



G486-EVB
Rev. A
System Board
User's Manual



-D24341209-





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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 modification 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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Energy Star Compliant System Board

❖ *Introduction*

The G486-EVB is an Energy Star Compliant system board that meets the Environmental Protection Agency's Green PC requirements. It reduces energy consumption to 15 Watts or less by automatically turning off peripherals or the entire system, when not in use.

The G486-EVB accommodates all of the Intel 486 family of CPUs including the energy saving SL Enhanced CPUs. The system board may be equipped with an 80486SX or 80486DX at 25/33 MHz, an 80486DX2 at 50/66 MHz, and, when equipped with optional 3.3V support, an 80486DX4 at 75/100 MHz. It will also support the Intel486 OverDrive Processor, AMD 486DXL low power processor, Cyrix Cx486DX/DX2 and Cx486S/S2 CPUs.

The G486-EVB uses 256K x 36, 1M x 36 and 4M x 36 HSIM modules. The memory can be configured to six different sizes from 1MB to 64MB. In addition, the G486-EVB is equipped with three 32-bit VESA VL-Bus, and six 16-bit and one 8-bit ISA expansion slots.



G486-EVB

Features and Specifications

- **Microprocessor**
 - Intel 486SX-25/33, 486DX-33, 486DX2-50/66,
SL Enhanced CPUs, Intel486™ DX2
OverDrive Processor,
80486DX4-75/100 (with optional 3.3V support)
 - AMD 486DXL low power CPU
 - Cyrix Cx486S-25/33, Cx486S2-50/66,
Cx486DX-25/33 and Cx486DX2-50/66

- **Energy-Efficient Design**
 - Intel SL Enhanced CPU ready
 - Supports system power management
 - Supports CPU stopped clock
 - Supports optional external power management
switch
 - Supports power saving video mode

- **Chipset**
 - EC802G: system and cache controller
 - EC100: data buffer

- **BIOS**
 - Award system BIOS

- **Cache Memory**
 - 128K, 256K or 512K
 - Supports direct map write-back or write-through
cache subsystem

- **Memory Onboard**
 - 1MB to 64MB



Energy Star Compliant System Board

- **DRAM Type**
256K x 36, 1M x 36 and 4M x 36 HSIMMs
- **Slots**
Three VESA VL-Bus slots
Six 16-bit ISA slots
One 8-bit ISA slot
- **Power Management**
Flexible Doze mode, Standby mode and Suspend mode transitions using SMM type of CPUs and SMM software handler.
Built-in hardware auto-transition mechanism.
Microsoft APM supported.
- **PCB**
4 layers



Package Checklist

The G486-EVB package contains the following items:

- The G486-EVB system board
- One G486-EVB user's manual

If either 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 G486-EVB 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 page 2-3 for the number and type of HSIM modules needed.

Preparing the Area

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

Be sure that 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 protection socket. This will protect the system board from damage that may result from a power surge on the 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 G486-EVB system board carefully.



Energy Star Compliant System Board

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 that no static build-up is present.

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) Do all preparation work on a static-free surface with components facing up.
- 3) 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.
- 4) Avoid touching the pins or contacts on all modules and connectors. Hold modules and connectors by their edges.

Hardware Installation

Memory Installation

The G486-EVB system board can support 1MB to 64MB of memory using HSIMM. HSIMM is an acronym for High Density Single In-line Memory Module.

A HSIMM consists of RAM chips soldered onto a small circuit board. A HSIMM connects to the system board via a 72-pin card-edge connector.

2-2 ♦ Installation Overview



The HSIMM sockets are divided into four banks on the system board. The G486-EVB system board uses 256K x 36, 1M x 36 and 4M x 36 HSIM modules.

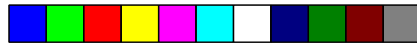
A list of tested memory brands and speeds is given in Appendix A.

You will need 1 to 4 pieces of HSIM modules, depending on the amount of memory you intend to install. Your system board can be configured with 1MB, 4MB, 8MB, 16MB, 32MB or 64MB of onboard memory.

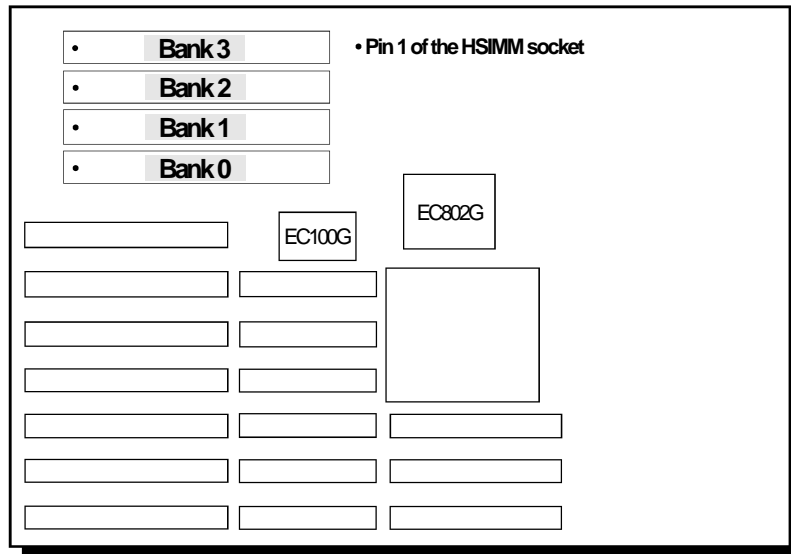
When installing the HSIM modules, populate Bank 0 first followed by Bank 1 and so on. Failure to do so will cause the system board to work improperly.

The following table summarizes the bank locations and modules needed for the corresponding memory sizes. Each bank consists of one HSIMM socket.

Memory Size	Bank 0	Bank 1	Bank 2	Bank 3
1MB	256K x 36	-	-	-
4MB	256K x 36	256K x 36	256K x 36	256K x 36
4MB	1M x 36	-	-	-
8MB	1M x 36	1M x 36	-	-
16MB	1M x 36	1M x 36	1M x 36	1M x 36
16MB	4M x 36	-	-	-
32MB	4M x 36	4M x 36	-	-
64MB	4M x 36	4M x 36	4M x 36	4M x 36



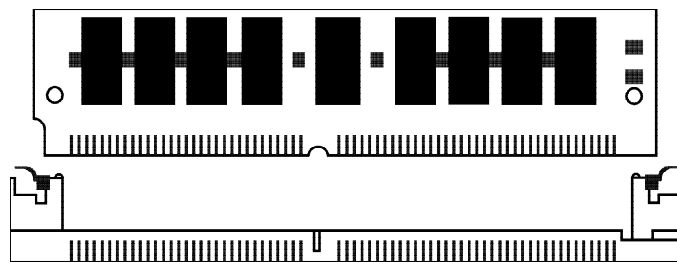
Energy Star Compliant System Board



Locations of the HSIMM Sockets on the G486-EVB System Board

Installing the Modules

HSIMMs simply snap into a socket on the system board. Pin 1 of the HSIMM must correspond with Pin 1 of the socket.



