



# **G586PBS**

**Rev. 0+**  
**System Board**  
**User's Manual**



**- D29251020 -**





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## ❖ FCC Statement on Class B

*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 when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, 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:*

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and the receiver.*
- *Connect the equipment into 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.*

### **Notice:**

1. *The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*
2. *Shielded interface cables must be used in order to comply with the emission limits.*



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## ❖ Introduction

The G586IPBS system board offers several advanced features integrated into the system board. Its design is based on the new Peripheral Component Interconnect (PCI) local bus and Industry Standard Architecture (ISA) standards.

The G586IPBS provides a 321-pin Zero Insertion Force (ZIF) CPU socket for Pentium™ processors running at 75MHz, 90MHz, 100MHz, 120MHz, 133MHz or 150MHz frequency. This ZIF socket allows users to easily upgrade their CPUs. It also provides a VRM (Voltage Regulation Module) header allowing you to upgrade to future low-voltage CPUs.

It is equipped with four PCI slots and three ISA slots.

The system board has two bus master PCI IDE connectors. Bus mastering reduces CPU use during disk transfer. The system board is also equipped with two NS16C550-compatible serial ports, an SPP/EPP/ECP parallel port, a floppy disk drive controller, one PS/2 mouse port and one PS/2 or AT keyboard connector.

The G586IPBS can support 8MB to 128MB of memory using 1Mx36, 2Mx36, 4Mx36 and 8Mx36 72-pin SIM modules.



G586IPBS

## Features and Specifications

### Processor

- Intel Pentium™ 75/90/100/120/133/150MHz
- Future Pentium™ OverDrive Processor

### System Design

- Intel Triton chipset
- Four 72-pin SIMM sockets
- 8MB to 128MB onboard memory
- Uses EDO or fast page mode x32 DRAM, 60 or 70ns, 5V
- 256KB or 512KB L2 cache, direct-map WB or WT
- Uses 3.3V pipeline burst or asynchronous cache SRAM on 160-pin cache module (optional)
- EDO DRAM and pipeline burst cache SRAM give optimal performance
- Award BIOS, Windows 95 Plug and Play compliant
- Flash EPROM for easy BIOS upgrades

### Energy Efficient Design

- System power management supported
- CPU stopped clock control
- Hardware supports SMI green mode
- Microsoft/Intel APM 1.1 compliant
- External power management switch supported

### Two Bus Master PCI IDE Connectors

- PIO Mode 3 & 4 Enhanced IDE (data transfer rate up to 16.6MB/sec.)
- DMA Mode 2 Bus Master IDE (data transfer rate up to 22.2MB/sec.)
- Bus mastering reduces CPU utilization during disk transfer
- ATAPI IDE CD-ROM supported



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### Integrated I/O

- Super I/O controller:
  - Winbond W83787F,
  - Winbond W83877F,
  - SMC FDC37C665GT or
  - SMC FDC37C669GT
- Two NS 16C550-compatible high speed UARTs
- One SPP/EPP/ECP parallel port
- One 720KB/1.2MB/1.44MB floppy controller (Winbond W83787F only) or One 720KB/1.2MB/1.44MB/2.88MB floppy controller (Winbond W83877F, SMC FDC37C665GT, SMC FDC37C669GT)
- Plug and Play compliant (Winbond W83877F, SMC FDC37C669GT)

### Integrated Audio System

- Compatible with Sound Blaster™, Sound Blaster Pro™ and Windows Sound System™
- Plug and Play compliant
- Industry leading Delta-Sigma data converters
- Dual DMA support w/FIFOs, full duplex operation
- MPC 2 compatible mixer
- Joystick port and MPU-401 compatible MIDI interface
- External FM and Wavetable synthesis support
- Serial audio data port
- Uses Crystal CS4232 multimedia audio system controller

### Connectors

- Serial ports: 2 connectors
- Parallel port: 1 connector
- IDE: 2 shrouded headers
- Floppy: 1 connector
- PS/2 mouse connector
- PS/2 keyboard connector or AT keyboard connector
- Audio DIP header
- One wavetable connector on the TWT-100 audio expansion board



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### Expansion Slots

- Four PCI slots (all bus masters)
- Three ISA slots (one shared with PCI slot)

### CPU Socket

- VRM (Voltage Regulation Module) header allows upgrade to future low-voltage CPUs
- 321-pin ZIF socket (Intel Socket 7)

### PCB

- 4 layers
- 280mm (11.02") x 220mm (8.66")

### Slot Limitations

Due to the size of the CPU with its accompanying heatsink/fan component, the length of the add-on cards in PCI Slot 2, 3 and 4 is limited to 205 mm (measured from the bracket of the card).

The length of the add-on card in PCI Slot 1 is limited to 205 mm only if its components protrude more than 5 mm from the components and/or solder side of the card.





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## **Package Checklist**

The G586IPBS package contains the following items:

- The G586IPBS system board
- The G586IPBS user's manual
- One set of IDE driver diskettes
- One 34-pin floppy disk drive cable
- Two 40-pin IDE hard disk cables
- One 25-pin printer port cable for chassis mounting
- One card-edge bracket with serial and mouse port cables
- One TWT-100 audio expansion board
- One wavetable daughter board (optional)
- Cache module (optional)

If any of these items is missing or damaged, please contact your dealer or sales representative for assistance.





## ❖ Installation Overview

This chapter summarizes the steps in installing the G586IPBS system board into your system unit. It also includes a description of the area in which you must work and directions for memory installation. Before installing the system board, obtain the memory you plan to install. Please refer to the memory chart, page 9, for the number and type of SIM modules needed for the amount of memory you require.

### Preparing the Area

Before unpacking the system board, make sure the location you have selected is relatively free of dust and static electricity. Excessive exposure to dust, static electricity, direct sunlight, excessive humidity, extreme cold, and water can damage the operational capabilities of your system board. Avoid placing the unit on surfaces such as carpeted floors. These areas also attract static electricity which can damage some circuits on your system board.

Make sure the power source has a properly grounded, three-pronged socket. It is essential that the power connection be properly grounded for correct functioning of your system board. For further protection, we recommend that you use a surge suppressor. This will protect the system board from damage that may result from a power surge on the electrical line.

Move items that generate magnetic fields away from your system board, since magnetic fields can also damage your system board. Once you have selected the ideal location, unpack the G586IPBS system board carefully.



