

**G486-EVA
System Board
User's Manual**

❖ **Copyright 1994, by DFI Inc.**

All rights reserved.

No part of this document may be copied or reproduced in any form or by any means without the prior written consent of DFI, Inc.

DFI, Inc. makes no warranties with respect to this documentation and disclaims any implied warranties of merchantability, quality, or fitness for any particular purpose. The information in this document is subject to change without notice. DFI, Inc. reserves the right to make revisions to this publication and to make changes to any and/or all parts of its content, at any time, without obligation to notify any person or entity of such changes. Further, DFI, Inc. assumes no responsibility for any errors that may appear in this document.

DFI is a registered trademark, and G486-EVA is a trademark of Diamond Flower, Inc. All other product names mentioned are trademarks or registered trademarks of their respective companies.

❖ **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.*

❖ Table of Contents ❖

Introduction	1-1
Features and Specifications	1-2
Installation Overview	2-1
Preparing the Area	2-1
Handling the System Board	2-2
Tips in Handling the System Board	2-2
Hardware Installation	2-2
Memory Installation	2-2
Installing the Modules	2-4
Board Configuration	2-5
Jumper Settings	2-6
Jumper Settings for the Internal Battery	2-6
Jumper Settings for VL-Bus Add-on Boards	2-8
Jumper Settings for Light and Deep Green	2-10
Cache Configuration	2-11
Jumper Settings for Cache Memory	2-13
CPU Installation and Upgrade	2-15
Jumper Settings for CPUs	2-15
Installing Upgrade CPUs	2-19
Installing the System Board	2-20
Initial Setup Program	3-1
Award BIOS CMOS Setup Utility	3-2
Standard CMOS Setup	3-2
BIOS Features Setup	3-5
Chipset Features Setup	3-7
Power Management Setup	3-8
Load BIOS Defaults	3-9
Load Setup Defaults	3-9
Password Setting	3-10
IDE HDD Auto Detection	3-11
Save and Exit Setup	3-11
Exit Without Saving	3-12

Troubleshooting	4-1
Appendix A: Types of Modules	A-1
Appendix B: System Error Report	B-1
Appendix C: Memory and I/O Maps	C-1
Appendix D: 16-Bit ISA I/O Pin Assignments	D-1
Appendix E: VL-Bus I/O Pin Assignments	E-1
Appendix F: Connector Pin Assignments	F-1
Appendix G: Award BIOS Hard Disk Table	G-1

❖ *Introduction*

The G486-EVA 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-EVA accommodates all of the Intel 486™ family of CPUs. The system board may be equipped with an 80486SX CPU running at 25/33MHz, an 80486DX CPU running at 33MHz, or an 80486DX2 CPU running at 50/66MHz. It also supports the new Intel SL Enhanced series of CPUs.

It may also use Intel486™ DX2 OverDrive Processors, AMD's 486DXL low power CPUs, Cyrix's Cx486DX/DX2 or Cyrix's Cx486S/S2 CPU.

The G486-EVA uses 256Kx9, 1Mx9 and 4Mx9 SIM modules. The memory can be configured to five different sizes from 1MB to 32MB. In addition, the G486-EVA is equipped with three 32-bit VESA VL-Bus, and six 16-bit and one 8-bit ISA expansion slots.

Features and Specifications

- **Microprocessor**
 - Intel 486SX-25/33, 486DX-33, 486DX2-50/66,
SL Enhanced CPUs, Intel486™ DX2
OverDrive Processor
 - 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
- **Chip Set**
 - EC802G: system and cache controller
 - EC100: data buffer
- **BIOS**
 - Award system BIOS
- **Cache Memory**
 - 128K or 256K
 - Supports direct map write-back or write-through
cache subsystem
- **Memory Onboard**
 - 1MB to 32MB

- **DRAM Type**
256Kx9, 1Mx9 and 4Mx9
- **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-EVA package contains the following items:

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

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

❖ *Installation Overview*

This chapter summarizes the steps in installing the G486-EVA 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 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. 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-EVA 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 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-EVA system board can support 1MB to 32MB of memory using SIMMs. SIMM is an acronym for Single In-line Memory Module.

A SIMM consists of RAM chips soldered onto a small circuit board. A SIMM connects to the system board via a 30-pin card-edge connector.

The SIMM sockets are divided into two banks on the system board. The G486-EVA system board uses 256Kx9, 1Mx9 and 4Mx9 SIM modules.

