E486-33/50IC
E486DX2-50IC
System Board
User's Manual

- D16020615-

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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 receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio TV technician for help.*

Notice

(1) The changes or modifications not expressly approved by the party responsible 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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Read Me First

The E486-33/50IC and/or E486DX2-50IC system board **requires** the installation of the ECU (EISA Configuration Utility), which is found in the EISA Configuration Utility diskette provided with this system board.

The ECU configures the EISA devices and maintain system parameters by storing them in the Extended CMOS Memory, so that BIOS can initialize the system board and the expansion boards inserted in the EISA slots once you power up your system.

The Extended CMOS Memory uses 8Kx8 SRAM and is equipped with an internal battery that needs to be constantly charged. Due to the length of time spent on shipment and storage of these system boards, the internal battery might have drained and the information stored in the Extended CMOS Memory may be lost. If you power up your system, the message "**EISA CMOS Inoperational**" may appear. If this happens, simply run the ECU software, bundled with the system board, to reconfigure the system. Save the configuration and reboot your system. Refer to the EISA Configuration Utility section on page 4-1 for more information.

❖ Introduction

The E486-33/50IC or E486DX2-50 is a highly functional, fully enhanced, 486 system board. E486-33/50IC uses an Intel 80486-33/50 CPU designed to run at 33/50MHz while E486DX2-50IC uses an Intel 80486DX2-50 CPU designed to run at 50MHZ (system running at 25MHZ), both are with a built-in 387 math coprocessor to speed up the processing of data. The board is equipped with six (6) 32-bit EISA slots and two (2) 16-bit ISA expansion slots.

The Extended Industry Standard Architecture (EISA) is a superset of the ISA 8- and 16-bit architecture. It extends the operational capabilities of the ISA standard while maintaining compatibility with ISA expansion boards. The EISA Configuration Utility must be installed into the system to configure the system board and the EISA expansion boards that will be inserted in the EISA expansion slots.

The E486-33/50IC and/or E486DX2-50IC system board consists of two levels of cache memory for fast local access of frequently accessed code and data. The first level, or internal cache, is built-in to the CPU with 8KB of cache memory. The second level, or external cache, can support 64KB of cache memory using 8Kx8 (25ns) SRAMs or 256KB of cache memory using 32Kx8 (25ns) SRAMs.

The E486-33/50IC and/or E486DX2-50IC uses 256Kx9, 1Mx9, and 4Mx9 SIM modules with speeds of at least 80ns. It can hold up to 64MB of memory onboard. Memory is configurable in thirty-two (32) different sizes, from 1MB to 64MB.

System support functions include seven (7) channels of Direct Memory Access, fourteen (14) programmable channels for level or edge-triggered interrupts and five (5) programmable 16-bit counter/timers.

Features and Specifications

- Uses Intel 80486-33/50 CPU running at 33/50MHz for E486-33/50IC while E486DX2-50IC uses Intel 80486DX2-50 CPU running at 50MHZ (system running at 25MHZ)
- Uses AMI BIOS
- Uses 82357 and 82358 Intel chipset
- 8.25MHz bus speed for 33MHz, 8.33MHz bus speed for 50MHz and DX2-50
- Supports external cache subsystem with 64KB cache size using 8Kx8 SRAMs (25ns) or 256KB cache size using 32Kx8 SRAMs (25ns)
- Uses 256Kx9, 1Mx9, and 4Mx9 SIM modules (80ns)
- Memory configurable up to 64MB
  Memory configurable as 1MB, 2MB, 3MB, 4MB, 5MB, 6MB, 7MB, 8MB, 9MB, 10MB, 12MB, 13MB, 16MB, 17MB, 18MB, 19MB, 20MB, 21MB, 22MB, 24MB, 25MB, 28MB, 32MB, 33MB, 34MB, 36MB, 37MB, 40MB, 48MB, 49MB, 52MB, and 64MB.
- Synchronous AT bus clock generation
- Battery backup for CMOS configuration and real-time clock/calendar
- Seven (7) DMA channels
- Fourteen (14) programmable channels for level or edge-triggered interrupts

- Five (5) programmable 16-bit counter/timers
- Six (6) 32-bit EISA slots and two (2) 16-bit ISA slots
- Socket for Weitek 4167-33 coprocessor for 33MHz, Weitek 4167-25 for DX2-50MHz and Weitek 4167-50 for 50MHz
- Six (6) layer PCB
- Standard AT size
- Landmark Speed Test V1.14:145.7MHz for 33MHz, 164MHz for DX2-50MHz, over 200MHz for DX-50MHz
- One year warranty

❖ Installation Overview

This chapter summarizes the steps in installing your E486-33/50IC and/or E486DX2-50IC system board into your system unit. It also includes a description of the area in which you must work in. Before installing the system board, determine first the size of the memory you need onboard. Please refer to the memory chart on pages 2-4 and 2-5 for the memory size and type of SIM modules needed.

Preparing the Area

Before unpacking the system board, make sure the location you have selected will provide a relatively dust and static free environment. 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, the use of a surge protection socket is recommended. 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 E486-33/50IC and/or E486DX2-50IC system board carefully.

Handling the System Board

It is quite easy to inadvertently damage your system board even before installing it to your system unit. Static electrical discharge can damage your system board even though there are no signs of physical damage. Extra care must be taken in handling the system board to make sure that no static build-up is present.

Tips in Handling the System Board

1) To prevent electrostatic build-up, you should leave the board in its anti-static bag until you are ready to install it.

2) Hold the system board by its edges only. Be careful not to touch any of the components, contacts or connections on the board.

3) Avoid touching the pins on all modules and connectors. Hold modules and connectors by their ends.

Hardware Installation

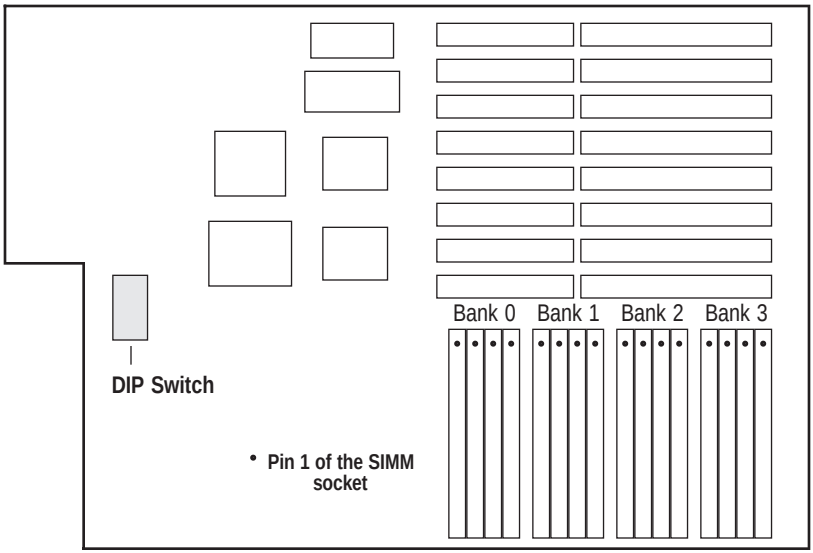
Computer components are easily damaged by static electricity. Be careful to handle the system board by its edges. Do not touch any part of its circuitry, especially the gold contacts, with your hands. Do all the preparation work on a static-free surface. Place the system board on a static-free table with the components facing up.

Memory Installation

The E486-33/50IC and/or E486DX2-50IC system board can support 1MB to 64MB of memory using SIMMs. Four banks are available to be installed with 256Kx9, 1Mx9, or 4Mx9 SIM modules. Each bank consists of four SIMM sockets. The SIM modules are plug into the banks at the upper left side of the board.

SIMM is an acronym for Single In-line Memory Module. A SIMM consists of several RAM chips soldered onto a small circuit board. A SIMM connects with the system board via a 30-pin card-edge connector.

You will need 4 to 16 pieces of SIM modules depending on the amount of memory you intend to install. Your system board can be configured with 1MB, 2MB, 3MB, 4MB, 5MB, 6MB, 7MB, 8MB, 9MB, 10MB, 12MB, 13MB, 16MB, 17MB, 18MB, 19MB, 20MB, 21MB, 22MB, 24MB, 25MB, 28MB, 32MB, 33MB, 34MB, 36MB, 37MB, 40MB, 48MB, 49MB, 52MB, or 64MB of memory onboard.



Location of the SIMM Sockets and DIP Switch on the Main Board

The following table summarizes the bank locations and modules needed for corresponding memory sizes. Each bank consists of 4 SIMM sockets.

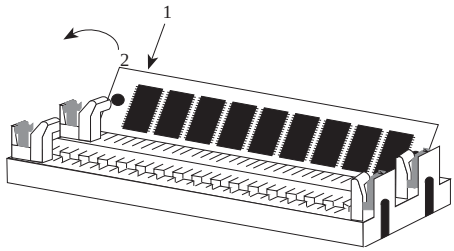
Memory Size	Bank 0	Bank 1	Bank 2	Bank 3
1MB	256K x 9	-	-	-
2MB	256K x 9	256K x 9	-	-
3MB	256K x 9	256K x 9	256K x 9	-
4MB	256K x 9	256K x 9	256K x 9	256K x 9
4MB	1M x 9	-	-	-
5MB	1M x 9	256K x 9	-	-
6MB	1M x 9	256K x 9	256K x 9	-
7MB	1M x 9	256K x 9	256K x 9	256K x 9
8MB	1M x 9	1M x 9	-	-
9MB	1M x 9	1M x 9	256K x 9	-
10MB	1M x 9	1M x 9	256K x 9	256K x 9

Memory Size	Bank 0	Bank 1	Bank 2	Bank 3
12MB	1M x 9	1M x 9	1M x 9	-
13MB	1M x 9	1M x 9	1M x 9	256K x 9
16MB	1M x 9	1M x 9	1M x 9	1M x 9
16MB	4M x 9	-	-	-
17MB	4M x 9	256K x 9	-	-
18MB	4M x 9	256K x 9	256K x 9	-
19MB	4M x 9	256K x 9	256K x 9	256K x 9
20MB	4M x 9	1M x 9	-	-
21MB	4M x 9	1M x 9	256K x 9	-
22MB	4M x 9	1M x 9	256K x 9	256K x 9
24MB	4M x 9	1M x 9	1M x 9	-
25MB	4M x 9	1M x 9	1M x 9	256K x 9
28MB	4M x 9	1M x 9	1M x 9	1M x 9
32MB	4M x 9	4M x 9	-	-
33MB	4M x 9	4M x 9	256K x 9	-
34MB	4M x 9	4M x 9	256K x 9	256K x 9
36MB	4M x 9	4M x 9	1M x 9	-
37MB	4M x 9	4M x 9	1M x 9	256K x 9
40MB	4M x 9	4M x 9	1M x 9	1M x 9
48MB	4M x 9	4M x 9	4M x 9	-
49MB	4M x 9	4M x 9	4M x 9	256K x 9
52MB	4M x 9	4M x 9	4M x 9	1M x 9
64MB	4M x 9	4M x 9	4M x 9	4M x 9

Bank Locations and Modules Needed

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 modules above the SIMM socket with the chips of the module facing toward the center of the motherboard.

2. Seat the module into the bank. Make sure that it is seated properly before pressing the module securely into the bank.

DIP Switch Setting

The E486-33/50IC and/or E486DX2-50IC system board has a DIP switch block onboard. The settings of the DIP switch are dependent on the amount of memory installed on the system board. Be sure that it is set according to the memory size you have on board, otherwise, the system board will not work properly.

