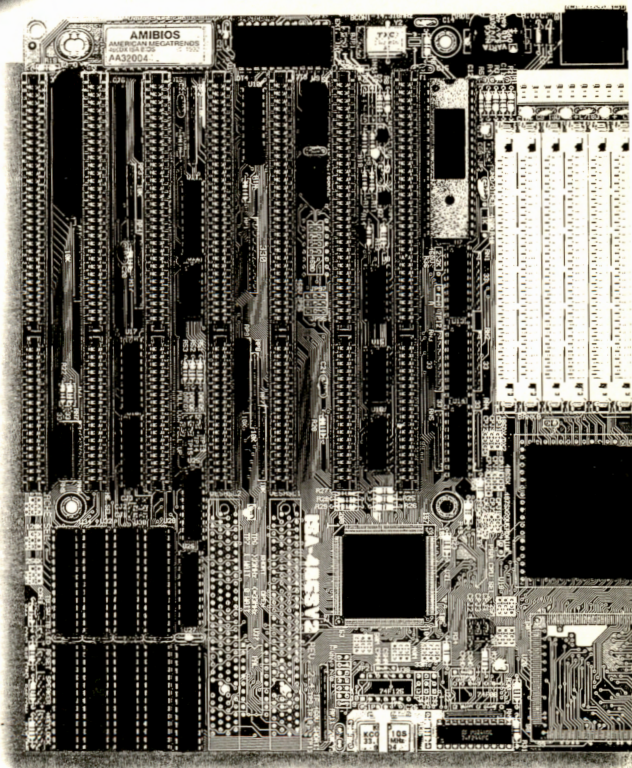


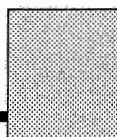
# ISA-486SV2

## MAIN BOARD



**USER'S MANUAL**

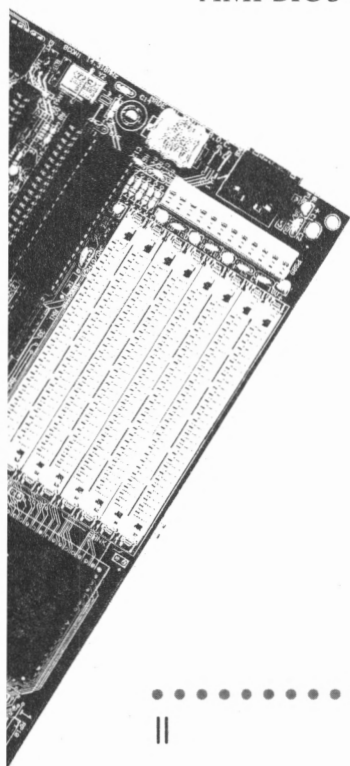
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## Introduction

This manual introduces the ISA-486SV2 and explains how to setup and use it. In addition to an overview of the design and features of the ISA-486SV2, the manual provides useful information if you want to change the configuration of the board or a system it is installed in.

First a word of caution. If the ISA-486SV2 is already installed in a system, it was most likely set up by your system dealer to meet the specific requirements of your system. This may include changes to the basic settings of the board. If you decide to make any changes yourself, make certain you don't violate your system warranty.

This manual provides all the information you need to upgrade or change the setup of the board. If however, you don't feel confident of your ability to work on it yourself, ask your dealer or a qualified technician to do it for you.

## ISA-486SV2 Features

The mainboard has several CPU upgrade options. It has space for a surface-mounted i486SX CPU running at 20 or 25 MHz. It also has a PGA CPU socket that can use an i486SX, i487SX, i486DX, i486DX2 or Overdrive PGA CPU. These CPUs are available in a range of speeds. You can use any Intel CPU of any speed with this mainboard by changing its clock jumper settings and/or the oscillator to a speed that matches the CPU in use.

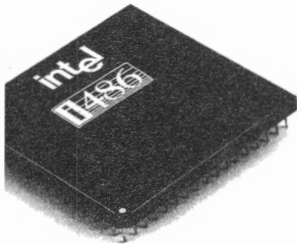
For example, if the model you have has the surface-mounted i486SX running at 20MHz and you want to upgrade, you can install an i487SX or an OverDrive of the same speed in the plug-in CPU socket. Alternatively, you could install a more powerful CPU such as the i486DX or i486DX2 in the socket, switch the oscillator and set the

clock speed and oscillator jumpers to match the speed of the new CPU. If your mainboard doesn't have a surface-mounted i486SX then the clock speed setting must match the CPU installed in the plug-in socket.

The ISA-486SV2 has seven 16-bit ISA expansion slots.

The mainboard's external cache subsystem accommodates three cache sizes, 64KB, 128KB and 256KB. The very fast speed of this SRAM (Static Random Access Memory) cache greatly increases the mainboard's performance. This mainboard uses a single ASIC chip to implement all AT logic functions.

The mainboard is a compact 22.1cm x 24.6cm (8.7 by 9.7 inches), a size sometimes referred to as "2/3 Baby AT". It has five mounting holes, two of which are double drilled. This allows the board to be mounted in a wide variety of cases, using various types of mounting hardware. The board uses either an external battery or a rechargeable Ni-Cad battery mounted on board to maintain the system configuration information you select in the BIOS setup program.



## Static Electricity Precautions

Under the right conditions static electricity will build up in your body. If you touch the mainboard or other sensitive components the build-up will discharge into the components and circuitry. Computer components are sensitive to damage from static electric discharge. They can be damaged or even destroyed if the discharge is powerful enough. Static build-up is most likely to occur in dry cold conditions, but it is important to be cautious in all circumstances.

To protect the mainboard and other components against damage from static electric discharge you should follow some basic precautions whenever you handle them:

1. Use an anti-static wrist strap. The strap will have an "alligator" clip at the end of a shielded wire lead. Clip it to a grounded object. Any static electricity will then harmlessly discharge through the strap. Put on and connect the strap *before* you handle the components.

2. Use an anti-static pad. Put the mainboard and any other components on the pad whenever you work on them outside the computer.

Both of these items are inexpensive and are generally available from computer supply companies.

## Numeric Coprocessor

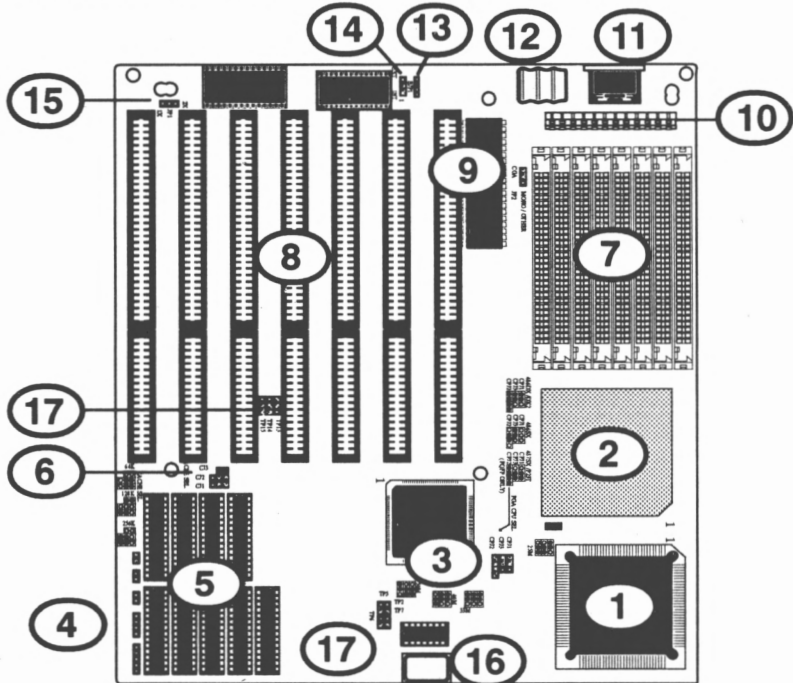
You can upgrade an i486SX CPU to a CPU with an internal numeric coprocessor by using the PGA CPU upgrade socket.