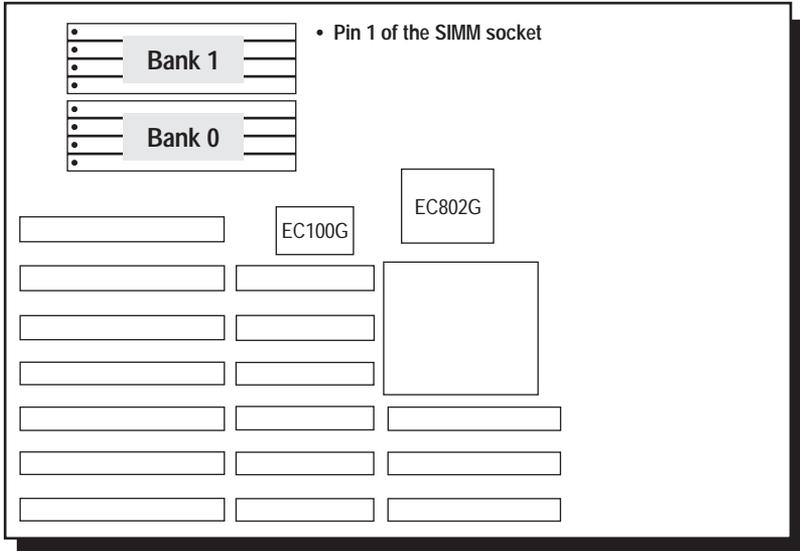
A list of approved memory brands and speeds is given in Appendix A.

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

When installing the SIM modules, populate Bank 0 first followed by Bank 1. 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 four SIMM sockets.

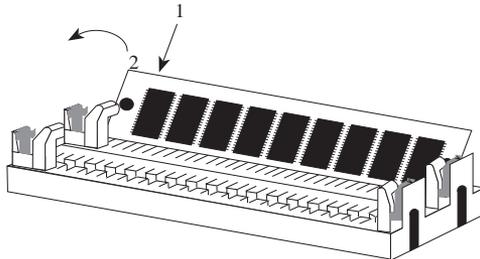
Memory Size	Bank 0	Bank 1
1MB	256Kx9	-
4MB	1Mx9	-
8MB	1Mx9	1Mx9
16MB	1Mx9	1Mx9
16MB	4Mx9	-
32MB	4Mx9	4Mx9



**Locations of the SIMM Sockets
on the G486-EVA System Board**

Installing the Modules

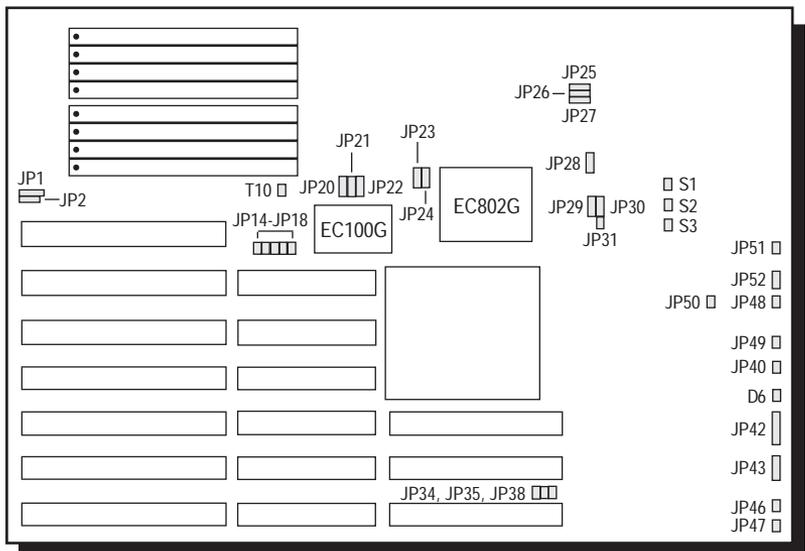
SIMMs simply snap into a socket on the system board. Pin 1 of the SIMM must correspond with Pin 1 of the socket.



1. Position the SIM module above the SIMM socket with the chips of the module facing the center of the system board.
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

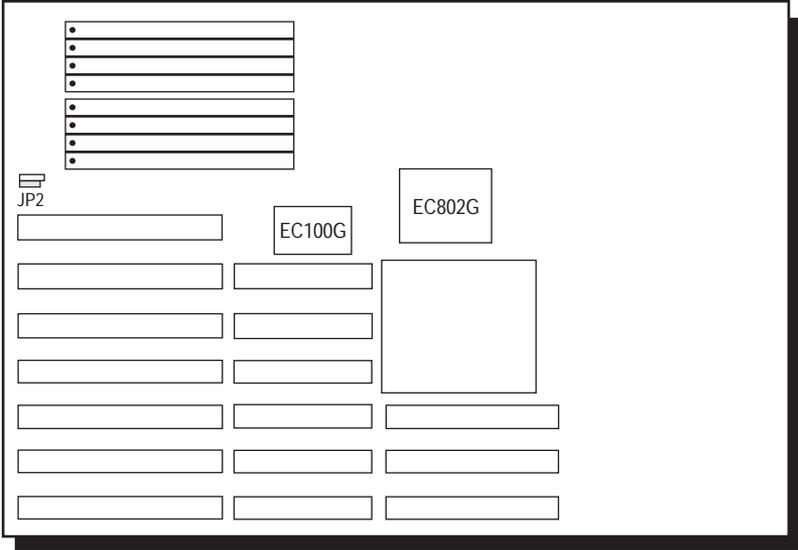
The G486-EVA is designed with jumpers and connectors onboard. Make sure that the jumpers are set correctly before installing the system board into your system unit.



