

# **MBG586VPMP2/R**

**System Board  
User's Manual**

**-C960327SAC-**

## **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 MBG586VPMP2/R system board offers several advanced features integrated into the system board. It supports a 320-pin Zero Insertion Force (ZIF) CPU socket for Cyrix P120+, P133+, P150+ or P166+ CPUs. These Cyrix CPUs support linear burst mode, with the motherboard's power supply circuit supporting up to 10 amperes for CPU power consumption. The ZIF socket allow users to easily upgrade their CPUs. The MBG586VPMP2/R also supports Flash EPROM for easy BIOS upgrades. Flash EPROM is a memory chip for the storage of BIOS which can be modified using a software utility.

Equipped with two built-in Bus Master PCI IDE interfaces, the MBG586VPMP2/R system board can control four drives and supports fast PIO Modes 3 and 4 hard drives and hard drives larger than 528MB. The MGB586VPMP2/R also supports DMA Mode 2 Bus Master IDE; bus mastering reduces CPU use during disk transfer. The system board is also equipped with two NS16C550A-compatible serial ports, an SPP/EPP/ECP, a floppy disk drive controller, and one mini-DIN-6 connector for the PS/2 mouse.

The MBG586VPMP2/R can be configured to 22 different memory sizes ranging from 4MB to 256MB using 256KBx32/36, 512KBx32/36, 1MBx32/36, 2MBx32/36, 4MBx32/36, 8MBx32/36 or 16MBx32/36 non-parity/parity SIM modules.

## Features and Specifications

### Processor

- Cyrix P120+, P133+, P150+ or P166+
  - Linear burst mode supported
  - On-board power supply circuit: supports up to 10 amperes for CPU

### Chipset

- VLSI Wildcat chipset
  - VLSI VL82C594 - system controller
  - VLSI VL82C595 - data buffer (2)
  - VLSI VL82C597 - PCI bridge

### Cache Memory

- One 160-pin cache module slot
- Supports 256KB or 512KB pipeline burst cache

### System Memory

- Up to 256MB of DRAM
- Four 72-pin single and/or double density SIMM sockets
- 256KBx32/36, 512KBx32/36, 1MBx32/36, 2MBx32/36, 4MBx32/36, 8MBx32/36 or 16MBx32/36 non-parity/parity SIMMs
- 60ns or 70ns fast page mode DRAM or EDO DRAM

### BIOS

- Award Flash BIOS, Windows 95 Plug and Play compatible
- Supports Enhanced IDE HDDs larger than 528MB
- Supports ATAPI CD-ROM

### Energy Efficient Design

- System Power Management supported
- APM V1.1 compliant
- Highly efficient switching power circuit
- CPU stopped clock control

**PCI IDE Connectors**

- CMD 646 Bus Master PCI IDE chip
- Two IDE connectors to control four drives
- PIO Modes 3 & 4 Enhanced IDE
- DMA Mode 2 Bus Master IDE
- ATAPI CD-ROM supported

**Integrated I/O**

- Two NS16C550A-compatible high speed UARTs
- One SPP/EPP/ECP
- Supports 720KB, 1.2MB, 1.44MB and 2.88MB floppy drives

**ZIF Socket**

- One 320-pin ZIF socket

**Connectors**

- 2 serial ports
- 1 parallel port
- 2 IDE connectors
- 1 floppy connector
- 1 PS/2 mouse port
- 1 mini-DIN-6 PS/2 keyboard connector

**Expansion Slots**

- 3 dedicated PCI slots
- 3 dedicated 16-bit ISA slots
- 1 shared PCI/ISA slot

**PCB**

- 6 layers, Baby AT form factor
- 33cm (12.87") x 22cm (8.58")

## Package Checklist

The MBG586VPMP2/R package contains the following items:

- MBG586VPMP2/R system board
- MBG586VPMP2/R user's manual
- One 40-pin IDE hard disk cable
- One 34-pin floppy disk drive cable
- One 25-pin printer port cable for chassis mounting
- One card-edge bracket with two serial and one mouse port cables
- One IDE driver diskette
- One PS/2-to-AT keyboard adapter

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

## Chapter 2 Hardware Installation

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This chapter summarizes the steps in installing the MBG586VPMP2/R 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 on pages 13 and 14 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 MBG586VPMP2/R system board carefully.

### Handling the System Board

It is quite easy to inadvertently damage your system board even before installing it in 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.

## Static Electricity Precautions

1. To prevent electrostatic build-up, leave the board in its anti-static bag until you are ready to install it.
2. Wear an anti-static wrist strap.
3. Do all preparation work on a static-free surface with the components facing up.
4. Hold the boards by their 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 or body.

### **Warning:**

*Electrostatic discharge (ESD) can damage your 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.*

## Installing the System Board

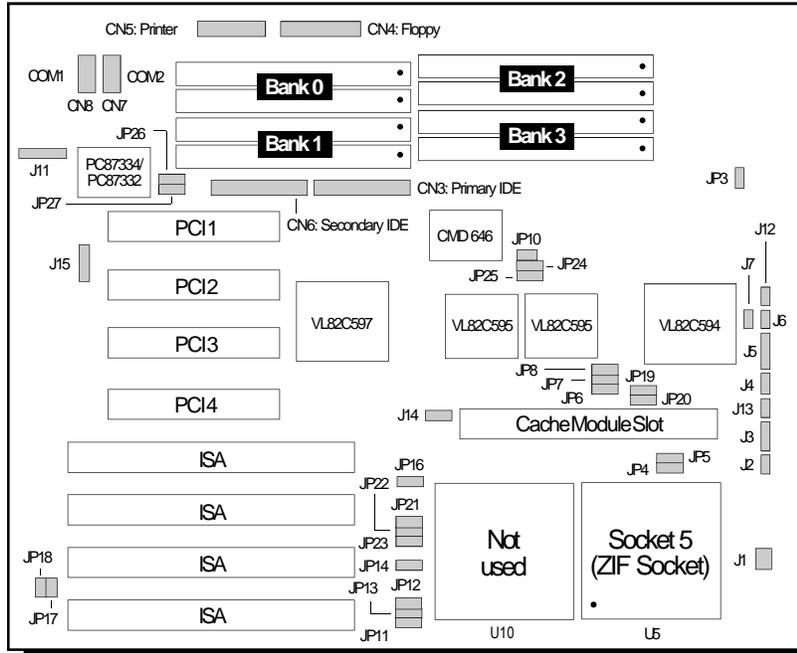
If you are installing the MBG586VPMP2/R system board, the following outlines the basic installation instructions. Before installing the system board into your system unit, you should prepare the tools you will need:

You will need:

- *One medium size, flat-bladed screwdriver*
  - *One medium Phillips screwdriver*
  - *One needle-nosed pliers*
1. Unlock your system unit. Turn off the power and disconnect all power cords and cables.

2. Remove the system unit cover. Refer to the manufacturer's instructions if necessary.
3. Remove expansion cards seated in any of the expansion slots and detach all connectors from the old system board.
4. Loosen the screws holding the original system board and remove the board from the system. Save the screws.
5. Remove the MBG586VPMP2/R from its original packing box. Be careful to avoid touching all connectors and pins on the board. Please refer to the handling instructions on pages 9-10 for proper handling techniques.
6. Insert the SIMMs into the SIMM banks on the MBG586VPMP2/R. The quantity and location of the SIMMs is dependent upon the memory configuration and type of modules you intend to use. Please read page 12 for the proper locations in which to place the modules.
7. Insert the cache module, if any, into the cache module slot on the MBG586VPMP2/R.
8. Install the CPU. Be sure pin 1 of the CPU is aligned with pin 1 of the socket.
9. Set the corresponding jumpers. These may already have been pre-set at the factory.
10. Install the prepared MBG586VPMP2/R system board into the case and replace the screws.
11. Reinstall all cards and connectors and replace the system unit cover. Reconnect all power cords and cables.

## Board Layout



- Pin 1 of the socket

## System Memory

The MBG586VPMP2/R system board can support 4MB to 256MB of memory using 72-pin SIMMs (Single In-line Memory Module). A SIM module consists of several RAM chips soldered onto a small circuit board.

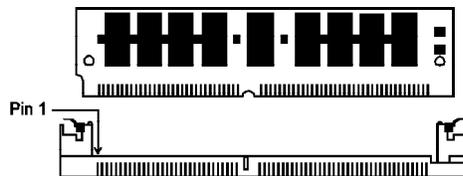
The SIMM sockets are divided into four banks on the system board. Each bank consists of 2 SIMM sockets. You can use up to 2 of the banks (4 sockets). It is best to occupy Bank 3 then Bank 2. This is preferred over occupying Bank 1 then Bank 0. You can insert single-sided or double-sided SIM modules to any of the banks located on the system board. You can also populate one SIM module in a bank to allow smaller upgrade increments.

The MBG586VPMP2/R system board uses 256KBx32/36, 512KBx32/36, 1MBx32/36, 2MBx32/36, 4MBx32/36, 8MBx32/36 and 16MBx32/36

SIMM modules. Your system board can be configured with 4MB, 6MB, 8MB, 12MB, 16MB, 24MB, 32MB, 48MB, 64MB, 96MB, 128MB, 192MB, or 256MB of onboard memory. Please refer to page 12 for the locations of the SIMM sockets.

### Installing a SIM Module

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.

### Memory Configuration

*You must use 2 pieces of cache modules in each bank*

Memory Size	Bank 3 (preferred) or Bank 1	Bank 2 (preferred) or Bank 0
4MB	256Kx32/36	256Kx32/36
4MB	512Kx32/36	—
8MB	512Kx32/36	512Kx32/36
8MB	1Mx32/36	—
16MB	1Mx32/36	1Mx32/36
16MB	2Mx32/36	—

Memory Size	Bank 3 (preferred) or Bank 1	Bank 2 (preferred) or Bank 0
32MB	2Mx32/36	2Mx32/36
32MB	4Mx32/36	—
64MB	4Mx32/36	4Mx32/36
64MB	8Mx32/36	—
128MB	8Mx32/36	8Mx32/36

## Cache Memory

The MBG586VPMP2/R provides a cache module slot rather than a built-in cache. The system board can be configured to two different cache sizes: 256KB (default), and 512KB. Insert the cache module into the cache module slot. The system board is equipped with a 8Kx8 Tag RAM mounted on location U6. Please refer to page 12 for the locations of the cache module slot and U6.