2-4 ♦ Installation Overview

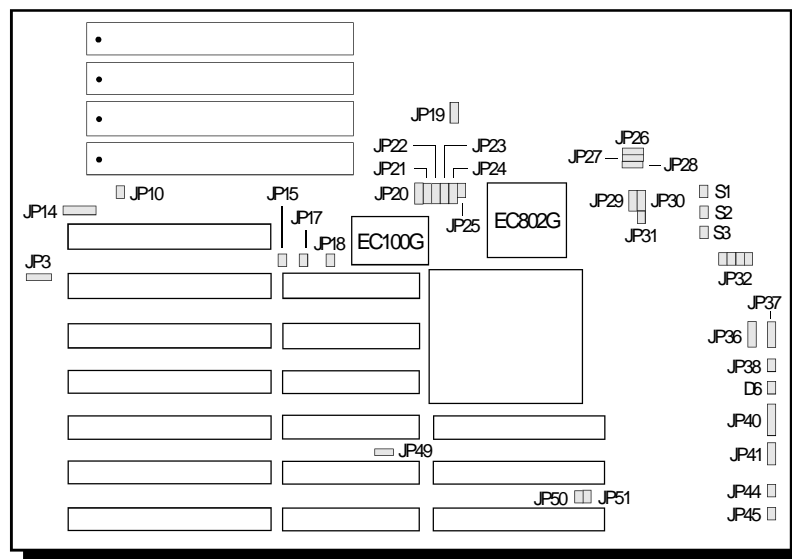


G486-EVB

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

Board Configuration

The G486-EVB is designed with jumpers to configure the board. Make sure that the jumpers are set correctly before installing the system board into your system unit.



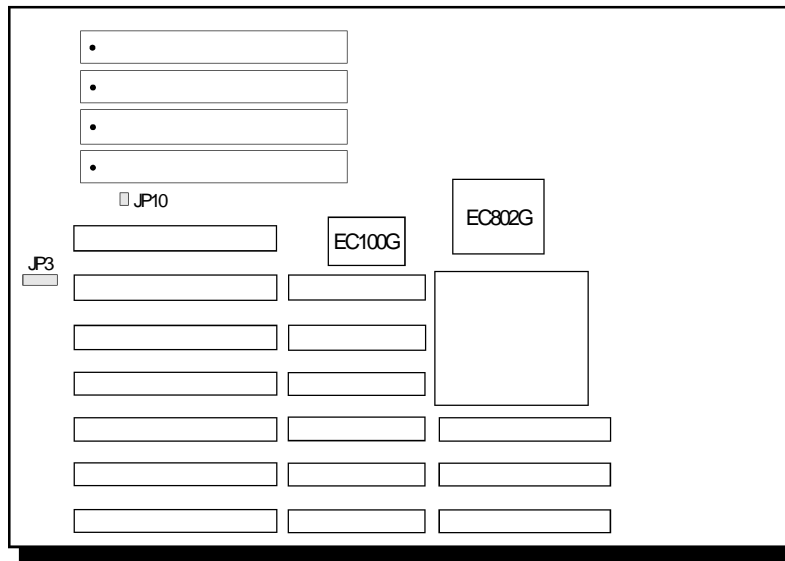
**Locations of Jumpers and Connectors
on the G486-EVB System Board**



Energy Star Compliant System Board

Jumper Settings

Locations of Jumpers JP3 and JP10



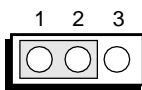
Locations of Jumpers JP3 and JP10 on the G486-EVB System Board

Jumper JP3 Internal Battery Select

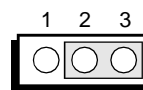
The G486-EVB comes with an internal battery. If you wish to install an external battery, set JP3 pins 1 and 2 to On.



----- G486-EVB



1 2 3
1-2 On:
External Battery Enabled
(Default)



1 2 3
2-3 On:
Internal Battery Enabled

Note:

If you enable the external battery, you must connect an external battery to connector JP14 or your system will lose its CMOS settings when powered off.

Jumper JP10
EPROM Type

Jumper JP10 should be set to match the type of EPROM installed on the G486-EVB system board.



On: Flash EPROM 28F010



Off: EPROM 27512
(Default)

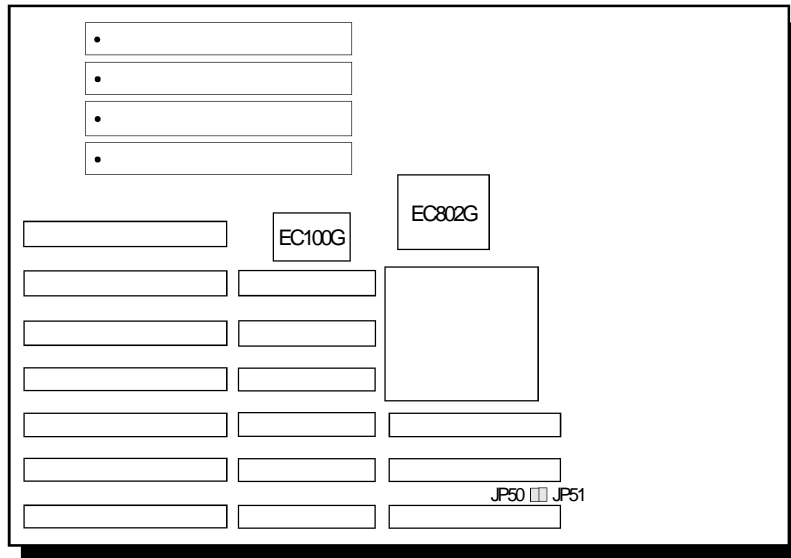
The jumper below is for factory testing only and should always be set to its default configuration. Reconfiguring this jumper will cause problems with your G486-EVB system board.

Jumper JP15 - On



Energy Star Compliant System Board

Jumper Settings for VL-Bus Add-on Boards

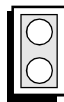


**Locations of Jumpers JP50 and JP51
on the G486-EVB System Board**

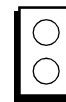


Jumper JP50
High Speed Mode for VL-Bus Board

Set Jumper JP50 to Off only if the VESA VL-Bus add-on board(s) installed in the VL-Bus slots support Zero Wait State. If you are not sure that your add-on board(s) support Zero Wait State, set JP50 to On; otherwise, a system error may occur.