## Component Layout

The diagrams on the following pages show the location of important components on the mainboard.

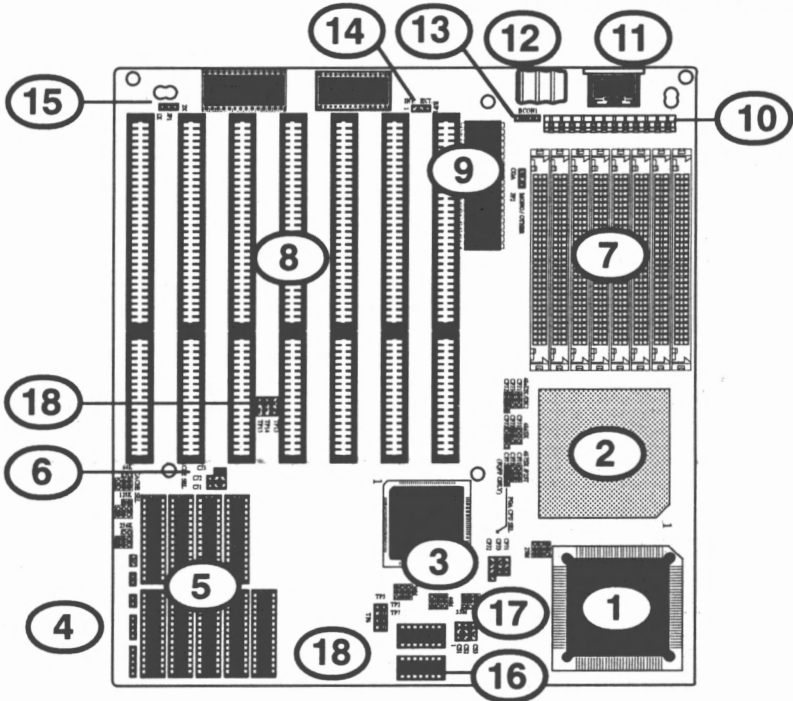


## ISA-486SV2 version 2.4



- |   |                                      |
|---|--------------------------------------|
| 1. i486SX PQFP CPU (optional)                             | 9. Video mode jumper JP2             |
| 2. PGA CPU  | 10. Power supply connector           |
| 3. CPU type selector jumpers, CPJ1, 2&3                   | 11. Keyboard connector               |
| 4. Case function connectors                               | 12. On board battery (some models)   |
| 5. External cache subsystem (some models)                 | 13. External battery connector BCON1 |
| 6. Cache size selection jumpers, CJ1, 2 & 3 (some models) | 14. Battery selection jumper BJP1    |
| 7. DRAM module sockets                                    | 15. 20MHz jumper JP1                 |
| 8. Expansion slots, seven 16-bit                          | 16. Oscillator (some models)         |
|   | 17. TP jumpers                       |

ISA-486SV2 version 2.5



- |   |  |
|---|--|
| 1. i486SX PQFP CPU (optional)                             | 11. Keyboard connector                         |
| 2. PGA CPU  | 12. On board battery (some models)             |
| 3. CPU type selector jumpers, CPJ1, 2&3                   | 13. External battery connector BCON1           |
| 4. Case function connectors                               | 14. Battery selection jumper BJP1              |
| 5. External cache subsystem (some models)                 | 15. 20MHz jumper JP1                           |
| 6. Cache size selection jumpers, CJ1, 2 & 3 (some models) | 16. Clock generator chip (some models)         |
| 7. DRAM module sockets                                    | 17. Clock Speed jumpers CS1, 2&3 (some models) |
| 8. Expansion slots, seven 16-bit                          | 18. TP jumpers                                 |
| 9. Video mode jumper JP2                                  |  |
| 10. Power supply connector                                |  |

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# Setup Guide

Setting up the ISA-486SV2 is very easy. Depending on which version of the mainboard you have, there are up to twelve jumper switches to set up features on the board. JP1 is for the CPU's clock speed. JP2 is for the display type. BJP1 selects the battery type. CPJ1, 2 & 3 select the CPU type. If you have an external cache, CJ1, 2 & 3 select the cache size. If present, CS1, 2 & 3 are also for the CPU's clock speed. On some versions you must replace an oscillator if you install a CPU with a different clock speed. This section also has information on switching the CPU and installing an upgrade CPU. If the board is already installed, you won't need the information in this section since your system dealer will already have made the necessary adjustments. However, if you want to make changes to your system or set up the board for the first time, read on.

## Jumper Switches

Jumper switches select between two options. The switches have several pins projecting up from the mainboard. In the case of three-pin jumpers, placing the cap over two pins makes a selection. With two-pin jumpers, covering (shorting) both pins or leaving them uncovered makes the selection.

If you decide to change the jumper setting, make sure the board has been disconnected from the power source first. This is to protect both you and the mainboard from damage.

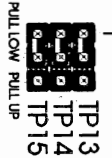
In addition to the user adjustable jumpers mentioned above, there are several factory-set jumpers. These jumpers are marked with the initials "TP" and *must not* be changed. If they are not correct, the mainboard might not function. You should note the factory settings before you make any changes to the mainboard setup. All jumper locations are shown on the board illustrations in the Introduction.



## "TP" Jumpers

There are seven jumpers marked with the initials "TP". They are set at the factory. For your reference the correct setting are shown below:

TP 13,14,15 setting

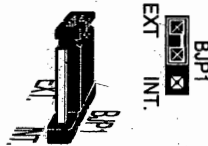


## Battery Selection Jumper BJP1

The mainboard may not have an on-board battery, in which case the setting for this jumper is "EXT". If you are using an external battery, it is connected to "BCON1".

### Battery selection jumper BJP1 setting

setting for external battery

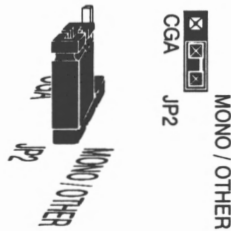


## Video Jumper JP2

JP2 selects the type of display you are using. The choices are between "CGA" and "MONO/OTHER". "CGA" is only for a CGA display. "MONO/OTHER" is for all other displays, including EGA, VGA and MONO. The default setting is "MONO/OTHER".

### Video jumper JP2 default setting

**Remember: The MONO/OTHER setting is for all color or monochrome display cards except CGA.**



## The Cache Size Selection Jumper Block

If your board has an external cache, CJ1, CJ2 and CJ3 form a group of three jumper switches which set the size of the cache installed, either 64KB, 128KB or 256KB.

### Cache size selection jumper settings



**64KB cache**



**128KB cache**



**256KB cache**

Chapter 3 has more information on how to configure the cache.

## Upgrading the CPU

If you want to install a PGA type CPU or upgrade an existing PGA type CPU, you must do the following:

1. Set jumpers CPJ1, 2 and 3 correctly for the new CPU.
2. If you are changing the CPU speed, reset JP1 if necessary, and CS1, 2 & 3 if they are present.
3. Install a new oscillator if your board has one.

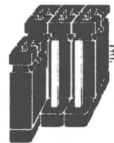
### PGA CPU Type Jumpers CPJ1, 2 & 3

CPJ1, 2 & 3 select the CPU type and position. If your board already has a CPU installed, the jumpers will be set. You don't need to check or change the settings unless you want to change the CPU or you suspect the board is not functioning properly because the switches are set incorrectly. There are diagrams printed on the board that illustrate the settings.