Memory Size	S1	S2	S3	S4	S5	S6
1MB	On	On	On	On	On	On
2MB	Off	On	On	On	On	On
3MB	On	Off	On	On	On	On
4MB	Off	Off	On	On	On	On
4MB*	On	On	Off	On	On	On
5MB	Off	On	On	On	Off	On
6MB	On	Off	On	On	Off	On

* *For 1M x 9 SIM module.*

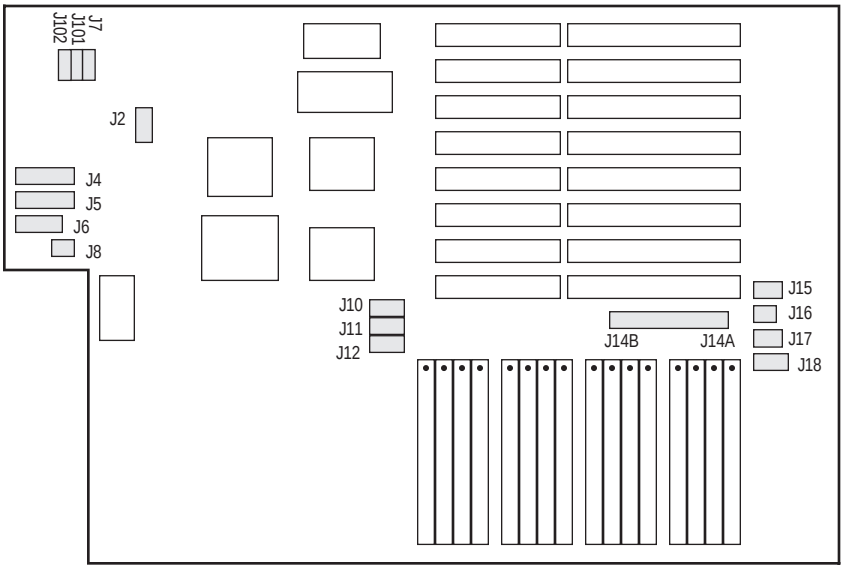
Memory Size	S1	S2	S3	S4	S5	S6
7MB	Off	Off	On	On	Off	On
8MB	Off	On	Off	On	On	On
9MB	On	Off	Off	On	Off	On
10MB	Off	Off	Off	On	Off	On
12MB	On	Off	Off	On	On	On
13MB	Off	On	Off	On	Off	On
16MB	Off	Off	Off	On	On	On
16MB*	On	On	On	Off	On	On
17MB	Off	On	On	On	On	Off
18MB	On	Off	On	On	On	Off
19MB	Off	Off	On	On	On	Off
20MB	Off	On	On	On	Off	Off
21MB	On	On	On	Off	Off	Off
22MB	Off	On	On	Off	Off	Off
24MB	On	Off	On	Off	Off	Off
25MB	On	On	On	On	Off	Off
28MB	Off	Off	On	Off	Off	Off
32MB	Off	On	On	Off	On	On
33MB	On	Off	On	Off	On	Off
34MB	Off	Off	On	Off	On	Off
36MB	On	Off	Off	On	Off	Off
37MB	Off	Off	On	On	Off	Off
40MB	Off	Off	Off	On	Off	Off
48MB	On	Off	On	Off	On	On
49MB	Off	On	On	Off	On	Off
52MB	On	Off	On	On	Off	Off
64MB	Off	Off	On	Off	On	On

* *For 4M x 9 SIM module.*

DIP Switch Settings of the Different Memory Configurations

Board Configuration

The E486-33/50IC and/or E486DX2-50IC is designed with jumpers and connectors onboard. Make sure that the jumpers and connector pins are set correctly before installing the system board into your system unit.

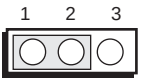


Location of Jumpers and Connector Pins on the E486-33/50IC and/or E486DX2-50IC

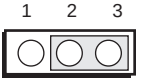
Jumper Settings

Jumper J17
Internal/External Battery Select

The E486-33/50IC and/or E486DX2-50IC comes with an internal battery. If there is a problem with the internal battery, or you prefer to connect an external battery, change Jumper J17 to the external selection and add an external battery to Connector J18.



1-2 On: Internal Battery (Default)

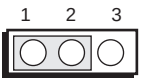


2-3 On: External Battery

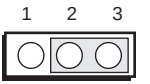
Important:
If you have Jumper J17 set to external, you MUST have an external battery pack connected to J18.

Jumper J15
Display Type Select

Jumper J15 sets the display adapter to color or mono. This jumper must match the type of display adapter installed. If you change your video adapter, make sure that this jumper is changed accordingly.



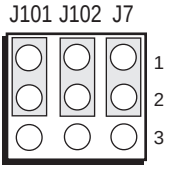
1-2 On: Mono Display



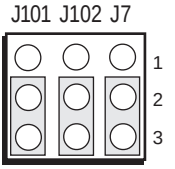
2-3 On: Color Display (Default)

Jumpers J7, J101 and 102
Speed Selector Setting

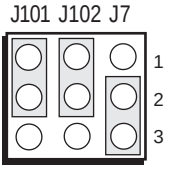
Jumpers J7, J101 and J102 set the speed setting at the system. These jumpers must match the speed of the CPU. If you change your CPU, make sure that these jumpers are changed accordingly.



1-2 On: 33MHZ



2-3 On: 50MHZ

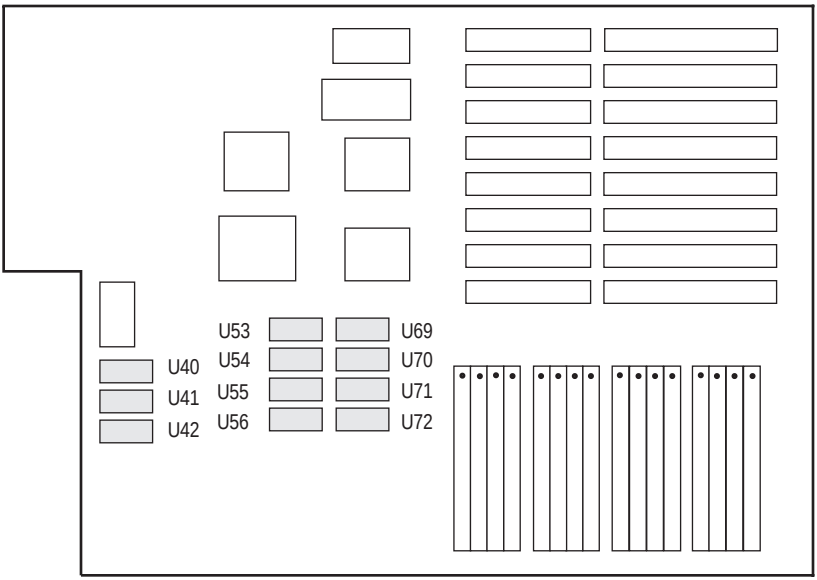


J7 2-3 On: DX2
J102 1-2 On
J101 1-2 On

Cache Configuration

The E486-33/50IC and/or E486DX2-50IC system board can be configured to two different cache sizes: 64KB and 256KB. 64KB of cache memory is the default size. Use 8K x 8 (25ns) SRAMs for 64KB of cache memory or 32K x 8 (25ns) SRAMs for 256KB of cache memory. Regardless of the amount of cache memory installed, three 16K x 4 (20ns) SRAMs are needed for tag RAM to store the cacheable addresses.

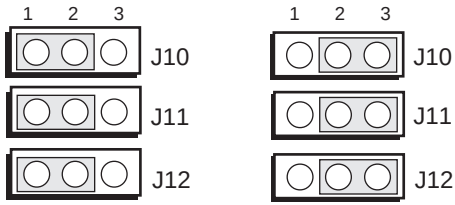
The figure shown on the next page shows the location of the SRAM sockets.



Cache Size	U53 - U56	U69 - U72	U40 - U42
64K*	8K x 8 (25ns)	8K x 8 (25ns)	16K x 4 (20ns)
256K	32K x 8 (25ns)	32K x 8 (25ns)	16K x 4 (20ns)

* *Default setting.*

Jumper Settings for Cache Memory



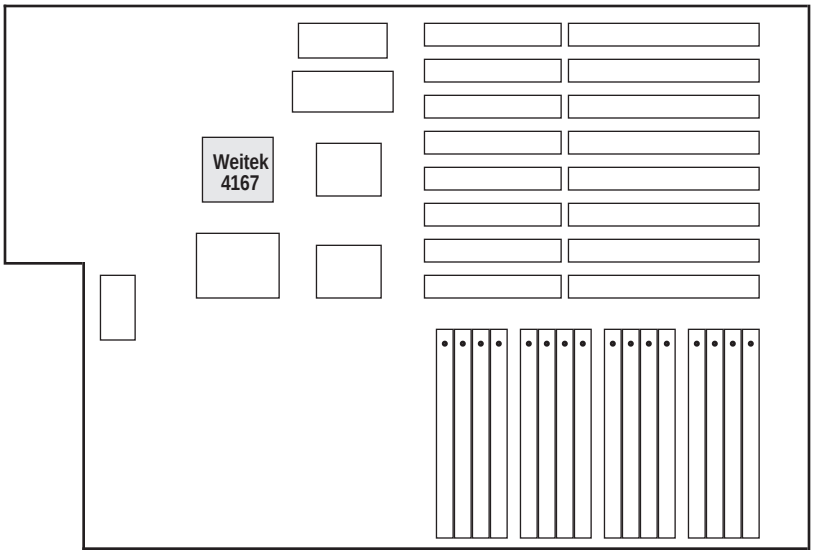
1-2 On
256K Cache
Memory

2-3 On
64K Cache
Memory

Coprocessor Installation

The E486-33/50IC and/or E486DX2-50IC is equipped with a 144-pin EMC (Extended Mathematical Coprocessor) socket which supports Weitek's 4167 floating point coprocessor at 33/50 and 25MHz, respectively. The 144-pin EMC socket consists of three (3) rows of pin holes on each side. When installing the Weitek 4167 floating point coprocessor, position it above the EMC socket and lower it until the pins are inserted properly in their corresponding holes.

When all pins are properly positioned, push the Weitek 4167 firmly into place until the pins are fully seated into the socket. The coprocessor's angled corner must be aligned to the corner of the 144-pin EMC socket.



Location of the Coprocessor Socket

Installing the System Board

Before installing the system board into your system unit, you should prepare the tools that you are going to use: You will need:

- *one medium size, flat-bladed screwdriver*
- *one medium screwstarter*

Step 1: Unlock your system unit. Turn off the power and disconnect all power cords and cables.

Step 2: Remove the system mounting screws from the rear of the system unit.

Step 3: Remove the system unit cover by sliding the top of the case forward and then lifting it up.

Step 4: Remove expansion cards seated in any of the expansion slots and detach all connectors from the old system board.

Step 5: Loosen the screws holding the original system board and remove the board from the system. Save the screws.

Step 6: Install the SIM modules into the E486-33/50IC and/or E486DX2-50IC. The quantity and location of the modules to be installed depends upon the memory configuration and type of modules you intend to use.

Step 7: Set the corresponding jumpers.

Step 8: Install the prepared E486-33/50IC and/or E486DX2-50IC system board into the case and replace the screws.

Step 9: Reattach 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 will appear on your screen and the memory count begins.

After the memory test, the message below will appear on the screen if your CMOS setup is correct:

Enter CURRENT Password:

The default password is AMI. You are given three chances to type the correct password. If the password is still incorrect after the third try, the system will lock up. You must turn your system off and back on again to restart it. You can change the password under the change password option. Refer to the "Change Password" section for more information. A screen similar to the one on the next page will now appear. If the password option is disabled, you will directly access this screen.

System Configuration (C) Copyright 1985-1990, American Megatrencs Inc.,					
Main Processor	:	80486	Base Memory Size	:	640 KB
Numeric Processor	:	Present	Ext. Memory Size	:	3072 KB
Floppy Drive A	:	1.2MB, 5 1/2"	Hard Disk C: Type	:	2
Floppy Drive B	:	None	Hard Disk D: Type	:	None
Display Type	:	Monochrome	Serial Port(s)	:	None
ROM-BIOS Date	:	07/07/91	Parallel Port(s)	:	3BC

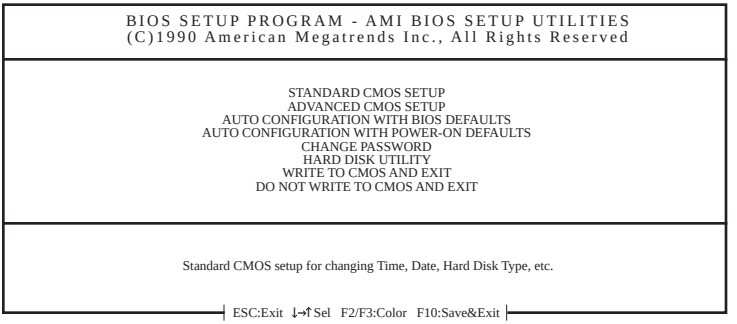
Current date is Wed 01-01-1992
Enter new date (mm-dd-yy):
Current time is 12:10:42.02a
Enter new time:

AMI BIOS Setup Utilities

If you want to change your CMOS setup or your CMOS setup is wrong, press <Del> when the message, "Hit <Del>, if you want to run setup", appears on the screen. Again, if you enabled the password option, you will be prompted to the message below:

Enter CURRENT Password:

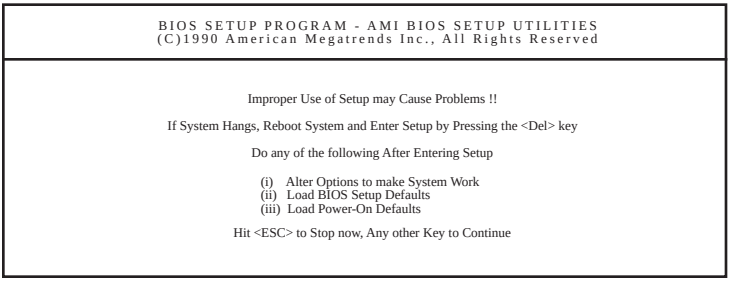
The default password is AMI. For information on how to change the password, refer to the "Change Password" section. After entering the correct password, the screen on the next page appears. If the password option is disabled, you will directly access this screen.



Use the arrow keys to highlight the option you want and hit the <ESC> key.

Standard CMOS Setup

Before accessing this option, the warning message below will appear on the screen:



This message warns you that if inappropriate modifications are made to the CMOS Setup, problems will occur. Press <Enter> to continue or press <Esc> to abort.

