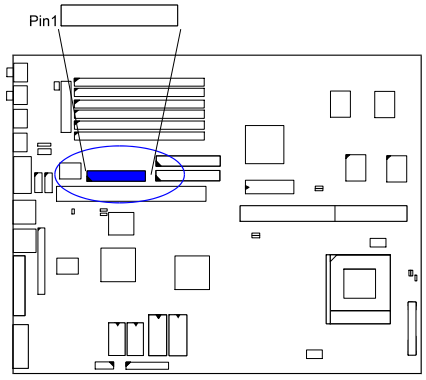
The LPB (Local Peripheral Bus) connector, a 2x5 pin male connector, is used together with the FC connector.





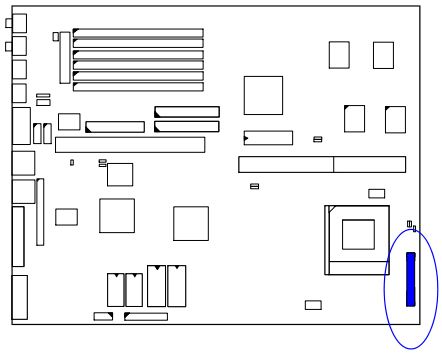
Floppy Diskette Drive Connector: FLOPPY

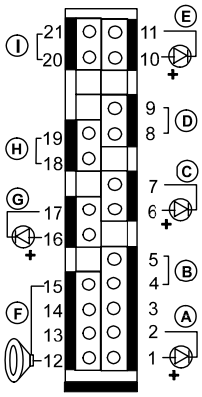
This 2x17 pin male connector connects to your floppy diskette drive (FDD) using the cable that is provided with this mainboard.



Front Panel Block Connector: F_PNL

This block connector includes: PW_LED, KB_LOCK, TB_LED, SP_SW, SPK, SP_LED, IDE_LED, RPW_SW, and RST connectors.

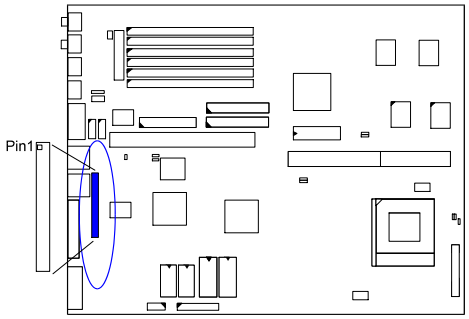


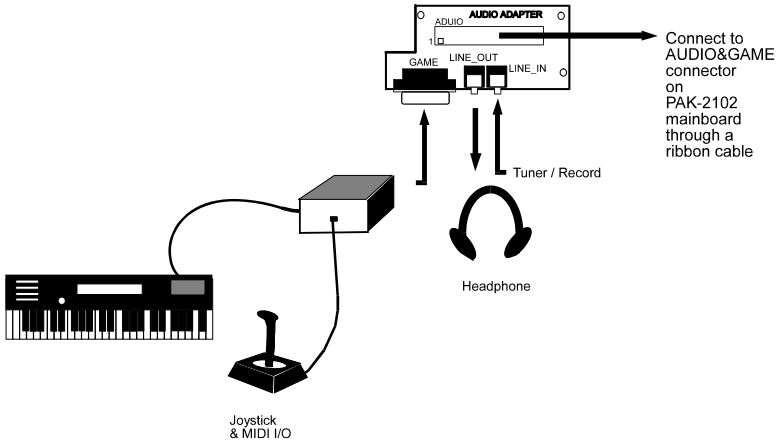


Item	Connector	Pin Type	Feature
A	PW_LED	2-pin male	indicates the system power status
B	KB_LOCK	2-pin male	allows the keyboard to access the system
C	TB_LED	2-pin male	indicates the system speed is in normal or turbo speed
D	SP_SW	2-pin male	Suspend mode switch
E	SP_LED	2-pin male	indicates the system into Suspend mode when LED lit
F	SPK	4-pin male	connects to speaker
G	IDE_LED	2-pin male	indicates the IDE HDD I/O access LED lit
H	RPW_SW	2-pin male	remote power switch
I	RST	2-pin male	allows you to reset the system

Audio and Game Connector: AUDIO&GAME

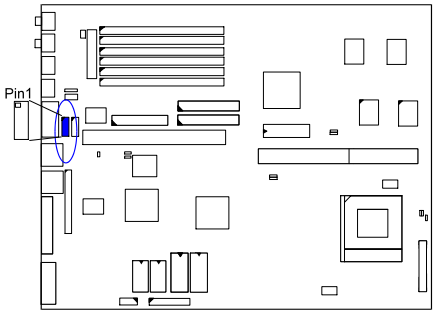
This connector is connected to the audio adapter card via a ribbon cable. The adapter card provides a 15-pin D-type female game port, a LINE_IN external jack and a LINE_OUT jack. The game port also functions as a MIDI port.