Locations of Jumpers and Connectors
on the G486-EVA System Board

Jumper Settings

Jumper Settings for the Internal Battery

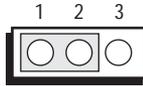


Location of Jumper JP2 on the G486-EVA System Board

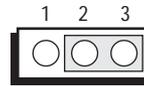
Jumper JP2

Internal Battery Select

The G486-EVA comes with an internal battery. If you wish to install an external battery, set JP2 pins 1 and 2 to On to disable the internal battery.



1-2 On: Disabled
(Default)



2-3 On: Enabled

Note:

If you disable the internal battery, you must connect an external battery to connector JP1 or your system will lose its CMOS settings when powered off.

The jumpers below are for factory testing only and should always be set to their default configuration. Reconfiguring these jumpers will cause problems with your G486-EVA system board.

Jumper JP14

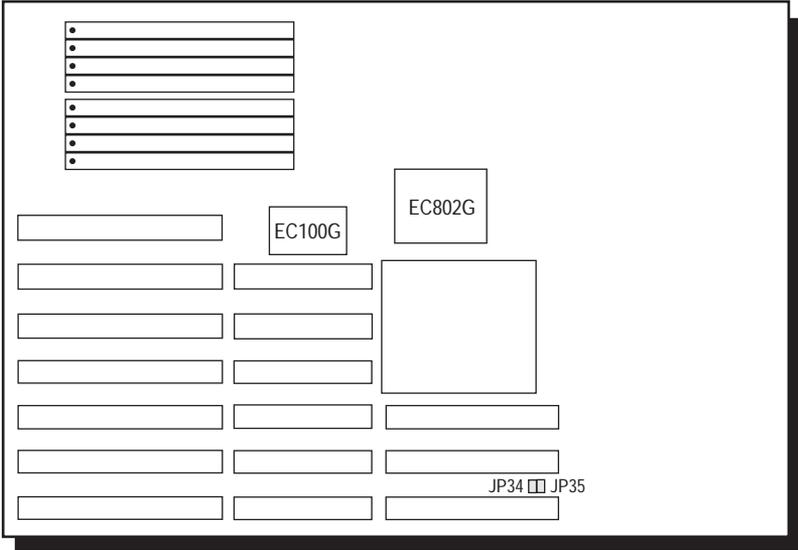
Off: 2X BOSC (28MHz)

On: CPU CLK1 - Default

Jumper JP28

1-2 On: Default

Jumper Settings for VL-Bus Add-on Boards



**Locations of Jumpers JP34 and JP35
on the G486-EVA System Board**

Jumper JP34

High Speed Mode for VL-Bus Board

Set Jumper JP34 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 JP34 to On; otherwise, a system error may occur.



On: Write One Wait State
(Default)



Off: Write Zero Wait State

Jumper JP35

CPU Speed for VL-Bus Board

If a VL-Bus board is installed in the G486-EVA system board, Jumper JP35 must be set to On if the CPU speed is greater than 33MHz. Set JP35 to Off if the CPU speed is less than or equal to 33MHz.

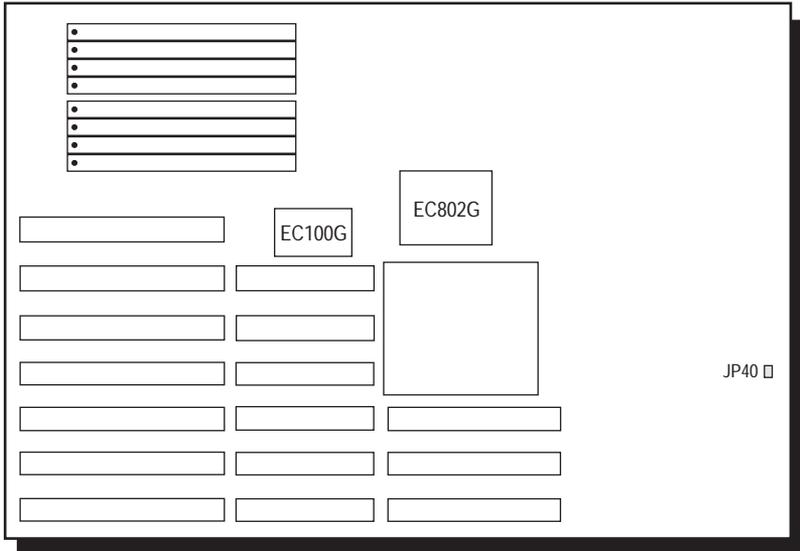


On: CPU Speed > 33MHz
(Default)



Off: CPU Speed <= 33MHz

Jumper Settings for Light and Deep Green



Location of Jumper JP40 on the G486-EVA System Board

Jumper JP40

Light/Deep Green Select

The different types of CPUs supported by the G486-EVA 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-EVA will run in light green mode. If you have an energy saving SL Enhanced Intel 486DX or Cyrix Cx486S/Cx486S2 CPU, then the G486-EVA will run in deep green mode. Set Jumper JP40 according to the type of CPU installed on the board.