Note:
If the system fails after the setup procedure, power off the computer and turn it on again. Wait for the message, "Hit <Del>, if you want to run setup" and press <Del>.

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

BIOS SETUP PROGRAM - STANDARD CMOS SETUP
(C)1990 American Megatrends Inc., All Rights Reserved

Date (mm/date/year) : Tue, Jan 01 1980
Time (hour/min/sec) : 00 : 13 : 32
Daylight saving : Disabled
Hard disk C: type : 2
Hard disk D: type : Not Installed
Floppy drive A: : 1.2 MB, 5 1/2"
Floppy drive B: : Not Installed
Primary display : Monochrome
Keyboard : Installed

Base memory size : 640 KB
Ext. memory size : 3328 KB

Cyln	Head	WPcom	DZone	Sect	Size
615	4	300	615	17	20 MB

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

Month : Jan, Feb,.....Dec
Date : 01, 02, 03,.....31
Year : 1901, 1902,...2099

ESC - Exit ↓→↑Select F2/F3:Color PU/PD:Modify

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

The left side of the screen lists the modifiable parameters. You can change the date, time, hard disk drive (C and D), type of floppy drive (A and B), primary display, and the keyboard options. The daylight Savings function is intended for use in notebook computers and is not supported by the E486-33/50IC and/or E486DX2-50IC, so it does not matter how it is set.
On the lower right hand side is a calendar that shows your current date.

The box at lower left provides information on each highlighted parameter.

Navigation and menu selection instructions are located below the information box. Use the up or down arrow key to move between options. Once you have highlighted the option you wish to change, use the Page Up or Page Down key to view the available selections for that option.

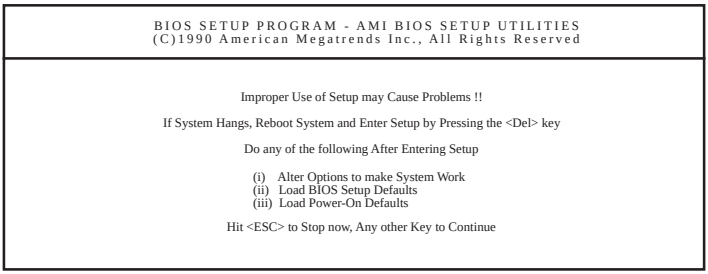
If you have added a hard drive, you must select the appropriate type for the drive. The E486-33/50IC and/or E486DX2-50IC has 46 pre-set types and one user-definable type. The table on Appendix H gives a complete listing of the available drive types. Any given hard drive must be set to one specific drive-type number. Please refer to your hard drive documentation to find the appropriate type number.

When you are through making all the changes, press <Esc> to return to the main menu.

If none of the pre-set types is appropriate for your hard drive, choose 47, 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 Page Up key until type 47 is showing. Fill in all the parameters as specified by the drive manufacturer. To move between parameters, hit the <Enter> key.

Advanced CMOS Setup

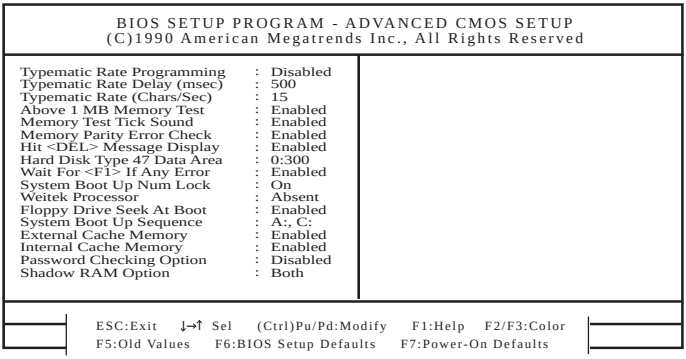
Before accessing this option, the warning message shown below appears on the screen:



This message warns you that if inappropriate modifications are made to the Advanced CMOS Setup, problems will occur. Press <Enter> to continue or press <Esc> to abort.

Note:
If the system fails after the setup procedure, power off the computer and turn it on again. Wait for the message, "Hit <Del> if you want to run setup", and press <Del>.

If you press <Enter>, the screen similar to the one on the next page will now appear:



Use the arrow keys to move the highlight bar to the options you wish to change or modify. Use the <PgUp> or <PgDn> keys to make the corresponding changes.

Set the password checking option to "always" or "setup" if you want to enable this option. Setting it to "always" will prompt you for a password everytime you cold boot your system or access setup. When you set the option to "Setup", you will be prompted for a password only when trying to access setup.

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

Auto Configuration with BIOS Defaults

If, for some reason, the CMOS becomes corrupted, the system can be configured with the default values stored in the ROM chips. The BIOS Setup default values should provide optimum performance for the system. You should use those values unless you are having

possible hardware problems.
Highlight this option and press <Enter>. The message below will now appear.

Load BIOS Setup Default Values from ROM Table (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.

Auto Configuration with Power-on Defaults

The Power-on 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 having possible hardware problems.

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

Load Power-on Default Values from ROM Table (Y/N)? N

Type "Y" and press <Enter> to return to the Power-on default values. After pressing <Enter>, you will be returned to the main menu.

Change Password

The default password is AMI. If you want to change the password, make sure you set the Password Checking Option to "ALWAYS" or "SETUP" under CMOS Advanced Setup. If not, the error message below will appear on the screen:

<Password Option> must be enabled in Advanced CMOS Setup

Press any key to continue

Use the arrow keys to highlight the Change Password Option and press <Enter>. The screen below will appear:

Enter Current Password:

The preset password is AMI. Type AMI, unless the password has been previously changed, and press <Enter>. The screen below will appear:

Enter NEW Password:

Type in the the new password. You are limited to six ASCII characters. Typing in more than six characters, you will get the following error message:

Error, press any key

Press any key on the keyboard to return to the message below:

Enter NEW Password:

Type in a password that is six characters long or shorter. When done, you will be prompted to the screen below:

Re-enter NEW Password:

You are asked to verify the new password. Type in exactly the same password. Failure to do so will yield the error message shown on the next page:

Error, press any key

If you received this error, you will have to start all over.

After typing in the new password, the message below will appear:

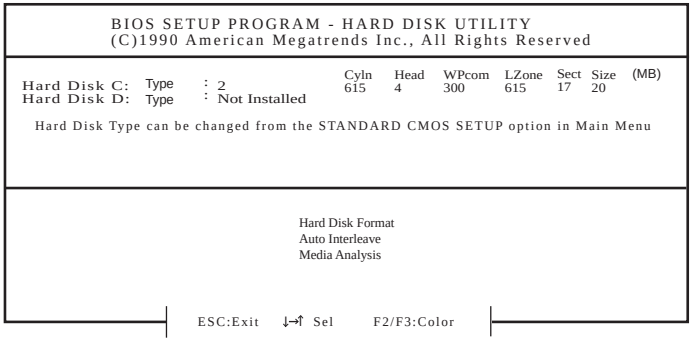
New password installed

Press the <Esc> key to return to the main menu.

Hard Disk Utility

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

Note:
DO NOT use this utility on IDE hard drive. Use of this can severely damage your IDE hard drive.



Use the arrow keys to select the desired options and press <Esc> to exit when done.

Write to CMOS and Exit

When all the changes have been made, highlight this option and press <Enter>. The message below will appear:

Write to CMOS and Exit (Y/N)? N

Type "Y" and press <Enter>. The modifications you've 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 <Del> after memory testing is done.

Do Not Write to CMOS and Exit

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

Want to 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 <Del> after memory testing is done.

❖ EISA Configuration Utility

Overview

The E486-33/50IC and/or E486DX2-50IC system board **requires** the installation of the EISA Configuration Utility (ECU) which is used to configure EISA (Extended Industry Standard Architecture) computer systems.

EISA system boards and EISA adapter cards are much more complex than the designs of the ISA (Industry Standard Architecture), making the setup of jumpers and switches more complicated. ECU was created to automate this configuration process.

The CFG files that come with each EISA expansion board must be copied onto the EISA Configuration Utility diskette. ECU will then store this configuration data in the system's Extended CMOS Memory. The CFG file tells the EISA Configuration Utility what choices the user has in configuring the card and what system resources have to be reserved for the card.

File Structure

The files used by the EISA Configuration Utility are as follows:

CFG Files

Each EISA expansion board comes with a CFG file. A board's CFG file contains detailed information about the board as well as the functions that the board can perform.

Duplicate Files

ECU allows you to copy an existing CFG file to a different filename or directory. If the file is copied into a directory where a file by the same name already exists, the new file will be renamed, using the same filename but with a number 1 before the filename. If the same file is copied into that directory again, it will be renamed again using the same filename, this time preceded by the number 2; and so on. This procedure prevents the loss of any CFG file.

CFGLIST File

The CFGLIST file is a text file that contains the names of the CFG files to be configured. Use the CFGLIST file when you do not want to select the CFG files individually each time you create a configuration.

CMS File

The CMS file contains a copy of the configuration information that is written into the system's Extended CMOS Memory. Each CMS file should have a corresponding INF file.

INF File

The INF file contains detailed information about a configuration such as switch and jumper settings, software statements, connection statements, and resource allocation. The INF file is used by the "Display/Print" command to recall information on a saved configuration. Each INF file should have a corresponding CMS file.

Initial Configuration

Prior to installing the EISA Configuration Utility, you must have the CFG files for the expansion boards and system board you are planning to install available. To install:

1. Create a directory on the disk drive you want the EISA Configuration Utility to be installed on.

2. Change into the directory you have just created.

3. Insert the EISA Configuration Utility diskette into drive a: and copy the files into the current directory.

4. To run the EISA Configuration Utility, access the EISA subdirectory you have created and type, **CFG** <Enter>.

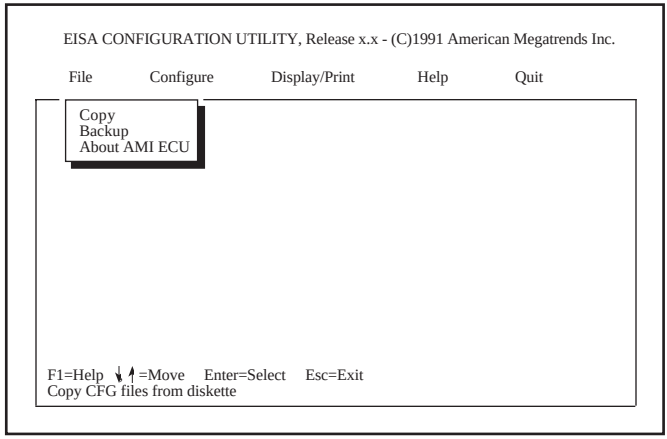
Menu Options

The EISA Configuration Utility allows you to copy or backup configuration files, configure an EISA system automatically or manually, and display or print information related to a configuration that has been previously saved. The utility also includes an online Help menu which may be accessed anytime by pressing the <F1> key.

Use the arrow keys to move to the menu or option of your choice, then press <Enter>. You may also select an option by pressing the key corresponding to the highlighted letter of the option. If you are using a mouse, move the mouse pointer to the selected option and click the left-mouse button once.

File Menu

The File menu is used to copy CFG files from a floppy diskette into the EISA Configuration Utility subdirectory, make a backup copy of a configuration file or allow you to check the copyright and version of the EISA Configuration Utility you are currently using.



Copy

The Copy command allows you to copy CFG files from a floppy diskette into the current directory. To Copy:

1. Choose the File Copy command.

2. The File Copy box will appear. Insert the diskette containing the CFG files into drive a: and choose OK.

3. The File Selection box will appear. Use the arrow keys to move the selection bar to the files you want to copy and press <Enter>. You may also click the files by using your mouse. Choose OK.

4. The Destination box will appear on the screen showing you the current drive and directory. Choose Continue to copy the selected files to the current directory.

If you want to copy the files into another drive or directory, choose Different Directory and a screen will appear for you to type-in the new drive/directory.

If the files to be copied already exist, an option box will appear.

Click:
Overwrite - to overwrite the existing file.
Rename - to rename the file to be copied.
Skip - to cancel.

Backup

The Backup command allows you to make a backup copy of the CMS and INF files. This is very useful in restoring your computer's configuration in the event of a battery failure or when you want to copy a configuration into another EISA system. To make a Backup copy:

1. Choose the File Backup command.

2. The Backup Config box will appear allowing you to copy the CMS and INF files, which contains all the configuration information, onto a backup diskette. Choose OK.

3. The File Selection box will appear. Use the arrow keys to move the selection bar to the files you want to backup and press <Enter>. You may also click the files by using your mouse. Choose OK.