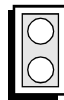
On: Write One Wait State
(Default)



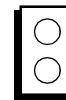
Off: Write Zero Wait State

Jumper JP51
CPU Speed for VL-Bus Board

If a VL-Bus board is installed in the G486-EVB system board, Jumper JP51 must be set to On if the CPU speed is greater than 33MHz. Set JP51 to Off if the CPU speed is less than or equal to 33MHz.



On: CPU Speed > 33MHz
(Default)

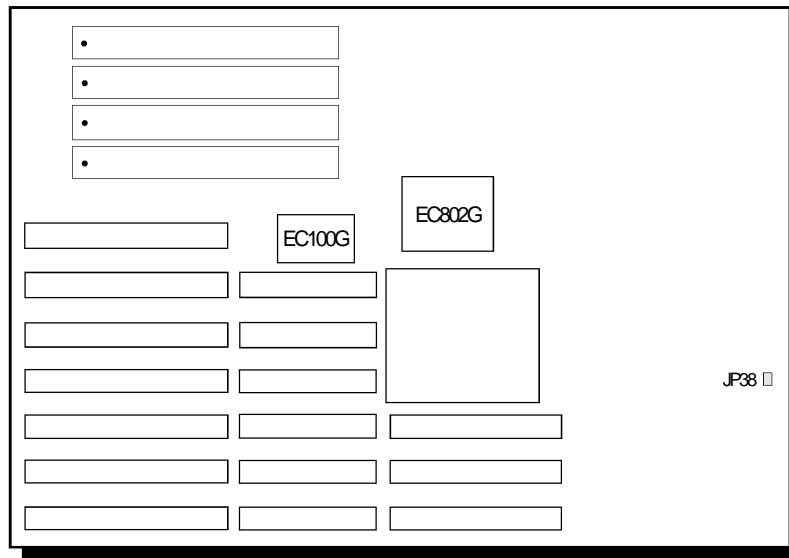


Off: CPU Speed <= 33MHz



Energy Star Compliant System Board

Jumper Settings for Light and Deep Green



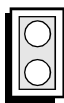
Location of Jumper JP38 on the G486-EVB System Board

Jumper JP38 Light/Deep Green Select

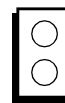
The different types of CPUs supported by the G486-EVB allow you to select from two different energy saving modes. If you have a standard Intel 486DX, SX, OverDrive Processor or AMD 486DXL, the G486-EVB will run in Light Green mode. If you have an energy saving SL Enhanced Intel 486DX, 486DX4 or Cyrix Cx486S/Cx486S2 CPU, then the G486-EVB will run in Deep Green mode. Set Jumper JP38 according to the type of CPU installed on the board.



G486-EVB



On: Light Green
486DX, 486SX,
Intel486™ OverDrive
Processor, AMD 486DXL



Off: Deep Green
SL Enhanced Intel486™ DX, 486DX4,
Cyrix Cx486S/Cx486S2
(Default)

Cache Configuration

The G486-EVB system board can be configured to three different cache sizes: 128KB, 256KB and 512KB. 128KB of cache memory is the default size. Either 32K x 8 (20ns) or 128K x 8 (20ns) SRAM chips are used for cache depending on the size of cache desired. One 8K x 8 or 32K x 8 (20ns) SRAM is needed for tag RAM to store the cacheable addresses (refer to the table below). The location of the SRAM sockets on the system board is shown on the next page.

Cache Size	U18/U19/U20/U21	U23/U24/U25/U26	U22
128KB*	32K x 8 (20ns)	None	8K x 8 (20ns)
256KB	32K x 8 (20ns)	32K x 8 (20ns)	32K x 8 (20ns)
512KB	128K x 8 (20ns)	None	32K x 8 (20ns)

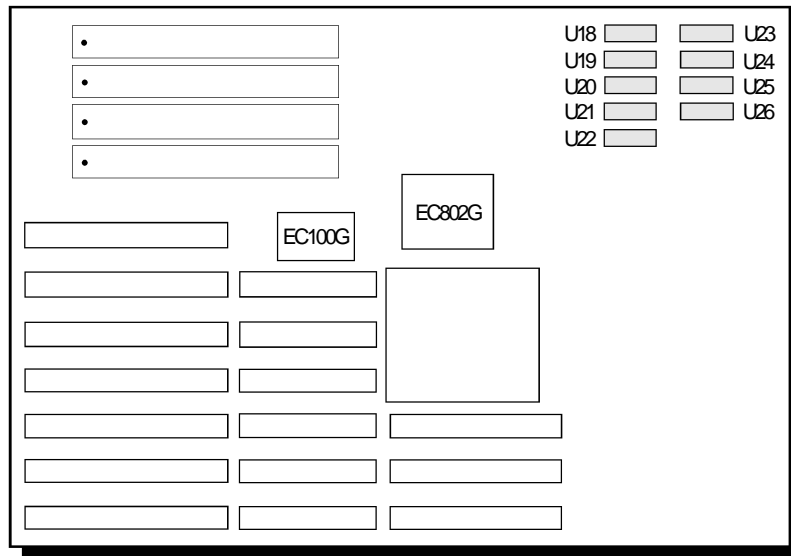
* Default setting



Energy Star Compliant System Board

Note:

When the G486-EVB is equipped with 128KB cache, cacheable memory is limited to 32MB. Any memory over 32MB will be non-cacheable. When the system board is installed with 256K cache, it only supports a maximum of 48MB onboard memory. If 512K cache is installed, it will support up to 64MB.



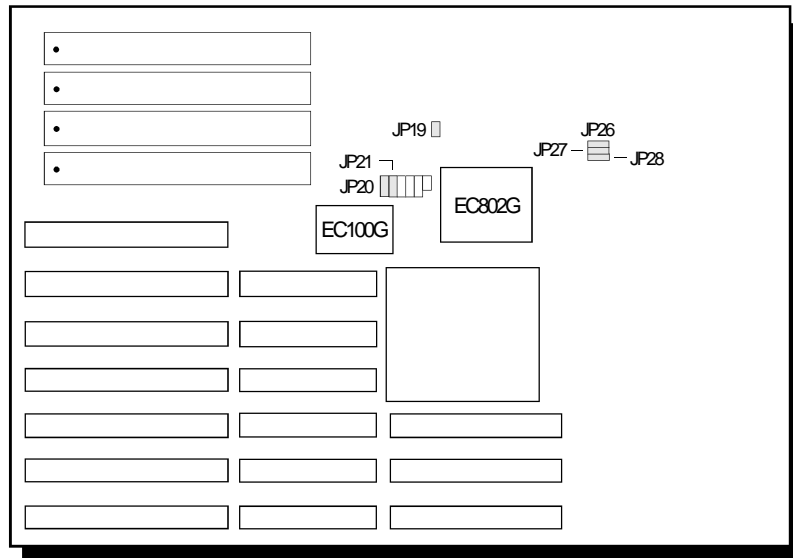
Locations of the SRAMs on the G486-EVB System Board