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## Handling the System Board

It is quite easy to inadvertently damage your system board even before installing it to your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling the system board to ensure against electrostatic build-up.

### Tips in Handling the System Board

1. To prevent electrostatic build-up, leave the board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wriststrap.
3. Do all preparation work on a static-free surface with components facing up.
4. Hold the system board by its edges only. Be careful not to touch any of the components, contacts or connections, especially gold contacts on the board.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules and connectors by their ends.

**Warning:**

*Electrostatic discharge (ESD) can damage your upgrade processor, disk drives, add-in boards, and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.*



## Hardware Installation

### Memory Installation

The G586IPBS system board can support 8MB to 128MB of memory using 72-pin SIMMs (Single In-line Memory Module).

The SIM sockets are divided into two banks on the system board. Each bank consists of 2 SIMM sockets. The G586IPBS system board uses 1Mx36, 2Mx36, 4Mx36 and 8Mx36 SIMMs. You will need 2 or 4 pieces of SIM modules, depending on the amount of memory you intend to install.

The table on the next page summarizes the bank locations and modules needed for the corresponding memory sizes.



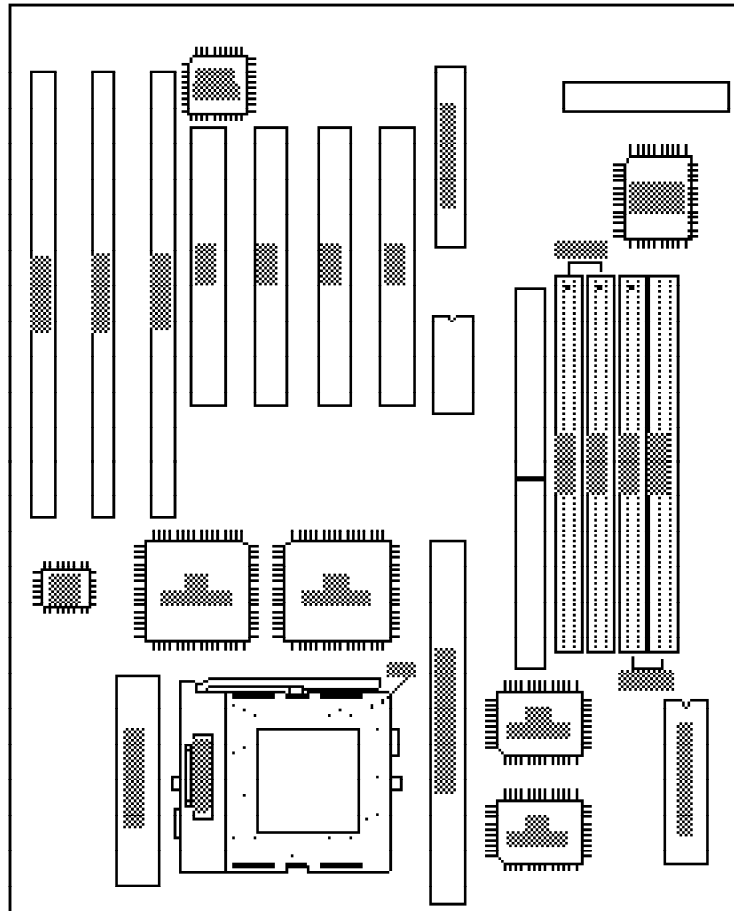


## G586IPBS

Memory Size	Bank0		Bank1	
	SM1	SM2	SM3	SM4
8MB	1Mx36	1Mx36	—	—
8MB	—	—	1Mx36	1Mx36
16MB	1Mx36	1Mx36	1Mx36	1Mx36
24MB	1Mx36	1Mx36	2Mx36	2Mx36
40MB	1Mx36	1Mx36	4Mx36	4Mx36
72MB	1Mx36	1Mx36	8Mx36	8Mx36
16MB	2Mx36	2Mx36	—	—
16MB	—	—	2Mx36	2Mx36
32MB	2Mx36	2Mx36	2Mx36	2Mx36
24MB	2Mx36	2Mx36	1Mx36	1Mx36
48MB	2Mx36	2Mx36	4Mx36	4Mx36
80MB	2Mx36	2Mx36	8Mx36	8Mx36
32MB	4Mx36	4Mx36	—	—
32MB	—	—	4Mx36	4Mx36
64MB	4Mx36	4Mx36	4Mx36	4Mx36
40MB	4Mx36	4Mx36	1Mx36	1Mx36
48MB	4Mx36	4Mx36	2Mx36	2Mx36
96MB	4Mx36	4Mx36	8Mx36	8Mx36
64MB	8Mx36	8Mx36	—	—
64MB	—	—	8Mx36	8Mx36
128MB	8Mx36	8Mx36	8Mx36	8Mx36
72MB	8Mx36	8Mx36	1Mx36	1Mx36
80MB	8Mx36	8Mx36	2Mx36	2Mx36
96MB	8Mx36	8Mx36	4Mx36	4Mx36

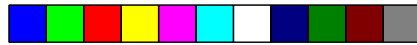


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- Pin 1 of the SIMM socket

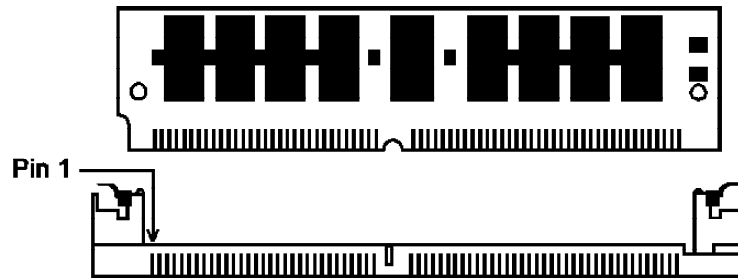
Locations of the SIM Sockets on the System Board



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### Installing the Modules

A SIM module simply snaps into a socket on the system board. Pin 1 of the SIM module must correspond with Pin 1 of the socket.