This board has been designed to support Linear Burst Mode. This hardwired module enhances system performance and will only function with a Cyrix 6x86 CPU.

### Warning:

*The VASM and VBSM cache modules are exclusively designed for the cache module slot in the MBG586VPMP2/R system board. Do not insert modules in the cache module slot other than those specified above. Severe damage WILL occur on the cache module and the system board. Users must take full responsibility for any damages that occur if not handled properly.*

### Cacheable Memory Range

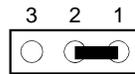
256KB with 32-byte line size	0-64MB
512KB with 32-byte line size	0-128MB

## Jumpers JP6-JP8, JP19, and JP20 Cache Memory

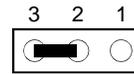
Jumpers JP6-JP8, JP19, and JP20 should be set according to the cache size as shown below.

	JP6	JP7	JP8	JP19	JP20
256KB with 32-byte line size*	1-2 On				
512KB with 32-byte line size	2-3 On	2-3 On	2-3 On	1-2 On	1-2 On

\* Default setting



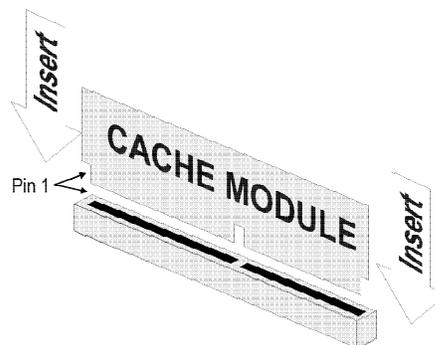
1-2: On



2-3: On

## Installing the Cache Module

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.



## CPU Installation

The MBG586VPMP2/R is equipped with a 320-pin Zero Insertion Force (ZIF) socket at location U5 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. Refer to page 12 for the location of the ZIF socket.

**Note:**

*The base of a ZIF socket is at location U10. This is a non-functional socket; do not attempt to install a CPU in this socket.*

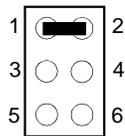
### Jumper Settings for CPU

**Jumpers J1, JP11 and JP12**

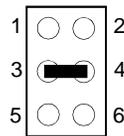
CPU Clock Speed

Set jumper J1 according to your CPU.

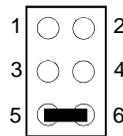
Model	CPU Speed	CPU External Speed	Jumper J1		
			Pins 1-2	Pins 3-4	Pins 5-6
P120+	100MHz	50MHz	On	Off	Off
P133+	110MHz	55MHz	On	On	Off
P150+	120MHz	60MHz	On	Off	On
P166+	133MHz	66.66MHz	On	On	On



1-2 On



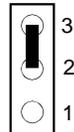
3-4 On



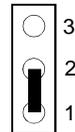
5-6 On

### Jumper JP3 CPU Voltage Select

Set Jumper JP3 to 3.3V for Cyrix CPUs or according to the voltage of the CPU installed on the MBG586VPMP2/R system board.



2-3 On: 3.3V - 3.45V  
(Default)



1-2 On: 3.45V - 3.6V

### Installing Upgrade CPUs

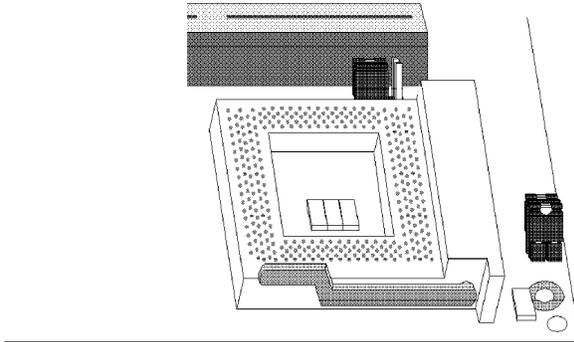
The MBG586VPMP2/R is equipped with a 320-pin Zero Insertion Force (ZIF) socket at location U5 of the system board. This socket is designed for easy removal of an old CPU and easy insertion of an upgrade CPU. The socket allows you to carefully place the new CPU into its position. If you need to apply excessive force to insert the CPU, you are not installing the CPU correctly.

#### **Warning:**

*Open the socket only if you are actually installing a CPU.*

*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 20 minutes.*

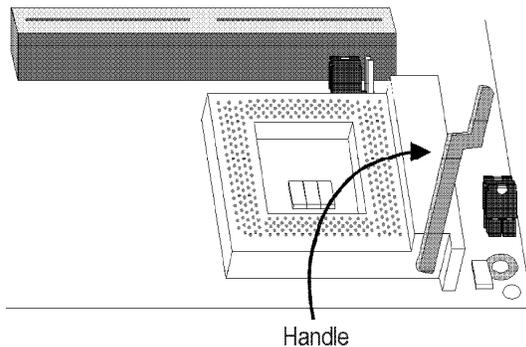
The 320-pin ZIF socket consists of five rows of pin holes on each side. To prevent improper CPU installation, the ZIF socket has a Plug/Keying mechanism. Several holes in the socket are plugged so that CPUs will go in only one way. If you cannot easily insert the CPU, verify that pin 1 of the CPU is aligned with pin 1 of the socket. A note of warning — be extremely careful to match pin 1 of the CPU with pin 1 of the socket. Usually pin 1 of the CPU is marked by a dot or a marked/cut corner.



### Zero Insertion Force (ZIF) Socket

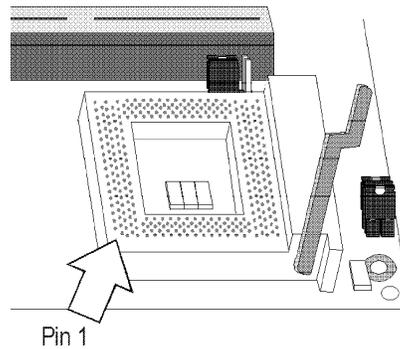
To install an upgrade CPU, do the following.

1. Make sure the handle on the side of the ZIF socket is up. To raise the handle, push it down, slightly pull it out to the side, then 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 you may damage 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.

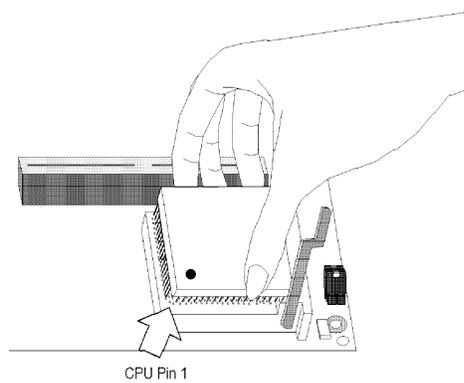


### Lifting the Handle

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



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 is not easily inserted, verify whether or not 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.

### **Clearance Requirements**

Your CPU comes with a heat sink mounted on top. To maintain proper airflow once the upgrade is installed on the system board, the CPU and heatsink require certain space clearances.

The clearance above the CPU's fan/heat-sink must be at least 0.4 inches. The clearance on at least 3 of 4 sides of the CPU must be at least 0.2 inches. 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 (113°F). The ambient or room temperature must be below 37°C (99°F).

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 fan/heatsink component in accordance with the space clearance discussed in the Clearance Requirements section of this manual.

## Jumper Settings for PCI Slot 4

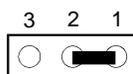
### Jumpers JP24 and JP25

PCI Slot 4 Master/Slave Select

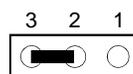
PCI Slot 4 of the MBG586VPMP2/R system board supports Master and Slave modes. If a Master add-in card is installed in PCI Slot 4, the IDE driver's DMA mode must be set to "Disabled." Set Jumpers JP24 and JP25 as shown below.

	JP24	JP25
PCI Slot 4 installed with Master add-in card Onboard PCI IDE must be set to PIO mode	2-3 On	2-3 On
PCI Slot 4 installed with Slave add-in card Onboard PCI IDE can be set to PIO or DMA mode*	1-2 On	1-2 On

\* Default setting



1-2 On



2-3 On

## Jumper Settings for Parallel Port

### Jumpers JP26 and JP27

ECP Printer Port DMA Channel Select

Jumpers JP26 and JP27 are used to select the ECP printer port's DMA Channel. The MBG586VPMP2/R system board supports DMA Channel 1 or 3. Set JP26 and JP27 according to the DMA channel used by the system board.

DMA Channel	JP26	JP27
DMA 1*	1-2 On	1-2 On
DMA 3	2-3 On	2-3 On

\* Default setting



## Jumper Settings for Display

### Jumper JP17

Display Type Select

Jumper JP17 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.



On: Color  
(Default)



Off: Mono

## Jumper Settings for PS/2 Mouse

### Jumper JP18

PS/2 Mouse

The MBG586VPMP2/R package includes a card-edge bracket with serial and mouse port. The PS/2 mouse port uses IRQ12. If you set Jumper JP18 to “IRQ12 Enabled,” make sure you connect the PS/2 mouse port to Connector J11. When IRQ12 is disabled and a PS/2 mouse is not used, the IRQ12 interrupt is available for other devices.



On: IRQ12 Enabled  
(Default)



Off: IRQ12  
Disabled

## Factory Testing Jumpers

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

**JP10, JP21, JP22, JP23:** Off  
**J14, JP12, JP14 and JP16:** 1-2 On  
**JP4, JP5, JP11 and JP13:** 2-3 On

## Built-in Ports

The MBG586VPMP2/R system board is equipped with two serial ports, one SPP/ECP/EPP parallel printer port, one FDD connector, two IDE hard disk connectors, and one PS/2 mouse port. Please refer to page 12 for the locations of the built-in ports.

### Serial Ports

The built-in serial ports are RS-232C asynchronous communication ports with NS16C550-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices. The MBG586VPMP2/R system board supports IRQ4 for the primary serial port and IRQ3 for the secondary serial port. These serial ports use the following system I/O addresses:

Port Configuration	I/O Address
COM1	3F8h
COM2	2F8h

### Connecting the Serial Ports

Two DB-9P serial port cables are provided with the system board. 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-A primary serial port; connect it to Connector CN8 on the system board. The lower serial port cable should be used for the COM-B secondary serial port; connect it to Connector CN7 on the system board. Make sure the col-

ored stripes on the ribbon cables align with pin 1 of Connectors CN7 and CN8. Mount the card-edge bracket to the system chassis.