G486-EVB

Jumper Settings for Cache Memory



Locations of Jumpers JP19-JP21 and JP26-JP28 on the G486-EVB System Board

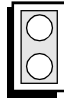
Jumpers	CacheMemorySize		
	128KB*	256KB	512KB
JP19	Off	Off	On
JP20	2-3On	1-2On	2-3On
JP21	2-3On	1-2On	1-2On
JP26	On	On	On
JP27	On	On	On
JP28	Off	On	On

* Default setting

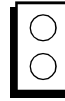


Energy Star Compliant System Board

JP19

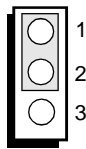


On

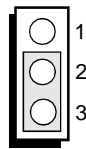


Off

JP20 or JP21

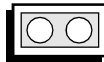


1-2: On



2-3: On

JP26, JP27 or JP28



On



Off

CPU Installation and Upgrade

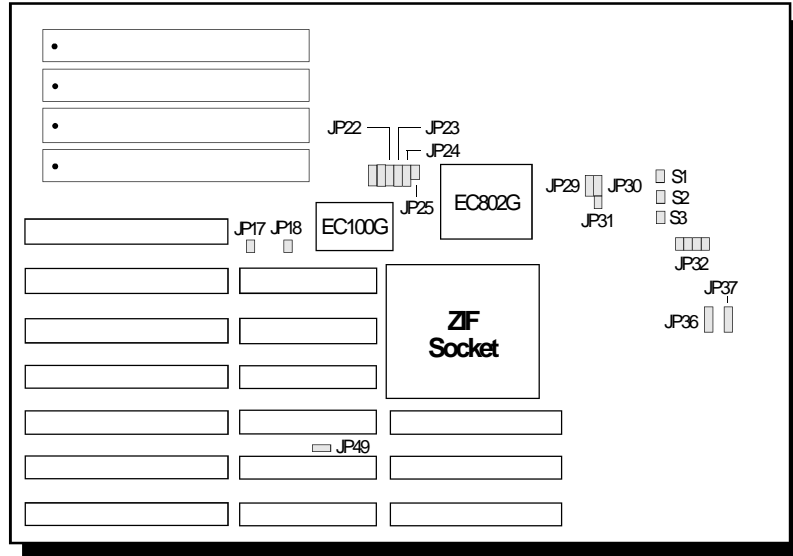
The G486-EVB is equipped with a 237-pin Zero Insertion Force (ZIF) socket at location U29 of the system board, to make upgrading flexible and easy. Make sure the jumpers are set correctly before applying power, or you may damage the CPU or system board.

The G486-EVB system board supports three VESA VL-Bus slots. VESA-1 and VESA-2 are master slots and VESA-3 is a slave slot with all CPUs except Cyrix. When the system board is equipped with a Cyrix CPU, VESA-1 is the only master slot and VESA-2 becomes a second slave slot.



G486-EVB

Jumper Settings for CPUs



Locations of Jumpers JP17, JP18, JP22-JP25, JP29-JP31, JP32, JP36, JP37, JP49, S1, S2 and S3 on the G486-EVB System Board

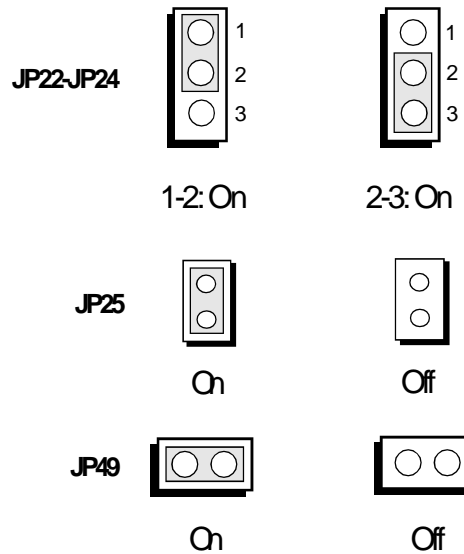


Energy Star Compliant System Board

Jumpers JP22-JP25 and JP49
SMM CPU Type Selection

These jumpers should be set to match the type of System Management Mode (SMM) CPU installed on the G486-EVB system board. These jumpers will be ignored if an Intel 486SX, 486DX/DX2 or Intel486™ OverDrive Processor is installed.

SMM CPU Type	JP22	JP23	JP24	JP25	JP49
SL Enhanced Intel486™ DX/DX2/DX4*	1-2 On	1-2 On	1-2 On	Off	Off
SL Enhanced Intel486™ SX	1-2 On	1-2 On	1-2 On	Off	Off
Cyrix Cx486DX	2-3 On	2-3 On	2-3 On	Off	Off
Cyrix Cx486DX2	2-3 On	2-3 On	2-3 On	Off	Off
Cyrix Cx486S	2-3 On	2-3 On	2-3 On	Off	Off
Cyrix Cx486S2	2-3 On	2-3 On	2-3 On	Off	Off
AM486DXL	Off	Off	Off	On	On



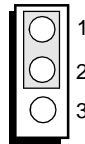


Jumpers JP17, JP18, JP29-JP31 CPU Type Selection

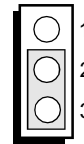
These jumpers should be set to match the type of the CPU installed on the G486-EVB system board.

CPU Type	JP17	JP18	JP29	JP30	JP31
486SX	Off	Off	2-3 On	Off	Off
486DX/DX2	Off	Off	1-2 On	2-3 On	On
Intel486™ OverDrive Processor	Off	Off	1-2 On	2-3 On	On
SL Enhanced Intel486™ DX/DX2/DX4*	Off	Off	1-2 On	2-3 On	On
SL Enhanced Intel486™ SX	Off	Off	2-3 On	Off	Off
Cyrix Cx486DX	On	On	1-2 On	2-3 On	On
Cyrix Cx486DX2	On	On	1-2 On	2-3 On	On
Cyrix Cx486S	On	Off	2-3 On	Off	Off
Cyrix Cx486S2	On	Off	2-3 On	Off	Off
AM486DXL	Off	Off	1-2 On	2-3 On	On

JP29 and JP30



1-2: On



2-3: On

JP17, JP18 and JP31



On



Off



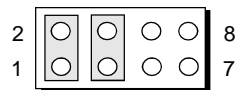
Energy Star Compliant System Board

Jumper Block JP32 CPU Voltage

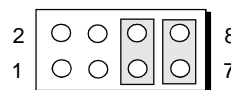
The G486-EVB supports 5 Volt and 3.3 Volt CPUs. Set Jumper Block JP32 according to the voltage of the CPU installed in your system board.