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



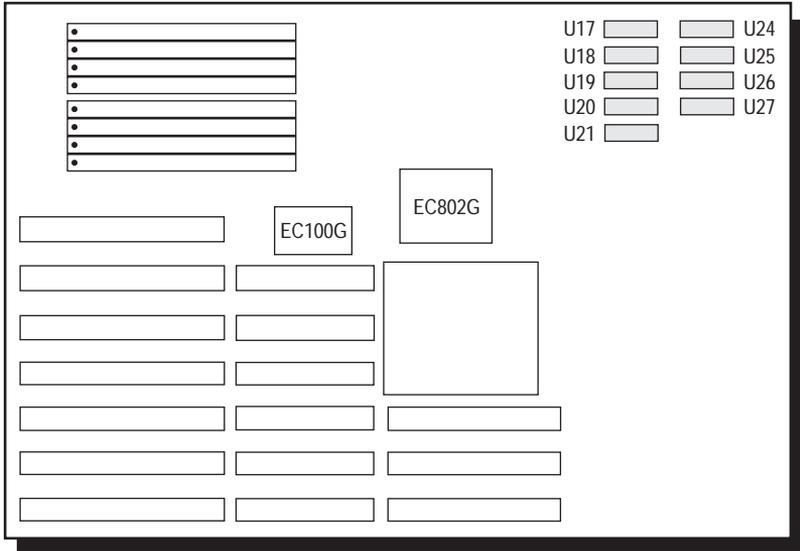
Off: Deep Green
SL Enhanced Intel486™ DX CPU,
Cyrix Cx486S/Cx486S2
(Default)

Cache Configuration

The G486-EVA system board can be configured to two different cache sizes: 128KB and 256KB. 128KB of cache memory is the default size. Either four or eight 32K x 8 (20ns) SRAM chips are used for cache depending on the size of cache desired. Regardless of the amount of cache memory installed, one 32K x 8 (20ns) SRAM is needed for tag RAM to store the cacheable addresses. The locations of the SRAM sockets on the system board is shown on the next page.

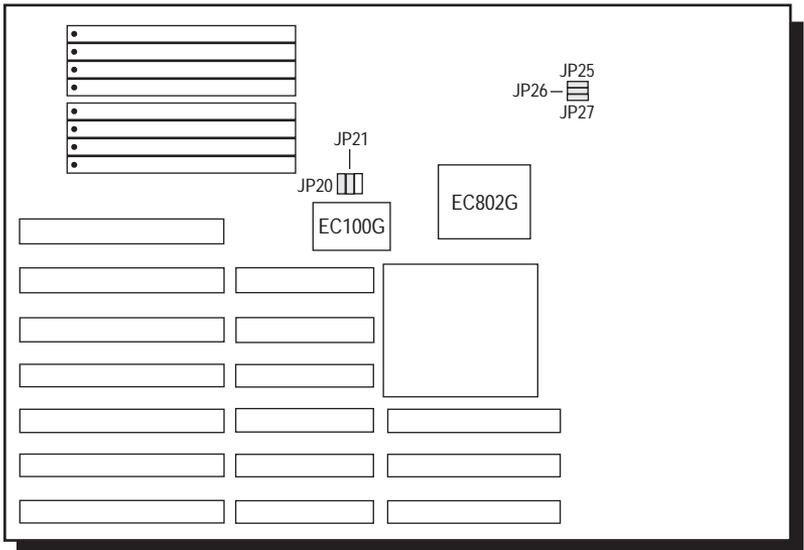
Cache Size	U17/U18/U19/U20	U24/U25/U26/U27	U21
128KB*	32K x 8 (20ns)	None	32K x 8 (20ns)
256KB	32K x 8 (20ns)	32K x 8 (20ns)	32K x 8 (20ns)

* Default setting



Locations of the SRAMs on the G486-EVA System Board

Jumper Settings for Cache Memory

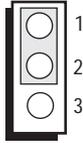


Locations of Jumpers JP20, JP21, JP25, JP26 and JP27 on the G486-EVA System Board

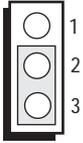
Jumpers	Cache Memory Size	
	128KB*	256KB
JP20	2-3 On	1-2 On
JP21	2-3 On	1-2 On
JP25	Off	On
JP26	On	On
JP27	On	On

* Default setting

JP20 or JP21



1-2: On



2-3: On

JP25, JP26 or JP27



On

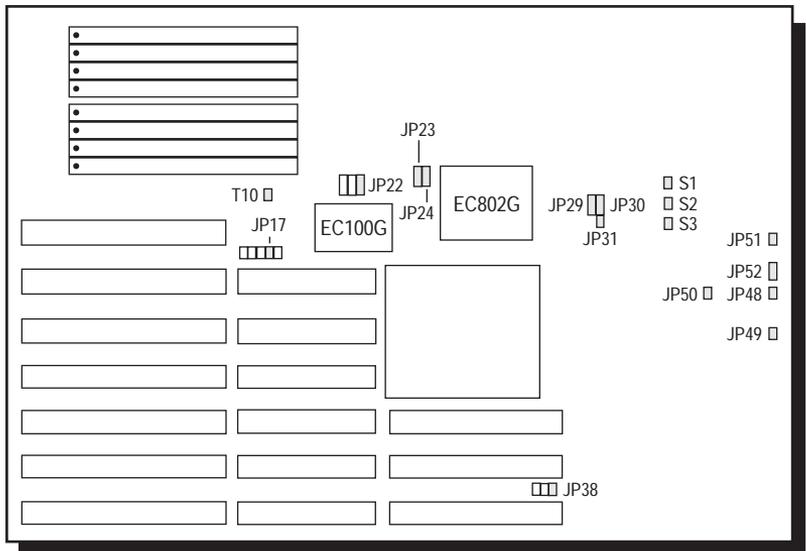


Off

CPU Installation and Upgrade

The G486-EVA is equipped with a 169-pin PGA socket at location U22 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.