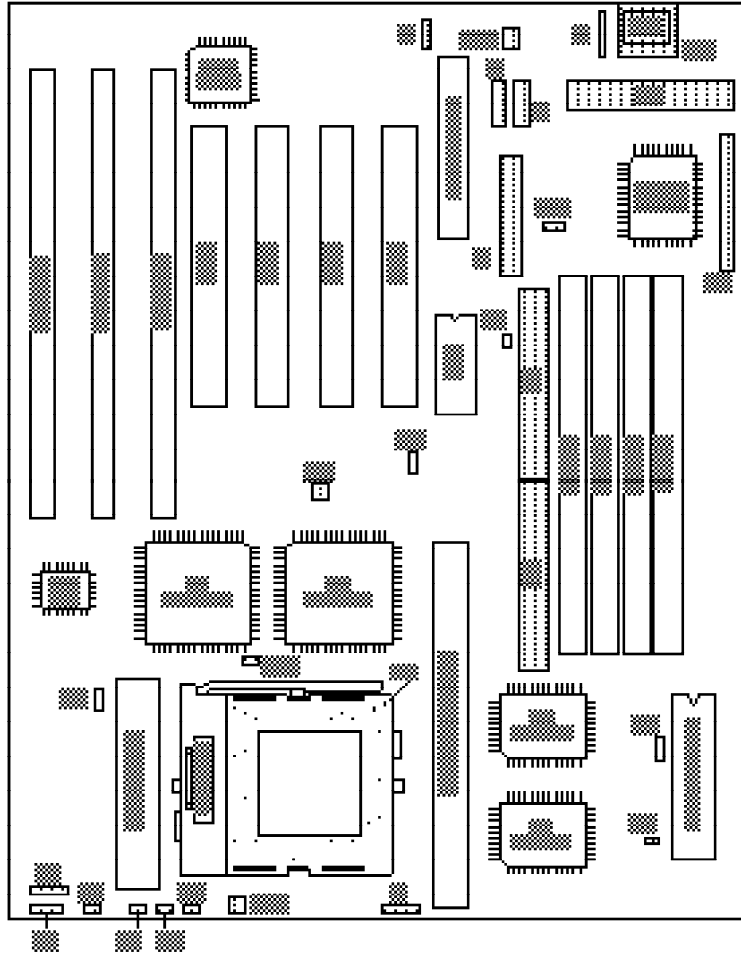


1. Position the SIMM above the socket with the “notch” in the module aligned with the “key” on the socket.
2. Seat the module at a 45° angle into the bank. Make sure it is completely seated. Tilt the module upright until it locks in place in the socket.



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## Board Configuration



Locations of Jumpers and Connectors on the System Board

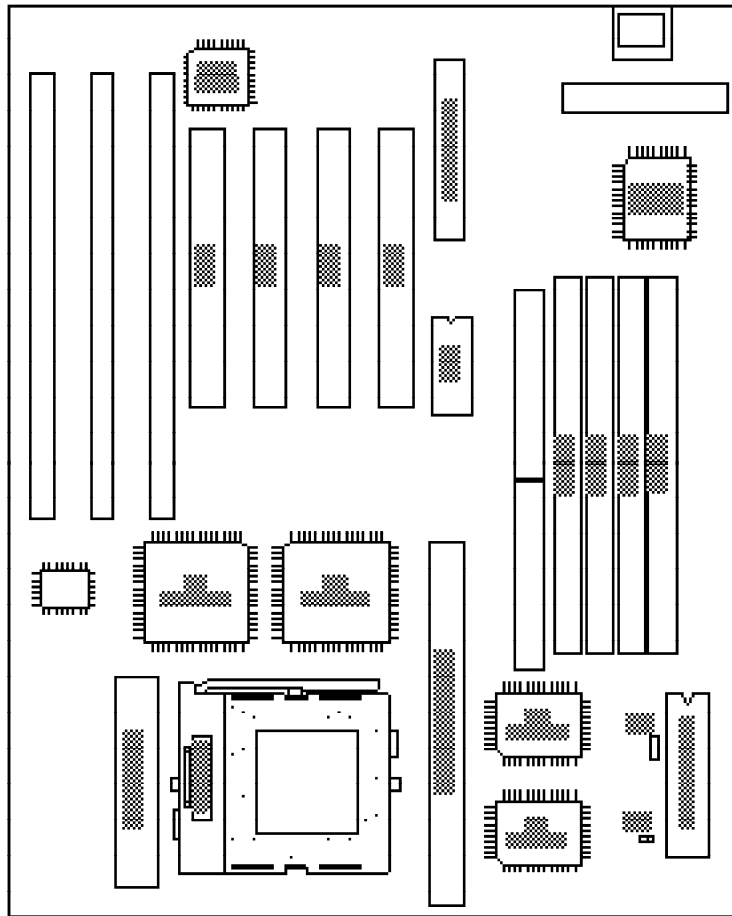




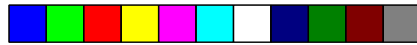
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## Jumper Settings

### Jumper Settings for Display Type and CMOS Clean



Locations of Jumpers JP2 and JP3 on the System Board



### Jumper JP2 Password Clear

If you set a password in the “Password Setting” option and forget your password, power off your system and set Jumper JP2 to On to clear the password stored in your CMOS. Now power on your system. After your system has detected the floppy or hard drive, turn it off again and set JP2 to Off.



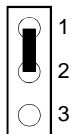
JP2 Off: Normal  
(Default)



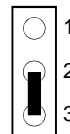
JP2 On: Password  
Clear

### Jumper JP3 Display Type Select

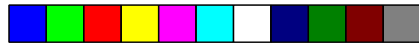
Jumper JP3 sets the display adapter to color or mono. This jumper must match the type of display adapter installed. If you change your video adapter, make sure this jumper is changed accordingly.