Warning:

If you are using a 3.3 Volt CPU, this jumper block must be set to 3.3 Volt. Otherwise, the CPU will be permanently damaged.



1-2, 3-4 On:
5 Volt CPU
(Default)



5-6, 7-8 On:
3.3 Volt CPU



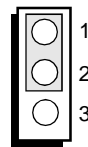
Jumpers JP36, JP37, S1, S2 and S3 Clock Selection

These jumpers should be set to match the speed of the CPU installed on the G486-EVB system board.

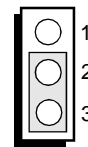
CPU Speed	JP36	JP37	S1	S2	S3
25MHz	1-2 On	1-2 On	On	Off	Off
33MHz*	1-2 On	1-2 On	On	On	On
40MHz	1-2 On	1-2 On	On	On	Off

* Default setting

JP36 and JP37



1-2: On



2-3: On

S1, S2 and S3



On



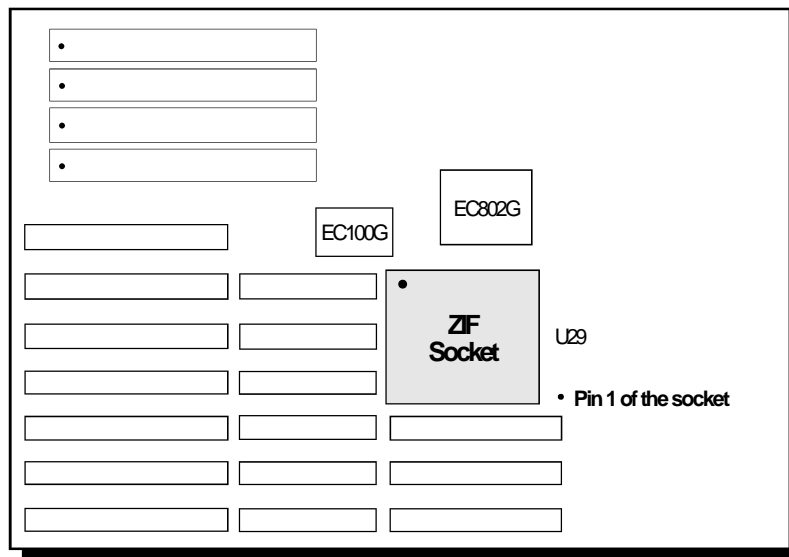
Off



Energy Star Compliant System Board

Installing Upgrade CPUs

The G486-EVB is equipped with a 237-pin ZIF socket at location U29 of the system board. The ZIF socket allows easy CPU upgrades and minimizes the chance of breaking off CPU pins. The location of the ZIF socket on the G486-EVB system board is shown below.



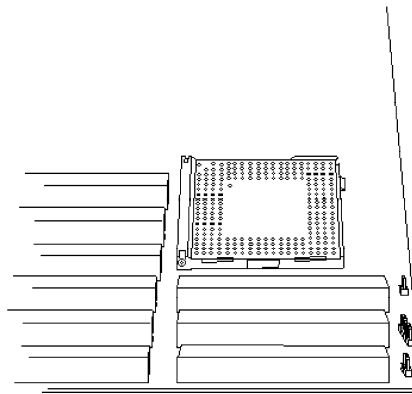
Location of the ZIF Socket on the G486-EVB System Board



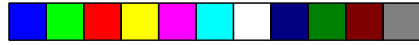
Warning:

Open the socket only if actually installing an upgrade CPU. The warranty on the original CPU will be voided if the S/N seal is broken. Installation of an OverDrive™ Processor will not affect the original system warranty.

The 237-pin ZIF socket consists of four rows of pin holes on each side.

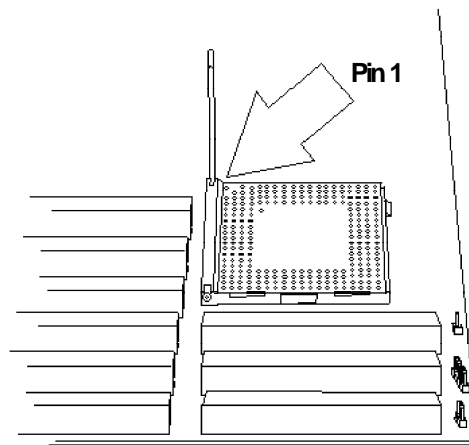


Zero Insertion Force (ZIF) Socket



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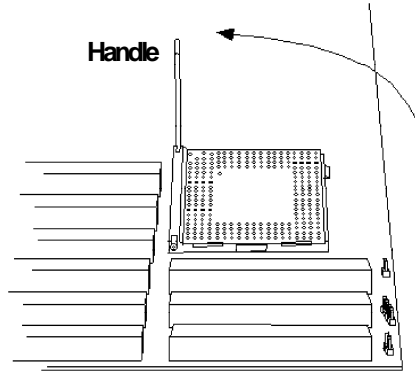
To install an upgrade CPU, move the handle of the ZIF socket upward. Position the upgrade CPU above the socket. Make sure pin 1 of the CPU is aligned with pin 1 of the socket. Lower the chip until the pins are inserted properly in their corresponding holes.



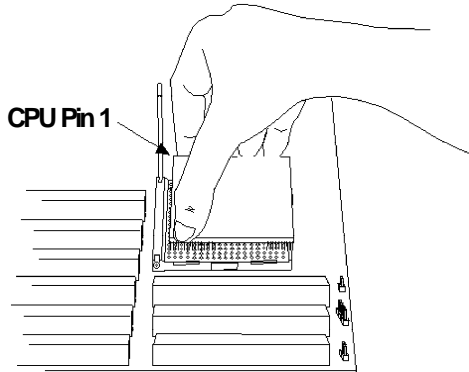
Pin 1 of the ZIF Socket



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Lifting the Handle



Positioning the CPU Above the ZIF Socket



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Gently push the handle down until the handle locks into place. You will hear a click when the handle is secure.

Warning:

The cables (floppy drive, hard drive, CD-ROM, etc.) must be routed clear of the CPU with a minimum of 0.25" horizontal clearance to allow heat dissipation.

A minimum of 1.4" vertical clearance (measured above the socket surface) must be kept free above the CPU. Do not run cables or other obstructions in this area.