### **PS/2 Mouse Port**

The PS/2 mouse port is a 6-pin connector on the MBG586VPMP2/R system board. Attach the 6-pin mouse port cable, which came in the MBG586VPMP2/R box, to connector J11. Make sure the brown wire on the PS/2 mouse connector aligns with pin 1 of connector J11. The other end of the wires are attached to the card-edge bracket that also holds the two serial port cables.

### **Parallel Port**

The MBG586VPMP2/R system board has a standard connector to a parallel printer. This port is compatible with both IBM AT printer ports and the new, high speed, bi-directional Extended Capabilities Port standard. The parallel port on your system board can be set to any of the following system I/O addresses:

<b>Port Configuration</b>	<b>I/O Address</b>
LPT 1	3BC-3BE Hex
LPT 2	378-37A Hex
LPT 3	278-27A Hex

### **Connecting the Parallel Printer Port**

Attach the DB-25S printer port cable, which came with the system board, to Connector CN5 on the MBG586VPMP2/R system board. Make sure the colored stripe on the ribbon cable aligns with pin 1 of Connector CN5. Use a small nutdriver to mount the cable into a DB-25 cutout in the system chassis.

### **Floppy Disk Drive Controller**

The MBG586VPMP2/R system board has a built-in floppy disk controller that supports two standard floppy disk drives. You can install any 720KB, 1.2MB, 1.44MB, or 2.88MB floppy disk drives.

## Connecting the Floppy Disk Cable

1. Install the 34-pin header connector into the floppy disk connector (CN4) on the MBG586VPMP2/R system board with the colored edge of the ribbon aligned to pin 1.
2. Install the other 34-pin header connector(s) into the disk drive(s) with the colored edge of the daisy chained ribbon cable aligned to pin 1 of the drive edge connector(s). The end-most connector should be attached to the drive you want to be Drive A.

## IDE Hard Disk Interface

The MBG586VPMP2/R system board is equipped with two PCI IDE connectors that will interface four IDE (Integrated Drive Electronics) hard disk drives. An IDE drive is a hard drive with the controller electronics built into the disk assembly. The integration of the controller and the drive as a single unit increases reliability and performance by eliminating redundant circuitry.

**Note:**

*Only IDE hard drives or ATAPI CD-ROMs can be connected to the IDE interface.*

## Connecting the IDE Hard Disk Interface

1. If you are connecting two hard drives, install the 40-pin connector of the IDE cable into the primary disk connector (CN3). If you are adding a third or fourth IDE device, install the 40-pin connector of the other IDE cable into the secondary connector (CN6). Make sure the colored edge of the ribbon is aligned to pin 1.
2. Install the other 40-pin header connector(s) into the device with the colored edge of the ribbon cable aligned to pin 1 of the drive edge connector(s).

**Note:**

*Refer to your disk drive user's manual for information about selecting proper drive switch settings.*

## **Adding a Second IDE Hard Drive**

When using two IDE drives, one must be set as the master and the other as the slave. Follow the instructions provided by the drive manufacturer for setting the jumpers and/or switches on the drives. No changes are needed on the MBG586VPMP2/R system board when adding a second hard drive.

We recommend that the IDE hard drives be from the same manufacturer. In a few cases, drives from two manufacturers will not function properly when used together. The problem lies in the hard drives, not the MBG586VPMP2/R system board.

## **Preparing an IDE Drive for Use**

IDE disk drives are already low-level formatted, with any bad-track errors entered, when shipped by the drive manufacturer. Do not attempt to do a low-level format or you may seriously damage the drive.

To use an IDE drive, you need to enter the drive type (this information is provided by the drive manufacturer) into the system's CMOS setup table. Then run FDISK and FORMAT provided with DOS.

### **Note:**

*Do not run FDISK and FORMAT programs on a drive that has already been formatted, or you will lose all programs and data stored on the drive.*

## **Adding a CD-ROM drive**

If installing a CD-ROM drive, attach it to the second IDE chain. Please refer to the CD-ROM manual for additional information.

## PS/2 Keyboard Port

A PS/2 mini-DIN 6 keyboard port is provided on the motherboard. Should you wish to utilize an older style "AT Keyboard," you may do so by plugging in the supplied keyboard adapter, then plugging the AT Keyboard connector into the installed Adapter. Note that when plugging in or removing a keyboard device, power to the motherboard should be turned off.

## Installing Expansion Cards

The MBG586VPMP2/R is equipped with three dedicated PCI and three dedicated ISA slots. One PCI slot and one ISA slot are shared. You can only install a card in one or the other of the shared slots at a time, you cannot install devices in both slots. The location of the expansion slots are shown on the illustration on page 12.

**Note:**

*The BIOS needs to be configured for the PCI add-on cards installed in the PCI slots. Refer to the PCI Configuration Setup on pages 33 and 34 for more information.*

## Chapter 3

### Initial Setup Program

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After you power up your system, the BIOS message appears on your screen and the memory count begins.

After the memory test, the following message will appear on the screen:

*Press DEL to enter setup*

If the message disappears before you respond, restart your system or press the “Reset” button. You may also restart the system by pressing the <Ctrl> <Alt> <Del> keys simultaneously. If you do not press these keys at the correct time and the system does not boot, the following error message will appear:

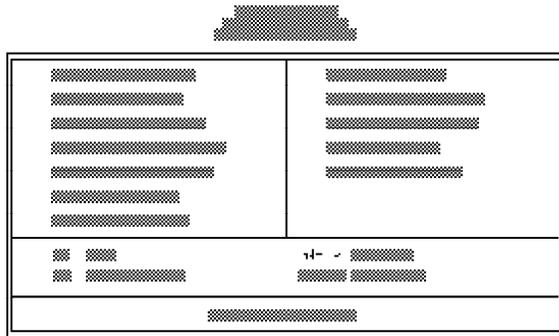
*Press Del to enter Setup*

If you have set a password and selected “System” in the Security Option of the BIOS Feature Setup menu, you will be prompted for the password everytime the system is rebooted or any time you try to enter Setup. Type in the correct password and press <Enter>.

If you selected “Setup” in the Security Option, you will be prompted for the password only when you try to enter Setup. Refer to the “BIOS Features Setup” section for more information.

### **Award BIOS CMOS Setup Utility**

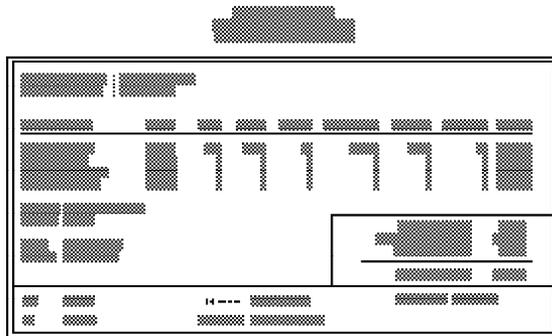
Press <Ctrl> <Alt> <Esc> simultaneously or <Del> to enter the Setup utility. A screen similar to the one on the next page will appear.



Use the arrow keys to highlight the option you want and press <Enter>.

### Standard CMOS Setup

Use the arrow keys to highlight "Standard CMOS Setup" and press <Enter>, a screen similar to the one below will appear.



### **Date and Time**

Sets the time and date for the system. Press <F3> for the calendar.

### **Hard Drive Type**

If you have added an IDE drive, you must select the appropriate type for the drive. You may use the "IDE HDD Auto Detection" from the main CMOS setup menu or you can set it manually. The MBG586VPMP2/R has 46 pre-set types and one user-definable type. Use the <Page Up> or <Page Down> keys to select the appropriate type for the drive.

The table in Appendix G gives a complete listing of the available drive types. Any given drive must be set to one specific drive-type number. Please refer to your IDE drive documentation to find the appropriate type number.

If none of the pre-set types are appropriate for your drive, choose "User", which is the user-definable type. To use this type, highlight either the drive you want to set: Primary Master, Primary Slave, Secondary Master or Secondary Slave. Use the arrow keys until type "User" is showing. Fill in all the parameters as specified by the drive manufacturer. If a drive is not installed, select "None" and press <Enter>.

### **Drive A and Drive B**

These options are used to select the type of floppy disk drives installed in your system. If either of the drives is not present, select "None." Make sure you choose the correct drive type; otherwise, your system might improperly format the device.

### **Video**

This is used to select the type of video adapter installed in your system.

## **Halt on**

The system will halt if an error is detected during power up.

No Errors: System boot will not stop for any detected errors.

All Errors: System will stop whenever the BIOS detects a non-fatal error.

All, But Keyboard: System will stop for any errors except a keyboard error.

All, But Diskette: System will stop for any errors except a disk error.

All, But Disk/Key: System will stop for any errors except a keyboard or disk error.

## **Memory**

The lower right hand corner shows the base memory size, extended memory size, and the other memory size of your system. You cannot alter these items; your computer automatically detects and displays them.

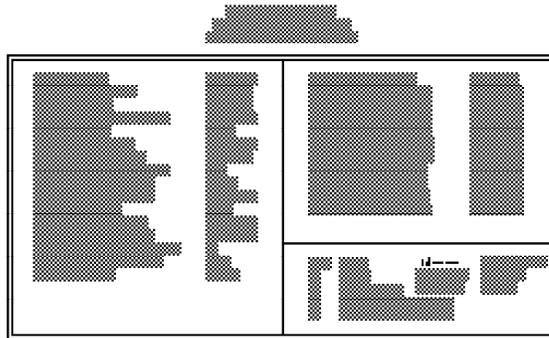
The Other Memory size refers to the memory located in the 4MB to 256MB address space. This is the memory used for different applications. DOS uses this area to load device drivers to keep as much base memory free for application programs. Most use this for the Shadow RAM.

When you are through making changes in the Standard CMOS Setup, press <Esc> to return to the main menu.

## **BIOS Features Setup**

BIOS Features Setup is a list of system configuration options. Some entries are defaults required by the system board while others, if enabled, would improve the performance of your system or let you set some features according to your preferences.

Use the arrow keys to highlight "BIOS Features Setup" and press <Enter>, a screen similar to the one below will appear.



### **Virus Warning**

The Virus Warning option may be set to "Enabled" or "Disabled". When enabled, the BIOS issues a warning when any program or virus sends a Disk Format command or attempts to write to the boot sector of the hard disk drive.

You must disable Virus Warning if you are installing or using certain operating systems, such as Windows 95. This operating system needs to access the FAT (File Allocation Table) portion of the hard drive and cannot do so if you have the Virus Warning enabled.