Jumper Settings for CPUs



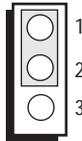
Locations of Jumpers JP17, T10, JP22-JP24, JP29-JP31, JP38, JP48-JP52, S1, S2 and S3 on the G486-EVA System Board

Jumpers JP22-JP24, JP49 and JP51 SMI CPU Type Selection

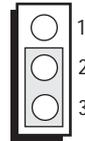
These jumpers should be set to match the type of the CPU installed on the G486-EVA system board. These jumpers will be ignored if an Intel 486SX, 486DX or Intel486™ OverDrive Processor is installed.

SMI CPU Type	JP22	JP23	JP24	JP49	JP51
SL Enhanced Intel486™ DX*	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

JP22-JP24



1-2: On



2-3: On

JP49 and JP51



On



Off

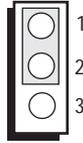
Jumpers JP17, T10, JP29-JP31, JP48, JP50 and JP52 CPU Type Selection

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

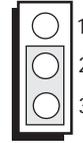
CPU Type	JP17	T10	JP29	JP30	JP31
486SX	Off	Off	2-3 On	Off	Off
486DX	Off	Off	1-2 On	2-3 On	On
Intel486™ OverDrive Processor	Off	Off	1-2 On	2-3 On	On
SL Enhanced Intel486™ DX*	Off	Off	1-2 On	2-3 On	On
SL Enhanced Intel486™ SX	Off	Off	2-3 On	Off	Off
Cyrix Cx486DX	On	On	1-2 On	2-3 On	On
Cyrix Cx486DX2	On	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

CPU Type	JP48	JP50	JP52
486SX	Off	On	2-3 On
486DX	Off	On	2-3 On
Intel486™ OverDrive Processor	Off	On	2-3 On
SL Enhanced Intel486™ DX*	Off	On	2-3 On
SL Enhanced Intel486™ SX	Off	On	2-3 On
Cyrix Cx486DX	On	Off	1-2 On
Cyrix Cx486DX2	On	Off	2-3 On
Cyrix Cx486S	On	Off	1-2 On
Cyrix Cx486S2	On	Off	1-2 On
AM486DXL	Off	Off	2-3 On

JP29, JP30, JP52



1-2: On



2-3: On

JP17, JP31, JP48, JP50 and T10



On



Off

Jumpers JP38, S1, S2 and S3

Clock Selection

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

CPU Speed	JP38	S1	S2	S3
25MHz	On	On	Off	Off
33MHz*	On	On	On	On
40MHz	On	On	On	Off

* Default setting



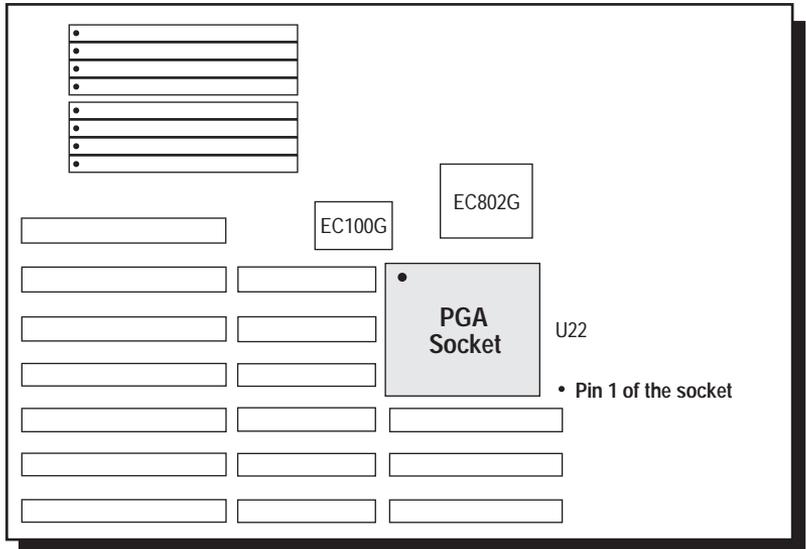
On



Off

Installing Upgrade CPUs

The G486-EVA is equipped with a 169-pin PGA (Pin Grid Array) socket at location U22 of the system board. The location of the PGA socket on the system board is shown below.



Location of the PGA Socket on the G486-EVA System Board

To install an upgrade CPU, 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.

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 Philips screwdriver*
- *one nutdriver, 3/16" or 5mm*
- *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.