About AMI ECU

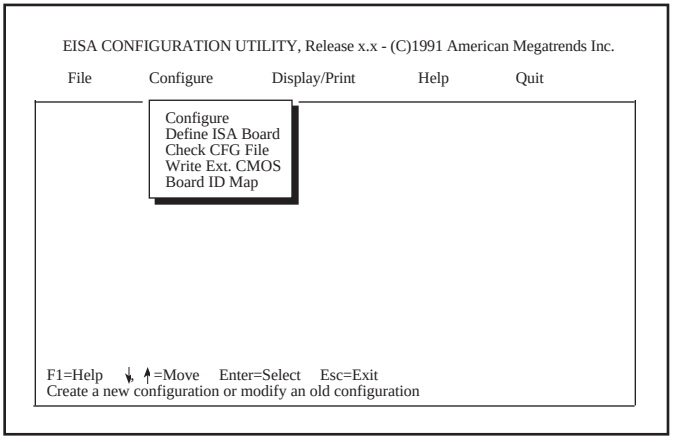
This command is used to check the copyright and version of the EISA Configuration Utility you are currently using. To view the information:

1. Choose File About AMI ECU command and the About AMI ECU box will appear.

2. Choose OK when done.

Configure Menu

The Configure menu is used to configure an EISA system either automatically or manually, define the ISA boards installed in the system, check CFG files for proper syntax, write configuration information into Extended CMOS Memory or view the boards that are physically present in the system.



Configure

The Configure command is used to create a new configuration or modify an old one. To Configure:

Choose the Configure Configure command and the Configuration box will appear.

Four groups of options comprise the Configuration box. They are:

Configuration Type:
Create New Configuration
Modify Old Configuration

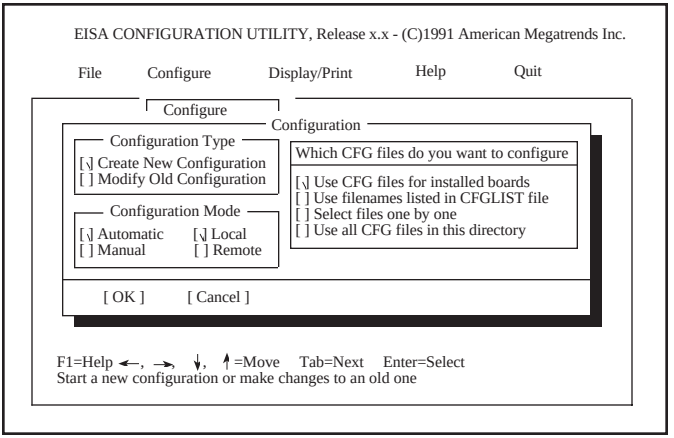
Configuration Mode: Automatic, Manual,
Local, Remote

Which CFG files do you want to configure (if the Create New Configuration option was chosen)

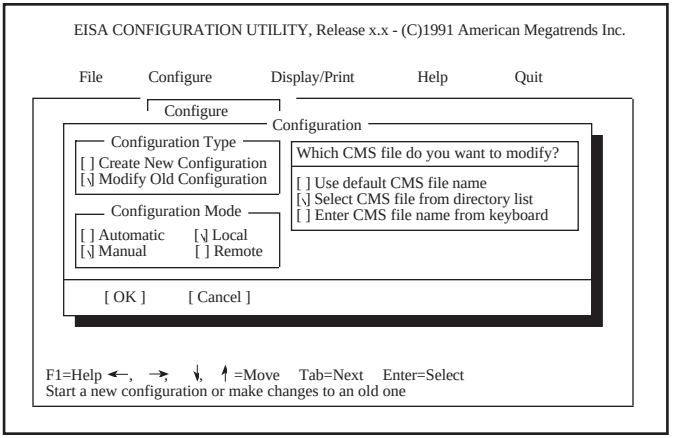
Which CMS files do you want to modify (if the Modify Old Configuration option was chosen)

See General Information on the Configuration Options later in this manual for more information.

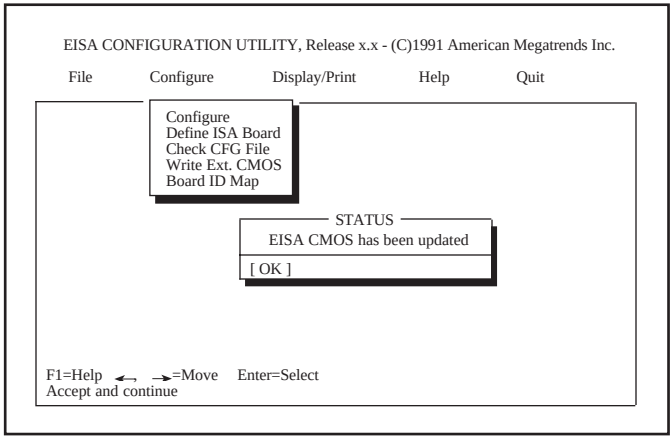
If you choose the Create New Configuration option, the screen shown on the next page will appear.



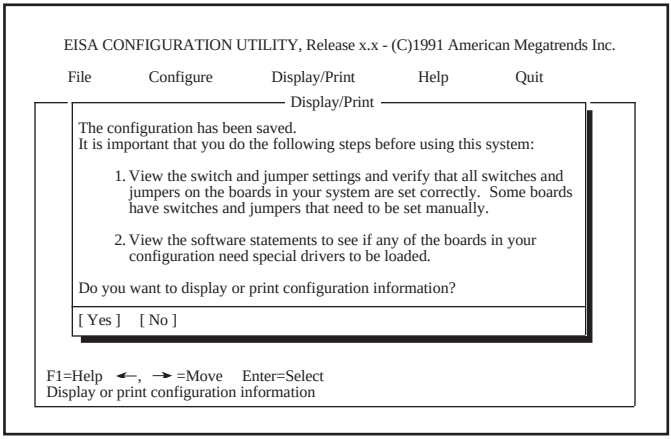
If the Modify Old Configuration option was chosen, the screen shown on the next page will appear.



If you choose the <Use CFG files for installed boards> under the "Which CFG files do you want to configure" using the Automatic mode, the utility will automatically save the configuration in the CMS and INF file, then save the configuration into the Extended CMOS Memory. The Status box shown below will now appear.



Choose OK and the Display/Print box shown on the next page will appear.



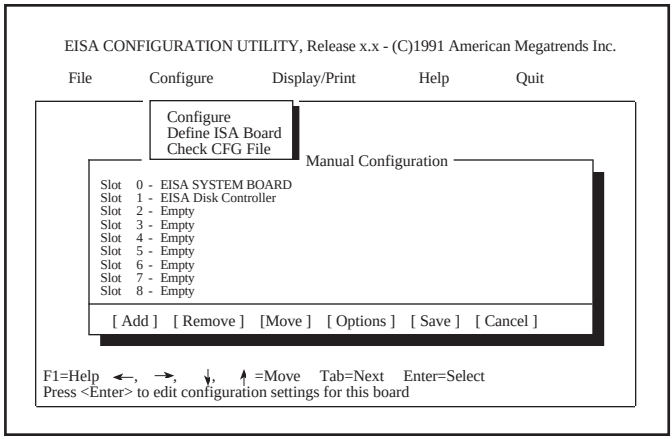
Choose:

Yes - to display or print the configuration.

See Display/Print Menu to display or print a configuration.

No - to cancel.

On the other hand, if the <Use CFG files for installed boards> under "Which CFG files do you want to configure" was chosen, or any of the options under the "Which CMS file do you want to modify" was chosen, the Manual Configuration box shown on the next page will appear.

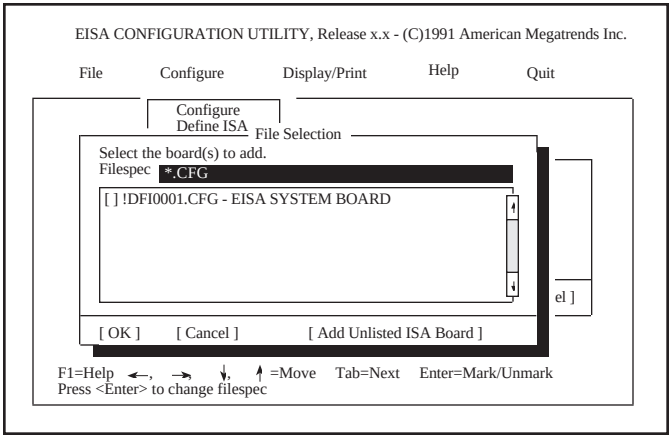


The Manual Configuration box is used to change a board's function settings and resource allocation settings. It also allows you to add, remove, move, display additional options, save, or cancel the current configuration.

Add

This option allows you to add a new board to the current configuration.

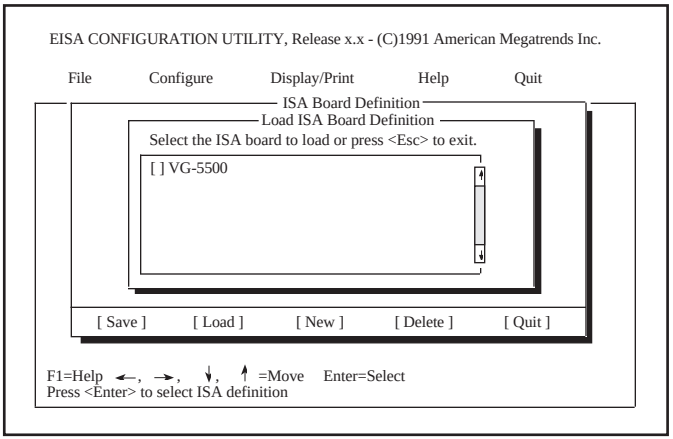
Choose Add and the File Selection box shown on the next page will appear.



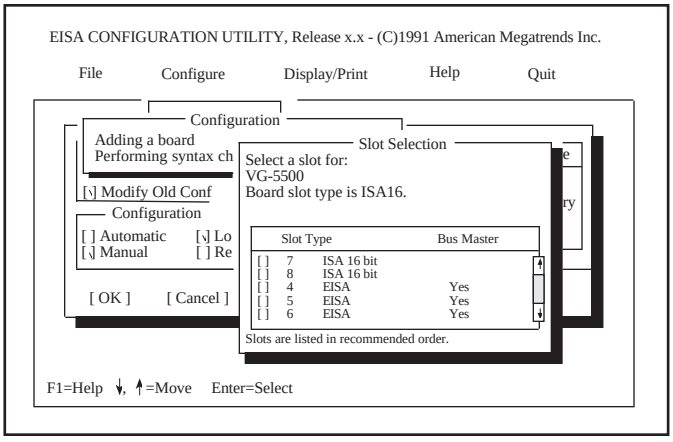
Select the board you want to add to the current configuration and choose OK. You may also type-in the filename of the board you want to add. Highlight the Filespec option and press <Enter>. The cursor will appear for you to type-in the filename. Enter the filename and choose OK.

Choose Cancel to go back to the Manual Configuration box.

Choose Add Unlisted ISA Board option to add a user defined ISA board in the configuration. The Load ISA Board Definition box shown on the next page will appear.



Highlight the board you want to add in the configuration and press <Enter>. The Slot Selection box shown below will appear.



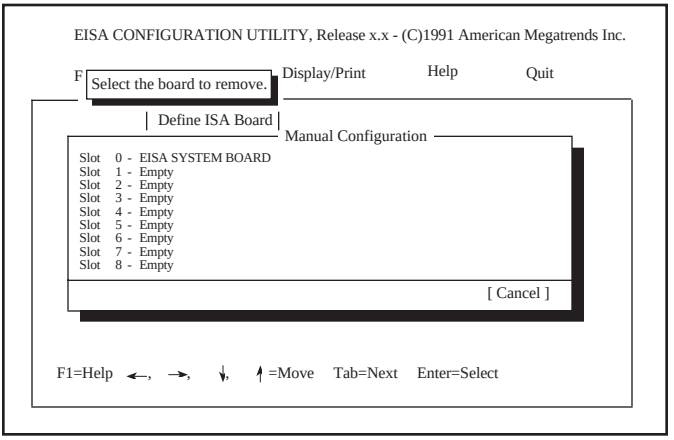
You must select a slot for each adapter board. The slots are listed in the recommended order of preference. If you already placed an EISA adapter board in a slot, the ECU puts that slot at the top of the list.

Select the slot that corresponds to the actual slot where the adapter board being configured resides and press <Enter>. Choose OK to continue the configuration process.

Remove

This option allows you to remove a board from the current configuration.

Choose the Remove and the screen shown below will appear.



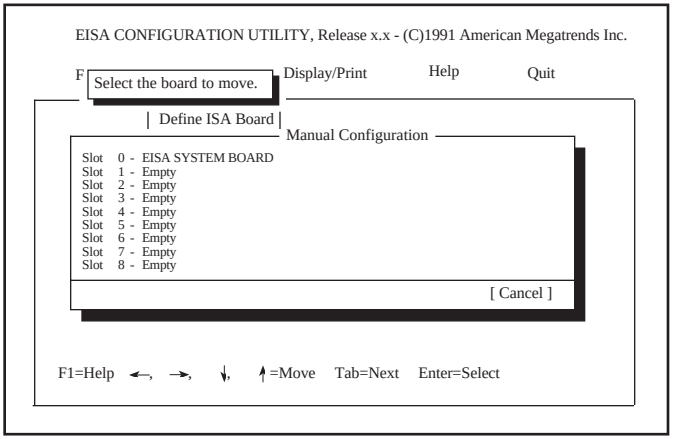
Select the board you want to remove from the configuration and press <Enter>.