Adequate airflow for cooling must be provided over the CPU. Verify that Jumper Block JP32 (CPU voltage) is set to match the voltage of your upgrade CPU.





Installing the System Board

Before installing the system board into your system unit, you should prepare the tools you will use:

You will need:

- *one medium size, flat-bladed screwdriver*
- *one medium Phillips screwdriver*
- *one nutdriver, 3/16" or 5 mm*
- *one grounded wriststrap is strongly recommended to protect the board against static electricity discharges.*

Step 1

Unlock your system unit. Turn off the power and disconnect all power cords and cables.

Step 2

Remove the system unit cover. Refer to the manufacturer's instructions if necessary.

Step 3

Remove expansion cards seated in any of the expansion slots and detach all connectors from the old system board.

Step 4

Loosen the screws holding the original system board and remove the board from the system. Save the screws.



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Step 5

Insert the HSIM modules into the HSIMM banks on the G486-EVB. The quantity and location of the HSIM modules are dependent upon the memory configuration and type of modules you intend to use.

Step 6

Set the appropriate jumpers.

Step 7

Install the prepared G486-EVB system board into the case and replace the screws.

Step 8

Reinstall all cards and connectors and replace the system unit cover. Reconnect all power cords and cables.





❖ **Initial Setup Program**

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 CTRL-ALT-ESC/DEL to enter setup

If you want to enter Setup and 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> keys. If you do not press the above keys at the correct time, the following error message will appear:

Press F1 to continue, Ctrl-Alt-Esc or 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>.

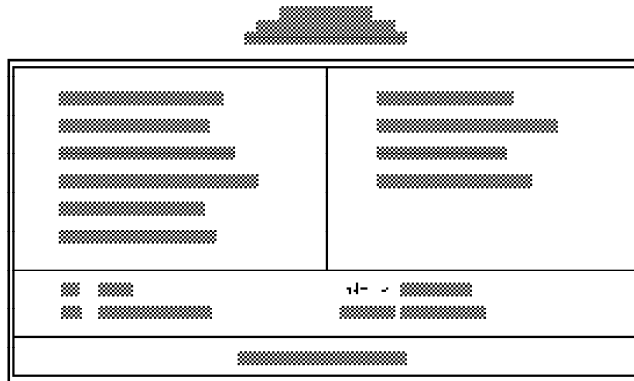
If you selected “Setup” in the Security Option, you will be prompted for the password only when you try to enter Setup. Refer to the “BIOS Features Setup” section for more information.



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Award BIOS CMOS Setup Utility

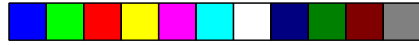
Press <Ctrl> <Alt> <Esc> or to enter the Setup utility. A screen similar to the one below will appear.



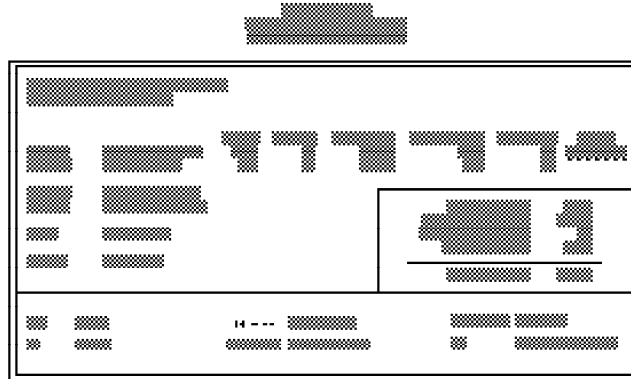
Use the arrow keys to highlight the option you want and press <Enter>.

Standard CMOS Setup

Use the arrow keys to highlight the “Standard CMOS Setup” and press <Enter>, a screen similar to the one on the next page will appear.



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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.

Date and Time

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

Drive C and Drive D

If you have added a hard drive, you must select the appropriate type for the drive. The G486-EVB 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 hard drive must be set to one specific drive-type number. Please refer to your hard drive documentation to find the appropriate type number.

Note:

SCSI drives are usually set to NOT INSTALLED in the BIOS setup area.



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If none of the pre-set types is appropriate for your hard drive, choose “User,” which is the user-definable type. To use this type, highlight either hard disk C or D, depending on your hard drive configuration. Use the arrow keys until type “User” is showing. Fill in all the parameters as specified by the drive manufacturer. You may also use the “IDE HDD Auto Detection” from the Main Menu to set up your HDD parameters. If either of the drives is not present, select “None” and press <Enter>.

Note:

When HDD type is “User,” the Mode option will be opened for the user to select their own HDD mode.

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 diskettes.

Video

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

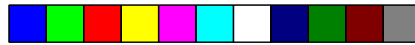
Halt on

This option selects when the system will halt if an error is detected during power up.

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

All Errors: The system will stop whenever the BIOS detected a non-fatal error.





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

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

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

Memory

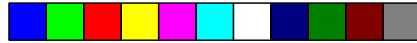
The lower right hand corner shows the base memory size, extended memory size, expanded memory size and the other memory size of your system. You cannot alter these items; your computer automatically detects and displays them.

The Other Memory size refers to the memory located between 640K and 1024K. This is the memory address space used for different applications. DOS uses this area to load device drivers to keep base memory free for application programs. Shadow RAM uses this area also.

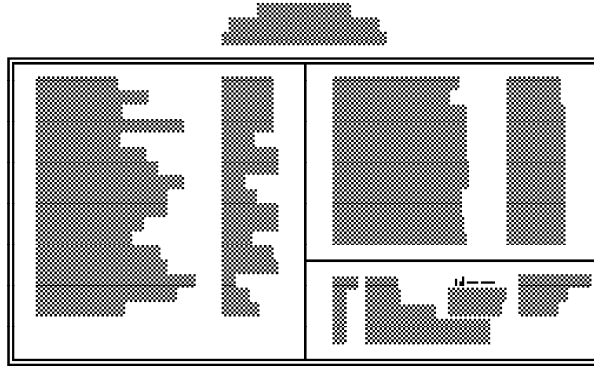
When you are through making changes in the Standard CMOS Setup, press <Esc> to return to the main menu.

BIOS Features Setup

Use the arrow keys to highlight the “BIOS Features Setup” and press <Enter>, a screen similar to the one on the next page will appear.



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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.

The IDE HDD Block Mode and IDE 32-bit Transfer options are functions for ISA IDE. These options may be “Enabled” or “Disabled.” However, if your system is using a VESA IDE, these options should always be set to “Disabled.”

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.

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.

3-6 ◆ Initial Setup Program



If the changes you make 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 G486-EVB uses the EFAR EC802G chipset. The Chipset Features Setup allows you to modify some functions to optimize system performance.