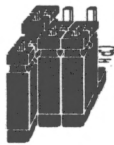
### PGA CPU type selection jumper settings for CPJ1, 2 & 3



486SX



486DX/486DX2



487SX/OverDrive  
PQFP CPU ONLY



## CPU Speed Settings

Depending the version of your board, when you change or upgrade to a CPU installed in the PGA type CPU socket, you may have to adjust jumper JP1, clock speed jumpers CS1, 2 & 3, and/or the oscillator.

### Jumpers JP1, CS1, 2 & 3 and Oscillator

Depending on the speed and type of PGA type CPU installed, you must change the speed settings if you change the CPU speed. If you are installing an i486SX, or i486DX this speed is the same as the CPU speed.

i486DX2 and OverDrive CPUs have two clock speeds, internal and external. The external speed is relevant here. For example, a 486DX2-50 has an external clock speed of 25MHz, so you would use a 25MHz oscillator.

### Oscillator jumper JP1 setting



**External CPU speed  
is 20MHz  
short pins 2 & 3.**



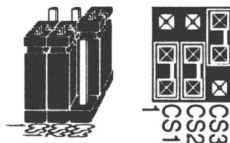
**All other CPU speeds  
short pins 1 & 2,**



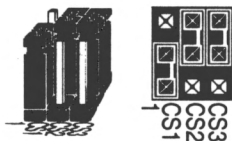
**Clock speed selection jumper settings CS1, 2 & 3  
for those mainboards which use a clock generator.**



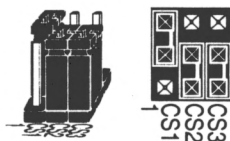
**33MHz**



**25MHz**



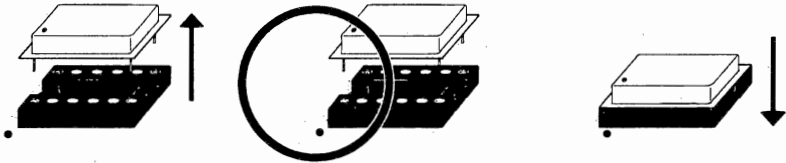
**40MHz**



**50MHz**

**Note: Use the 40MHz setting for a 20MHz CPU.  
For other CPU speeds, the setting must match the CPU speed.**

**Changing the oscillator  
for those mainboards which use an oscillator.**

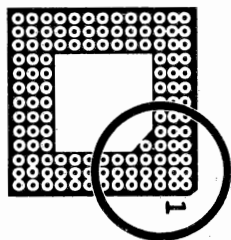


- 1. Pull out the old oscillator.**
- 2. Orient the dot on the top of the new oscillator to the dot next to the socket.**
- 3. Press it into the socket.**

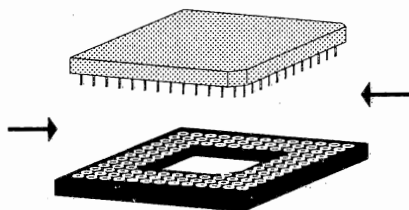
**Note: Use a 40MHz oscillator for a 20MHz CPU.**

**For other CPU speeds, the oscillator must match the CPU speed.**

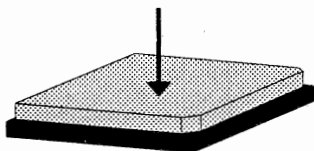
### Installing a PGA type CPU chip in a standard socket



The Pin 1 corner is marked by a notch and a 1 on the board.



Align the chip to the socket receptacles.



Press the chip into the socket

## Connectors

In addition to the jumper switches, the ISA-486SV2 also has seven connectors. Six of them resemble jumper switches. The seventh is a larger double connector for the power connection.

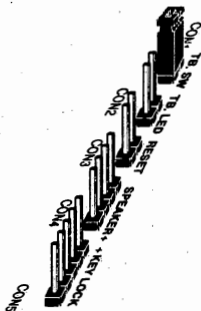
**Con 1:** The T.SW. (Turbo Switch) connector connects to a "Turbo" switch on a system case. This switches between the system's fast and slow processing speeds. The connector comes with a jumper cap covering the two pins. With the cap on, the mainboard is set to operate at its fast speed. You can remove the jumper cap to connect a Turbo switch.

**Con 2** The T.LED (Turbo LED) connector connects to the Turbo LED light on a system case. The light comes on when the mainboard is running at its fast speed. As you make this connection make sure the lead's polarity corresponds to the connector's polarity indications.

**Con 3:** The RESET connector connects to a Reset switch on your system case. Resetting the system cold restarts the computer from the self-test. Use Reset to restart without turning off the power.

**Con 4:** The SPEAKER connector connects to the speaker most system cases have.

## Connectors





**Con 5:** The KEYLOCK connector is for the keylock switch on a system case. This allows you to switch off the keyboard and so provide limited security against casual intruders.

**BCON1:** The battery connector is for an external battery if your mainboard doesn't have one on-board. If an external battery is connected, the jumper BJP1 must be set to "EXT".

If a case-mounted function does not work after you turn on the system, this is probably because the connector is improperly orientated. If this happens, turn off the system, disconnect the power and turn the lead connector around. After reconnecting everything, the function in question should work.

## Installing an Upgrade Processor

The PGA type CPU socket accomodates a 487SX or OVERDRIVE microprocessor. The installation procedure is the same as that of any other microprocessor for the PGA socket.

The ISA-486SV2 BIOS will automatically detect any upgrade processor's presence when you boot up.

## The Memory Subsystem

This part of the manual is about the memory subsystem, what it is, how it works and its possible configurations.

The DRAM or Dynamic Random Access Memory is the main information storage for the CPU. The ISA-486SV2's cache memory, which was described earlier, is a special static form of RAM. When the CPU looks for information, it first searches the cache. If the information is not there, the search continues in the DRAM. If the DRAM does not have the information either, then the CPU goes to a hard disk or another information storage peripheral.

The speed at which memory is addressed is measured in nano-seconds (ns). The ISA-486SV2 requires fast page mode DRAM modules with a speed of at least 80ns. Consult your dealer to upgrade your system memory.

The ISA-486SV2 uses memory chips in sets of nine or three which are permanently mounted on small circuit boards to form "SIMMs" (Single In-line Memory Modules).

The ISA-486SV2 mainboard can use three varieties of SIMMs. The first has a capacity of 256KB of storage. The second can hold up to 1MB and the third can hold up to 4MB. Depending on the combination of modules used, the board can use between 1 and 32MB when both SIMM banks of 4 sockets each are filled. Later in this section we will provide more information on possible configurations.

## Memory Design & Specifications

This section is about the organization of memory on your ISA-486SV2. As we mentioned earlier, system memory can be installed directly on the mainboard.

### The DRAM Subsystem

The memory subsystem has eight module mounting sockets which are divided into "banks" of four sockets each. These banks are labeled Bank 0 and Bank 1. Memory modules added to these banks must be installed a full bank at a time, and in sequence (0 then 1).

### Possible Memory Configurations

You can configure the memory of the ISA-486SV2 in a variety of ways, using different combinations of SIMM modules. The chart at right shows the possible combinations.

### DRAM Module Requirements

Due to the high-speed design of the ISA-486SV2, there are some special requirements regarding what kind of DRAM modules you can use for system memory.