Choose Cancel to return to the Manual Configuration box.

Move

This option allows you to move an adapter board into another slot.

Choose Move and the screen shown below will appear.



Select the board you want to move and press <Enter>. The Slot Selection box shown on page 4-13 will appear.

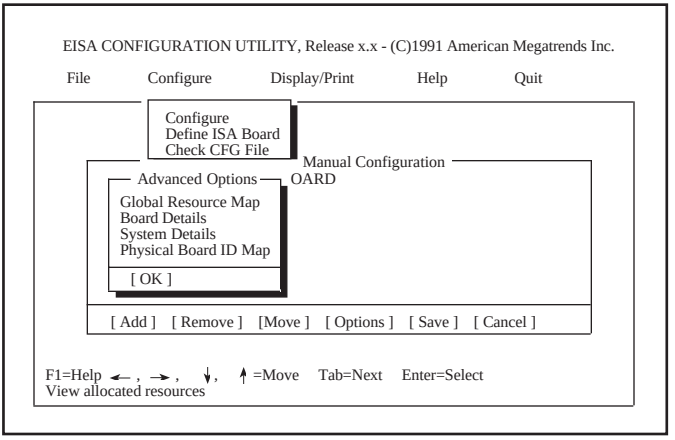
Select the slot that corresponds to the actual slot where the adapter board to be moved will reside, and press <Enter>.

Choose Cancel to return to the Manual Configuration box.

Options

This option allows you to view detailed information about the system board and the adapter boards installed in the system. It also allows you to view the Global Resource Map and Physical ID Map of these boards.

Choose Options and the Advanced Options box shown below will appear.



Global Resource Map

The Global Resource Map allows you to view the IRQ line, I/O port address and memory address of a board.

Board Details

This option informs you about the slot number, ID or the board slot type of a board.

System Details

This option allows you to view the slot type, the amperage used or EISA CMOS size of the boards installed in the system.

Physical Board ID Map

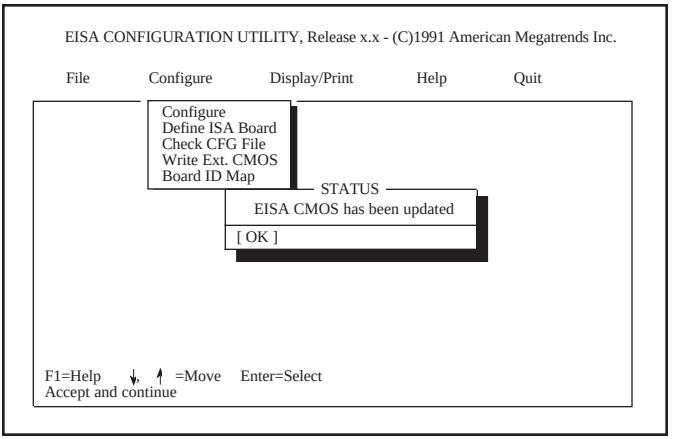
The Physical Board ID Map allows you to view the boards that are physically present in the system.

Save

This option allows you to save the configuration in the CMS and INF file. If you are configuring in Local mode, the system's Extended CMOS Memory will be updated too.

1. After you have finished modifying the configuration, choose Save.

2. The Extended CMOS Memory will be updated and the Status box shown on the next page will appear.



Choose OK and the Display/Print box will appear. Choose:

Yes - to display or print the configuration.

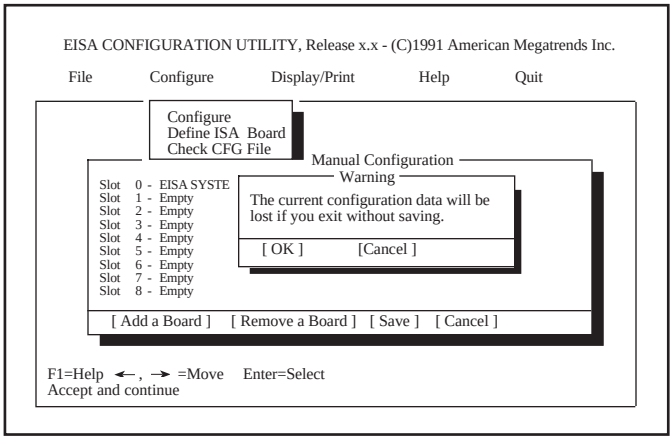
See Display/Print Menu to display or print a configuration.

No - to cancel.

Cancel

Select this option to return to the main menu.

1. If you didn't save your work, a warning message shown on the next page will appear.



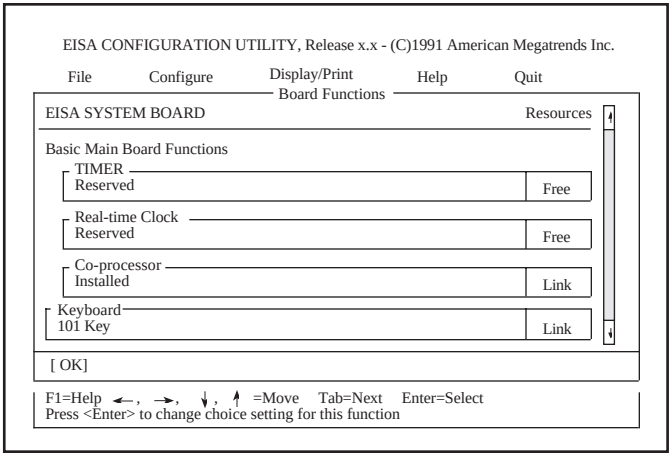
Choose:
OK - to return to the main menu.
Cancel - to return to the Manual Configuration box.

Board Functions/Resources

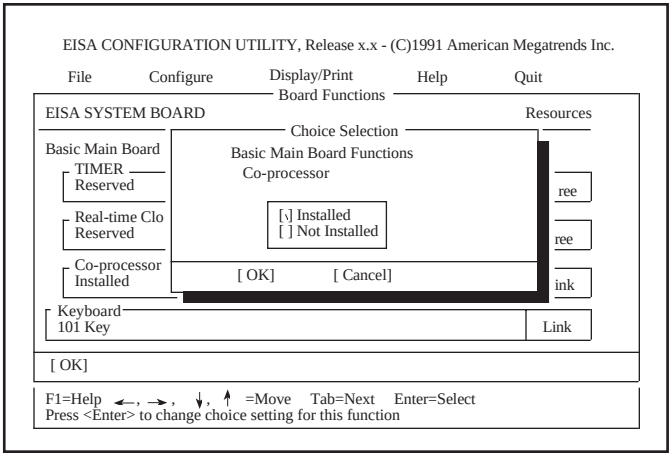
The Board Functions and Resources allocation settings will allow you to edit the configuration settings of a board. To edit:

Choose the board you want to edit in the Manual Configuration box, and press <Enter>.

The Board Functions box shown on the next page will appear.



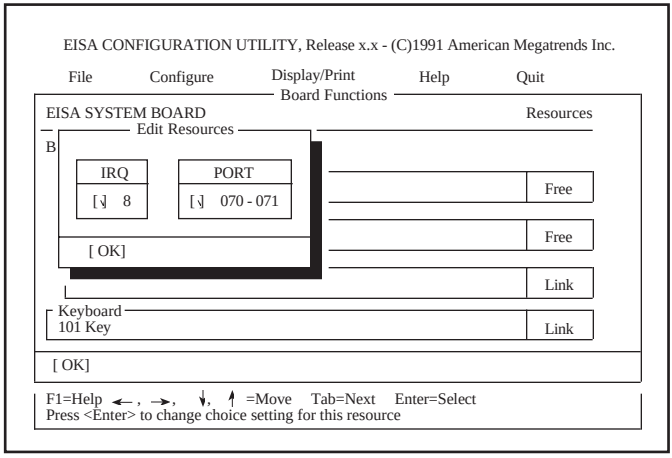
On the left side of the Board Functions box is a list of all the functions of the board. Each function has a choice setting. Move the selection bar to the function you want to edit and press <Enter>. The Choice Selection box shown below will appear.



Select the appropriate settings and choose OK.

Choose Cancel if you want to ignore the changes you have made to return to the Board Functions box.

The Resources to the right of each function is used to edit the resource allocation settings of a function's Resource group. Move to the Resource you want to edit and press <Enter>. The Edit Resources box shown below will appear.

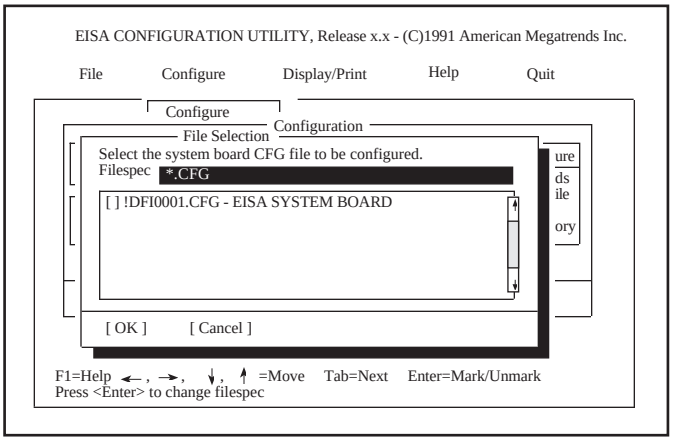


Select the appropriate settings and choose OK.

After you are through editing the board, press <Esc> to return to the Manual Configuration box.

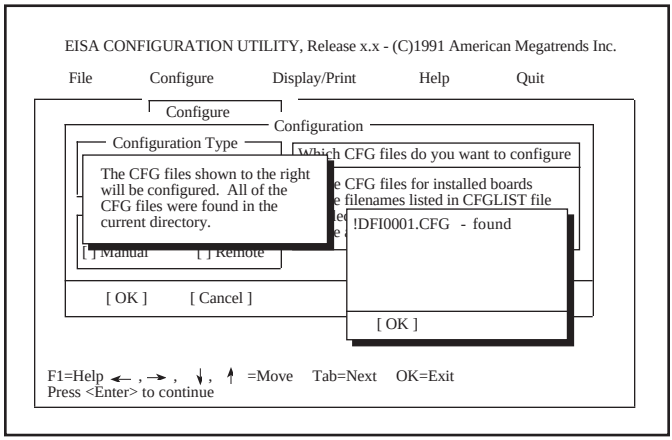
If the <Select files one by one> option under "Which CFG files to configure" was chosen or the <Select CMS file from directory list> under "Which CMS files to modify" was chosen, the File Selection box shown below will appear.

Note:
These two options must be modified only in Manual mode.

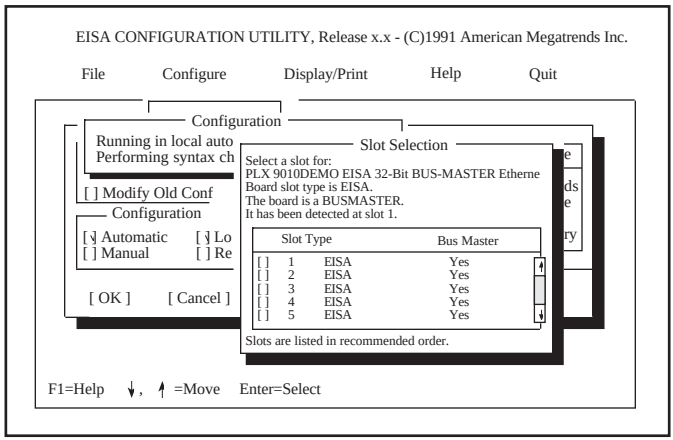


Select the file to be configured or modified, then choose OK. The Manual Configuration box will appear. Refer to page 4-11 to 4-16 for more information on how to configure a board in Manual mode.

If you chose the <Use all CFG files in this directory> under "Which CFG files do you want to configure", using the Automatic mode, the screen shown below will appear.



Choose OK and the Slot Selection box shown below will appear.



Select the slot that corresponds to the actual slot where the adapter board being configured resides and press <Enter>.

The Status box will appear informing you that the EISA CMOS has been updated. Choose OK and the Display/Print box shown on page 4-10 will appear.

If this option is configured in the Manual mode, the Manual Configuration box will appear. Refer to page 4-11 to 4-16 for more information on how to configure a board in Manual mode.

General Information on the Configuration Options

Create New Configuration and Modify Old Configuration

The Create New Configuration option is used to start or create a new configuration. This option allows you to use either the Automatic or Manual mode.

Choose the Modify Old Configuration option if you want to modify and make changes to a previously saved configuration. You can only use the Manual mode under this option.

Automatic and Manual

Choosing the Automatic mode option allow the utility to automatically configure the system for you. This is very helpful if you do not have prior experience configuring EISA boards.

The Manual mode option, on the other hand, allows you to configure the system manually in the Manual Configuration box. You may create a new configuration or modify an old configuration under this mode.

Local and Remote

Select the Local mode option if the configuration that you are working on is for this computer system. The configuration information will be stored in this computer's Extended CMOS Memory as well as in the CMS and INF files.