### **CPU Internal Cache**

The default setting for this category is Enabled (BIOS default, Setup default). This setting speeds up memory access. Turning the cache off will slow down your system.

### **External Cache**

The default setting for this option is Enabled (BIOS default, Setup default). This setting enables the secondary cache.

### **Quick Power On Self Test**

This category speeds up Power On Self Test (POST) after you power on your system. The default setting (BIOS default, Setup default) for Quick POST is Disabled (Normal POST). If you set it to Enabled, the BIOS will skip some items normally checked during POST.

### **Boot Sequence**

This refers to the drive where the computer searches first for an operating system (i.e. DOS). The default setting is A, C (BIOS default, Setup default) which means that the system will first search for a floppy drive and then a hard disk drive.

### **Swap Floppy Drive**

When enabled and the system is booting from the floppy drive, this option causes the system to boot from drive B instead of drive A. The default setting is Disabled (BIOS default, Setup default).

### **Boot Up Floppy Seek**

The Boot Up Floppy Seek default setting is Enabled (BIOS default, Setup default). When it is selected, the BIOS will check whether the floppy disk drive installed is 40 or 80 tracks. 360K floppy disk drives have 40 tracks while 760K, 1.2M and 1.44M floppy drives all have 80 tracks. When it is disabled, the BIOS will not search for the type of floppy disk drive by track number. There will not be any warning message if the drive installed is 360K.

### **Boot Up NumLock Status**

This feature determines which function, the numeric values or the arrow keys, will be selected on the numeric keypad of IBM-compatible keyboards. It is not necessary to use the numeric keypad to control the cursor since the keyboards supplied with most compatible systems have separate arrow control keys. The default setting is On (BIOS default, Setup default).

### **Boot Up System Speed**

This category selects the CPU speed your system will run at immediately after power up. The default setting is High (BIOS default, Setup default).

### **IDE HDD Block Mode**

When IDE HDD Block mode is enabled, the BIOS will detect the block size of the HDD and send block command automatically.

### **Gate A20 Option**

Gate A20 is a gated address line that allows the system to switch between CPU Protected Mode and Real Mode without a CPU reset. When the Setup default (Fast) is selected, the CPU can switch to Real Mode from Protected Mode within just several micro-seconds. The BIOS default is Normal.

### **Memory Parity Check**

In normal memory parity check, if the system DRAM has no parity bit, then check is disabled, the system will ignore memory parity check even the DRAM has no parity bit and the system will not display "RAM parity error".

### **Typematic Rate Setting**

The default setting is Disabled (BIOS default, Setup default). Choosing Enabled allows you to select the typematic controls described in the next page.

### **Typematic Rate (Chars/Sec)**

This category determines the speed at which the system registers repeated keystrokes. The default setting is 6 characters per second (BIOS default, Setup default). The other options are: 8, 10, 12, 15, 20, 24 and 30 char/sec.

### **Typematic Delay (Msec)**

The Typematic Delay controls the time between the first and second character displayed. The default setting is 250 msec (BIOS default, Setup default). The other choices are: 500 msec, 750 msec and 1000 msec.

### Security Option

If you choose "System" in the Security Option, you will be prompted for a password every time you cold boot your system or access setup. If you choose "Setup", you will be prompted for a password only when trying to access setup.

### Shadow Controls

The Video BIOS Shadow allows the system BIOS to copy the video BIOS ROM code of an add-on video card to your system memory for faster access. The MBG586VPMP2/R uses the C0000-C7FFF address range for video shadowing. The default setting is Enabled (BIOS default, Setup default). The next six lines, C8000-CBFFF Shadow to DC000-DFFFF Shadow in 16KB increments, determine whether option card ROMs residing at those addresses will be copied to RAM. The default setting is Disabled (BIOS default, Setup default).

The table below gives an overview of the BIOS Features Setup options.

Item	BIOS Default	Setup Default	Option	Function
Virus Warning	Disabled	Disabled	Enabled	Disables/enables the virus warning.
CPU Internal Cache	Enabled	Enabled	Disabled	Disables/enables the CPU internal cache.
External Cache	Enabled	Enabled	Disabled	Disables/enables the external cache.
Quick Power On Self Test	Disabled	Enabled	Enabled	Quick/normal POST.

Item	BIOS Default	Setup Default	Option	Function
Boot Sequence	A,C	A,C	C,A	The drive where the system first searches for an operation system.
Swap Floppy Drive	Disabled	Disabled	Enabled	Allows the system to boot from drive A or B.
Boot Up Floppy Seek	Enabled	Enabled	Disabled	Disables/enables the search for 40/80 track floppy drives.
Boot Up NumLock Status	On	On	Off	Determines the keypad function: numeric values or arrow keys.
Boot Up System Speed	High	High	Low	Sets high/low speed of the CPU.
IDE HDD Block Mode	Disabled	Disabled	Enabled	Disables/Enables Multisector transfer.
Gate A20 Option	Normal	Fast	None	Enables fast/normal transit from protect to real mode.
Memory Check	Disabled	Disabled	Enabled	Enables/disables memory check.
Typematic Rate Setting	Disabled	Disabled	Enabled	Disables/enables typematic rate.
Typematic Rate (Chars/Sec)	6	6	8, 10, 12, 15, 20, 24, 30	Allows you to adjust the speed at which the system registers the repeated key strokes.
Typematic Delay (Msec)	250msec	250msec	500ms, 700ms, 1000ms	Controls the time between the first and the second character displayed.
Security Option	Setup	Setup	System	Allows you to limit access to the system and/or setup.
Video BIOS Shadow	Enabled	Enabled	Disabled	Disables/enables video BIOS shadow at C0000-C7FFF.
C8000-CBFFF Shadow	Disabled	Disabled	Enabled	Disables/enables the optional shadow.

Item	BIOS Default	Setup Default	Option	Function
<b>CC000-CFFFF Shadow</b>	Disabled	Disabled	Enabled	Disables/enables the optional shadow.
<b>D0000-D3FFF Shadow</b>	Disabled	Disabled	Enabled	Disables/enables the optional shadow.
<b>D4000-D7FFF Shadow</b>	Disabled	Disabled	Enabled	Disables/enables the optional shadow.
<b>D8000-DBFFF Shadow</b>	Disabled	Disabled	Enabled	Disables/enables the optional shadow.
<b>DC000-DFFFF Shadow</b>	Disabled	Disabled	Enabled	Disables/enables the optional shadow.
<b>E0000-E3FFF Shadow</b>	Disabled	Disabled	Enabled	Disables/enables the optional shadow.
<b>E4000-E7FFF Shadow</b>	Disabled	Disabled	Enabled	Disables/enables the optional shadow.
<b>E8000-EBFFF Shadow</b>	Disabled	Disabled	Enabled	Disables/enables the optional shadow.
<b>EC000-EFFFF Shadow</b>	Disabled	Disabled	Enabled	Disables/enables the optional shadow.

If the changes you made are incorrect or you change your mind, press <F6> or <F7> to return to the default settings. Press <Esc> after making the changes to return to the main menu.

## Chipset Features Setup

The MBG586VPMP2/R uses VLSI chipset. The Chipset Features Setup allows you to modify some functions to optimize system performance. It also allows you to enable, disable or select the port address of the built-in serial ports, parallel port, floppy disk controller and hard disk controller.

If you press <Enter>, a screen similar to the one below will appear.



Use the arrow keys to move the highlight bar to the option you wish to change or modify. Use the <Page Up>, <Page Down>, <+> or <-> keys to make the corresponding changes.

If the changes you made are incorrect or you change your mind, press <F6> or <F7> to return to the default setting.

The following tables show the default and optional settings for all categories and their corresponding functions.

Item	BIOS Default	Setup Default	Option	Function
Cache Read Lead Wait	1WS	1WS	None	1WS = One Wait State is for 3-1-1-1 burst read cycle.
Cache Write Lead Wait	1WS	4WS	4W, 1W	0WS is for 2-1-1-1 Burst (Sync.) SRAM and 1 WS is for 3-1-1-1 Sync. SRAM; or 0 WS is for 3-2-2-2 Async. SRAM and 1 WS is for 4-2-2-2 Async. SRAM.
Cache & DRAM Pipeline*	Off	On	On, Off	When you set the BIOS Default off, pipelining will be also off. Vice versa when you set the BIOS Default on.
DRAM Page Mode	Disabled	Enabled	Enabled	Disabled/enabled DRAM Page Mode.
DRAM Refresh Speed	15 u sec.	15 u sec.	15 u sec. 62 u sec. 125 u sec. 250 u sec.	Determines delay successive DRAM refresh cycles.
DRAM Cycle Start*	3rd T2	3rd T2	None	DRAM Page Miss RAS cycle stat.
DRAM RAS Hold Time	2T	2T	1T	Sets row address hold time from RAS# active.
DRAM RAS Precharge Time	4T	4T	2T, 3T, 4T, 5T	Sets RAS# precharge time for page misses.

\*These parameters may be fixed and may not be changed.

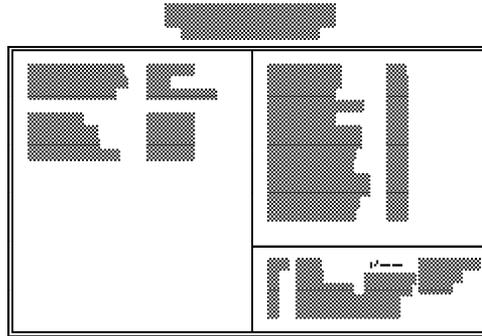
Item	BIOS Default	Setup Default	Option	Function
<b>DRAMRAS Active Time</b>	5T	4T	2T, 3T, 4T, 5T	RAS# active to CAS# active delay for reads and writes.
<b>DRAMRAS To CAS Delay</b>	5T	4T	2T, 3T, 4T, 5T	Sets RAS# - CAS# delay for page write or read cycle.
<b>DRAMCAS Hold Time*</b>	2T	2T	1T, 2T	Sets column address hold time from CAS# active.
<b>DRAMCAS Setup Time*</b>	3T	3T	2T, 3T	Sets minimum column address setup time to CAS# active.
<b>DRAMCAS Precharge Time*</b>	2T	2T	1T, 2T	Sets minimum allowable CAS# precharge time between active CAS# pulse.
<b>CASPulse Write Width*</b>	2T	2T	1T, 2T	Sets CAS# active pulse width for write cycles.
<b>CASPulse Read Width*</b>	4T	4T	2T, 3T, 4T	Sets CAS# pulse width for read cycles.
<b>EDODRAM Read CAS Width</b>	2 cpu clk	2 cpu clk	1 cpu clk 2 cpu clk 3 cpu clk	Sets CAS# pulse width for read cycle for EDO DRAM banks only.
<b>Posted I/O Writes</b>	Disabled	Enabled	Enabled	Post I/O Write is disabled or enabled with this bit.
<b>CPU To PCI Write Buffer</b>	Disabled	Enabled	Enabled	This option allows you to Enabled or Disabled CPU to PCI Write Buffer.
<b>PCI Posted Memory</b>	Disabled	Enabled	Enabled	PCI Posted Memory Write is disabled or enabled with this bit.
<b>Write 8-Bit DMA Wait States</b>	4WS	3WS	2WS 3WS 4WS	These bits are encoded with the number of clocks. The command is active for 8-bit DMA cycles.
<b>16-Bit DMA Wait States</b>	4WS	3W	2WS	These bits are encoded with the number of clocks. the command is active for 16-bit DMA cycles.