JP3, Pins 1-2 On:  
Color (Default)

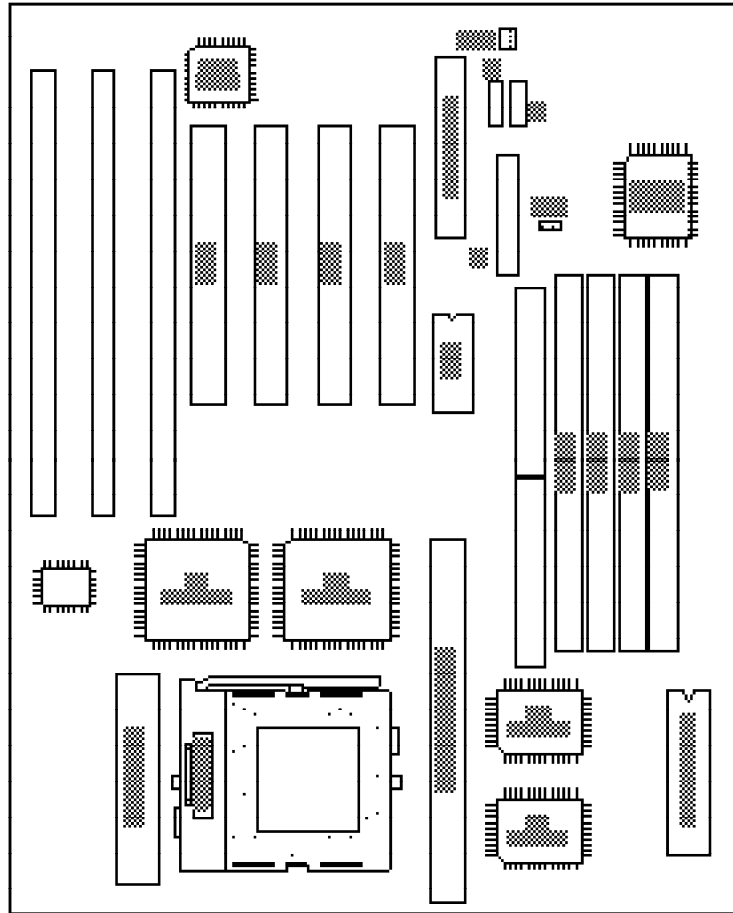


JP3, Pins 2-3 On:  
Mono

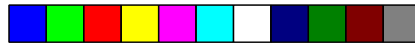


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### Jumper Settings for Super I/O Setting and IRQ Select



Locations of Jumpers JP51 and JP52 on the System Board



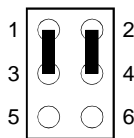
## G586IPBS

### Note:

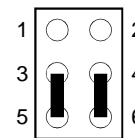
*Jumpers JP51 and JP52 are available only on the G586IPBS system board that supports Winbond W83787F or SMC FD37C665GT super I/O controller.*

### Jumper JP51 ECP DRQ/DACK Select

The G586IPBS system board supports an ECP parallel port that allows you to use DMA Request (DRQ) Channel 1 or 3 and DMA Acknowledge (DACK) Channel 1 or 3. Set Jumper JP51 so the ECP port does not conflict with an add-on card's DMA channel.



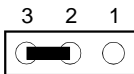
JP51, Pins 1-3 and 2-4 On:  
ECP DRQ1/DACK1  
(Default)



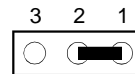
JP51, Pins 3-5 and 4-6 On:  
ECP DRQ3/DACK3

### Jumper JP52 IRQ Select

Use Jumper JP52 to select between IRQ5 and IRQ7.



JP52, Pins 2-3 On:  
IRQ7 (Default)

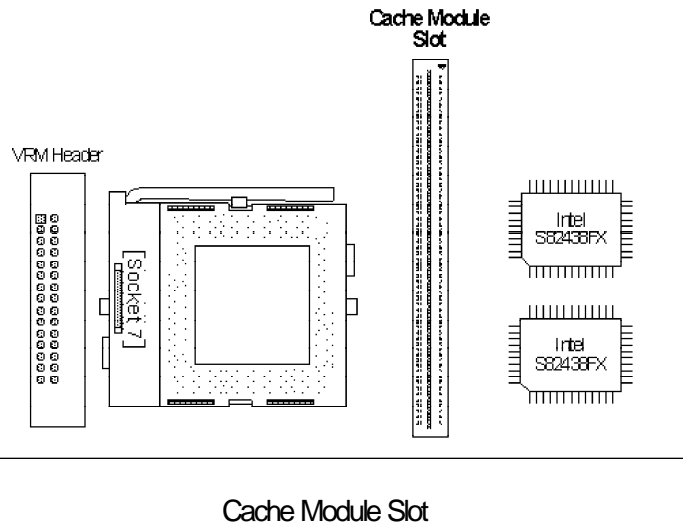


JP52, Pins 1-2 On:  
IRQ5

## Cache Configuration

The G586IPBS system board supports 3.3V pipeline burst or asynchronous cache SRAM installed in the 160-pin cache module slot. The board can be configured to the following cache sizes: 256KB and 512KB.

### Installing the Cache Module



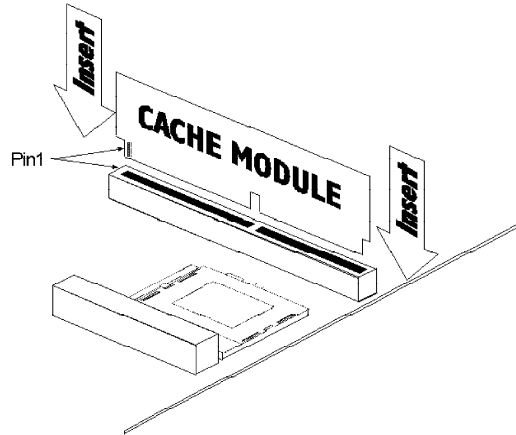
1. Locate the 160-pin cache module slot on the system board. Position the cache module above the slot. Make sure pin 1 of the cache module is aligned with pin 1 of the slot. Carefully slide the module into the slot. Press firmly on the top of it to seat it properly.

**Note:**

*You do not need to modify any jumpers when installing the cache module.*



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- 2 Once the cache module has been installed, make sure the “External Cache” option in the “BIOS Features Setup” menu of the Award BIOS CMOS Setup Utility is set to “Enabled”.

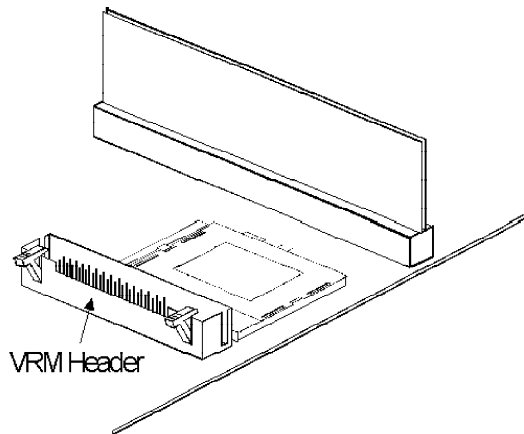
**Note:**

*With the cache module installed in the cache module slot, the length of the add-on card in PCI Slot 1 is limited to 205 mm only if its components protrude more than 5 mm from the components and/or solder side of the card.*

## G586IPBS

### VRM Header

Your G586IPBS system board is equipped with a VRM (Voltage Regulation Module) header shown below. It allows you to upgrade to future low-voltage CPUs by installing a Voltage Regulation Module.