Step 5

Insert the SIM modules into the SIMM banks on the G486-EVA. The quantity and location of the SIM 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-EVA 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.

Award BIOS CMOS Setup Utility

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

ROM ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP LOAD BIOS DEFAULTS LOAD SETUP DEFAULTS	PASSWORD SETTING IDE HDD AUTO DETECTION SAVE & EXIT SETUP EXIT WITHOUT SAVING
Esc : Quit F10 : Save & Exit Setup	
↑↓→← : Select Item (Shift) F2 : Change Color	
Time, Date, Hard Disk Type...	

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.

ROM ISA BIOS
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy): Mon, 01 Jan 1994						
Time (hh:mm:ss) 00:00:00						
		CYLS.	HEADS	PRECOMP	LANDZONE	SECTORS
Drive C	: 10 (20MB)	820	3	None	820	17
Drive D	: 35 (110MB)	1024	13	None	1023	17
Drive A	: 1.2MB, 5-1/4 in.					
Drive B	: 1.44MB, 3-1/2 in.					
Video	: EGA/VGA					
Halt on	: All Errors					
					Base Memory :	640K
					Extended Memory :	1024K
					Expanded Memory :	0K
					Other Memory :	384K
					Total Memory : 2048K	
Esc	: Quit	↑↓←→ : Select Item		PU/PD/+/- : Modify		
F1	: Help	(Shift) F2 : Change Color		F3 : Toggle Calendar		

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-EVA 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.

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. If either of the drives is not present, 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 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.

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 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

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.

ROM ISA BIOS
 BIOS FEATURES SETUP
 AWARD SOFTWARE, INC.

Virus Warning	: Enabled	System BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	Video BIOS Shadow	: Enabled
External Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	CC000-CFFFF Shadow	: Disabled
Boot Sequence	: C, A	D0000-D3FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D4000-D7FFF Shadow	: Disabled
Boot Up Floppy Seek	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot Up NumLock Status	: On	DC000-DFFFF Shadow	: Disabled
Boot Up System Speed	: High	E0000-E3FFF Shadow	: Disabled
IDE HDD Block Mode	: Disabled	E4000-E7FFF Shadow	: Disabled
IDE 32-bit transfer	: Disabled	E8000-EBFFF Shadow	: Disabled
Gate A20 Option	: Fast	EC000-EFFFF Shadow	: Disabled
Memory Parity Check	: Enabled		
Typematic Rate Setting	: Disabled	ESC : Quit	↑↓←→ : Select Item
Typematic Rate (Chars/Sec)	: 6	F1 : Help	PU/PD/+/- : Modify
Typematic Delay (Msec)	: 250	F5 : Old Values (Shift) F2	: Color
Security Option	: Setup	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

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.

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-EVA 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.

ROM ISA BIOS CHIPSET FEATURES SETUP AWARD SOFTWARE, INC.			
Auto Configuration	: Enabled	IDE hard disk prefetch	: Enabled
Cache write wait state	: 1 W/S	IDE data transfer speed	: Slow
External cache burst read	: 3-1-1-1	IDE turbo data transfer	: Disabled
Cache update policy	: Write-Bk		
CPU cache update policy	: Write-Th		
Video BIOS Cacheable	: Disabled		
DRAM R/W wait state	: Turbo		
AT bus clock selection	: CLK1/3		
AT I/O recovery time	: 6 AT CYLS		
IDE I/O recovery time	: AT I/O WS		
Extra AT cycle wait state	: Disabled		
DMA frequency select	: SYSCLK/2		
Local device wait state	: 0WS		
		ESC : Quit	↑↓←→ : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values (Shift) F2	: Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

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

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.

ROM ISA BIOS POWER MANAGEMENT SETUP AWARD SOFTWARE, INC.	
Power Management	: Max Power Saving
Standby Mode Timer	: 16 Sec
Suspend Mode Timer	: 4 Min
Video Standby Timer	: 8 Min
HDD Standby Timer	: 1 Min
Suspend Mode Speed	: STOP CLK2
Standby Mode Speed	: 1/4 Speed
DMA Request Check	: Enabled
Keyboard/Mouse Check	: Enabled
Interrupt Check	: Enabled
Parallel Port Check	: Disabled
Serial Port Check	: Enabled
Hard Disk Check	: Enabled
Video Write Check	: Disabled
Local Master Check	: Enabled
Reset V-Timer Event	: Keyboard/Mouse
ESC : Quit ↑↓→← : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift) F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults	

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

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:

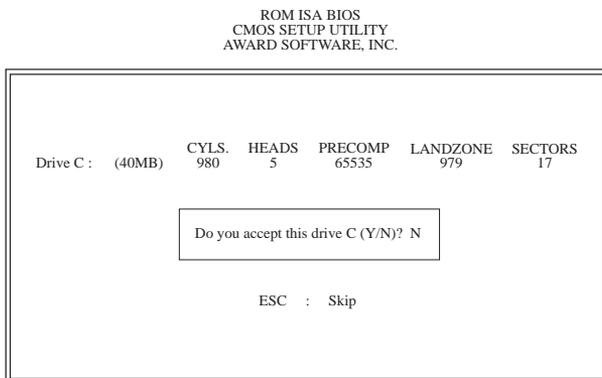
You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. Otherwise, enter a new password.