\*These parameters may be fixed and may not be changed.

Item	Setup Default	BIOS Default	Option	Function
<b>Bus 8-Bit Wait States</b>	1WS	0WS	1WS, 0WS	Determines whether to use 1 or 0 WS for 16-bit ISA BUS accesses. By default, the PC/AT-compatible 1 WS is used. 0 WS is used to allow faster operation of add-in cards.
<b>Fast Clock Divider</b>	BUSOSC/LCLK/4	BUSOSC/LCLK/4	None	These bits control the fast SYSCLK divider. LCLK= 32 MHz divided by 4 = 8 MHz (LCK is fixed to 32 MHz)
<b>PCI Bus/ CPU Clocks</b>	Asynch	Asynch	None	Fixed to 33MHz PCI
<b>Onboard FDC Control</b>	Enabled	Enabled	Disabled	This option controls the function of the floppy disk controller on the system board.
<b>Onboard Serial Port 1</b>	COM1	COM1	COM2 COM3 COM4 Disabled	This option controls the assignment of the serial port 1 connector on the system board.
<b>Onboard Serial Port 2</b>	COM2	COM2	COM1 COM3 COM4 Disabled	This option controls the assignment of the serial port 2 connector on the system board.
<b>Onboard Parallel Port</b>	378H/IRQ7	378H/IRQ7	378H/IRQ5 3BC/IRQ7 278H/IRQ5 Disabled	This option allows you to select different addresses and IRQs for the onboard parallel port.
<b>Onboard Printer Mode</b>	Compatible	Compatible	Extended ECP Mode EPP Mode	This option allows you to select the printer mode for your system. This abbreviations used in the "Option" column are explained as follows: Extended Mode - Bidirection Mode ECP Mode - Extended Capabilities Port Mode EPP Mode - Enhanced Parallel Port Mode
<b>Onboard PCI IDE Chip</b>	Enabled	Enabled	Disabled	This option allows you to Enable/ Disable onboard CMD646 PCI IDE controller.

## Power Management Setup

Use the arrow keys to highlight the “Power Management Setup” and press <Enter>, a screen similar to the one below will appear.



The above Power Management Setup configuration will not use any of the power management features at all since Power Management is disabled.

Choosing “User Defined” in the Power Management option will allow you to set the time of the power management features. “Min Power Saving” and “Max Power Saving” will set the minimum and maximum value of these options respectively. Choose “Disabled” if you do not wish your system to enter the power saving mode.

If you want your computer to resume an IRQ event, you can enable that IRQ. For example, if you have a network card installed that uses IRQ 5, you may want to turn IRQ 5 to On to allow the computer to resume when the network polls the system.

**Note:**

***Before installing Windows 95***

*Please enable the Power Management feature in the BIOS setup before you install Windows 95. This is so that the Power Management icon will show up in the Control Panel box after you have Windows 95 installed and running.*

The following tables describe the options in the Power Management Setup screen.

Item	BIOS Default	Setup Default	Option	Function
<b>Power Management</b>	Disabled	Disabled	Disabled	The Global Power Management will be disabled.
			User Define	Allows you to specify the settings according to your own preference.
			Min Saving	The predefined timer settings that have the maximum values.
			Max Saving	The predefined timer settings that have the minimum values.
<b>PM Control by APM</b>	Yes	Yes	Yes	<p>System Power Management will wait for the APM call before it enters a software power management mode.</p> <p>Note: If the APM is installed and there is a task running, the APM will not prompt the BIOS to put the system into any of the power management modes even if the timer is time out.</p> <p>Normally, the APM is insalled in the DOS and Windows systems by loading the device C:\DOS\POWER.EXE file in CONFIG.SYS. In Windows 95, Enable Power Management before installing the operating system or the Windows 95 APM may not work.</p>
			No	<p>The System BIOS will ignore Advanced Power Management (APM) when initiating the power management mode.</p> <p>Note: If APM is not installed, this option has no effect.</p>

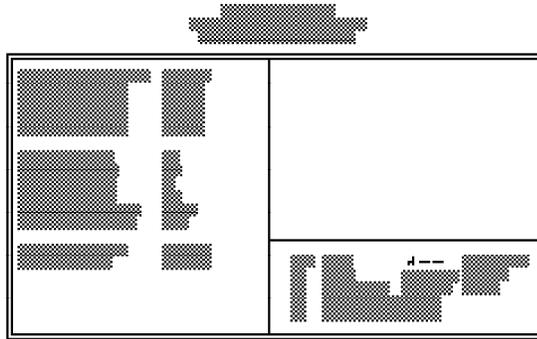
Item	BIOS Default	Setup Default	Option	Function
<b>Video Off Method</b>	Blank Screen	Blank Screen	Blank Screen  V/H SYNC + Blank	<p>The System BIOS blanks off the screen only when disabling the video.</p> <p>In addition to the function provided by the Blank Screen option, this option also turns off the V-SYNC and H-SYNC signals from VGA card to monitor.</p> <p>Note: After detecting the V/H SYNC signals, an energy saving monitor will turn off its gun.</p>
<b>Doze Mode</b>	Disabled	Disabled	Disabled 15 Sec 30 Sec 1 Min 2 Min 4 Min 8 Min 15 Min 30 Min 1 Hr 2 Hr 4 Hr 8 Hr 15 Hr	<p>The Doze mode will be disabled. This option defines the idle time that elapses before the system enters the Doze mode.</p> <p>If any of the items marked with an asterisk (*) are enabled and activated, the Doze timer will be reset.</p> <p>Note: This item will be loaded with the predefined values as long as the item "Power Management" is not configured to "User Defined".</p>
<b>Standby Mode</b>	Disabled	Disabled	Disabled 15 Sec 30 Sec 1 Min 2 Min 4 Min 8 Min 15 Min 30 Min 1 Hr 2 Hr 4 Hr 8 Hr 15 Hr	<p>The Standby mode will be disabled.</p> <p>This option defines the idle time that elapses before the system enters the Standby mode.</p> <p>If any of the items marked with an asterisk (*) are enabled and activated, the Standby timer will be reset.</p> <p>Note: This item will be loaded with the predefined values as long as the item "Power Management" is not configured to "User Defined".</p>

Item	BIOS Default	Setup Default	Option	Function
<b>Suspend Mode</b>	Disabled	Disabled	Disabled 15 Sec 30 Sec 1 Min 2 Min 4 Min 8 Min 15 Min 30 Min 1 Hr 2 Hr 4 Hr 8 Hr 15 Hr	<p>The Suspend mode will be disabled.</p> <p>This option defines the idle time that elapses before the system enters the Suspend mode.</p> <p>If any of the items marked with an asterisk (*) are enabled and activated, the Suspend timer will be reset.</p> <p>Note: This item will be loaded with the predefined values as long as the item "Power Management" is not configured to "User Defined".</p>
<b>HDD Power Down</b>	Disabled	Disabled	Enabled 1 min 15 min	Hard disk drive power saving for Power Management.
<b>IRQ3 (COM2)</b>	On	On	On  Off	<p>The activity of this event causes the power management timers to be reset, i.e., the Power Management Unit (PMU) monitors the specified activities as power management events.</p> <p>The activity of this event will not affect the power management timers.</p>
<b>IRQ4 (COM1), IRQ5 (LPT2), IRQ6 (Floppy Disk) and IRQ7 (LPT1)</b>	On	Off	On  Off	<p>The activity of this event causes the power management timers to be reset, i.e., the Power Management Unit (PMU) monitors the specified activities as power management events.</p> <p>The activity of this event will not affect the power management timers.</p>
<b>IRQ8 (RTC Alarm)</b>	Off	Off	None	<p>The activity of this event will not affect the power management timers.</p> <p>Note: Due to the chipset configuration, the option ON should not be selected.</p>

Item	BIOS Default	Setup Default	Option	Function
IRQ9 (IRQ2 Redir)	On	Off	On  Off	The activity of this event causes the power management timers to be reset, i.e., the Power Management Unit (PMU) monitors the specified activities as power management events.  The activity of this event will not affect the power management timer.
IRQ10 (Reserved) and IRQ11 (Reserved)	On	Off	On  Off	The activity of this event causes the power management timers to be reset, i.e., the Power Management Unit (PMU) monitors the specified activities as power management events.  The activity of this event will not affect the power management timers.
IRQ12 (PS/2 Mouse)	On	On	Off  On	The activity of this event will not affect the power management timers.  The activity of this event causes the power management timers to be reset, i.e., the Power Management Unit (PMU) monitors the specified activities as power management events.
IRQ13 (Coprocessor) and IRQ14 (Hard Disk)* and IRQ15 (Reserved)*	On	Off	On  Off	The activity of this event causes the power management timers to be reset, i.e., the Power Management Unit (PMU) monitors the specified activities as power management events.  The activity of this event will not affect the power management timers.
Read Merge Control	Disabled	Enabled	Enabled	Read Data is merged with the more recent bytes from the the write buffer before being returned to the CPU.
Combined Control	Disabled	Enabled	Enabled	Combined two write buffer hit data into the pre-existing entry in the write buffer which can reduce write traffic from 8-bit and 16-bit software.

## PCI Configuration Setup

Use the arrow keys to highlight "PCI Configuration Setup" and press <Enter>, a screen similar to the one on the next page will appear.