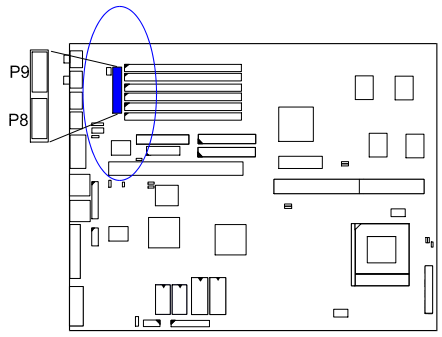
Infrared Connector: IR

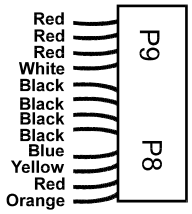
This 2x5 pin male connector is used for connecting to the infrared (SIR) port and allows transmission of data to another system which also supports the SIR feature.



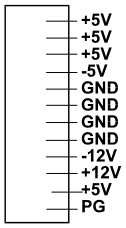
Power Connector: POWER

This 12 pin block connector is used for connecting to the standard 5V power supply. In the picture below, notice that, in most cases, there are two marks **P8** and **P9** on the surface of the connector. You have to insert the **P8** plug into the **P8** section of the connector, and so forth for **P9**. Two black wires must be in the middle.





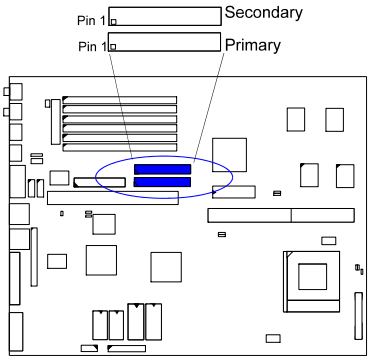
Power Plugs of Power Supply



Power Connector

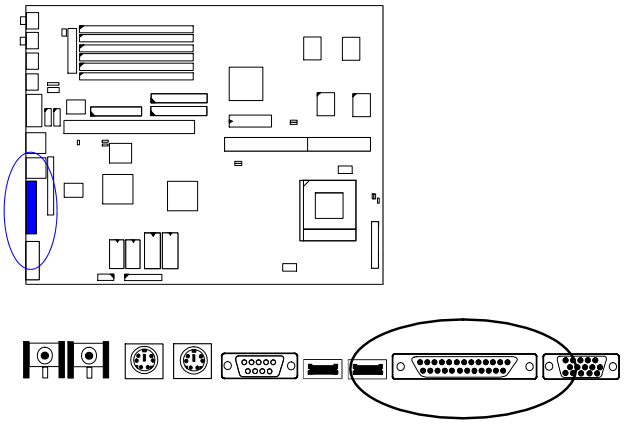
IDE HDD Device Connector: PRIMARY and SECONDARY

These two 2x20 pin male connectors are used for your IDE hard disks. If you have one IDE hard disk, connect it to the PRIMARY connector using the IDE HDD flat cable provided with the mainboard. The BIOS auto detection sets it to be a **Primary Master** disk. If you want to install another IDE hard disk or CD-ROM, please use the SECONDARY connector. If two hard disks are connected to the PRIMARY connector using the same cable, one of them is the master drive, the other one is the slave drive. You may need to set jumpers for the slave drive; please refer to the HDD manual for details.



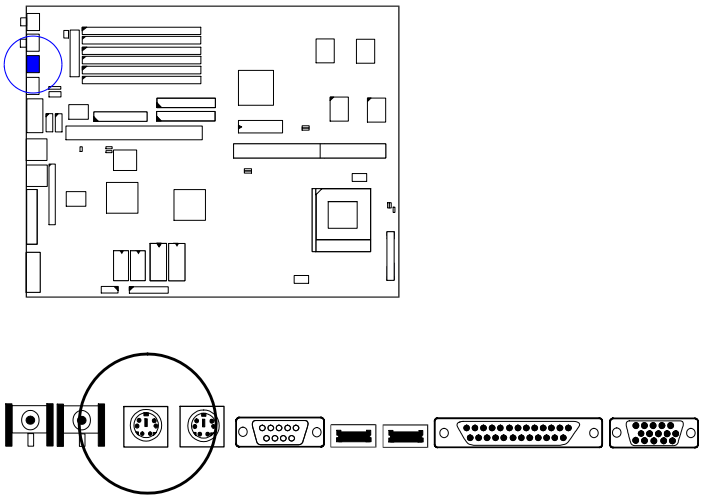
Printer Connector: PRINTER

This 26-pin D-type female connector is attached to your printer via a cable.