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.

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.

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

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.

❖ *Troubleshooting*

If you experience difficulty with the G486-EVA 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 SIM modules are seated securely into the bank sockets.
- 3) Make sure that the SIM modules are in the correct location.
- 4) Check that all populated memory banks are completely filled. If not, fill them completely.
- 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) Recheck the CMOS settings.

❖ *Appendix A: Types of Modules*

The G486-EVA system board allows you to populate memory with 256Kx9, 1Mx9, and 4Mx9 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 256Kx9 Modules

Brand	Chip Number
Samsung	KM44C256AJ-8
Panasonic	MN41C4256-08
Hitachi	HM514256AJP8 (80ns)

For SIM 1Mx9 Modules

Brand	Chip Number
Panasonic	MN41C1000SJ-08
Fujitsu	81C1000-80
NEC	MC421000A9A-80
OKI	M511000A-80J
Motorola	MCM511000AJ80

For SIM 4Mx9 Modules

Brand	Chip Number
Hitachi	HB56A49BR-8AL

❖ *Appendix B: System Error Report*

POST (hex)	Name	Description
C0	Turn off chipset cache	OEM specific-cache control.
1	Processor test 1	Processor status (1FLAGS) verification. Test the following processor status flags carry, zero, sign, overflow. The BIOS will set each of these flags, verify they are set, then turn each flag off and verify it is off.
2	Processor test 2	Read/Write/Verify all CPU registers except SS,SP and BP with data pattern FF and 00.
3	Initialize chips	Disable NMI, PIE, AIE, UEI, SQWV. Disable video, parity checking, DMA. Reset math coprocessor. Clear all page registers, CMOS shutdown byte. Initialize timer 0, 1 and 2, including set EISA timer to a known state. Initialize DMA controllers 0 and 1. Initialize interrupt controllers 0 and 1. Initialize EISA extended registers.
4	Test memory refresh toggle	RAM must be periodically refreshed in order to keep the memory from decaying. This function assures that the memory refresh function is working properly.
5	Blank video, initialize keyboard	Keyboard controller initialization.
6	Reserved	
7	Test CMOS interface and battery status	Verifies CMOS is working correctly, detects bad battery.

POST (hex)	Name	Description
BE	Chipset default initialization	Program chipset registers with power on BIOS defaults.
C1	Memory presence test	OEM Specific-Test to size on-board memory.
C5	Early shadow	OEM Specific-Early Shadow enable for fast boot.
C6	Cache presence test	External cache size detection.
8	Setup low memory	Early chip set initialization. Memory presence test. OEM chip set routines. Clear low 64K of memory. Test first 64K memory.
9	Early cache initialization	Cyrix CPU initialization. Cache initialization.
A	Setup interrupt vector table	Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL.
B	Test CMOS RAM checksum	Test CMOS RAM checksum, if bad, or insert key pressed, load defaults.
C	Initialize keyboard	Detect type of keyboard controller (optional). Set NUM_LOCK status.
D	Initialize video interface	Detect CPU clock. Read CMOS location 14h to find out type of video in use. Detect and initialize video adapter.
E	Test video memory	Test video memory, write sign-on message to screen. Setup shadow RAM - Enable shadow according to Setup.

POST (hex)	Name	Description
F	Test DMA controller 0	BIOS checksum test. Keyboard detect and initialization.
10	Test DMA controller 1	
11	Test DMA page registers	Test DMA page registers.
12-13	Reserved	
14	Test timer counter 2	Test 8254 timer 0 counter 2.
15	Test 8259-1 mask bits	Verify 8259 channel 1 masked interrupts by alternately turning off and on the interrupt lines.
16	Test 8259-2 mask bits	Verify 8259 channel 2 masked interrupts by alternately turning off and on the interrupt lines.
17	Test stuck 8259's interrupt bits	Turn off interrupts then verify no interrupt mask register is on.
18	Test 8259 interrupt functionality	Force an interrupt and verify the interrupt occurred.
19	Test stuck NMI bits (Parity/IO check)	Verify NMI can be cleared.
1A		Display CPU clock.
1B-1E	Reserved	
1F	Set EISA mode	If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests and clear EISA mode flag. Test EISA Configuration Memory Integrity (checksum & communication interface).

POST (hex)	Name	Description
20	Enable slot 0	Initialize slot 0 (system board).
21-2F	Enable slots 1 - 15	Initialize slots 1 through 15.
30	Size base and extended memory	Size base memory from 256K to 640K and extended memory above 1MB.
31	Test base and extended memory	Test base memory from 256K to 640K and extended memory above 1MB using various patterns. Note: This will be skipped in EISA mode and can be "skipped" with ESC key in ISA mode.
32	Test EISA extended memory	If EISA mode flag is set then test EISA memory found in slots initialization. Note: This will be skipped in ISA mode and can be "skipped" with Esc key in EISA mode.
33-3B	Reserved	
3C	Setup enabled	
3D	Initialize and install mouse	Detect if mouse is present, initialize mouse, install interrupt vectors.
3E	Setup cache controller	Initialize cache controller.
3F	Reserved	
BF	Chipset initialization	Program chipset registers with Setup values.
40		Display virus protest disable or enable.
41	Initialize floppy drive and controller	Initialize floppy disk drive controller and any drives.