### VRM Header and 3.3V Pentium Processor

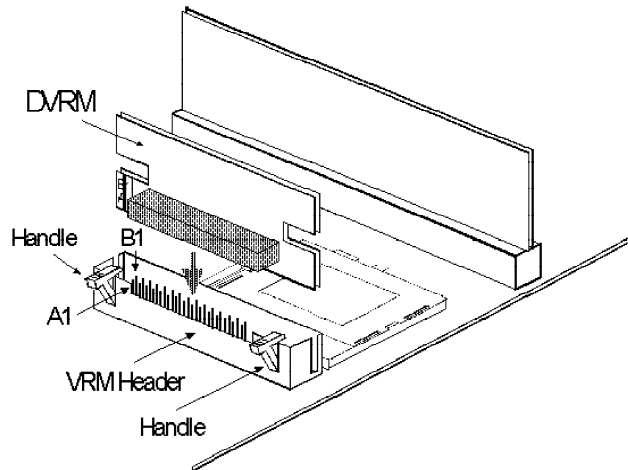
A DVRM (Dummy Voltage Regulation Module) must be installed if you are using a 3.3V Pentium processor.

**To Install:**

Position the DVRM above the header. Make sure pins A1 and B1 of the module are aligned with pins A1 and B1 of the VRM header (see the illustration on the next page). Carefully slide the module into the slot. Press firmly on the top of it to seat it properly. The handles on the VRM header will lift up automatically to secure the module.

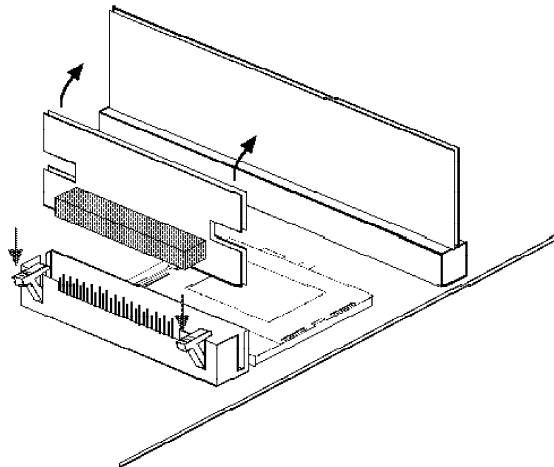


G586IPBS



**To Remove:**

Press the handles on the header simultaneously. The module will be forced out of the VRM header.







**G586IPBS**

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### **VRM Header and Future Low-Voltage CPUs**

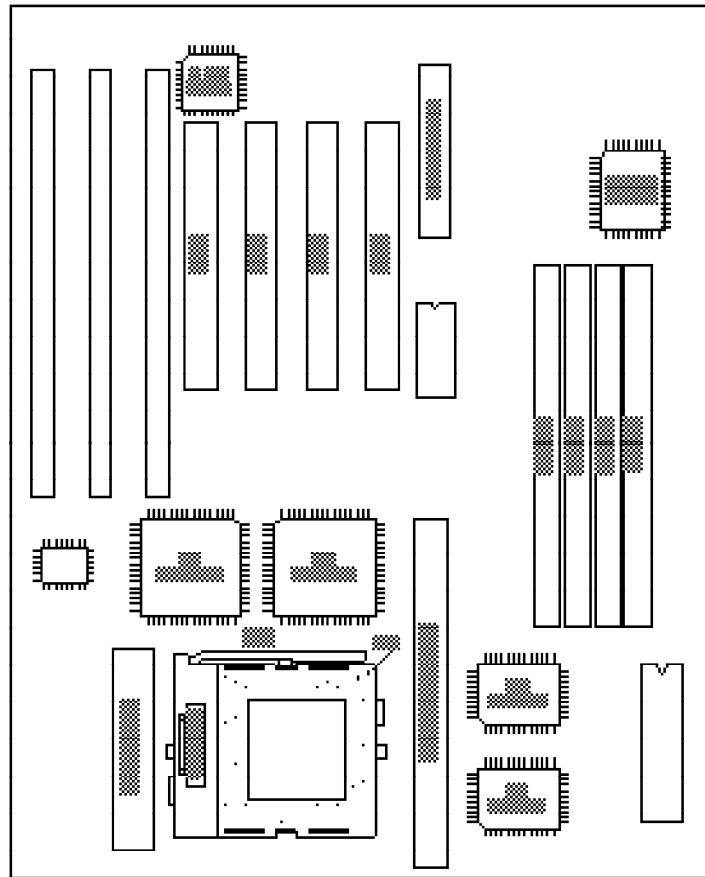
The types of VRM supported and installation procedures will be described in a future edition of the G586IPBS manual.