There are several types of SIMM modules, not all of which can be used with the ISA-486SV2. This board requires modules with the following specifications:

**Module Size:** 256KB, 1MB or 4MB












**DRAM Mode:** Fast Page Mode

**DRAM Speed:** 80ns (or faster)

**RAS access time [Trac]:** 60ns - 80ns

**CAS access time [Tcac]:** 10ns - 25ns

## ISA-486SV2 memory configuration options

Total Memory	Bank 0	Bank 1
1MB		
2MB		
4MB		
8MB		
20MB		
16MB		
32MB		



Four 256KB SIMMs = 1MB



Four 1MB SIMMs = 4MB



Four 4MB SIMMs = 16MB

You'll note that in the preceding list "Fast Page Mode" is mentioned. This is the type of access method used for the DRAM. Almost all DRAM components use either "Normal" or "Page Mode" control. Normal is slower but more simply implemented. Fast Page mode is quicker but more complex.

Fast Page Mode has a more efficient data transfer speed than Normal Mode. When adding memory to the ISA-486SV2 you should use only Fast Page Mode DRAM.

In addition, you must also check the module's access time specifications. Previous mainboard designs let the user consider only the module's RAS access time. Due to the the ISA-486SV2's high speed design, the CAS access time must also be considered. DRAM with the same RAS access times can have an unsuitable CAS access time. Make sure that any memory you add meets all of the specifications noted in the list.

**NOTE:** Most 256K-bit DRAM is Page Mode, while almost all 1M-bit and 4M-bit DRAM is Fast Page Mode. Almost all CMOS-type DRAM is Fast Page Mode. When you purchase memory for the ISA-486SV2 you must make sure that the modules you buy meet the requirements noted above. The ISA-486SV2 can only use Fast Page mode.

## Installing Memory Modules

This section explains how to install SIMMs. The sockets used at the time of manufacture may vary from those illustrated but they are still functionally the same.

### Additional Safety Precautions

In addition to static electricity precautions noted earlier, you should also be concerned about physical damage to your memory modules. While installing components it is important not to touch the edge connectors with your fingers. The oils on your fingers can cause corrosion to form on the connectors. The best way to prevent this is to be careful not to touch the connector surfaces.

### Installation Procedure

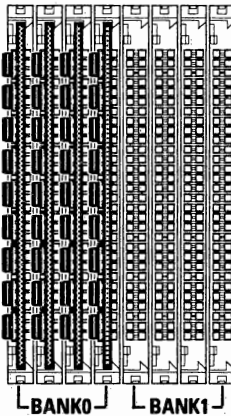
Decide what needs to go where and make sure you have everything you need. Check all your safety and anti-static precautions. See the preceding section for more information on this.

As you follow the procedure described, remove the modules from their anti-static protection one at a time only as you need them.

### Installing Modules On The Mainboard

- a. The modules should face to the left.
- b. Press the module edge connector into the socket at a slight angle to the board.
- c. The module should click into place as the retaining clips at each end of the socket snap into the retaining holes on the module.
- d. Repeat this procedure until the entire bank is filled.

### ISA-486SV2 memory banks



← The chips on the modules should face to the left



## Upgrading The Cache Subsystem (optional)

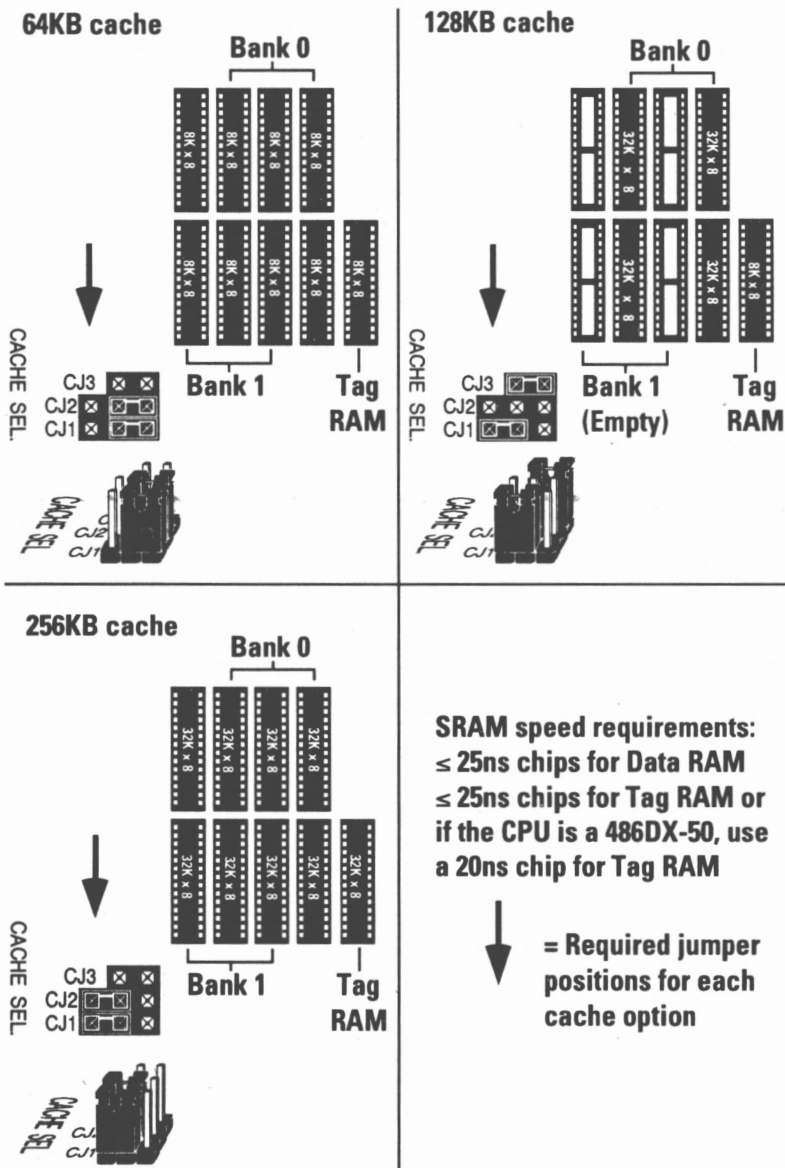
Depending on the version, your mainboard may have a cache of 64KB, 128KB or 256KB.

The cache SRAM chips come in two sizes, 8KB and 32KB. The eight cache sockets are divided into two banks of four chips, Bank 0 and Bank 1. Each cache configuration also uses one Tag chip. The chart below shows the configuration options for the secondary cache.

Cache Size	Tag RAM	Data RAM
64KB	One 8Kx8 SRAM	Eight 8Kx8 SRAMs
128KB	One 8Kx8 SRAM	Four 32Kx8 SRAMs*
256KB	One 32Kx8 SRAM	Eight 32Kx8 SRAMs

\* Four SRAMs in Bank 0

The following figures show the chip specifications and jumper settings for each cache configuration. If your mainboard has a cache, you must set the three jumpers that select the cache size as explained in Chapter 2.



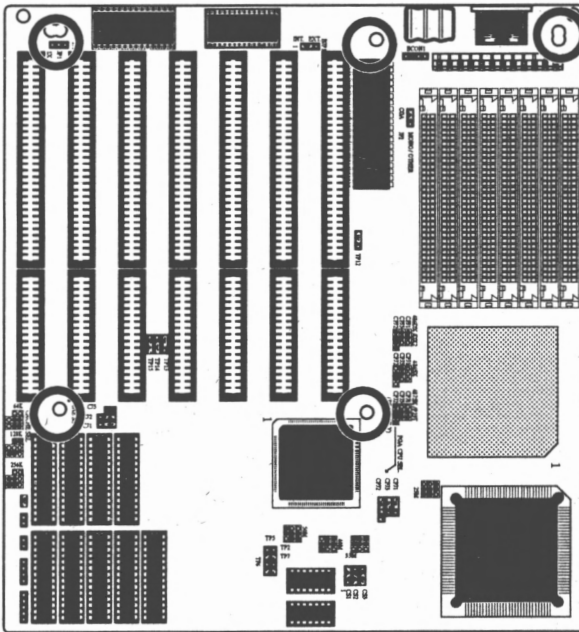
## Installation

If your ISA-486SV2 mainboard is not installed, this section will give you some useful basic information. The convenient size of the ISA-486SV2 makes it possible to install the board in a wide variety of cases. Therefore this section only covers factors common to installing the board in most situations.