The MBG586VPMP2/R system board supports four PCI master/slave slots. Each slot may be assigned INT A, B, C, D or Auto if the card installed in the slot requires an interrupt. Each INT may then be assigned an IRQ value.

**Note:**  
*We recommend that you assign all slots to Auto.*

The following tables describe the options in the PCI Configuration Setup screen.

Item	BIOS Default	Setup Default	Option	Function
<b>Slot 1 INT# Map to Slot 2 INT# Map to Slot 3 INT# Map to Slot 4 INT# Map to</b>	Auto	Auto	A, B, C, D,	Each slot may be assigned INT A, B, C or D if the card installed in the slot requires an interrupt. Each INT may be assigned an IRQ value.
<b>1st Available IRQ</b>	11	Auto	NA, 3, 4, 5, 7, 9, 10, 11, 12, 14, 15	This option allows you to assign an IRQ value to the detected PCI device.
<b>2nd Available IRQ</b>	10	Auto	NA, 3, 4, 5, 7, 9, 10, 11, 12, 14, 15	This option allows you to assign an IRQ value to the detected PCI device.
<b>3rd Available IRQ</b>	9	Auto	NA, 3, 4, 5, 9, 10, 11, 12, 14, 15	This option allows you to assign an IRQ value to the detected PCI device.
<b>4th Available IRQ</b>	15	Auto	NA, 3, 4, 5, 7, 9, 10, 11, 12, 14, 15	This option allows you to assign an IRQ value to the detected PCI device.
<b>PCI IRQ Activated by</b>	Level	Level	None	The interrupts will be controlled by level trigger.
<b>PCI IDE IRQ Map To</b>	ISA	ISA	None	Onboard PCI IDE IRQ mapping to IRQ 14 or IRQ 15.

## Load BIOS Defaults

If, for some reason, the CMOS becomes corrupted, the system can be reconfigured with the default values stored in the ROM chips. The BIOS default values provide the slowest performance for the system but are stable. You should use these values only if you are having hardware problems.

Highlight this option on the main menu and press <Enter>. The message below will appear.

*Load BIOS Defaults (Y/N)? N*

Type “Y” and press <Enter> to load the BIOS setup default values. After pressing <Enter>, you will be returned to the main menu.

## Load Setup Defaults

The Setup default values are stable and optimized for standard configuration. These defaults must be selected as standard values for your system. Highlight this option on the main menu and press <Enter>. The message below will appear.

*Load Setup Defaults (Y/N)? N*

Type “Y” and press <Enter> to load the Setup default values. After pressing <Enter>, you will be returned to the main menu.

To configure your system for optimum performance, you must reset the options under the Chipset Features Setup. However, you are allowed to do so under the instruction of a technical engineer, otherwise, failure may occur.

## Password Setting

If you want to set a password, make sure that the Security Option under the BIOS Features Setup is set to “System” or “Setup”. Refer to the BIOS Features Setup option for more information.

Use the arrow keys to highlight the Password Setting option and press <Enter>. The message below will appear.

*Enter Password:*

Type in the password. You are limited to eight characters. Type in a password that is eight characters long or shorter. When done, the message below will appear:

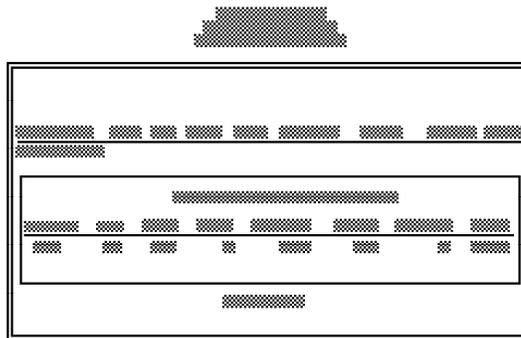
*Confirm Password:*

You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. Otherwise, enter a new password.

To delete or disable the password function, simply press <Enter> instead of typing in a new password. Press the <Esc> key to return to the main menu.

## **IDE HDD Auto Detection**

This option detects the hard disk parameters for the hard disk drives installed in your system. Highlight this option and press <Enter>. A screen similar to the one below will appear.



The screen displays the parameters detected and allows you to accept or reject the parameters. Type "Y" and press <Enter> to accept the parameters or press <Esc> to abort. If you select "Y", the parameters of the hard disk will be displayed in the Standard CMOS Setup.

### **Hard Drive Mode**

The MBG586VPMP2/R supports three HDD modes: Normal, LBA and Large. If your hard disk drive does not support LBA mode, the "LBA" option will not be displayed. If your HDD has 1024 or fewer cylinders, the "Large" option will not be displayed.

### **Normal Mode**

The Normal mode is the generic access mode in which neither the BIOS nor the IDE controller will make any transformations during hard drive access. The maximum number of cylinders, heads and sectors for Normal mode are 1024, 16 and 63, respectively.

	no. Cylinders	(1024)
x	no. Heads	(16)
x	no. Sectors	(63)
x	bytes per sector	(512)
<hr/>		
528 Megabytes		

If you set your HDD to Normal mode, the maximum accessible HDD size will be 528MB even though its physical size may be greater than that.

### **LBA (Logical Block Addressing) Mode**

The LBA mode is a new HDD accessing method to overcome the 528MB limitation. The number of cylinders, heads and sectors shown on the screen may not be the actual number for the HDD.

During the HDD accessing, the IDE controller will transform the logical address described by the sector, head and cylinder number into its own physical address inside the HDD.

The maximum HDD size supported by the LBA mode is 8.4 Gigabytes. It is obtained by the following formula.

$$\begin{array}{r}
 \text{no. Cylinders} \quad (1024) \\
 \times \text{ no. Heads} \quad (225) \\
 \times \text{ no. Sectors} \quad (63) \\
 \times \text{ bytes per sector} \quad (512) \\
 \hline
 8.4 \text{ Gigabytes}
 \end{array}$$

### Large Mode

The Large mode is the extended HDD access mode supported by the MBG586VPMP2/R system board. Some IDE HDDs have more than 1024 cylinders without LBA support (in some cases, you may not want the LBA mode). The system board provides another alternative to support these kinds of HDD.

The BIOS tells the operating system that the number of cylinders is 1/2 of the actual and that the number of heads is double the actual. During the disk access, the reverse conversion is done by the INT13h routine.

Example of Large mode:

CYLS.	HEADS	SECTORS	MODE
1120	16	59	Normal
560	32	59	Large

$$\begin{array}{r}
 \text{Maximum HDD size:} \\
 \text{no. Cylinders} \quad (1024) \\
 \times \text{ no. Heads} \quad (32) \\
 \times \text{ no. Sectors} \quad (63) \\
 \times \text{ bytes per sector} \quad (512) \\
 \hline
 1 \text{ Gigabyte}
 \end{array}$$

## POST BEEP

Currently, there are two kinds of beep codes in BIOS. The one code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by three short beeps. The other one code indicates that your DRAM error has occurred. This beep code consists of a single long beep repeatedly.

## Error Message

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list indicates the error message for all Award BIOSes:

### *CMOS BATTERY HAS FAILED*

CMOS battery is no longer functional. It should be replaced.

### *CMOS CHECKSUM ERROR*

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

### *DISPLAY SWITCH IS SET INCORRECTLY*

Display switch on the mother board can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

**Floppy Disk(S)** fail (80) → Unable to reset floppy subsystem.

**Floppy Disk(S)** fail (40) → Floppy type mismatch.

**Hard Disk(s)** fail (80) → HDD reset failed.

**Hard Disk(s)** fail (40) → HDD controller diagnostics failed.

**Hard Disk(s)** fail (20) → HDD initialization error.

**Hard Disk(s) fail (10)** → Unable to recalibrate fixed disk.

**Hard Disk(s) fail (08)** → Sector Verify failed.

BIOS detect the keyboard is locked. P17 of keyboard controller is pulled low.

*Keyboard error or no keyboard present*

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

*Manufacturing POST loop*

System will repeat POST procedure infinitely while the P15 of keyboard controller is pulled low. This is also used for MB burn in test.

*BIOS ROM checksum error - System halted.*

The checksum of ROM address F000H-FFFFFFH is bad.

*Memory test fail*

BIOS reports the memory test fail if the onboard memory is tested with an error.

**Save And Exit Setup**

When you select this option and press <Enter>, the values entered during the current session will be written into the CMOS memory on the system board.

**Exit Without Saving**

This option allows you to exit the Setup Utility without recording any new values or changing the old ones.

BIOS detect the keyboard is locked. P17 of keyboard controller is pulled low.

*Keyboard error or no keyboard present*

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

*Manufacturing POST loop*

System will repeat POST procedure infinitely while the P15 of keyboard controller is pulled low. This is also used for MB burn in test.

*BIOS ROM checksum error - System halted.*

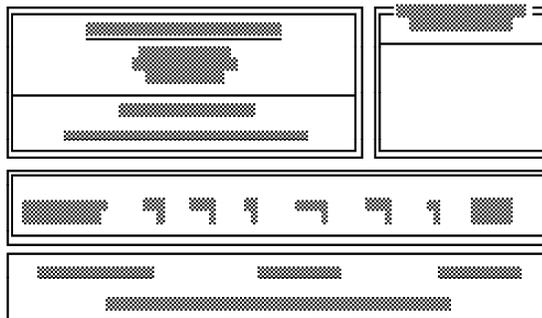
The checksum of ROM address F0000H-FFFFFFH is bad.

*Memory test fail.*

BIOS reports the memory test fail if the onboard memory is tested error.

## HDD Low Level Format

This option will format, set the interleave mode and do a media analysis of your hard drives. Highlight this option and press <Enter>. A screen similar to the one below will appear.



**Warning:**

*Do not attempt to do a low-level format, or you may cause serious damage to the drive. IDE disk drives are already low-level formatted, with any bad-track errors entered, when shipped by the drive manufacturer.*

Use the arrow keys to select an option and press <Enter> to accept the option. Press <Esc> when done.

**Save & Exit Setup**

When all the changes have been made, highlight "Save & Exit Setup" and press <Enter>. The following message will appear:

*Save to CMOS and Exit (Y/N)? N*

Type "Y" and press <Enter>. The following message will appear:

*Reboot System (Y/N)? N*

Type "Y" and press <Enter>. The modifications you have made will be written into the CMOS memory, and the system will reboot. You will once again see the initial diagnostics on the screen. If you wish to make additional changes to the setup, press <Ctrl> <Alt> <Esc> simultaneously or <Del> after the memory testing is completed.