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



The IDE Hard Disk Prefetch, IDE Turbo Read and IDE Turbo Write options are functions for ISA IDE. These options may be “Enabled” or “Disabled.” However, if your system is using a VESA IDE, these options should always be set to “Disabled.”

Use the arrow keys to move the highlight bar to the option you wish to change or modify. Use the <Page



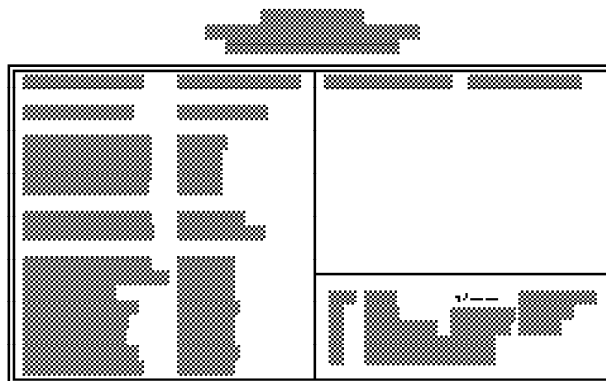
Energy Star Compliant System Board

Up>, <Page Down>, <+> or <-> keys to make the corresponding changes.

If the changes you make 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.

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.



Choosing “User Defined” in the Power Management option will allow you to set the time of the Standby Mode Timer, Suspend Mode Timer, Video Standby Timer, HDD Standby Timer, Suspend Mode Speed and Standby Mode Speed. “Min Power Saving” and “Max Power Saving” will show the minimum and maximum value of these options. Choose “Disabled” if you do not wish your system to enter the Standby mode.



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.

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 Setup default values should provide optimum performance for the system. You should use these values unless you are possibly 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 return to the BIOS setup default values. After pressing <Enter>, you will be returned to the main menu.

Load Setup Defaults

The Setup defaults are similar to the BIOS Setup defaults. These defaults are the most stable values for the system and should be used if you are possibly having hardware problems.

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

Load Setup Defaults (Y/N)? N



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

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.

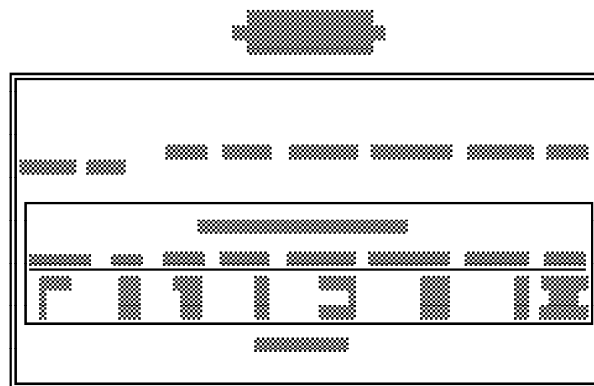




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IDE HDD Auto Detection

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 G486-EVB supports three HDD modes: Normal, LBA, and Large. If your HDD does not support LBA mode, the “LBA” option under Mode will not appear. If your HDD has 1024 or fewer cylinders, the “Large” option under Mode will not 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.



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Normal Mode

Normal mode is the generic access mode in which neither the BIOS nor the IDE controller will make any transformations during accessing.

The maximum number of cylinders, heads and sectors for Normal mode are 1024, 16 and 63.

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

If you set your HDD to Normal mode, the maximum accessible HDD size will be 528 Megabytes 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 528 Megabyte limitation. The number of cylinders, heads and sectors shown on the screen may not be the actual number for the HDD.

During 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 which is obtained by the following formula:



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no. Cylinders	(1024)
x no. Heads	(255)
x no. Sectors	(63)
x bytes per sector	(512)

8.4 Gigabyte

Large Mode

The Large mode is the extended HDD access mode supported by the G486-EVB 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 actual and that the number of heads is double the actual. During 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

Maximum HDD size:

no. Cylinders	(1024)
x no. Heads	(32)
x no. Sectors	(63)
x bytes per sector	(512)

1 Gigabyte



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Note:

To support LBA or Large mode HDDs, there must be some software involved. All of this software is included in the Award HDD Service Routine (INT13h). It may fail to access a HDD with LBA or Large mode selected if you are running under an operating system which replaces the entire INT13h.

Save & Exit Setup

When all the changes have been made, highlight “Save & Exit Setup” and press <Enter>. The message below 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> or after memory testing is done.

Exit Without Saving

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

Quit Without Saving (Y/N)? N



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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> or after memory testing is done.



Initial Setup Program ◆ 3-15





Energy Star Compliant System Board

❖ *Troubleshooting*

If you experience difficulty with the G486-EVB 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 “Board Configuration” section.
2. Verify that all HSIM modules are seated securely into the bank sockets.
3. Make sure that the HSIM modules are in the correct location.
4. Make sure that the power source is delivering power and is correctly connected.
5. Make sure that pin 1 of the CPU is in pin 1 of the CPU socket.
6. 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).

❖ *Appendix A: Types of Modules*

The G486-EVB system board allows you to populate memory with 256K x 36, 1M x 36, and 4M x 36 HSIM modules. The following modules have been tested with this board. Most untested brands will work but a few may fail to do so.

For HSIM 256K x 36 Modules

Brand	Chip Number
OKI	M51C256A-70

For HSIM 1M x 36 Modules

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

For HSIM 4M x 36 Modules

Brand	Chip Number
OKI	M514100A-70S



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❖ **Appendix B: System Error Report**

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

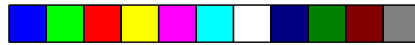
One or more of the following messages may be displayed if the BIOS detects an error during the POST.

CMOS BATTERY HAS FAILED

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

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>. If you assumed the system would boot 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

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

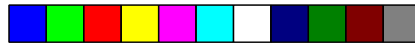
Display switch on the motherboard can be set to other monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

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.



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ERROR INITIALIZING HARD DISK CONTROLLER

Cannot initialize controller. Make sure the cord 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 SIZE HAS CHANGED SINCE LAST BOOT

Memory has been added or removed since the last boot. Enter Setup and enter the new memory size in the memory fields.

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 you to 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 you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.



Energy Star Compliant System Board

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.