Before removing the board from its anti-static bag, be sure to read the static electricity precautions in the Introduction.

The ISA-486SV2 has five mounting holes, including two double-drilled holes. These holes will line up with some of the mounting points in a system case.

### Mounting holes

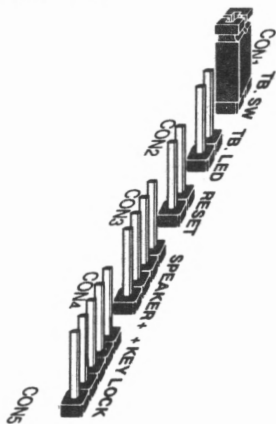


Usually screws are the only mounting hardware you need to securely anchor the board to the case. In some other cases the board's edge(s) fits under metal flanges built into the case frame.

Cases can come with a variety of mounting fasteners made of either metal or plastic. Most of the metal fasteners have two sections. The first part screws into the case and the second part screws the board to the fastener. Plastic fasteners usually snap into the case and then into the board. There are even cases which use both types since metal fasteners can ground the board to the case.

The next step is to hook up the case mounted functions with their appropriate connectors on the board as described in the section on connectors. These points are numbered and, except for the power connection, are labeled with their function. Most cases have these. When the case has a particular requirement for the orientation of a connector, check the positive ("+") markings on the board. If for some reason the function does not work, first turn off the system, next disconnect it from the power source. Then turn the connection around and try it again.

### External connectors



**Turbo SW**

**Turbo LED**

**Reset SW**

**Speaker**

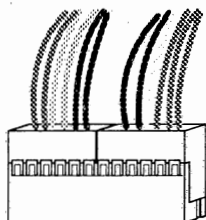
**KeyLock**

The last connection to attach is the power connection. As you prepare for this procedure, make sure that the power source is disconnected.

Most power supplies have two connectors which go to the mainboard. Each connector has six wires, two of which are black. As you attach these connectors to the board, orient them so that the black wires are together in the middle forming a row of four.

## Power supply connection

**The black wires should be to the inside**



## Installing Expansion Cards

After you have installed the ISA-486SV2 mainboard you should install any add-on or expansion cards. However, before you do this, make sure the machine is off.

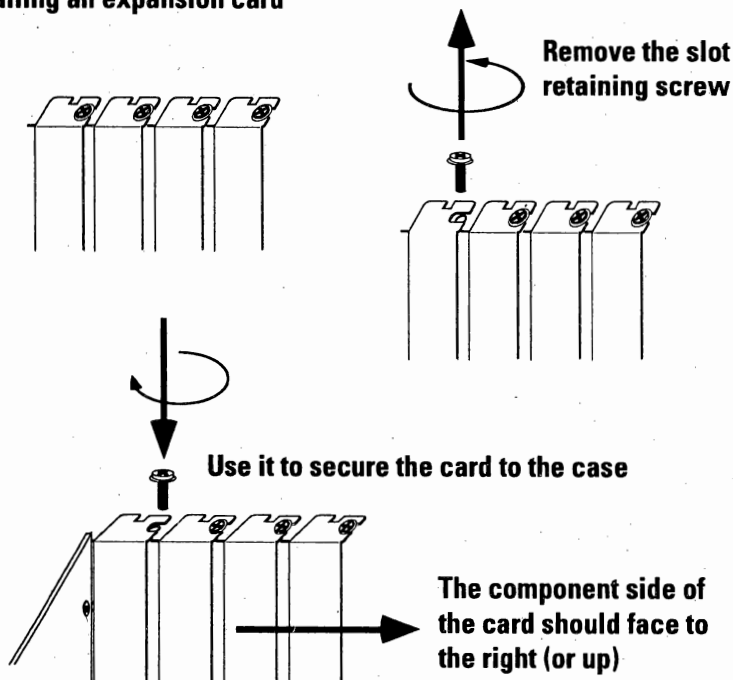
- a. First remove from the case the slot-cover corresponding to the position of the card you want to install. Save the slot cover's screws.
- b. Remove the card from its protective packaging.
- c. Insert the card in the slot. As you insert the card, keep it at a 90° angle to the mainboard with the edge connectors aligned to the slots.

d. Using the slot cover screws, attach the mounting bracket of the card to the case where you removed the slot cover.

e. Close the case.

The procedure for installing expansion cards in the expansion bus is the same for both 8-bit and 16-bit cards. Remember that this description only covers the basic installation procedure. Expansion cards often require pre-installation setup and sometimes post-installation software setup. Check any documentation that comes with a card for instructions on this.

### Installing an expansion card

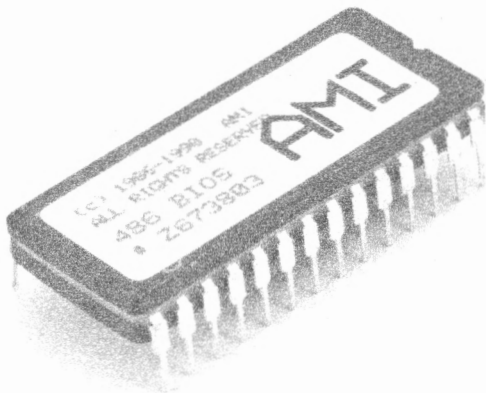


# AMI BIOS Setup Program

This chapter explains how to use the Setup program for the ISA-486SV2's AMI BIOS from American Megatrends Inc.

All computer system boards of this type have a set up program stored in the ROM BIOS. This program creates a record of the system hardware present and settings that control some functions of the board and system. If you received the ISA-486SV2 Mainboard installed as part of a system, the proper entries have probably already been made. If so, you might want to call up the Setup program as described later to take a look at them for future reference.

If you are installing the board you'll need to enter the set up information for the first time. This section explains how to use the program and make the appropriate entries.



The Setup program is stored in the BIOS ROM. When you turn the computer on, a screen message appears to give you an opportunity to call up the Setup program. It displays briefly during the POST (Power On Self Test). If it disappears before you have a chance to respond, reset the system by turning it OFF then ON or pushing the "RESET" button on the system cabinet. You can also restart by simultaneously typing the <Ctrl>, <Alt> and <Delete> keys. This message will then reappear:

"Hit <Del>, If you want to run SETUP".

After you press the <Del> key a screen will appear displaying the following choices.

