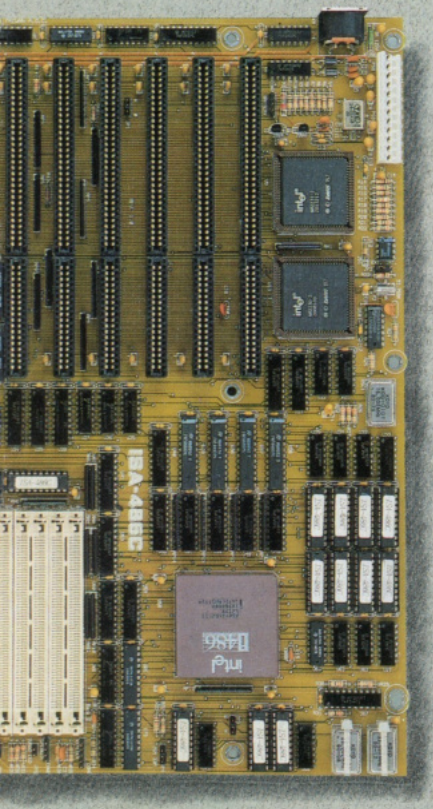
ISA-486C
USER'S MANUAL



MANUAL

COPYRIGHT

THIS PRODUCT, INCLUDING SOFTWARE AND DOCUMENTATION, MAY NOT, IN WHOLE OR IN PART, BE COPIED, PHOTOCOPIED, TRANSLATED OR REDUCED TO ANY ELECTRONIC OR MACHINE-READABLE FORM WITHOUT PRIOR WRITTEN CONSENT FROM THE VENDOR, EXCEPT FOR COPIES RETAINED BY THE PURCHASER FOR BACKUP PURPOSES.

NO WARRANTY OR REPRESENTATION, EITHER EXPRESSED OR IMPLIED, IS MADE WITH RESPECT TO THIS DOCUMENTATION, ITS QUALITY, PERFORMANCE, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. AS A RESULT, THE DOCUMENTATION IS LICENSED "AS IS", AND THE LICENSE WILL ASSUME THE ENTIRE RISK AS TO ITS QUALITY AND PERFORMANCE. THIS MANUAL AND ANY ACCOMPANYING SOFTWARE AND DOCUMENTATION, IF ANY, ARE COPYRIGHTED BY ASUS/ASUSTeK (COPYRIGHT © 1990) AND ALL RIGHTS ARE RESERVED. THE VENDOR RESERVES THE RIGHT TO REVISE THIS OPERATION MANUAL AND ALL ACCOMPANYING SOFTWARE AND DOCUMENTATION AND TO MAKE CHANGES IN THE CONTENT WITHOUT OBLIGATION TO NOTIFY ANY PERSON OR ORGANIZATION OF THE REVISION OR CHANGE.

IN NO EVENT WITH THE VENDOR BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS PRODUCT OR DOCUMENTATION EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, IN PARTICULAR, THE VENDOR SHALL NOT HAVE LIABILITY FOR ANY HARDWARE, SOFTWARE, OR DATA STORED OR USED WITH THE PRODUCT, INCLUDING THE COSTS OF REPAIRING, REPLACING, OR RECOVERING SUCH HARDWARE, SOFTWARE OR DATA.

PRODUCTS, MENTIONED IN THIS MANUAL ARE MENTIONED FOR IDENTIFICATION PURPOSES ONLY. PRODUCT NAMES APPEARING IN THIS MANUAL ARE REGISTERED TRADEMARKS OF THEIR RESPECTIVE COMPANIES.

Table of Contents

Chapter 1: Introduction 1-1
486 Features 1-1
Features of the ISA-486C Main board 1-2
Cache Memory 1-3
Expansion Bus 1-3
ROM BIOS 1-5
Shadow RAM 1-5
Caching of System ROM 1-5
External Controls 1-6
Changing the Processing Speed 1-6
The Reset Switch 1-7
The Keyboard Lock 1-7
Peripheral Connectors 1-8
Keyboard 1-8
Power Supply 1-8
Case Connectors 1-8
Battery Connector 1-9
Component Layout 1-9

Chapter 2: Setup Guide 2-1
Jumper Switches 2-1
Connectors 2-3

Chapter 3: Memory Guide 3-1
The ISA-486C Main Board Memory 3-2
The 32-bit Memory Card 3-3
Adding a SIMM to a SIMM Socket 3-6
To install a SIMM onto the ISA-486C Main Board 3-6
To install a SIMM onto the Memory Card 3-8
Installing the Memory Card onto the ISA-486C Main Board 3-10
Cache Memory. 3-12
Installing Cache RAM and Tag RAM onto the Memory Card 3-12
Installing the Chips 3-15
Setting the Cache Memory Size 3-17

Chapter 4: Installation Guide 4-1
Static Electricity Precautions 4-2
Mounting Holes 4-2
Mounting Fasteners 4-3
External Connections 4-4

Chapter 5: Firmware 5-1

Introduction

This first chapter of the manual will introduce the ISA-486C Main Board and will explain various features and required peripheral connections.

This main board uses some of the latest techniques in main board design to assure you both high performance and flexibility. The 80486 processor is the most powerful microprocessof in the PC field. This main board uses that power to give you the speed that you need for even the most demanding applications.

This manual provides basic information to help you better understand your ISA-486C Main Board. The manual also provides information about how to change certain settings or to upgrade the main board. If you are not confident in your ability to make any needed changes or upgrades then you should consider having an authorized dealer or computer store do the work for you. Altering the system yourself may violate the system warranty, check your warranty to be sure.