**Exit Without Saving**

When you do not want to save the changes you have made, highlight this option and press <Enter>. The following message will appear:

*Quit Without Saving (Y/N)? N*

Type "Y" and press <Enter>. The system will reboot and you will once again see the initial diagnostics on the screen. If you wish to make any changes to the setup, press <Ctrl> <Alt> <Esc> simultaneously or <Del> after the memory testing is completed.

## **IDE Device Drivers**

To install the IDE device drivers supported by the MBG586VPMP2/R board, please refer to the various "Readme" files contained in the provided diskette.

## Chapter 4 Troubleshooting Checklist

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If you experience difficulty with the MBG586VPMP2/R system board, please refer to the checklist below. If you still cannot isolate the problem, please contact your dealer.

1. Check the jumper settings to ensure that the jumpers are properly set. If in doubt, refer to the "Hardware Installation" section.
2. Verify that all SIM modules are seated securely into the bank sockets.
3. Make sure that the SIM modules are in the correct locations.
4. Check that all populated memory banks are filled with valid sized SIM modules and that each bank is occupied by 2 modules.
5. If your board fails to function, place the board on a flat surface and seat all socketed components (gently press each component into the socket).
6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults. "Load Setup Defaults" and save the new values before exiting the BIOS setup.
7. If there is no video, put the video card in another slot or try another brand of video card.
  - a. If the graphics are distorted or the system is unstable, disable the "CPU to PCI Write Buffer" in the Chipset Feature Setup.
  - b. If your graphics board uses S3 or Arklogic chipsets, disable the "CPU to PCI Write Buffer" in the Chipset Feature Setup.
8. If you cannot install SCO Unix using an LBA mode type IDE hard drive, select "Normal mode" in the CMOS setup.

## Appendix A

### Types of Modules

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The MBG586VPMP2/R system board allows you to populate memory with 256Kx36, 512Kx36, 1Mx36, 2Mx36, 4Mx36 and 8Mx36 SIM modules. The following modules have been tested with this board. Most untested brands will work but a few may fail to do so.

#### For SIM 256Kx36 Modules

Brand	Chip Number
OKI	M51C256A-70

#### For SIM 512Kx36 Modules

Brand	Chip Number
OKI	M514256B-70J

#### For SIM 1Mx36 Modules

Brand	Chip Number
Toshiba	TC511000AJL
OKI	GT-1M*36B
Fujitsu	81C1000A-70

#### For SIM 2Mx36 Modules

Brand	Chip Number
OKI	M511000B

**For SIM 4Mx36 Modules**

<b>Brand</b>	<b>Chip Number</b>
OKI	M514100A-70S

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**For SIM 8Mx36 Modules**

<b>Brand</b>	<b>Chip Number</b>
OKI	M514100AL-70K

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## Appendix B System Error Report

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When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and a message PRESS F1 TO CONTINUE, CTRL-ALT-ESC or DEL TO ENTER SETUP will be shown in the information box at the bottom.

### POST Beep

Currently, there is only one beep code in BIOS. This code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps.

### Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST.

#### **CMOS BATTERY HAS FAILED**

CMOS battery is no longer functional. It should be replaced. The replacement battery is a Lithium watch battery, 3 Volt or equivalent. Replacing the battery will clear the CMOS and return the CMOS settings to the default values. Use a replacement battery with the same model/part number.

#### **CMOS CHECKSUM ERROR**

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

#### **DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER**

No boot device was found. Insert a system disk into Drive A and press <Enter>. Assuming the system is booted from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also, be sure the disk is formatted as a boot device. Then reboot the system.

**DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP**

The type of diskette drive installed in the system is different from the CMOS definition. Run setup to reconfigure the drive type correctly.

**DISPLAY SWITCH IS SET INCORRECTLY**

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

**DISPLAY TYPE HAS CHANGED SINCE LAST BOOT**

Since last powering off the system, the display adapter has been changed. You must configure the system for the new display type.

**ERROR ENCOUNTERED INITIALIZING HARD DRIVE**

Hard drive cannot be initialize. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also, be sure the correct hard drive type is selected in Setup (refer to Appendix G).

**ERROR INITIALIZING HARD DISK CONTROLLER**

Cannot initialize controller. Make sure the card is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also, check to see if any jumper needs to be set correctly on the hard drive.

**FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT**

Cannot find or initialize the floppy drive controller. Make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

**KEYBOARD ERROR OR NO KEYBOARD PRESENT**

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

**MEMORY ADDRESS ERROR AT...**

Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

**MEMORY PARITY ERROR AT...**

Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

**MEMORY VERIFY ERROR AT...**

Indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

**OFFENDING ADDRESS NOT FOUND**

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

**OFFENDING SEGMENT**

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.

**PRESS A KEY TO REBOOT**

This will be displayed at the bottom screen when an error occurs that requires a reboot. Press any key and the system will reboot.

**PRESS F1 TO DISABLE NMI, F2 TO REBOOT**

When BIOS detects a Non-maskable Interrupt condition during boot, this will allow NMI to be disabled and continue to boot. You can also reboot the system with the NMI enabled.

**RAM PARITY ERROR - CHECKING FOR SEGMENT**

Indicates a parity error in Random Access Memory.

**SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT...**

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL simultaneously.

## Appendix C Memory and I/O Maps

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### Memory Address Map

Address	Name	Function
0000000 to 009FFFF	640K System Board RAM	System Board Memory
00A0000 to 00BFFFF	128K Video Display Memory	Reserved for Graphics Display Memory
00C0000 to 00DFFFF	192K I/O Expansion ROM	Reserved for ROM on I/O Adapter Card
00E0000 to 00FFFFFF	128K ROM on the System Board	System Board BIOS
0100000 to 7FFFFFFF	Maximum Memory 256MB	System Board Memory

---

## I/O Address Map

I/O Address	Function
000-01F	DMA Controller 1, 8237A-5
020-03F	Interrupt Controller 1, 8259A, Master
040-05F	Timer, 8254-2
060-06F	8742 (Keyboard and Mouse Controller)
070-07F	Real-time Clock, NMI (Non-maskable Interrupt) Mask
080-09F	DMA Page Memory, 74LS612
0A0-0BF	Interrupt Controller 2, 8259A
0C0-0DF	DMA Controller 2, 8237A-5
0E8	Shadow RAM and Cache Control Bit
0F0	Clear Numeric Processor Extension Busy
0F1	Reset Numeric Processor Extension
0F8-0FF	Numeric Processor Extension
1F0-1F8	Fixed Disk Control 1
170-178	Fixed Disk Control 2
200-207	Game I/O
278-27F	Parallel Printer Port 2
2F8-2FF	Serial Port 2
300-31F	Prototype Card
360-36F	Reserved
378-37F	Parallel Printer Port 1
380-38F	SDLC, Bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome Display and Printer Adapter
3C0-3CF	Reserved
3D0-3DF	Color/Graphics Monitor Adapter
3F0-3F7	Diskette Controller
3F8-3FF	Serial Port 1

**Note:**

*The I/O address hex 000 to 0FF are reserved for the system board I/O.  
Hex 100 to 3FF are available on the I/O channels.*

## Appendix D PCI I/O Pin Assignments

---

Component Side	B	A	Solder Side
	-12V	-01 -	TRST#
	TCK	-02 -	+12V
	Ground	-03 -	TMS
	TDO	-04 -	TDI
	+5V	-05 -	+5V
	+5V	-06 -	INTA#
	INTB#	-07 -	INTC#
	INTD#	-08 -	+5V
	PRSNT1#	-09 -	Reserved
	Reserved	-10 -	+5V (I/O)
	PRSNT2#	-11 -	Reserved
	Ground	-12 -	Ground
	Ground	-13 -	Ground
	Reserved	-14 -	Reserved
	Ground	-15 -	RST#
	CLK	-16 -	+5V (I/O)
	Ground	-17 -	GNT#
	REQ#	-18 -	Ground
	+5V (I/O)	-19 -	Reserved
	AD[31]	-20 -	AD[30]
	AD[29]	-21 -	+3.3V
	Ground	-22 -	AD[28]
	AD[27]	-23 -	AD[26]
	AD[25]	-24 -	Ground
	+3.3V	-25 -	AD[24]
	C/BE[3]#	-26 -	IDSEL
	AD[23]	-27 -	+3.3V
	Ground	-28 -	AD[22]
	AD[21]	-29 -	AD[20]
	AD[19]	-30 -	Ground
	+3.3V	-31 -	AD[18]
	AD[17]	-32 -	AD[16]
	C/BE[2]#	-33 -	+3.3V
	Ground	-34 -	FRAME#
	IRDY#	-35 -	Ground
	+3.3V	-36 -	TRDY#
	DEVSEL#	-37 -	Ground
	Ground	-38 -	STOP#
	LOCK#	-39 -	+3.3V
	PERR#	-40 -	SDONE
	+3.3V	-41 -	SBO#
	SERR#	-42 -	Ground
	+3.3V	-43 -	PAR
	C/BE[1]#	-44 -	AD[15]
	AD[14]	-45 -	+3.3V
	Ground	-46 -	AD[13]
	AD[12]	-47 -	AD[11]
	AD[10]	-48 -	Ground
	Ground	-49 -	AD[09]
	AD[08]	-52 -	C/BE[0]#
	AD[07]	-53 -	+3.3V
	+3.3V	-54 -	AD[06]
	AD[05]	-55 -	AD[04]
	AD[03]	-56 -	Ground
	Ground	-57 -	AD[02]
	AD[01]	-58 -	AD[00]
	+5V (I/O)	-59 -	+5V (I/O)
	ACK64#	-60 -	REQ64#
	+5V	-61 -	+5V
	+5V	-62 -	+5V

## Appendix E ISA I/O Pin Assignments

B	A
Grnd	- 01 -
ResetDrv	- 02 -
+5VDC	- 03 -
IRQ9	- 04 -
-5VDC	- 05 -
DRQ2	- 06 -
-12VDC	- 07 -
OVS	- 08 -
+12VDC	- 09 -
Grnd	- 10 -
-SEMEMV	- 11 -
-SEMEMR	- 12 -
-IOV	- 13 -
-IOR	- 14 -
-Dack3	- 15 -
-DRQ3	- 16 -
-Dack1	- 17 -
DRQ1	- 18 -
-Refresh	- 19 -
CLK	- 20 -
IRQ7	- 21 -
IRQ6	- 22 -
IRQ5	- 23 -
IRQ4	- 24 -
IRQ3	- 25 -
-Dack2	- 26 -
T/C	- 27 -
Bale	- 28 -
+5VDC	- 29 -
O/S	- 30 -
Grnd	- 31 -