BIOS SETUP PROGRAM - AMI BIOS SETUP UTILITIES (C)1992 American Megatrends Inc., All Rights Reserved			
STANDARD CMOS SETUP			
ADVANCED CMOS SETUP			
ADVANCED CHIPSET SETUP			
AUTO CONFIGURATION WITH BIOS DEFAULTS			
AUTO CONFIGURATION WITH POWER-ON DEFAULTS			
CHANGE PASSWORD			
AUTO DETECT HARD DISK			
HARD DISK UTILITY			
WRITE TO CMOS AND EXIT			
DO NOT WRITE TO CMOS AND EXIT			
Standard CMOS Setup for Changing Time, Date, Hard Disk Type, etc.			
ESC:Exit	↓↑ Sel	F2/F3:Color	F10:Save & Exit

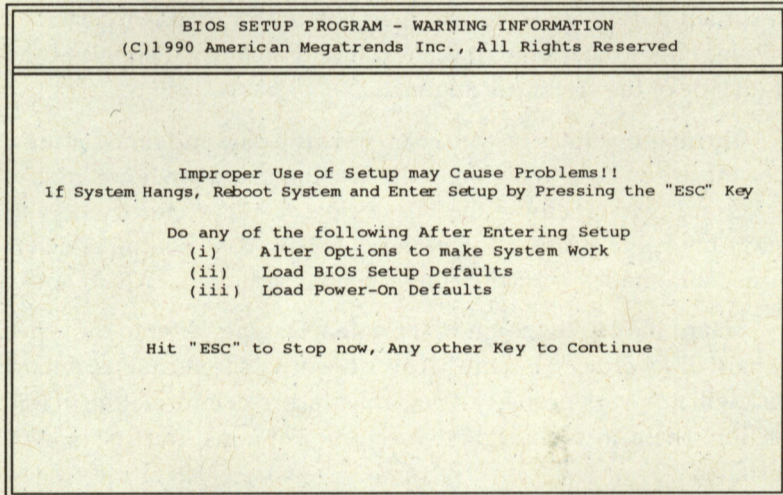


## The Improper Use Caution

After you select and enter the any of the setup utilities a warning screen appears to caution you against "Improper Use of Setup".

This screen tells you what to do in case the system won't work properly because there are incorrect entries somewhere in the settings you have made. It also tells you what you may do after you enter the Setup program. Type <Esc> to go back to the main menu or any other key to use the utility you selected.

## The Improper Use caution screen





## STANDARD CMOS SETUP

Use "STANDARD CMOS SETUP" for recording the basic system hardware setup. If your ISA-486SV2 is already installed in a working system you will not need to use this utility. If the configuration record is lost or you change your system hardware configuration you will need to recreate the record. The information can also be lost due to loss of battery support.

"STANDARD CMOS SETUP" displays a screen with a list of entries. Follow the on screen instructions to move around the screen. A small help window at the bottom of the screen explains how to use the arrow keys to move between the fields; <Page Up> and <Page Down> to make changes; <F2> and <F3> to change the color scheme of the display; and <Esc> to exit the utility. Another window in the lower left part of the screen displays choices for each item listed as you highlight that item. The calendar and memory displays at the right side of the screen are automatic.

The first two lines on the screen have the date and time settings. Use the arrow keys to highlight the month, date, year, hour, minute or second field. Then use the <Page Up> or <Page Down> keys to select the value you want in each field. The "day" setting is determined automatically by the other calendar settings.

"Hard disk C: type:" and "Hard disk D: type" refer to the types of hard disks present. Be sure to check the drive specifications. A hard disk will not work properly if you enter incorrect information in this section. There are forty-eight disk selection options. The first is "Not Installed".

Nos. 1-46 are a pre-defined list of drive specifications, many of which are standards for desktop computer hard disks. You should match your hard disk specifications to one of the listed types. If you cannot find a type that matches, you must enter the information manually, using the user-definable "Type 47".