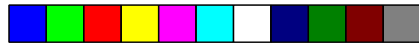




## CPU Installation

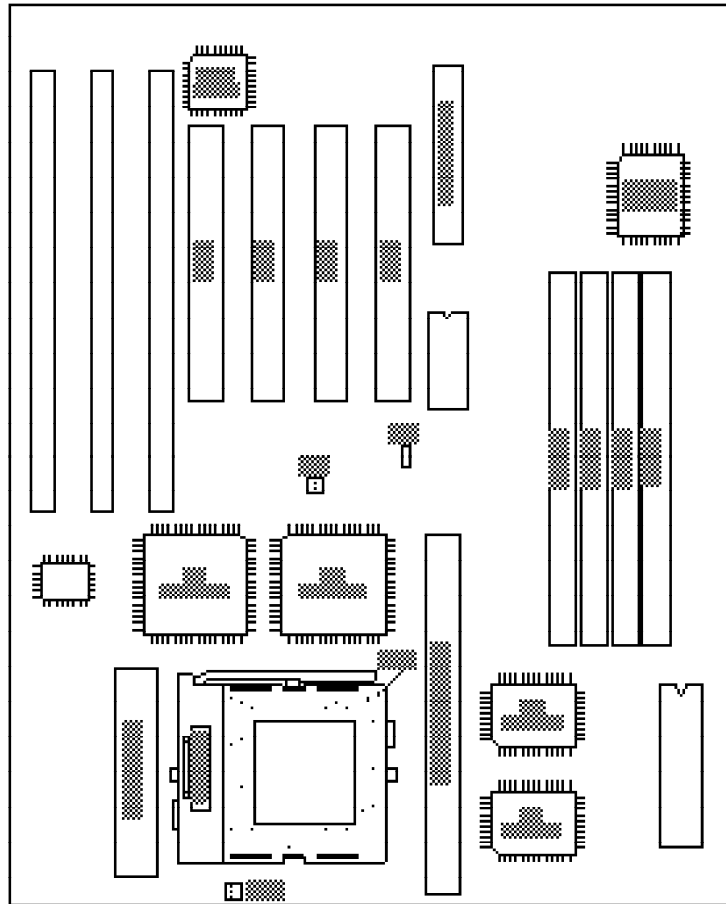
The G586IPBS is equipped with a 321-pin Zero Insertion Force (ZIF) socket at location U31 of the system board. The ZIF socket allows for easy installation of upgrade CPUs as your system needs grow. Make sure all jumpers are set correctly before applying power, or you may damage the CPU or system board.





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### Jumper Settings for CPU

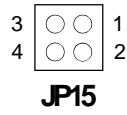
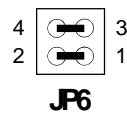
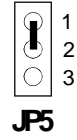


Locations of Jumpers JP5, JP6 and JP15  
on the System Board



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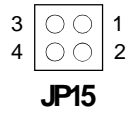
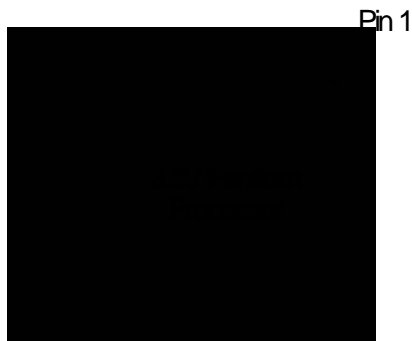
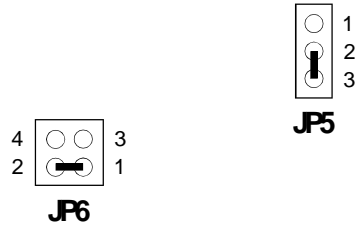
**3.3V Pentium Processor (75MHz)**  
System (External) Bus Speed: 50MHz





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**3.3V Pentium Processor (90MHz) \***  
System (External) Bus Speed: 60MHz

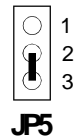
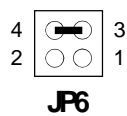


\* Default Setting

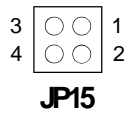


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**3.3V Pentium Processor (100MHz)**  
System (External) Bus Speed: 66MHz



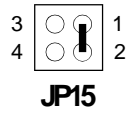
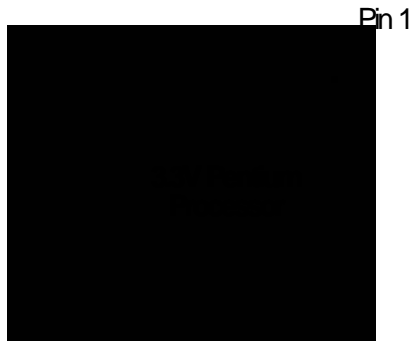
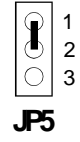
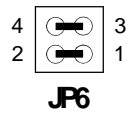
Pin 1





**G586IPBS**

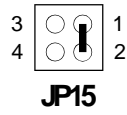
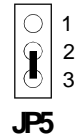
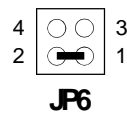
**3.3V Pentium Processor (100MHz)**  
System (External) Bus Speed: 50MHz





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**3.3V Pentium Processor (120MHz)**  
System (External) Bus Speed: 60MHz

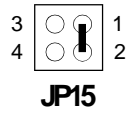
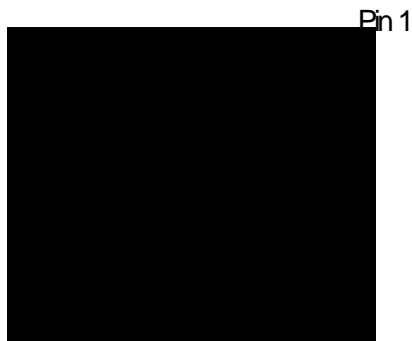
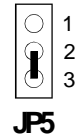
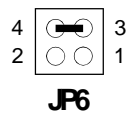






**G586IPBS**

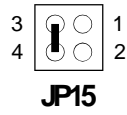
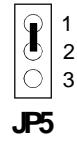
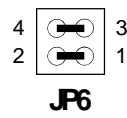
**3.3V Pentium Processor (133MHz)**  
System (External) Bus Speed: 66MHz





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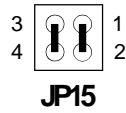
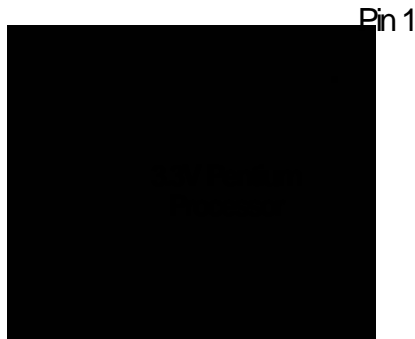
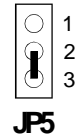
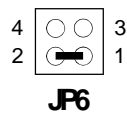
**3.3V Pentium Processor (150MHz)**  
System (External) Bus Speed: 50MHz