If you want to produce a configuration for a computer other than this one, select the Remote mode. The configuration information will be stored in the files only and can be copied to a floppy diskette later by using the Backup command. The configuration on the floppy diskette can then be copied into another computer system's Extended CMOS Memory.

Which CFG Files to Configure

Choosing the Create New Configuration option will prompt you to select the CFG files to be used in the configuration.

1. Use CFG files for installed boards

   The utility will automatically detect the EISA boards installed in the computer system and will configure the CFG files of these boards. This option is available in Local mode only.

2. Use filenames listed in CFGLIST file

   The utility will open the CFGLIST file that contains a list of all the CFG files.

3. Select files one by one

   Allows you to select the CFG files to be configured. This option would require you to configure the board in Manual mode.

4. Use all CFG files in this directory

   The utility will configure all the CFG files in the current directory.

Which CMS File to Modify

Choosing the Modify Old Configuration option will prompt you to select the CMS files to be modified.

1. Use default CMS file name

   The utility searches for the CMS file that matches the name of the system board. This option is available in Local mode only.

2. Select CMS file from the directory list

   This option allows you to select the CMS file that you want to modify from a list of all the CMS files in the current directory.

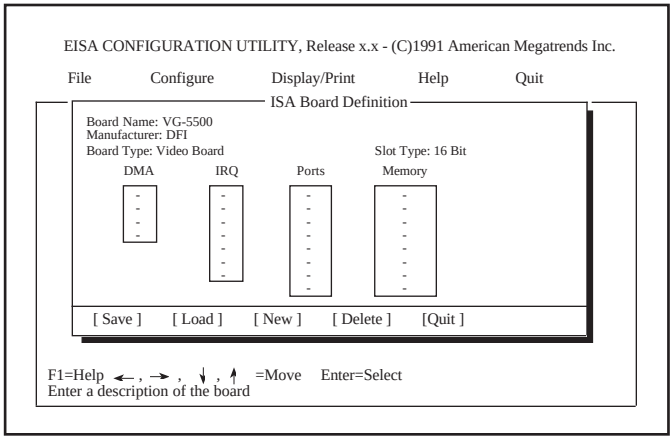
3. Enter CMS file name from keyboard

   This option allows you to type-in the CMS file that you want to modify.

Define ISA Board

In addition to EISA adapter boards, you can install ISA adapter boards by choosing this option. Most ISA adapter board do not have a CFG file. Without a CFG file, the ECU cannot reserve system resources automatically for ISA adapter boards. These boards must be configured manually. To configure an ISA board:

Choose Configure Define ISA Board command and the ISA Board Definition box shown on the next page will appear.



Highlight "Board Name" and press <Enter>. The cursor will appear for you to type-in the name of the board. After typing-in the board name, press <Enter> again.

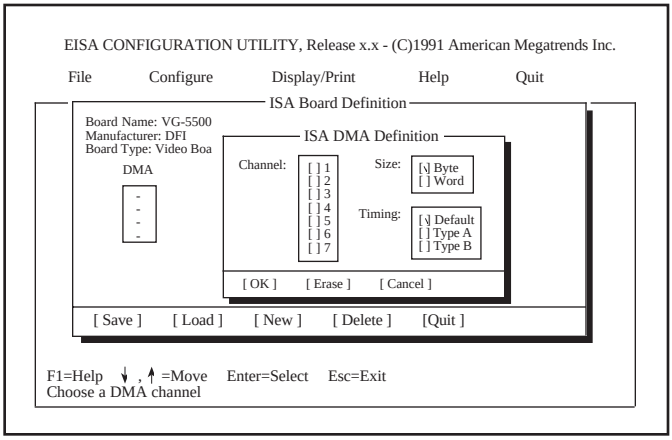
Highlight "Manufacturer" and press <Enter>. The cursor will appear for you to type-in the name of the manufacturer. After typing-in the manufacturer's name, press <Enter> again.

Highlight "Board Type" and press <Enter>. Several options are available. Select the type appropriate for the board and press <Enter>.

Highlight "Slot Type" and press <Enter>. Several options are available. Select the slot type appropriate for the board and press <Enter>.

It is necessary to define an ISA board when you want to prevent other boards in the system from using the same IRQ levels, DMA channels, I/O Port address or Memory address that your ISA board uses.

"DMA" allows you to define up to four (4) DMA channels. Select one of the DMA options and press <Enter>. The ISA DMA Definition box shown below will appear.



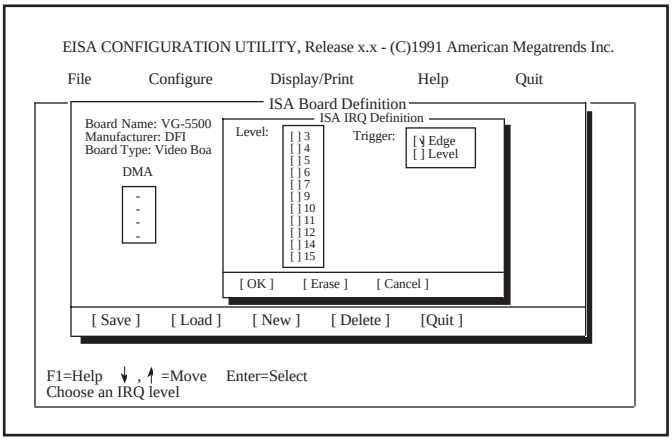
Move the cursor to the appropriate DMA channel, size and timing of the ISA board, and press <Enter>.

Choose OK to save the changes you have just made.

Choose Erase to delete the previously saved DMA definition.

Choose Cancel to return to the ISA Board Definition box without saving the changes.

"IRQ" allows you to define up to seven (7) IRQ levels. Select one of the IRQ options and press <Enter>. The ISA IRQ Definition box shown below will appear.



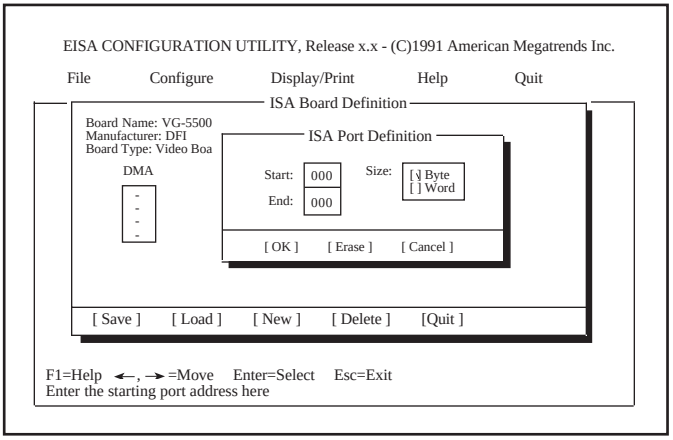
Select the appropriate IRQ level and the type of interrupt trigger to be used, then press <Enter>.

Choose OK to save the changes you have just made.

Choose Erase to delete the previously saved IRQ definition.

Choose Cancel to return to the ISA Board Definition box without saving the changes.

"Ports" allows you to define up to eight (8) ranges of I/O ports. Select one of the I/O Port options and press <Enter>. The ISA Port Definition box shown below will appear.



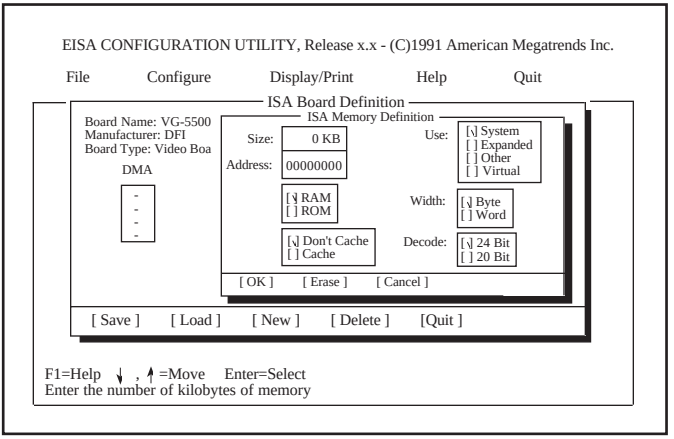
Select the starting and ending port address and the timing setting of the selected port address.

Choose OK to save the changes you have just made.

Choose Erase to delete the previously saved Port definition.

Choose Cancel to return to the ISA Board Definition box without saving the changes.

"Memory" allows you to define up to eight (8) memory addresses. Select one of the Memory options and press <Enter>. The ISA Memory Definition box shown below will appear.



Select the appropriate options in the ISA Memory Definition box.

Choose OK to save the changes you have just made.

Choose Erase to delete the previously saved Memory definition.

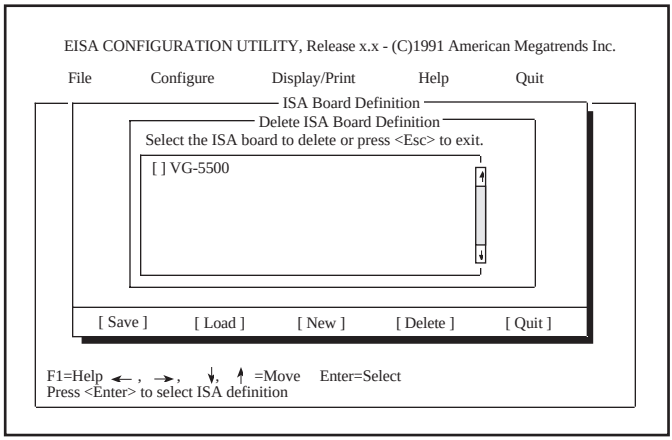
Choose Cancel to return to the ISA Board Definition box without saving the changes.

After you have finished configuring the board, choose Save to save the configuration in an ISA CFG file.

Choose Load to edit a previously saved ISA CFG file. The Load ISA Board Definition box shown on pages 4-27 and 4-28 will appear. Highlight the ISA board to be edited and press <Enter>.

Choose New to start a new ISA board configuration.

Choose Delete to remove an ISA board definition from the ECU's internal ISA board database. The Delete ISA Board Definition box shown below will appear.



Quit returns you to the main menu without saving any changes.

Check CFG File

Checks CFG files for proper syntax. To check the CFG file:

1. Choose the Configure Check CFG File command.

2. The File Selection box will appear. Select the CFG file you want to check. You may select more than one file at a time. Choose OK.

3. The Parser Messages box will appear. Any syntax errors detected by the utility will be displayed in this box. Choose OK after you have finished viewing.

Write Ext. CMOS

This command will copy the data stored in the CMS file into the Extended CMOS Memory. It will erase any previously saved configuration information. To Write to Extended CMOS:

1. Choose the Configure Write Ext. CMOS command.

2. The Write Extended CMOS box will appear. Choose OK.

3. Once the data in the CMS file has been saved into the CMOS memory, the Status box will appear informing you that the CMOS memory has been updated. Choose OK.

Board ID Map

The Board ID Map command displays the IDs of the boards that are physically present in the system.

Choose Configure Board ID Map command and the Physical Board ID Map box will appear. Physical Board ID Map shows which boards are physically installed in your system. Only boards with readable IDs are shown.

Choose OK after you have finished viewing.

Display/Print Menu

This menu allows you to display or print previously saved configuration information. To Display or Print:

1. Choose the Display/Print menu. The Display/Print box will appear.

2. The Information option on the left side of the Display/Print box provides you with a list of information. You may choose more than one piece of information at a time.

3. The Source option in the upper-right side of the box allows you to choose the board.

   If you choose Selected Boards, a Board Selection box will appear. Select the board and choose OK.

4. Finally, choose where the information is to be sent, to the Screen, to the Printer, or to a File.

   If you choose File, a Print Filename box will appear. Enter the filename and press <Enter>.

5. After making the appropriate selections, choose OK, otherwise, choose Cancel to return to the main menu.

Help Menu

The EISA Configuration Utility provides you with an extensive on-line Help menu. It may be accessed any time by pressing the <F1> key or by choosing the Help menu.

Quit Menu

The configurations created or modified in the EISA Configuration Utility will be saved and stored in the extended CMOS memory. These configurations will not take effect unless the system is rebooted. The Quit menu allows you to reboot the system or exit to DOS. To Quit:

1. Choose the Quit menu.

2. The Exit to DOS/Reboot box will appear.

   Choose:
   Yes - to return to DOS.
   No - to cancel and return to the main menu.
   Reboot - to reboot the computer system.