## The STANDARD CMOS SETUP screen

```

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

Date (mn/date/year) : Tue, Jan 01 1993	Base memory: 640 KB
Time (hour/min/sec) : 11 : 54 : 04	Ext. memory: 3072 KB
Hard disk C: type : 47 = USER TYPE	Cyln Head WPcom LZone Sect Size
Hard disk D: type : Not Installed	560 6 65535 560 26 43MB
Floppy drive A: : 1.2 MB, 5 1/4"	
Floppy drive B: : Not Installed	
Primary display : VGA/PGA/EGA	
Keyboard : Not Installed	

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

Sun	Mon	Tue	Wed	Thu	Fri	Sat
27	28	29	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

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

Type number 47 is user defined and can be different for drive C: and drive D:. If you do choose "type: 47", there are an additional five categories of information you must enter: "Cyln" (number of cylinders), "Head" (number of heads), "WPcom" (write precom), "LZone" (landing zone) and "Sect" (number of sectors). "Size" is automatically determined by the other entries. The hard disk vendor's or system manufacturer's documentation should provide you with the information on the hard disk drive(s) you will use. If this information is not in evidence, you can look on the hard disk drive itself, if it is accessible. If all else fails, you must ask your hard disk drive or system vendor for the information.

Remember: Entering an incorrect type number will result in the hard disk drive functioning improperly or not at all.

Novell Netware 286 Users: You must shadow the system BIOS if you will use a user defined hard disk type.



The next two lines record the types of floppy disk drives present. The five options for drives A and B are:

360KB 5 1/4"

1.2MB 5 1/4"

720KB 3 1/2"

1.44MB 3 1/2"

2.88MB 3 1/2"

Not Installed

"**Primary display**" refers to the type of video display your system has. The five options are:

Monochrome (for Hercules or MDA)

Color 40x25

VGA/PGA/EGA

Color 80x25

Not Installed

You should select the setting that matches your video display card and monitor.

The last line "**Keyboard**" has two options: "Installed" and "Not Installed". If you choose "Not Installed", the system won't halt on any keyboard errors.

When you have made your selections, exit to the initial screen of the program by pressing the <Esc> key. To finish the set up process, continue on to "ADVANCED CMOS SETUP".



## ADVANCED CMOS SETUP

“ADVANCED CMOS SETUP” is a list of system features that allows you to fine tune your system setup. Some entries are defaults required by the ISA-486SV2’s design. Others will improve your system’s performance if enabled, or let you setup some system features according to your preference.

The “ADVANCED CMOS SETUP” screen displays information about Typematic features, Memory, Shadow RAM and Clock settings as well as several convenience features.

The following are the default settings (AUTO CONFIGURATION WITH BIOS DEFAULTS) for these areas.

### The ADVANCED CMOS SETUP screen

BIOS SETUP PROGRAM - ADVANCED CMOS SETUP			
(C)1990 American Megatrends Inc., All Rights Reserved			
Typematic Rate Programming	: Disabled	Adaptor ROM Shadow C800,32K	: Disabled
Typematic Rate Delay (msec)	: 500	Adaptor ROM Shadow D000,32K	: Disabled
Typematic Rate (Chars/Sec)	: 24	Adaptor ROM Shadow D800,32K	: Disabled
Above 1 MB Memory Test	: Disabled	Boot Sector Virus Protection	: Disabled
Memory Test Tick Sound	: Enabled		
Memory Parity Error Check	: Enabled		
Hit (Del) Message Display	: Enabled		
Hard Disk Type 47 RAM Area	: 0:300		
Wait For (F1), If Any Error	: Enabled		
System Boot Up Num Lock	: On		
Numeric Processor	: Present		
Weitek Processor	: Absent		
Floppy Drive Seek At Boot	: Disabled		
System Boot Up Sequence	: A:, C:		
External Cache Memory	: Enabled		
ALL Cache Memory	: Enabled		
Password Checking Option	: Disabled		
Video ROM Shadow C000,32K	: Disabled		

ESC:Exit ↓ → ←:Sel (Ctrl)Pu/Pd:Modify F1:Help F2/F3:Color	
F5:Old Values F6:BIOS Setup Defaults F7:Power-On Defaults	



The Typematic features control the rate at which the system accepts and acts on information entered through the keyboard. They allow you four delay rate choices: 250ms, 500ms, 750ms and 1000ms (default is 500ms).

The character/second rate choices range from 2.0 to 30.0 (default is 24.0).

The "Above 1 MB Memory Test" is usually disabled in the interest of saving time during the Power On Self Test.

The "Memory Test Tick Sound" audibly clicks during the memory test. The default setting is "Enabled".

The "Memory Parity Error Check" tests for transmission errors in data read from memory. The default setting is "Enabled".

The "Hit <Del> Message Display" controls the screen prompt to access the setup program. Pressing the <Del> key will still access the Setup program even if the message is not displayed. The default setting is enabled.

"Hard Disk Type 47 Data Area" If the BIOS Shadow RAM is disabled, the Hard Disk type 47 parameter table will use regular RAM.

There are two options:

0:300 (lower system RAM)

DOS 1KB (the top 1KB of the 640K base memory)

The default is 0:300.

If an error is detected, "Wait for <F1> If Any Error" causes the system to halt until you press the <F1> key. If this is not enabled, the message will not appear. The default setting is "Enabled".

"System Boot Up Num Lock" is a convenience feature. When the computer boots, it selects the numeric values rather than the cursor control functions on the numeric keypad of IBM compatible key-



boards. The extended keyboards supplied with most compatible systems have separate cursor control keys. It is therefore unnecessary to use the numeric keypad for this. The default setting is "On".

"**Numeric Processor**" setting for an I486SX setting is "Absent" because the 486SX CPU does not have an integral numeric coprocessor. For all other CPUs the setting is "Present".

"**Weitek Processor**" refers to an optional Weitek math coprocessor. The default setting is "Absent" because the ISA-486SV2 does not have a Weitek socket.

The "**Floppy Drive Seek At Boot**" default setting is "Disabled". On this setting the system will check the hard disk first to find the disk operating.

The "**System Boot Up Sequence**" default setting is "C:, A:."; the other option is "A:, C:". The setting determines which drive the computer searches first for the operating system. If the previous feature is disabled, the "A:, C:" setting will have no effect.

The "**External Cache Memory**" default setting is "Enable". This setting enables the ISA-486SV2's secondary cache.

The "**ALL Cache Memory**" default setting is "Enable". This setting enables the internal CPU and the external cache. The "Disabled" setting turns off both caches. Turning the caches off will slow down the system. This might be useful if you have older software that will not run properly at full speed.

The "**Password Checking Option**" controls the Password feature. The default setting is "Disabled". Other settings are "Always" if you want to use the Password feature every time you boot up and "Setup" if you want to use the password only to protect the configuration settings from being tampered with. You create a password by using "CHANGE PASSWORD".



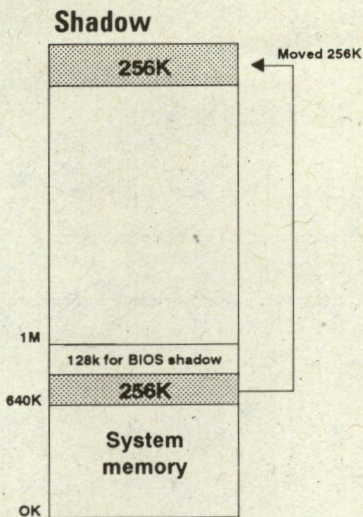
The default setting for the "Video ROM Shadow C000,32K" is "Enabled".

The next three lines, "Adaptor ROM Shadow C800,32K" to "Adaptor ROM Shadow D800,32K" are for shadowing other adaptor ROMs. The default setting for these areas is "Disabled". If you have other expansion cards with ROMs on them, you will need to know which addresses the ROMs use. If you don't know and cannot find out, you can enable all of the ROM shadow settings. This ensures that the ROMs will be shadowed. It will also reduce the memory available between 640KB and 1024KB. The system BIOS ROM is always automatically shadowed.

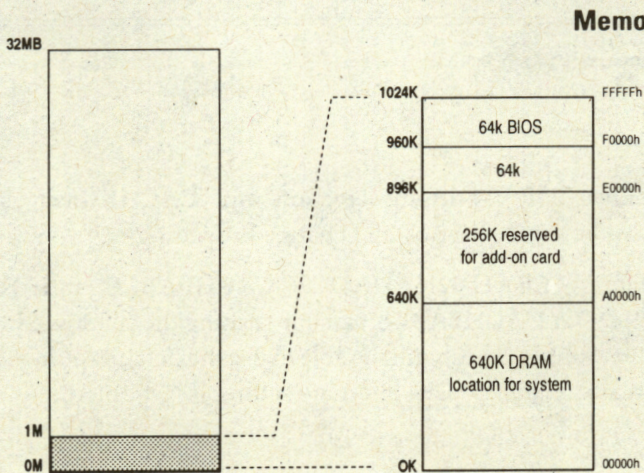
The default setting for "Boot Sector Virus Protection" is "Disabled". This feature protects your drive C: boot sector from computer virus infection. **You must format your hard disk before Enabling this feature.**

After you have made your selections within the ADVANCED CMOS SETUP press the <Esc> key to go back to the utility menu. When you finish with the ADVANCED CMOS SETUP the next item is ADVANCED CHIPSET SETUP.





**Note: 256KB is relocated only if Cxxx shadow addresses are enabled. If either or both the D000 and D800 shadow addresses are enabled the 256KB is not moved.**





## ADVANCED CHIPSET SETUP

The ADVANCED CHIPSET-SETUP sets some memory wait states and enables you to move shadowed BIOS material into the cache memory.

### The ADVANCED CHIPSET SETUP screen

BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP	
(C)1990 American Megatrends Inc., All Rights Reserved	
DRAM timing selection	:Fast
CACHE timing selection	:Fast
C000h 32K SHADOW CACHEABLE	:Enabled
F000h 32K SHADOW CACHEABLE	:Enabled
End of 16M DISABLE SIZE	:Disabled
Hidden Refresh	:Enabled

ESC: Exit	↓→↑←:Sel	(Ctrl)Pu/Pd:Modify	F1:Help	F2/F3:Color
F5:Old Values	F6:BIOS Setup Defaults	F7:Power-On Defaults		

The lines, "DRAM timing selection" and "CACHE timing selection" must be set to "Fast". Don't change the setting.

- The lines, "C000H 32K SHADOW CACHEABLE" and "F000H 64K SHADOW CACHEABLE", enable caching the shadowed video and system ROMs. You should be able to use the default settings, both of which are "Enabled". The alternate setting is "Disabled".



The "End of 16M DISABLE SIZE" default setting is "Disabled". Some expansion cards (e.g. network or multiple serial port cards) may need to use addresses at the end of the 16MB address space. This option allows you to disable up to 4MB at the end of the 16MB address space for this purpose. Check the documentation of your card to determine what its requirements are.

The default setting for "Hidden Refresh" is "Enabled". Hidden Refresh works in the background to improve system performance. Some specialized video display cards may not function correctly with this feature turned on. If you have any problems, set it to "Disabled".

When you are finished in this section press the <Esc> key to return to the main screen.

## **AUTO CONFIGURATION WITH BIOS DEFAULTS**

"AUTO CONFIGURATION WITH BIOS DEFAULTS" loads the default system values directly from ROM. If the stored record created by the Setup program becomes corrupted (and therefore unusable), these defaults will load automatically when you turn the computer on.

To use this feature, select it in the main menu and press <Enter>. A line will appear on screen asking if you want to load the default values. Press the <Y> key and then press the <Enter> key. The BIOS default settings will then load in the other utilities.

## **AUTO CONFIGURATION WITH POWER-ON DEFAULTS**

The "AUTO CONFIGURATION WITH POWER-ON DEFAULTS" loads the settings detected when you turn on the computer. If your system is behaving erratically you can use this feature to check for incorrect settings.



To use this feature, select it in the main menu and press <Enter>. A line will appear in the same way as the previous entry. Press the <Y> key and then press the <Enter> key. The power-on settings will then load in the other utilities.

### Auto configuration

```

BIOS SETUP PROGRAM - AMI BIOS SETUP UTILITIES
(C)1992 American Megatrends Inc., All Rights Reserved

STANDARD CMOS SETUP
ADVANCED CMOS SETUP
ADVANCED CHIPSET SETUP
AUTO CONFIGURATION WITH BIOS DEFAULTS

Load BIOS Setup Default Values from ROM Table (Y/N) ? N

Standard CMOS Setup for Changing Time, Date, Hard Disk Type, etc.