**G586IPBS**

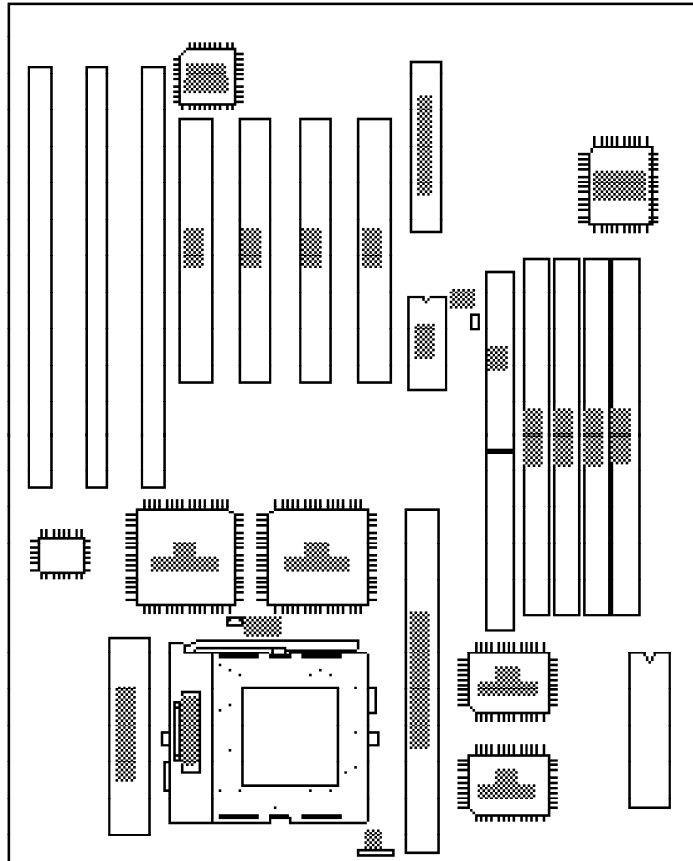
**3.3V Pentium Processor (150MHz)**  
System (External) Bus Speed: 60MHz





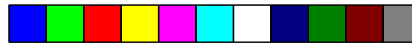
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### Jumpers J1, JP11 and J50



The following jumpers are for factory testing only and should always be set to their default configurations. Reconfiguring these jumpers will cause problems with your system board.

**J1, JP11, J50: Off**



## G586IPBS

### Installing Upgrade CPUs

The G586IPBS is equipped with a 321-pin Zero Insertion Force (ZIF) socket at location U31 of the system board. This socket is designed for easy removal of the old CPU and easy insertion of the upgrade CPU. The socket allows you to carefully place the new CPU into its position. If you need to apply excessive force to insert the CPU, the installation is being done incorrectly.

**Warning:**

*Open the socket only if actually installing a CPU. The warranty on the original CPU will be voided if the S/N seal is broken.*

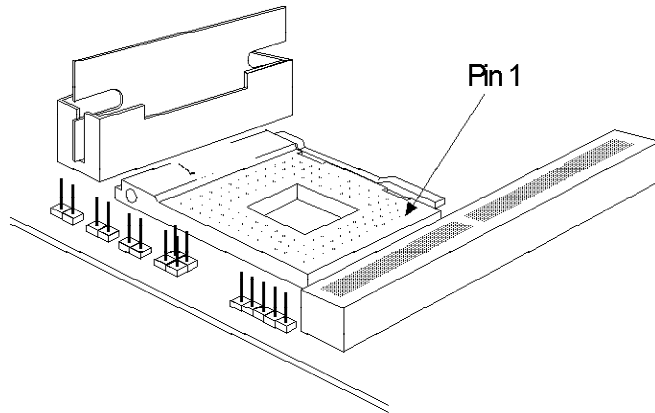
*Do not change any factory CPU speed jumper settings. You do not need to change any jumpers to properly install the 3.3V Pentium Upgrade Processor.*

*Before proceeding with the upgrade, take note of the following. The microprocessor and heat sink may be hot if the system has been running. To avoid the possibility of a burn, power the system off and let the processor and heat sink cool for 10 minutes.*

The 321-pin ZIF socket consists of the five rows of pin holes on each side. To prevent improper OverDrive Processor installation, the ZIF socket has a Plug/Keying mechanism. Several holes in the socket are plugged so OverDrive Processors will go in only one way. If you cannot easily insert the OverDrive Processor, verify that pin 1 of the CPU is aligned with pin 1 of the socket. A warning note — be extremely careful to match pin 1 of the CPU with pin 1 of the socket. Only Intel's OverDrive Processor is keyed to prevent improper placement in the ZIF socket. Other Intel CPUs, as well as CPUs from other vendors, can be placed incorrectly and will be permanently damaged.



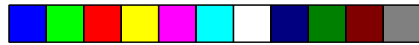
G586IPBS



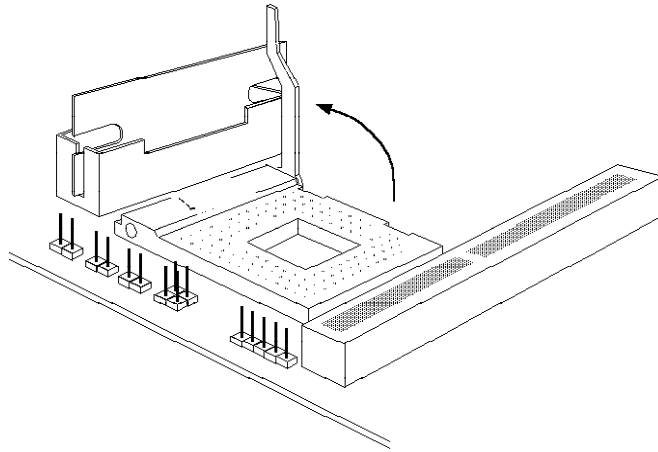
Zero Insertion Force (ZIF) Socket

To install an upgrade CPU, do the following.

1. Make sure the handle on the side of the ZIF socket is up. To raise the handle, push down, pull it out to the side a little and raise it as far as it will go. The top plate will slide back. Do not use screwdrivers or other tools to open the socket, or damage may occur to the system or socket. It may be necessary to initially apply a small amount of sideways force to free the handle from its retaining "tab." Once clear of the "tab," the handle will open relatively easily.