❖ DEMM 386 Software Driver

DEMM 386 is a software driver that is used on the E486-33/50IC and/or E486DX2-50IC system board to translate extended memory into expanded memory. Copy the DEMM386.SYS driver from the diskette provided into your root directory. After copying the driver, add this line to your CONFIG.SYS file:

Device = DEMM386.SYS [/B=xxxx] [/H=yy] [/S=zz] [/T=tttt] [/X=aaaa-bbbb] [/I=cccc-dddd] [/L]

Note:
This line should be placed before any other drivers that use extended memory.

xxxx is the EMS page frame base address in hexadecimal. In expanded memory management, a contiguous 64KB page frame segment must be reserved. The following are valid page frame addresses; C000, C400, C800, CC00, D000, D400, D800, DC00 and E000. The default page frame address is E000.

yy is the maximum handle numbers (in hexadecimal) to be reserved. The default value is 40H (64 in decimal).

zz is the maximum number of contexts (in hexadecimal) to be reserved. The default value is 40H (64 in decimal).

tttt specifies an area of the extended memory (in kilobytes) to be reserved and should not be used by the EMS driver. Without the /T option, all

of the extended memory will be used as expanded memory.

aaaa-bbbb specifies that a certain range of memory should be excluded from EMS mapping. aaaa is the starting segment address and bbbb is the ending segment address of the range. For example, if there is a network adapter in your system that occupies memory from D000 to D3FF, specify /X=D000-D3FF to exclude this range from EMS mapping.

cccc-dddd specifies that a certain range of memory should be included in EMS mapping. cccc is the starting segment address and dddd is the ending segment address of the range. This option is very useful if you want the EMS driver to utilize unused video area. For example, if a Hercules graphics adapter is installed in your system, the memory range between A000 to AFFF is not used at all. By specifying /I=A000-AFFF, the EMS driver will utilize the area for EMS mapping.

/L specifies that the backfill area (384KB from 4000:0 to 9000:FFFF) will be used exclusively as conventional memory. The EMS driver will not be able to use this area as page frames or EMS pages.

Note:
All the parameters are optional and need only to be added in certain instances, depending on your application.

❖ Troubleshooting Checklist

If you experience difficulty with the E486-33/50IC and/or E486DX2-50IC 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).

❖ Appendix A: Types of Modules

The E486-33/50IC and/or E486DX2-50IC system board allows you to populate memory with 256K x 9, 1M x 9, and 4M x 9 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

During the POST (Power On Self Test) routines, which are performed each time the system is powered on, errors may occur. Errors can be fatal or non-fatal.

Fatal Errors

Fatal errors are those which will not allow a system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

Beep Count	Error Message
1	Refresh Failure
2	Parity Error
3	Base 64KB Memory Failure
4	Timer Not Operational
5	Processor Error
6	8042 - Gate A20 Failure
7	Processor Exception Interrupt Error
8	Display Memory Read/Write Error
9	ROM Checksum Error
10	CMOS Shutdown Read/Write Error

Non-Fatal Errors

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Error Message

1. CH-2 Timer Error
2. INTR #1 Error
3. INTR #2 Error
4. CMOS Battery State Low
5. CMOS Checksum Failure
6. CMOS Options Not Set
7. CMOS Display Type Mismatch
8. Display Switch Not Proper
9. Keyboard is Locked...Unlock It
10. Keyboard Error
11. KB/Interface Error
12. CMOS Memory Size Mismatch
13. FDD Controller Failure
14. HDD Controller Failure
15. C: Drive Error
16. D: Drive Error
17. C: Drive Failure
18. D: Drive Failure
19. CMOS Time & Date Not Set
20. Cache Memory Bad, Do not Enable Cache
21. 8042 Gate-A20 Error
22. Address Line Short!
23. DMA #2 Error/DMA #3 Error/DMA Error
24. No ROM Basic
25. Diskette Boot Failure/Invalid Boot Diskette
26. On Board Parity Error/Off Board Parity Error/ Parity Error????

❖ Appendix C: Memory & I/O Maps

Memory Address Map

Address	Name	Function
000000 to 09FFFF	640K System Board RAM	System Board Memory
0A0000 to 0BFFFF	128K Video Display Memory	Reserved for Graphics Display Memory
0C0000 to 0DFFFF	128K I/O Expansion ROM	Reserved for ROM on I/O Adapter Card
0F0000 to 0FFFFF	64K ROM on the System Board	Duplicated Code Assignment at Address FF0000
0100000 to 3FFFFFF	Maximum Memory 63M	System Board Memory
FFFF0000 to FFFFFFFF	64K ROM on the System Board	Duplicated Code Assignment at Address 0F0000

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
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/0. Hex 100 to 3FF are available on the I/O channels.

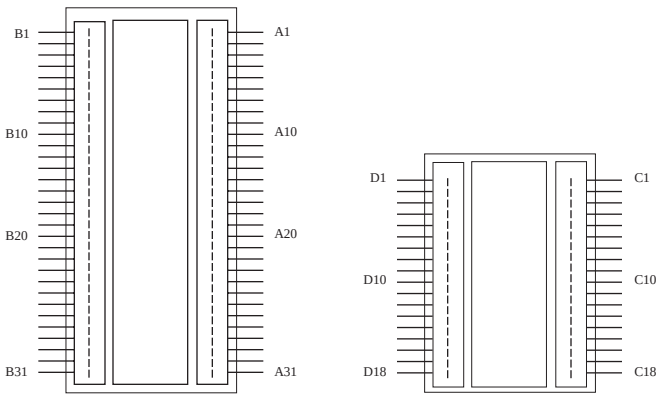
EISA I/O Address Map

I/O Address	Read/Write Only	Function
0400h		Reserved
0401h	rw	DMA Ch-0 High Base & Current Count
0402h		Reserved
0403h	rw	DMA Ch-1 High Base & Current Count
0404h		Reserved
0405h	rw	DMA Ch-2 High Base & Current Count
0406h		Reserved
0407h	rw	DMA Ch-3 High Base & Current Count
0408h		Reserved
0409h		Reserved
040Ah	ro	DMA Interrupt pending register
040Ah	wo	DMA (0-3) Chaining Mode register
040Bh	wo	DMA (0-3) Extended Mode register
040Ch	ro	Host CPU/EISA Master
040Dh		Reserved
040Eh		Reserved
040Fh		Reserved
0461h	rw	Extended NMI and reset control register
0462h	wo	Software NMI register
0464h	ro	Last EISA Bus Master granted (L)
0465h	ro	Last EISA Bus Master granted (H)
0480h		Reserved
0481h	rw	DMA Ch 2 High Page register
0482h	rw	DMA Ch 3 High Page register
0483h	rw	DMA Ch 1 High Page register
0484h		Reserved
0485h		Reserved
0486h		Reserved
0487h	rw	DMA Ch 0 High Page register
0488h		Reserved
0489h	rw	DMA Ch 6 High Page
048Ah	rw	DMA Ch 7 High Page register
048Bh	rw	DMA Ch 5 High Page register
048Ch		Reserved
048Dh		Reserved
048Eh		Reserved
048Fh		Reserved

I/O Address	Read/Write Only	Function
04C2h		Reserved
04C6h	rw	DMA Ch-5 High Base & Current Count
04CAh	rw	DMA Ch-6 High Base & Current Count
04CEh	rw	DMA Ch-7 High Base & Current Count
04D0h	rw	INT-1 edge/level control register
04D1h	rw	INT-2 edge/level control register
04D2h		Reserved
04D3h		Reserved
04D4h	wo	DMA (4-7) Chaining Mode register
04D4h	ro	DMA Chaining Mode Status register
04D5h		Reserved
04D6h	wo	DMA (4-7) Extended Mode register
04D7h		Reserved
04D8h		Reserved
04D9h		Reserved
04DAh		Reserved
04DBh		Reserved
04DCh		Reserved
04DDh		Reserved
04DEh		Reserved
04DFh		Reserved
04E0h	rw	DMA CH0 Stop register bits <7:2>
04E1h	rw	DMA CH0 Stop register bits <15:8>
04E2h	rw	DMA CH0 Stop register bits <23:16>
04E3h		Reserved
04E4h	rw	DMA CH1 Stop register bits <7:2>
04E5h	rw	DMA CH1 Stop register bits <15:8>
04E6h	rw	DMA CH1 Stop register bits <23:16>
04E7h		Reserved
04E8h	rw	DMA CH2 Stop register bits <7:2>
04E9h	rw	DMA CH2 Stop register bits <15:8>
04EAh	rw	DMA CH2 Stop register bits <23:16>
04EBh		Reserved
04ECh	rw	DMA CH3 Stop register bits <7:2>
04EDh	rw	DMA CH3 Stop register bits <15:8>
04EEh	rw	DMA CH3 Stop register bits <23:16>
04EFh		Reserved

I/O Address	Read/Write Only	Function
04F0h		Reserved
04F1h		Reserved
04F2h		Reserved
04F3h		Reserved
04F4h	rw	DMA CH5 Stop register bits <7:2>
04F5h	rw	DMA CH5 Stop register bits <15:8>
04F6h	rw	DMA CH5 Stop register bits <23:16>
04F7h		Reserved
04F8h	rw	DMA CH6 Stop register bits <7:2>
04F9h	rw	DMA CH6 Stop register bits <15:8>
04FAh	rw	DMA CH6 Stop register bits <23:16>
04FBh		Reserved
04FCh	rw	DMA CH7 Stop register bits <7:2>
04FDh	rw	DMA CH7 Stop register bits <15:8>
04FEh	rw	DMA CH7 Stop register bits <23:16>
04FFh		Reserved
0C80h	ro	System Board ID Byte 1
0C81h	ro	System Board ID Byte 2
0C82h	ro	System Board ID Byte 3
0C83h	ro	System Board ID Byte 4
0C84h	ro	System Board Enable

❖ Appendix D: I/O Channel Pin Assignments



I/O Channel Pin Numbering

I/O Pin	Signal Name	I/O
A1	-I/O CHK	I
A2	SD7	I/O
A3	SD6	I/O
A4	SD5	I/O
A5	SD4	I/O
A6	SD3	I/O
A7	SD2	I/O
A8	SD1	I/O
A9	SD0	I/O
A10	-I/O CHRDY	I
A11	AEN*	O
A12	SA19	I/O
A13	SA18	I/O
A14	SA17	I/O
A15	SA16	I/O
A16	SA15	I/O
A17	SA14	I/O
A18	SA13	I/O
A19	SA12	I/O
A20	SA11	I/O
A21	SA10	I/O
A22	SA9	I/O
A23	SA8	I/O
A24	SA7	I/O
A25	SA6	I/O
A26	SA5	I/O
A27	SA4	I/O
A28	SA3	I/O
A29	SA2	I/O
A30	SA1	I/O
A31	SA0	I/O

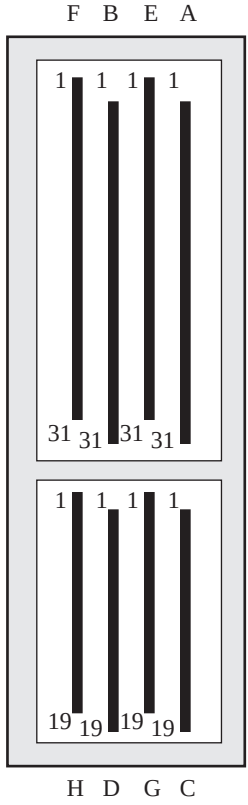
* *Slot specific signal.*

I/O Pin	Signal Name	I/O
B1	Gnd	Gnd
B2	Reset Drv	O
B3	+5V DC	Power
B4	IRQ9	I
B5	-5V DC	Power
B6	DRQ2	I
B7	-12V DC	Power
B8	OWS	I
B9	+12V DC	Power
B10	Gnd	Gnd
B11	-Sememw	O
B12	-Sememr	O
B13	-IOW	I/O
B14	-IOR	I/O
B15	-Dack3	O
B16	-DRQ3	I
B17	-Dack1	O
B18	DRQ1	I
B19	-Refresh	I/O
B20	CLK	O
B21	IRQ7	I
B22	IRQ6	I
B23	IRQ5	I
B24	IRQ4	I
B25	IRQ3	I
B26	-Dack2	O
B27	T/C	O
B28	Bale	O
B29	+5V DC	Power
B30	Osc	O
B31	Gnd	Gnd

I/O Pin	Signal Name	I/O
C1	SBHE	I/O
C2	LA23	I/O
C3	LA22	I/O
C4	LA21	I/O
C5	LA20	I/O
C6	LA19	I/O
C7	LA18	I/O
C8	LA17	I/O
C9	-Memr	I/O
C10	-Memw	I/O
C11	SD08	I/O
C12	SD09	I/O
C13	SD10	I/O
C14	SD11	I/O
C15	SD12	I/O
C16	SD13	I/O
C17	SD14	I/O
C18	SD15	I/O

I/O Pin	Signal Name	I/O
D1	-Mem CS16	I
D2	-I/O CS16	I
D3	IRQ10	I
D4	IRQ11	I
D5	IRQ12	I
D6	IRQ13	I
D7	IRQ14	I
D8	-Dack0	O
D9	DRQ0	I
D10	-Dack5	O
D11	DRQ5	I
D12	-Dack6	O
D13	DRQ6	I
D14	-Dack7	O
D15	DRQ7	I
D16	+5V DC	Power
D17	-Master	I
D18	Gnd	Gnd