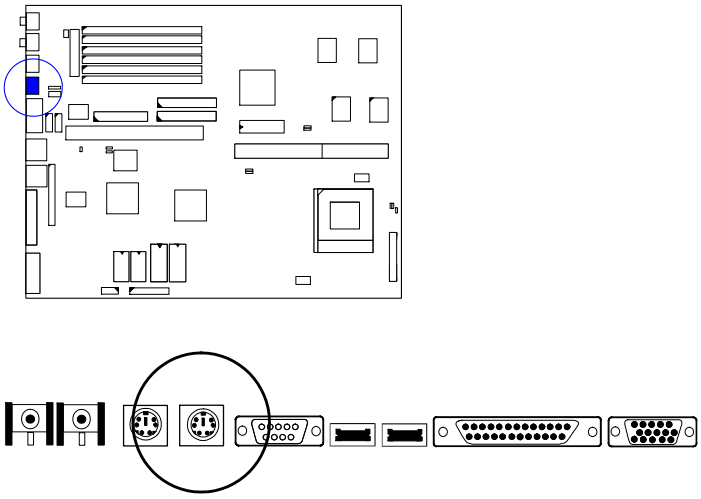
PS/2 Keyboard Connector: PS2_KB

This 5 pin female connector is connected to the PS/2 keyboard.



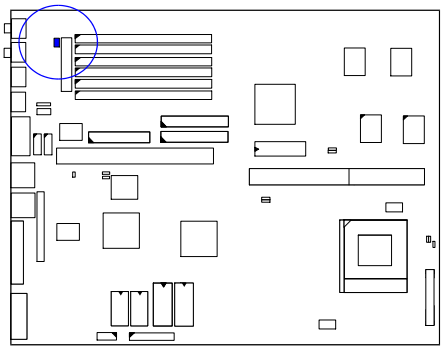
PS/2 Mouse Connector: PS2_MS

This 5 pin female connector is connected to the PS/2 mouse.



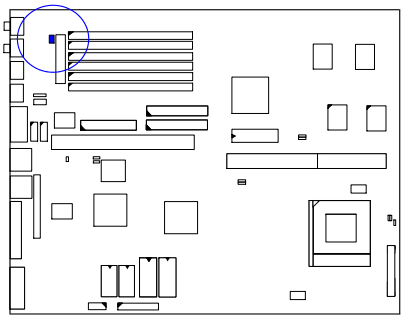
Remote Power Supply Connector: RPW_CON

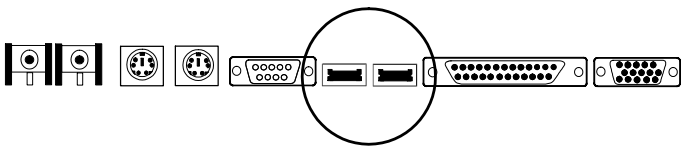
This 3 pin male connector allows you to enable (or disable) the system power if the RPW_SW is on (or off).



Universal Serial Bus Connectors (reserved for future upgrade)

This connects to the port that allows you to attach a USB hub. The USB connectors are built-in for future upgrade of devices or peripherals that support Universal Serial Bus features.

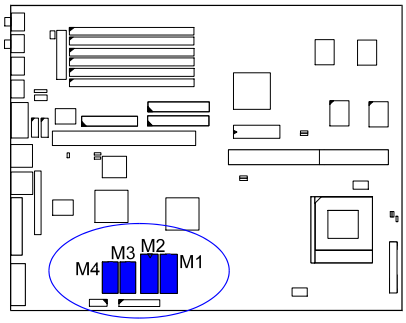




VGA Connector: VGA

VGA Subsystem

The mainboard has built-in VGA controller that supports 1280x1024 resolutions. The related data about resolutions are listed in the next page. To upgrade the onboard VGA DRAM size to 2MB, insert two 256Kx16Bits-7 (SOJ type) DRAM at locations M1, M2.