POST (hex)	Name	Description
42	Initialize hard drive and controller	Initialize hard drive controller and any drives.
43	Detect and initialize serial/parallel ports	Initialize any serial and parallel ports (also game port).
44	Reserved	
45	Detect and initialize math coprocessor	Initialize math coprocessor.
46	Reserved	
47	Reserved	
48-4D	Reserved	
4E	Manufacturing POST Loop or Display Messages	Reboot if manufacturing POST loop pin is set. Otherwise display any messages (i. e. any non-fatal errors that were detected during POST) and enter Setup.
4F	Security check	Ask password security (optional).
50	Write CMOS	Write all CMOS values back to RAM and clear screen.
51	Pre-boot enable	Enable parity checker. Enable NMI, enable cache before boot.
52	Initialize option ROMs	Initialize any option ROMs present from C8000h to EFFFFh. Note: When FSCAN option is enabled, will initialize from C8000h to F7FFFh.
53	Initialize time value	Initialize time value in 40h: BIOS area.
60	Setup virus protect	Setup virus protect according to Setup.
61	Set boot speed	Set system speed for boot.

POST (hex)	Name	Description
62	Setup NumLock	Setup NumLock status according to Setup.
63	Boot attempt	Set low stack. Boot via INT 19h.
B0	Spurious	If interrupt occurs in protected mode.
B1	Unclaimed NMI	If unmasked NMI occurs, display Press F1 to disable NMI, F2 reboot.
E1-EF	Setup pages	E1-Page 1, E2-Page 2, etc.
FF	Boot	

❖ *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

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
0A0-08F	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
Gnd	- 01 -
Reset Drv	- 02 -
+5V DC	- 03 -
IRQ9	- 04 -
-5V DC	- 05 -
DRQ2	- 06 -
-12V DC	- 07 -
OVS	- 08 -
+12V DC	- 09 -
Gnd	- 10 -
-SEMEMW	- 11 -
-SEMEMR	- 12 -
-IOW	- 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 -
+5V DC	- 29 -
OSC	- 30 -
Gnd	- 31 -

D	C
-Mem CS16	- 01 -
-I/O CS16	- 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 -
+5V DC	- 16 -
-Master	- 17 -
Gnd	- 18 -

-I/O Chck
SD7
SD6
SD5
SD4
SD3
SD2
SD1
SD0
-I/O Chrdy
AEN
SA19
SA18
SA17
SA16
SA15
SA14
SA13
SA12
SA11
SA10
SA9
SA8
SA7
SA6
SA5
SA4
SA3
SA2
SA1
SA0

SBHE
LA23
LA22
LA21
LA20
LA19
LA18
LA17
-Memr
-Memw
SD08
SD09
SD10
SD11
SD12
SD13
SD14
SD15

Pin Name	No.	LBC ¹	LBC ²	LBM ³	LBT
ADR<31..2>	30	0		0	
ADS#	1	0		0	
BE<3..0>	4	0		0	
BLAST#	1	0		0	
BRDY#	1		0		0
D/C#	1	0		0	
DAT<31..0>	32	I/O	I/O	I/O	I/O
ID<4..0>	5	0	0		
IRQ9	1			0	0
LBS16#	1		0		0
LCLK	1	0	0		
LDEV<x># ⁴	1		N/A	N/A	0
LEADS#	1	0		0	
LGNT<x># ⁴	1	0	0		N/A
LKEN#	1	0	0		
LRDY#	1			N/A	0
LREQ<x># ⁴	1			0	0
M/IO#	1	0		0	
RDYRTN#	1	0	0		
RESET#	1	0	0		
W/R#	1	0		0	
WBACK#	1	0	0		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

❖ *Appendix F: Connector Pin Assignments*

Connector JP1

External Battery Connector

Pin	Function
1	Voltage
2	Reserved
3	Ground
4	Ground

Connector JP42

Power LED/Keylock Connector

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

Connector JP43

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 JP46

Standby Mode Switch Connector

Pin	Function
1	Ground
2	Signal

Connector JP47
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,
2	20	615	4	17	300	615	MMI 112, 5412
3	30	615	6	17	300	615	Seagate ST225,
4	62	940	8	17	512	940	ST4026
5	46	940	6	17	512	940	
6	20	615	4	17	None	615	Seagate ST125,
7	30	462	8	17	256	511	Tandon TM262
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,
14	42	733	7	17	None	733	MMI M125
15				(Reserved)			
16	20	612	4	17	0	663	Microscience HH725,
17	40	977	5	17	300	977	Syquest 3250, 3425
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,
28	152	1024	15	17	None	1223	Priam S14
							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 Miniscribe 3053/6053
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							

G486-EVA System Board User's Manual