❖ Appendix E: EISA I/O Pin Assignments



Note:
Rows A, C, B and D are ISA contacts
Rows E, G, F and H are EISA contacts

I/O Pin	Signal Name	I/O
E1	-CMD	O
E2	-Start	I/O
E3	Exrdy	I/O
E4	-EX32	I/O
E5	Gnd	Gnd
Access Key		
E7	-EX16	I/O
E8	-SLBurst	I
E9	-MSBurst	I/O
E10	W-R	I/O
E11	Gnd	Gnd
E12	Reserved	
E13	Reserved	
E14	Reserved	
E15	Gnd	Gnd
Access Key		
E17	-BE1	I/O
E18	-LA31	I/O
E19	Gnd	Gnd
E20	-LA30	I/O
E21	-LA28	I/O
E22	-LA27	I/O
E23	-LA25	I/O
E24	Gnd	Gnd
Access Key		
E26	LA15	I/O
E27	LA13	I/O
E28	LA12	I/O
E29	LA11	I/O
E30	Gnd	Gnd
E31	LA9	I/O

I/O Pin	Signal Name	I/O
F1	Gnd	Gnd
F2	+5V	Power
F3	+5V	Power
F4	XXXXXX	
F5	XXXXXX	
Access Key		
F7	XXXXXX	
F8	XXXXXX	
F9	+12	Power
F10	M-IO	I/O
F11	-Loc	O
F12	Reserved	
F13	Gnd	Gnd
F14	Reserved	
F15	-BE3	I/O
Access Key		
F17	-BE2	I/O
F18	-BE0	I/O
F19	Gnd	Gnd
F20	+5V	Power
F21	-LA29	I/O
F22	Gnd	Gnd
F23	-LA26	I/O
F24	-LA24	I/O
Access Key		
F26	-LA16	I/O
F27	-LA14	I/O
F28	+5V	Power
F29	+5V	Power
F30	Gnd	Gnd
F31	LA10	I/O

I/O Pin	Signal Name	I/O
G1	LA7	I/O
G2	Gnd	Gnd
G3	LA4	I/O
G4	LA3	I/O
G5	Gnd	Gnd
Access Key		
G7	SD17	I/O
G8	SD19	I/O
G9	SD20	I/O
G10	SD22	I/O
G11	Gnd	Gnd
G12	SD25	I/O
G13	SD26	I/O
G14	SD28	I/O
Access Key		
G16	Gnd	Gnd
G17	SD30	I/O
G18	SD31	I/O
G19	MREQ	I

I/O Pin	Signal Name	I/O
H1	LA8	I/O
H2	LA6	I/O
H3	LA5	I/O
H4	+5V	Power
H5	LA2	I/O
Access Key		
H7	SD16	I/O
H8	SD18	I/O
H9	Gnd	Gnd
H10	SD21	I/O
H11	SD23	I/O
H12	SD24	I/O
H13	Gnd	Gnd
H14	SD27	I/O
Access Key		
H16	SD29	I/O
H17	+5V	Power
H18	+5V	Power
H19	MAK	O

❖ Appendix F: System Overview

82357 Integrated System Peripheral

The E486-33/50IC and/or E486DX2-50IC uses an 82357 integrated system peripheral that supports the following:

Provides Enhance DMA Functions
- ISA/EISA DMA compatible cycles
- 32-bit addressability
- Provides timing control for 8-, 16-, and 32-bit DMA data transfers
- Provides timing control for compatible, type "A", type "B", and type "C" (Burst) cycle types

Incorporates the Functionality of Two 82C59A Interrupt Controllers
- 14 independently programmable channels for level-or-edge triggered interrupts

Five Programmable 16-bit Counter/Timers

Provides Logic for Generation/Control of Non-Maskable Interrupts
- Parity errors for system and expansion board memory
- 8*u*s and 32*u*s bus timeout
- Immediate NMI interrupt via software control
- Fail-safe timer

DMA Channels

DMA Controller 1	DMA Controller 2
Ch0-Reserved for User	Ch4-Cascade for CTRL 1
Ch1-SDLC	Ch5-Reserved for User
Ch2-Diskette (IBM Personal Computer)	Ch6-Reserved for User
Ch3-Reserved for User	Ch7-Reserved for User

Note:
DMA controller 1 supports 8-bit Data Transfer
DMA controller 2 supports 16-bit Data Transfer

Address generation for DMA Channels 3 to 0

Source	DMA High Page Memory	DMA Low Page Memory	DMA Controller 1
Address	A31 < ——— > A24	A23 < ——— > A16	A15 < ——— > A0

Address generation for DMA Channels 7 to 5

Source	DMA High Page Memory	DMA Low Page Memory	DMA Controller 2
Address	A31 < ——— > A24	A23 < ——— > A17	A16 < ——— > A1

Page Memory Address

DMA Channel	I/O Address 8237 Compatible Segment	I/O Address Low Page Segment	I/O Address High Page Segment
0	0000h	0087h	0487h
1	0004h	0083h	0483h
2	0008h	0081h	0481h
3	000Ch	0082h	0482h
5	00C4h	008Bh	048Bh
6	00C8h	0089h	0489h
7	00CCh	008Ah	048Ah

System Interrupts

An NMI is an interrupt requiring immediate attention and has priority over the normal interrupt lines (IRQX). NMI interrupts are caused by the following conditions:

NMI Source
Parity #
Fail Safe Timer
IOCHK #
Bus Timeout
Write to Port 0462h

Interrupt Controller 1	Interrupt Controller 2
IRQ0-Timer Output 0 (Out 0)	IRQ8-Realtime Clock INT
IRQ1-Keyboard (Output Buffer Full)	IRQ9-Software Redirected to INT 0AH (IRQ2)
IRQ2-Interrupt from INTR2	IRQ10-Reserved
IRQ3-Serial Port 2	IRQ11-Reserved
IRQ4-Serial Port 1	IRQ12-Reserved
IRQ5-Parallel Port 2	IRQ13-Coprocessor
IRQ6-Diskette Controller	IRQ14-Fixed Disk Controller
IRQ7-Parallel Port 1	IRQ15-Reserved

Note:
Any or all interrupts including NMI may be masked. The 16 levels of system interrupts from high to low are ordered as: IRQ0>IRQ1>IRQ8>IRQ9>IRQ10>IRQ11 >IRQ12>IRQ13>IRQ14>IRQ15>IRQ3>IRQ4>IRQ5> IRQ6>IRQ7.

SystemTimers

	Interval Timer 1	Interval Timer 2
Channel 0	System Timer (IRQ0)	Fail-Safe Timer (NMI Interrupt)
Channel 1	Refresh Request Generator (15*u*s Rate Generator Period Signal)	
Channel 2	Tone Generation for Speaker	CPU Speed Control

Real-Time Clock

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

RAM Module

The DRAM memory of the E486-33/50IC and/or E486DX2-50IC system board can be expanded to a total of 64M using 256K x 9, 1M x 9, and 4M x 9 SIMMs. The DRAM controller uses a page mode design with an access time of 80ns or less.

Cache Module

The E486-33/50IC supports 64KB of direct map cache using 8K x 8 (25ns) SRAMs or 256KB using 32K x 8 (25ns) SRAMs.

Burst Cycles

The 486 microprocessor accepts burst cycles for any bus request that requires more than one data cycle. During burst cycles, a new data item is strobed into the 486 microprocessor for every clock rather than every other clock as in non-burst cycles.

82358 EISA Bus Controller

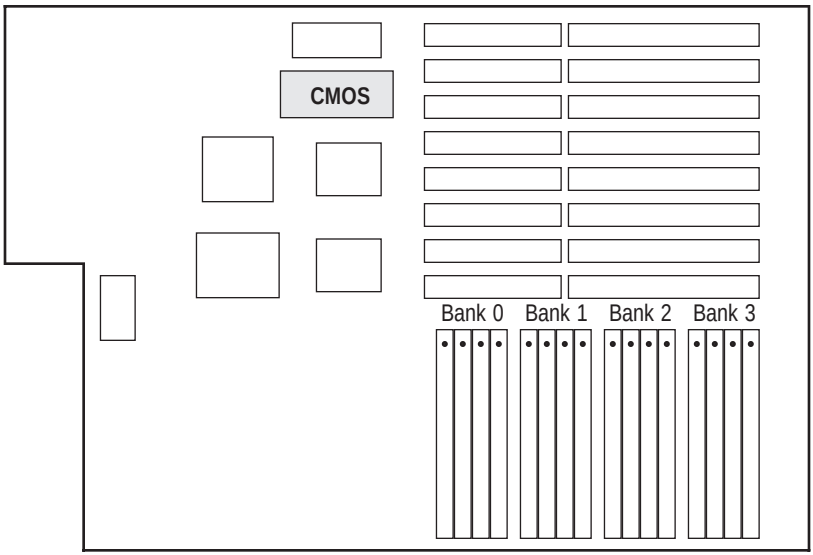
The E486-33/50IC and/or E486DX2-50IC system board uses the 82358 EISA Bus Controller that supports the following:

- Provides EISA/ISA bus cycle compatibility
- Interfaces host (CPU) bus to EISA/ISA bus
- Translates host bus cycles to EISA/ISA bus cycles
- Generates ISA signals for EISA masters
- Generates EISA signals for ISA masters
- Supports 8-, 16-, or 32-bit DMA cycles
- Supports host and EISA/ISA refresh cycles
- Generates control signals for address and data buffers
- Supports byte assembly/disassembly for 8-, 16-, or 32-bit data transfers
- Supports I/O recovery mechanism

Extended CMOS Memory

The E486-33/50IC and/or E486DX2-50IC system board has Extended CMOS Memory installed onboard. Configuration information is stored in the Extended CMOS Memory so that BIOS can initialize the system board and the expansion boards inserted in the EISA slots once you power up your system.

The Extended CMOS Memory uses 8Kx8 SRAM and is equipped with an internal battery. If the battery runs down, the information stored in the CMOS memory may be lost. It is then necessary to either reconfigure the system or copy the backup file of the configuration into the Extended CMOS Memory.



Location of the Extended CMOS Memory on the E486-33/50IC and/or E486DX2-50IC

❖ *Appendix G: Connector Pin Assignments*

Jumper J4
Keyboard Connector

Pin	Function
1	Keyboard Clock
2	Keyboard Data
3	No Connection
4	Ground
5	+5V DC

Jumpers J8, J16
Reset Switch Connector

Pin	Function
1	Reset Signal
2	Ground

* *Use only one.*

Jumper J6
Speaker Connector

Pin	Function
1	Speaker Data Out
2	No Connection
3	Ground
4	+5 V DC

Jumper J5
Power On and Keylock Connector

Pin	Function
1	LED Power
2	Key
3	Ground
4	Keyboard Inhibitor
5	Ground

Jumper J18
External Battery Connector

Pin	Function
1	Battery +3.6DC
2	Key
3	Ground
4	Ground

Connector Power J14A/B
Power Connector

Pin	Function
1	Power Good
2	+5V DC
3	+12V DC
4	-12V DC
5	Ground
6	Ground
7	Ground
8	Ground
9	-5V DC
10	+5V DC
11	+5V DC
12	+5V DC

❖ Appendix H: AMI BIOS Hard Disk Table

Type	Cyln	Head	WPcom	LZone	Sect	Size
1	306	4	128	305	17	10MB
2	615	4	300	615	17	20MB
3	615	6	300	615	17	31MB
4	940	8	512	940	17	62MB
5	940	6	512	940	17	47MB
6	615	4	65535	615	17	20MB
7	462	8	256	511	17	31MB
8	733	5	65535	733	17	30MB
9	900	15	65535	981	17	112MB
10	820	3	65535	828	17	20MB
11	855	5	65535	855	17	35MB
12	855	7	65535	855	17	50MB
13	306	8	128	319	17	28MB
14	733	7	65535	733	17	43MB
16	612	4	0	663	17	20MB
17	977	5	300	977	17	41MB
18	977	7	65535	977	17	57MB
19	1024	7	512	1024	17	60MB
20	733	5	300	732	17	30MB
21	733	7	300	732	17	43MB
22	733	5	300	733	17	30MB
23	306	4	0	336	17	10MB
24	925	7	0	925	17	54MB
25	925	9	65535	925	17	69MB
26	754	7	754	754	17	44MB
27	754	11	65535	754	17	69MB
28	699	7	256	699	17	41MB
29	823	10	65535	823	17	68MB

Type	Cyln	Head	WPcom	LZone	Sect	Size
30	918	7	918	918	17	53MB
31	1024	11	65535	1024	17	94MB
32	1024	15	65535	1024	17	128MB
33	1024	5	1024	1024	17	43MB
34	612	2	128	612	17	10MB
35	1024	9	65535	1024	17	77MB
36	1024	8	512	1024	17	68MB
37	615	8	128	615	17	41MB
38	987	3	987	987	17	25MB
39	987	7	987	987	17	57MB
40	820	6	820	820	17	41MB
41	977	5	977	977	17	41MB
42	981	5	981	981	17	41MB
43	830	7	512	830	17	48MB
44	830	10	65535	830	17	69MB
45	917	15	65535	918	17	114MB
46	1224	15	65535	1223	17	152MB
47			User defined			

❖ *Appendix I:Types of SRAMMs*

Cache Memory Size	Brand
8K x 8-25	Motorola
	SONY
	MHS
16K x 4-20	Motorola
32K x 8-25	Motorola
	Hitachi
	Fujitsu

E486-33/50IC
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System Board
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