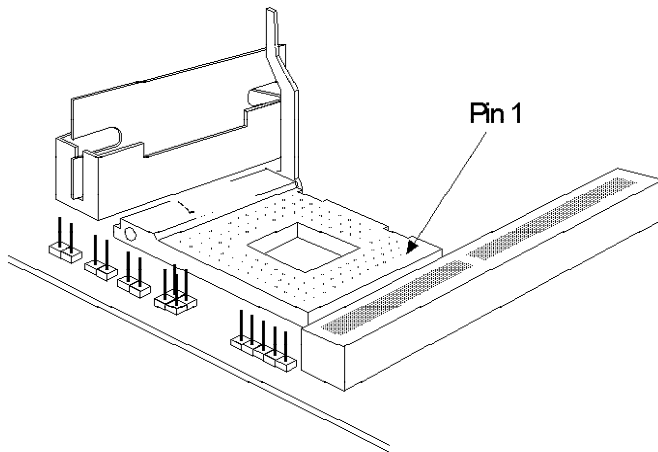


## G586IPBS



Lifting the Handle

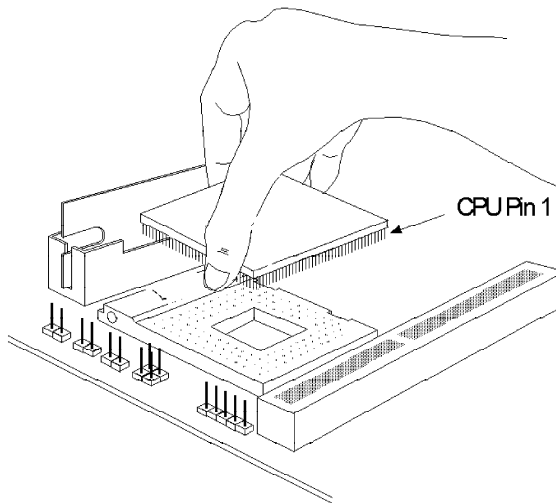
2. Once the lever is completely up, remove the old CPU by carefully lifting it straight out of the socket. You are now ready to insert the new CPU.





## G586IPBS

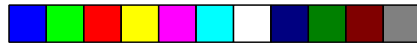
3. Position the CPU above the ZIF socket. Make sure pin 1 of the CPU is aligned with pin 1 of the socket. Lower the chip until the pins are inserted properly in their corresponding holes. Remember that very little force is needed to install the CPU. If the CPU will not insert easily, verify pin 1 of the CPU is aligned with pin 1 of the socket. Applying too much pressure can damage the CPU or the socket.



Positioning the CPU Above the ZIF Socket

4. Push the handle down until the handle locks into place. The top plate will slide forward. You will feel some resistance as the pressure starts to secure the CPU in the socket. This is normal and will not damage the CPU. However, if the handle is not completely closed, damage to the CPU and/or system board may result.





## G586IPBS

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### Clearance Requirements

The 3.3V Pentium Upgrade Processor comes with a heat sink mounted on top. To maintain proper airflow once the upgrade is installed on the system board, the processor and sink require certain space clearances.

The clearance above 3.3V Pentium Upgrade Processor's fan/heat-sink must be at least 0.4 in. The clearance on at least 3 of 4 sides of the processor must be at least 0.2 in. The cables (for floppy drive, hard drive, CD-ROM, etc.) must be routed clear of the CPU and its airspace.

### Fan Exhaust

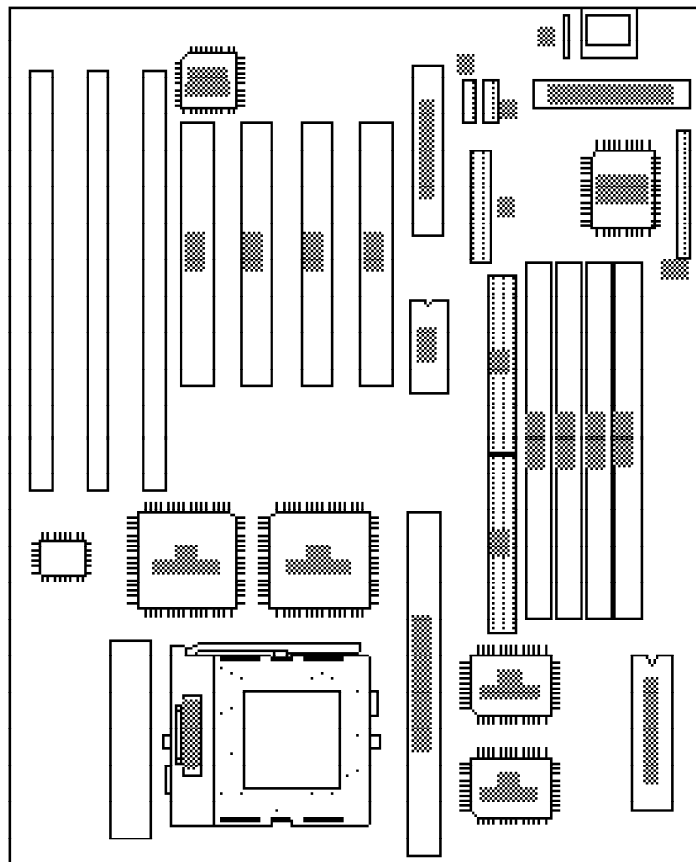
The CPU must be kept cool by using a fan exhaust configuration in connection with the heatsink. The temperature of the air entering the fan/heatsink cannot exceed 45°C. The ambient or room temperature must be below 37°C (99°F) for a system installed with the 3.3V Pentium Upgrade Processor.

In order to provide proper airflow to the CPU, all movable obstructions (power supply cables, cards, floppy disk cables) must be clear of the CPU heatsink/fan component in accordance with the space clearance discussed in the CPU installation section of this manual.



## Built-in Ports

The G586IPBS system board is equipped with two serial ports, one SPP/EPP/ECP parallel printer port, one FDD connector, one PS/2 mouse connector and two IDE hard disk shrouded headers.



Locations of the Built-in Ports on the System Board

## Serial Ports

The built-in serial ports are RS-232C asynchronous communication ports with 16C550-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices. They use the following system I/O addresses:

Port Configuration	I/O Address
COM1	3F8h
COM2	2F8h
COM3/COM4	3E8h/2E8h

### Connecting the Serial Ports

Two DB-9P serial port cables are provided with the motherboard. They are mounted on a card-edge bracket along with the PS/2 mouse cable. The upper serial port cable should be used for the COM 1 primary serial port; connect it to Connector J6 on the motherboard. The lower serial port cable should be used for the COM 2 secondary serial port; connect it to Connector J5 on the motherboard. Make sure the colored stripes on the ribbon cables align with pin 1 of Connectors J6 and J5. Mount the card-edge bracket to the system chassis.



————— **G586IPBS**