The PAK-2102 supplies drivers for DOS and Windows-based programs; software drivers for other operating systems may be available in the future or upon request. These drivers will help you to utilize and to enhance the video subsystem of your computer system. The driver disk contains a READ.ME file that is accessible through any word processor using the ASCII or non-document mode.

NOTE :

1. Make backup disks of the original disks and use the backup ones.
2. Use the correct chips for the amount of DRAMs you to add.
3. Observe static electricity precautions.
4. Read the READ.ME file in the driver disk for the installation and recent updates.

Display

Your system has a standard memory of 2MB and provides an onboard VGA controller installed on your mainboard that supports various resolutions up to 1024 x 1280 in 16 colors under both the standard and enhanced VGA modes. It also supports 132-column text modes and non-interlaced monitors up to 72Hz refresh rates.

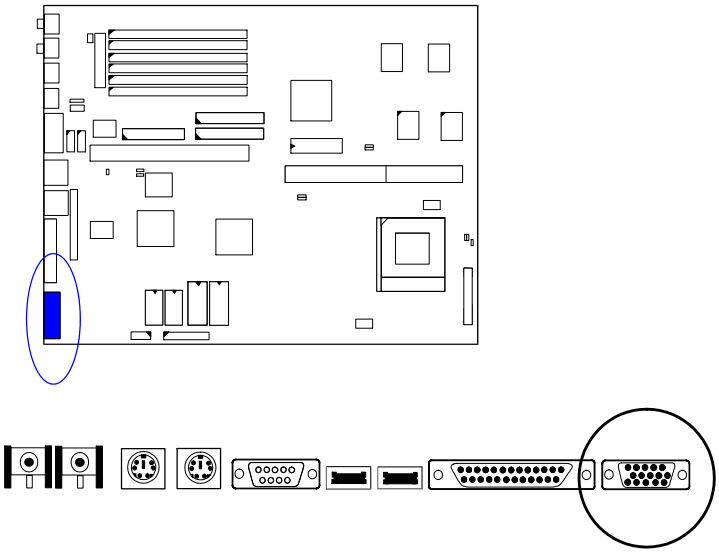
VGA drivers and utilities have been provided with the installation diskettes to enable you to take full advantage of the display capabilities of your monitor while using different application programs. Please refer to the README file in the utility diskettes or ask your dealer for more information or documentation on these utilities and drivers.

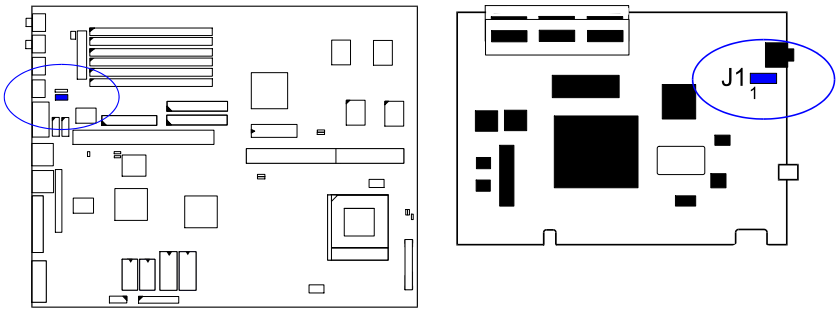
The following table shows the VGA resolutions supported by the system.

Resolution	Colors	Sweep Rate (KHz)	Refresh Rate (Hz)	Dot Clock (MHz)	Min. Video Memory (MB)	Display =D Render-ing = R
640x480	256	37.51	75.02	31.500	2	D, R
640x480	32K	37.51	75.02	31.500	2	R
640x480	64K	37.52	75.02	31.500	2	R
640x480	16M	37.51	75.02	31.500	2	R
800x600	256	46.92	75.02	49.500	2	D, R
800x600	64K	48.02	71.99	50.000	2	R
1024x768	256	60.02	74.96	80.000	2	D, R
1280x1024	256	46.46	43.4 (I)	75.000	2	D

The Connector

This 15 pin D-type female connector is connected to the VGA monitor.



Wave Table Connector: WAVE

The onboard audio system controller, CT2505, and FM synthesizser together with an optional wave table card CT1920 contributes an even better audio effect. The wave table card is installed on an availlable ISA slot. Use a ribbon cable to connect J1 connector on the wave table card with the WAVE connector (2x4 pin male) on the mainboard.