ESC:Exit      ←→:Sel      F2/F3:Color      F10:Save & Exit
  
```

### CHANGE PASSWORD

The "CHANGE PASSWORD" utility allows you to change the user password. The ISA-486SV2 is shipped with the default password "AMI". If you want to change it, you must first enter the current password ("AMI" in this case). Then at the prompt, enter your new password. At the next prompt, confirm the new password by entering it again. At the end of this operation, the screen automatically reverts to the utilities menu. Remember, to enable this feature, you must first select either "Setup" or "Always" in the ADVANCED CMOS SETUP, or the password feature won't work.



## AUTO DETECT HARD DISK UTILITY

This utility works with IDE hard disks only.

If you have an IDE hard disk, and don't know its drive parameters the "Auto Detect Hard Disk" utility will automatically detect and list them.

When you select this utility from the main menu, it will open and display the following message:

### Auto detection in progress

The utility will detect the parameters for the first hard disk in your system. It then displays a line for hard disk C: as User Type 47, in the same format as in the Standard CMOS Setup screen. Then it asks if you want to accept the parameters as shown:

#### • Accept parameters for C: [Y/N]?

If you type "Y", it will automatically write the parameters for "Hard Disk C:" into the Standard CMOS Setup. It will then continue and look for "Hard Disk D:", the second physical hard disk.

If you type "N", the utility will go on to look for "Hard Disk D:". If there is no "D:" drive, a message will display:

### Not Detected

If the utility finds "Hard Disk D:", it will also list it as Type 47, fill in the detected parameters and ask if you want to accept them.

When finished, the utility will automatically close and return you to the main Setup menu.

### Important Note:

Some IDE drives can use more than one set of drive parameters. For this reason, you should keep a record of the parameters you used if you set up a drive manually in the Standard CMOS Setup the first



time. It is possible for the auto-detect utility to detect a valid parameter set that you did not use to set up the drive. If you attempt to use an invalid parameter set from this utility, the drive will not work. If you use the auto-detect utility to set up a drive the first time, this problem will not occur.

## HARD DISK UTILITY

The next utility is the "HARD DISK UTILITY". This utility is basic drive setup software. All of the options are destructive to data existing on a disk and are used for low-level formatting before the DOS "FDISK" and "FORMAT", or similar utilities. You can use this utility on MFM encoded hard drives if they require but have not been low-level formatted by the manufacturer. IDE, ESDI and SCSI drives don't need this utility and you should not use it on them.

### The HARD DISK UTILITY screen

BIOS SETUP PROGRAM - HARD DISK UTILITY						
(C)1990 American Megatrends Inc., All Rights Reserved						
	Cyln	Head	WPcom	LZone	Sect	Size(MB)
Hard Disk C: Type : 47=USER TYPE	560	6	65535	560	26	43
Hard Disk D: Type : Not Installed						
Hard Disk Type can be changed from the STANDARD CMOS SETUP option in Main Menu						
<div style="border: 1px solid black; display: inline-block; padding: 2px;">Hard Disk Format</div> Auto Interleave Media Analysis						
ESC:Exit    ←→:Sel    F2/F3:Color						



Note: The hard disk type should be set in the STANDARD CMOS SETUP. Using the HARD DISK UTILITY is destructive to existing data on a disk.

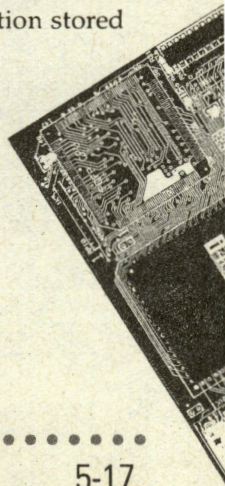
## WRITE TO CMOS AND EXIT

The next selection on the Utilities menu is "WRITE TO CMOS AND EXIT". If you select this and press the <Enter> key the values entered in the setup utilities will be recorded in the CMOS memory of the chip set. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

## DO NOT WRITE TO CMOS AND EXIT

The last selection on the Utilities menu is "DO NOT WRITE TO CMOS AND EXIT". Selecting this option and pressing the <Enter> key lets you exit the Setup program without recording any new values or changing old ones. If you want to save a new configuration do not use this option. If you do, the new setting information will be lost.

You can now use your ISA-486SV2 system without further reference to these programs unless you make a change in the system hardware configuration. If the system configuration information stored in CMOS RAM is lost, you will have to reenter it.





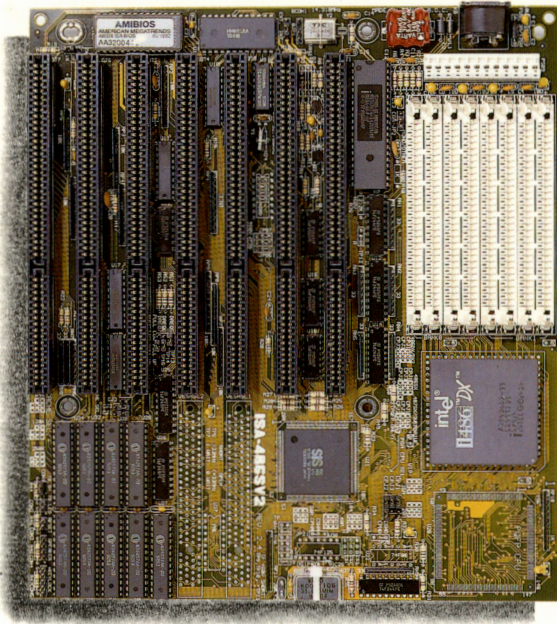
## AMI BIOS Hard Drive Types

AType	CylIn	Head	WPcom	LandZone	Section	Size
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	31
4	940	8	512	940	17	62
5	940	6	512	940	17	47
6	615	4	65535	615	17	20
7	462	8	256	511	17	31
8	733	5	65535	733	17	30
9	900	15	65535	901	17	112
10	820	3	65535	820	17	20
11	855	5	65535	855	17	35
12	855	7	65535	855	17	50
13	306	8	128	319	17	20
14	733	7	65535	733	17	43
16	612	4	0	663	17	20
17	977	5	300	977	17	41
18	977	7	65535	977	17	57
19	1024	7	512	1023	17	60
20	733	5	300	732	17	30
21	733	7	300	732	17	43
22	733	5	300	733	17	30
23	306	4	0	336	17	10
24	925	7	0	925	17	54
25	925	9	65535	925	17	69

AType	CylIn	Head	WPcom	LandZone	Section	Size
26	754	7	754	754	17	44
27	754	11	65535	754	17	69
28	699	7	256	699	17	41
29	823	10	65535	823	17	68
30	918	7	918	918	17	53
31	1024	11	65535	1024	17	94
32	1024	15	65535	1024	17	128
33	1024	5	1024	1024	17	43
34	612	2	128	612	17	10
35	1024	9	65535	1024	17	77
36	1024	8	512	1024	17	68
37	615	8	128	615	17	41
38	987	3	987	987	17	25
39	987	7	987	987	17	57
40	820	6	820	820	17	41
41	977	5	977	977	17	41
42	981	5	981	981	17	41
43	830	7	512	830	17	48
44	830	10	65535	830	17	69
45	917	15	65535	918	17	114
46	1224	15	65535	1223	17	152
47	User Type					



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## ISA-486SV2 MAIN BOARD

*For Dual Type, PQFP 486SX and PGA CPU:  
80486DX/DX2/SX, 487SX, OverDrive, 16~66MHz*



Part No. 200.14SU.002