D	C
-MemCS16	- 01 -
-I/OCS16	- 02 -
IRQ10	- 03 -
IRQ11	- 04 -
IRQ12	- 05 -
IRQ13	- 06 -
IRQ14	- 07 -
-Dack0	- 08 -
DRQ0	- 09 -
-Dack5	- 10 -
DRQ5	- 11 -
-Dack6	- 12 -
DRQ6	- 13 -
-Dack7	- 14 -
DRQ7	- 15 -
+5VDC	- 16 -
-Master	- 17 -
Grnd	- 18 -

## Appendix F

### Connector Pin Assignments

---

#### Connector J2

Reset Switch Connector

Pin	Function
1	Reset
2	Ground

---

#### Connector J3

Speaker Connector

Pin	Function
1	Signal
2	None
3	None
4	Ground

---

#### Connector J4

Turbo Switch Connector

Pin	Function
On	Low Speed
Off	Turbo (Normal) Speed

---

#### Connector J5

Keylock Connector

Pin	Function
1	LED Signal
2	Reserved
3	Ground
4	Keylock Signal
5	Ground

---

**Connector J6**

PCI IDE LED

Pin	Function
1	LED (+)
2	LED (-)

**Connector J7**

Disk Active

Pin	Function
1	Signal
2	Gnd

**Connector J11**

PS/2 Mouse Connector

Pin	Function
1	Mouse Data
2	Reserved
3	Ground
4	+5V
5	Mouse Clock
6	Reserved

**Connector J12**

Green/Sleep Function LED

Pin	Function
1	LED+
2	LED-

### Connector J13

Turbo LED

Pin	Function
1	LED-
2	LED+

### Connector J15

External Battery

Pin	Function
1	+3V
2	N.C.
3	N.C.
4	Ground

### Connectors CN3 and CN6

Primary and Secondary IDE Hard Disk Drive Connectors

Pin	Function	Pin	Function
1	-Reset	21	Reserved
2	Ground	22	Ground
3	D7	23	-IOW
4	D8	24	Ground
5	D6	25	-IOR
6	D9	26	Ground
7	D5	27	Reserved
8	D10	28	BALE
9	D4	29	Reserved
10	D11	30	Ground
11	D3	31	IRQ14
12	D12	32	IOCS16
13	D2	33	SA1
14	D13	34	Reserved
15	D1	35	SA0
16	D14	36	SA2
17	D0	37	HCS0
18	D15	38	HCS1
19	Ground	39	LED
20	Reserved	40	Ground

**Connector CN4**  
 Floppy Disk Drive Connector

Pin	Function	Pin	Function
1	Ground	18	Dir
2	DENSEL	19	Ground
3	Ground	20	Step
4	Reserved	21	Ground
5	Ground	22	Write Data
6	Drate0	23	Ground
7	Ground	24	Write Gate
8	Index	25	Ground
9	Ground	26	Track 0
10	MTR0	27	MSEN
11	Ground	28	Wr Protect
12	DR1	29	Ground
13	Ground	30	Read Data
14	DR0	31	Ground
15	Ground	32	Head Select
16	MTR1	33	Ground
17	Drate1	34	Disk Change

**Connector CN5**  
 Parallel Printer Port

Pin	Function	Pin	Function
1	-Strobe	14	-Autofd
2	Data 0	15	-Error
3	Data 1	16	-Init
4	Data 2	17	-Slctin
5	Data 3	18	Ground
6	Data 4	19	Ground
7	Data 5	20	Ground
8	Data 6	21	Ground
9	Data 7	22	Ground
10	-Ack	23	Ground
11	Busy	24	Ground
12	Paper Empty	25	Ground
13	Select		

### Connectors CN8 and CN7

Primary (COM-A) and Secondary (COM-B) Serial Ports

Pin	Function
1	DCD (Data Carrier Detect)
2	RX (Receive Data)
3	TX (Transmit Data)
4	DTR (Data Terminal Ready)
5	Ground (Signal Ground)
6	DSR (Data Set Ready)
7	RTS (Request to Send)
8	CTS (Clear to Send)
9	RI (Ring Indicator)

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## Appendix G Award BIOS Hard Disk Table

Type	Size (MB)	Cylinders	Heads	Sectors	Write Precomp	Land Zone	Example Model
1	10	306	4	17	128	305	TEAC SD510, MMI 112, 5412
2	20	615	4	17	300	615	Seagate ST225, ST4026
3	30	615	6	17	300	615	
4	62	940	8	17	512	940	
5	46	940	6	17	512	940	
6	20	615	4	17	None	615	Seagate ST125, Tandon TM262
7	30	462	8	17	256	511	
8	30	733	5	17	None	733	Tandon TM 703
9	112	900	15	17	None	901	
10	20	820	3	17	None	820	
11	35	855	5	17	None	855	
12	49	855	7	17	None	855	
13	20	306	8	17	128	319	Disctron 526, MMI M125
14	42	733	7	17	None	733	
15	(Reserved)						
16	20	612	4	17	0	663	Microscience HH725, Syquest 3250, 3425
17	40	977	5	17	300	977	
18	56	977	7	17	None	977	
19	59	1024	7	17	512	1023	
20	30	733	5	17	300	732	

Type	Size (MB)	Cylinders	Heads	Sectors	Write Precomp	Land Zone	Example Model
21	42	733	7	17	300	732	
22	30	306	5	17	300	733	Seagate ST4038
23	10	977	4	17	0	336	
24	40	1024	5	17	None	976	Seagate ST4051
25	76	1224	9	17	None	1023	Seagate ST4096
26	71	1224	7	17	None	1223	Maxtor 2085
27	111	1224	11	17	None	1223	Maxtor 2140, Priam S14
28	152	1024	15	17	None	1223	Maxtor 2190, Priam S19
29	68	1024	8	17	None	1023	Maxtor 1085, Micropolis 1325
30	93	918	11	17	None	1023	Maxtor 1105, 1120, 4780
31	83	925	11	17	None	1023	Maxtor 1170
32	69	1024	9	17	None	926	CDC 9415
33	85	1024	10	17	None	1023	
34	102	1024	12	17	None	1023	
35	110	1024	13	17	None	1023	
36	119	1024	14	17	None	1023	
37	17	1024	2	17	None	1023	
38	136	1024	16	17	None	1023	
39	114	918	15	17	None	1023	Maxtor 1140, 4380
40	40	820	6	17	None	820	Seagate ST251
41	42	1024	5	17	None	1023	Seagate 4053, Miniscribe 3053/6053

Type	Size (MB)	Cylinders	Heads	Sectors	Write Precomp	Land Zone	Example Model
42	65	1024	5	26	None	1023	Miniscribe 3053/ 6053 RLL
43	40	809	6	17	None	852	Miniscribe 3650
44	61	809	6	26	None	852	Miniscribe 3675 RLL
45	100	776	8	33	None	775	Conner CP3104
46	203	684	16	38	None	685	Conner CP3204
47	User Defined						

## Appendix H System Overview

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### DMA Channels

DMA Controller 1	DMA Controller 2
Ch0-Reserved for User	Ch4-Cascade for CTRL 1
Ch1-ECP *	Ch5-Reserved for User
Ch2-Diskette	Ch6-Reserved for User
Ch3-Reserved for User	Ch7-Reserved for User

\* ECP DMA channel can be changed to Ch3 by using Jumpers JP26 and JP27 (see page 21 of the manual).

**Note:**

*DMA controller 1 supports 8-bit data transfer.*

*DMA controller 2 supports 16-bit data transfer.*

### Address Generation for DMA Channels 3 to 0

Source	DMA Page Memory	DMA Controller 1
Address	A23 <————> A16	A15 <————> A0

### Address Generation for DMA Channels 7 to 5

Source	DMA Page Memory	DMA Controller 2
Address	A23 <————> A17	A16 <————> A1

### Page Memory Address

I/O Port Address	Page Memory
0081H	DMA Channel 2
0082H	DMA Channel 3
0083H	DMA Channel 1
0087H	DMA Channel 0
0089H	DMA Channel 6
008AH	DMA Channel 7
008BH	DMA Channel 5

## System Interrupts

Interrupt Controller 1	Interrupt Controller 2
IRQ0-Timer Output (Out 0)	IRQ8-Realtime Clock INT
IRQ1-Keybaord (Output Buffer Full)	IRQ9-Software Redirected to INT 0AH (IRQ2)
IRQ2-Interrupt from INTR2	IRQ10-Reserved
IRQ3-Serial Port 2	IRQ11-Reserved
IRQ4-Serial Port 1	IRQ12-PS/2 Mouse
IRQ5-Parallel Port 2 or 3 *	IRQ13-Coprocessor
IRQ6-Diskette Controller	IRQ14-Primary Fixed Disk Controller (1F0)
IRQ7-Parallel Port 1 or 2 *	IRQ15-Secondary Fixed Disk Controller (170) / Green IRQ **

\* The on-board parallel port can be configured to either Parallel Port 1, 2 or 3. The Parallel Port 1 uses I/O address 3BCh, Parallel Port 2 I/O address 378h, while Parallel Port 3 uses I/O address 278h.

\*\* If you enable the Green function in the CMOS Setup while using a non-green CPU, it will occupy IRQ15.

### Note:

*The 16 levels of system interrupts have the following priority: IRQ0 > IRQ1 > IRQ8 > IRQ9 > IRQ10 > IRQ11 > IRQ12 > IRQ13 > IRQ14 > IRQ15 > IRQ3 > IRQ4 > IRQ5 > IRQ6 > IRQ7.*

## System Timers

<b>Channel 0</b>	System Timer (IRQ0)
<b>Channel 1</b>	Refresh Request Generator (15us Rate Generator Period Signal)
<b>Channel 2</b>	Tone Generation for Speaker

## Real-Time Clock

Address	Function
00	Seconds
01	Second Alarm
02	Minutes
03	Minute Alarm
04	Hours
05	Hour Alarm
06	Day of Week
07	Date of Month
08	Month
09	Year
0A	Register A
0B	Register B
0C	Register C
0D	Register D

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