G486-EVB

❖ *Appendix C: Memory & I/O Maps*

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 00EFFFF	192K I/O Expansion ROM	Reserved for ROM on I/O Adapter Card
00F0000 to 00FFFFFF	64K ROM on the System Board	System Board BIOS
0100000 to 3FFFFFF	Maximum Memory 63M	System Board Memory



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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 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
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: 16-Bit ISA I/O Pin Assignments

B		A
Grnd	- 01 -	-I/OChck
ResetDrv	- 02 -	SD7
+5VDC	- 03 -	SD6
IRQ9	- 04 -	SD5
-5VDC	- 05 -	SD4
DRQ2	- 06 -	SD3
-12VDC	- 07 -	SD2
O/S	- 08 -	SD1
+12VDC	- 09 -	SD0
Grnd	- 10 -	-I/OChrdy
-SEMEMW	- 11 -	AEN
-SEMEMR	- 12 -	SA19
-IOW	- 13 -	SA18
-IOR	- 14 -	SA17
-Dack3	- 15 -	SA16
-DRQ3	- 16 -	SA15
-Dack1	- 17 -	SA14
DRQ1	- 18 -	SA13
-Refresh	- 19 -	SA12
CLK	- 20 -	SA11
IRQ7	- 21 -	SA10
IRQ6	- 22 -	SA9
IRQ5	- 23 -	SA8
IRQ4	- 24 -	SA7
IRQ3	- 25 -	SA6
-Dack2	- 26 -	SA5
T/C	- 27 -	SA4
Bale	- 28 -	SA3
+5VDC	- 29 -	SA2
O/S	- 30 -	SA1
Grnd	- 31 -	SA0

D		C
-MemCS16	- 01 -	SBHE
-I/OCS16	- 02 -	LA23
IRQ10	- 03 -	LA22
IRQ11	- 04 -	LA21
IRQ12	- 05 -	LA20
IRQ13	- 06 -	LA19
IRQ14	- 07 -	LA18
-Dack0	- 08 -	LA17
DRQ0	- 09 -	-Memr
-Dack5	- 10 -	-Memw
DRQ5	- 11 -	SD08
-Dack6	- 12 -	SD09
DRQ6	- 13 -	SD10
-Dack7	- 14 -	SD11
DRQ7	- 15 -	SD12
+5VDC	- 16 -	SD13
-Master	- 17 -	SD14
Grnd	- 18 -	SD15



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Appendix E: VL-Bus I/O Pin Assignments

Component Side	B	A	Solder Side
	DAT00	- 01 -	DAT01
	DAT02	- 02 -	DAT03
	DAT04	- 03 -	GND
	DAT06	- 04 -	DAT05
	DAT08	- 05 -	DAT07
	GND	- 06 -	DAT09
	DAT10	- 07 -	DAT11
	DAT12	- 08 -	DAT13
	Vcc	- 09 -	DAT15
	DAT14	- 10 -	GND
	DAT16	- 11 -	DAT17
	DAT18	- 12 -	Vcc
	DAT20	- 13 -	DAT19
	GND	- 14 -	DAT21
	DAT22	- 15 -	DAT23
	DAT24	- 16 -	DAT25
	DAT26	- 17 -	GND
	DAT28	- 18 -	DAT27
	DAT30	- 19 -	DAT29
	Vcc	- 20 -	DAT31
	ADR31	- 21 -	ADR30
	GND	- 22 -	ADR28
	ADR29	- 23 -	ADR26
	ADR27	- 24 -	GND
	ADR25	- 25 -	ADR24
	ADR23	- 26 -	ADR22
	ADR21	- 27 -	Vcc
	ADR19	- 28 -	ADR20
	GND	- 29 -	ADR18
	ADR17	- 30 -	ADR16
	ADR15	- 31 -	ADR14
	Vcc	- 32 -	ADR12
	ADR13	- 33 -	ADR10
	ADR11	- 34 -	ADR08
	ADR09	- 35 -	GND
	ADR07	- 36 -	ADR06
	ADR05	- 37 -	ADR04
	GND	- 38 -	WBAC0#
	ADR03	- 39 -	BE0#
	ADR02	- 40 -	Vcc
	nc	- 41 -	BE1#
	RESET#	- 42 -	BE2#
	DC#	- 43 -	GND
	MIO#	- 44 -	BE3#
	WR#	- 45 -	ADS#
	RDYRTN#	- 48 -	LRDY#
	GND	- 49 -	LDEV∞#
	IRC9	- 50 -	LRQ∞#
	BRDY#	- 51 -	GND
	BLAST#	- 52 -	LGNT∞#
	ID0	- 53 -	Vcc
	ID1	- 54 -	ID2
	GND	- 55 -	ID3
	LCLK	- 56 -	ID4
	Vcc	- 57 -	LDEN#
	LBS16#	- 58 -	LEADS#

Note:

Side "A" of the connector is the add-in board component side.

Side "B" of the connector is the add-in board solder side.



Pin Name	No.	LBC ¹	LBC ²	LBM ³	LBT
ADR<31..2>	30	O		O	
ADS#	1	O		O	
BE<3..0>	4	O		O	
BLAST#	1	O		O	
BRDY#	1		O		O
DC#	1	O		O	
DAT<31..0>	32	I/O	I/O	I/O	I/O
ID<4..0>	5	O	O		O
IRQ9	1			O	O
LBS16#	1		O		O
LCLK	1	O	O		
LDEV<<># ⁴	1		N/A	N/A	O
LEADS#	1	O		O	
LGNT<<># ⁴	1	O	O		N/A
LKEN#	1	O	O		
LRDY#	1			N/A	O
LREQ<<># ⁴	1			O	O
MIO#	1	O		O	
RDYRTN#	1	O	O		
RESET#	1	O	O		
WR#	1	O		O	
WBACK#	1	O	O		N/A
(power)	8				
(ground)	14				
(reserved)	1				
Total per slot	112				

¹ Direction of signals for the LBC if the host CPU or a system I/O bus master is active.

² Direction of signals for the LBC if an LBM is active.

³ Direction of signals for any LBM while it owns the VL-Bus.

⁴ One unique signal per slot or device.

Note:

LBC = VL Local Bus Controller

LBM = VL Local Bus Master

LBT = VL Local Bus Target



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❖ *Appendix F: Connector Pin Assignments*

Connector JP14
External Battery Connector

Pin	Function
1	Voltage
2	Reserved
3	Ground
4	Ground

Connector JP40
Power LED/Keylock Connector

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



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Connector JP41
Speaker Connector

Pin	Function
1	Signal
2	Connector to Buzzer
3	Ground
4	+5V

Connector D6
Standby Mode LED



Pin	Function
1	Ground
2	Signal



Jumper JP44
Standby Mode Switch Connector

Pin	Function
1	Ground
2	Signal





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Connector JP45
Reset Switch Connector

Pin	Function
1	Reset
2	Ground





❖ 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	Discron 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	
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



Type	Size (MB)	Cylinders	Heads	Sectors	Write Precomp	Land Zone	Example Model
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
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
User							



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