486 Features

High integration is a special design feature of the 80486 microprocessor. The main features include an integrated 80387 numeric coprocessor that offers double or triple the speed of a conventional external numeric coprocessor. There is an 8KB static RAM cache, using a 4 ways set associative controller. The 80486 can perform 10.9 million instructions per second (10.9 MIPS) at 25MHz or 14.5 million instructions per second (14.5 MIPS) at 33MHz. The 80486 also integrates the following features: paged memory management, clock control, integer execution and also instruction decoding.

1 ISA-486C User's Manual

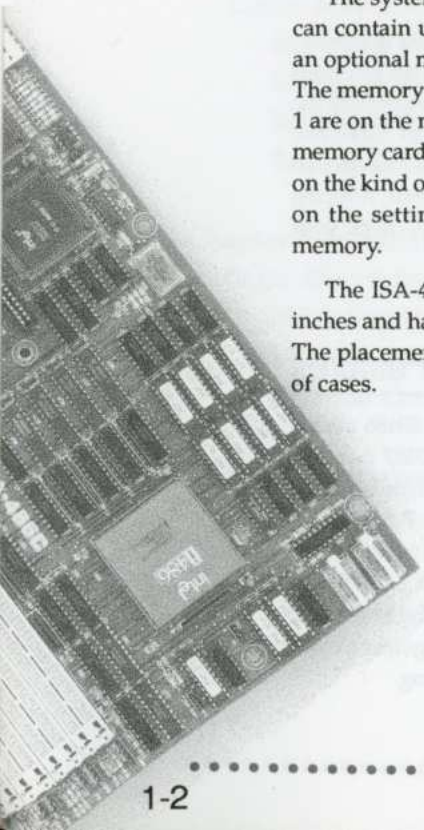
Features of the ISA-486C Main Board

The main board uses a 80486-25 or 80486-33 CPU that operates at a nearly zero wait state. Sized to fit almost any case from a XT to a tower design, the board uses six layer P.C.B. construction.

The main board when installed in a system can use a variety of operating systems. Any version of MS-DOS, 286,386 binary code based UNIX/ZENIX, Netware or the OS/2 operating system can be used.

The system can support up to 64MB of DRAM. The main board can contain up to 32MB of DRAM resident on the board. There is an optional memory board that can contain up to 32MB of DRAM. The memory can be installed in up to four banks. Bank 0 and Bank 1 are on the main board and Bank 2 and Bank 3 are on the optional memory card. Each bank can contain 1MB, 4MB or 16MB depending on the kind of memory used. See the Setup chapter for information on the setting of the switches for different kinds and sizes of memory.

The ISA-486C Main Board measures approximately 13.1 X 8.6 inches and has 9 mounting holes (two of which are double drilled). The placement of the holes allow the board to be used in a variety of cases.



Cache Memory

This section contains information regarding the cache memory system. This includes the optional and up-gradable secondary cache of 64KB, 128KB or 256KB. The internal and optional secondary cache memories allow the main board to have a faster throughput without requiring all memory to be expensive high-speed DRAM chips.

The main board uses the internal 8KB cache of the 80486 chip and can also use the optional 64KB, 128KB or 256KB cache memory on the optional memory card. ISA-486C can work without optional memory card. It means ISA-486C can work under only 8 KB cache RAM.

Storing frequently used data into fast memory means faster system throughput. The system can then access the data without having to wait for it to be retrieved from slower system memory.

Expansion Bus

The main board has eight expansion slots: one 8-bit expansion slot, six 16-bit expansion slots and one 32-bit expansion slot. The 32-bit slot is a proprietary signal bus which is reserved for the ISA-486C memory card only. The 8 and 16-bit slots conform to the AT bus standard. Check before buying any expansion cards if it is speed compatible with the 8 MHz bus speed of the ISA-486C Main Board.

The expansion slots must be kept clean so that a good connection is possible. Do not touch the metal connector pins on the slot or the edge connector on the bottom of the expansion card.

The 8-Bit Slot

The 8-bit slot is for expansion cards that do not need a full 16-bit data path. Examples of this are some video cards, modems and mouse controllers. The slot is one connector with two rows of 31 pins each.

The 16-Bit Slot

The six 16-bit slots allow for a faster transfer of data. They will be used for hard disk controllers and high speed I/O cards. Each of the slots has two connectors. There is a long connector that is the same as the 8-bit slot, there is also a shorter connector that has two rows of 18 pins each. These two connectors combine to make a 16-bit slot.

The 32-Bit Slot

The ISA-486C Main Board has one special slot that can be used with the optional 32-bit memory card. The slot has two connectors, each connector looks the same as the connector for an 8-bit slot. The proprietary ISA-486C memory card uses this slot for its 32-bit data path. See the Chapter on Memory for full details.

ROM BIOS

The ISA-486C Main Board requires certain programs in order to communicate with the rest of the system. The BIOS (Basic Input Output System) are programs permanently stored in ROM (Read Only Memory). Refer to the BIOS section for a full description of the BIOS and how to best use it.

Shadow RAM

The ISA-486C Main Board has a "Shadow RAM" feature. This feature copies the contents of the system BIOS from ROM which operates at a slow speed into DRAM which operates at a higher speed. The shadow feature can also copy video ROM into DRAM. Both of these features allow for faster overall system speed. Shadowing of the ROM BIOS is standard, the video ROM can be shadowed using the extended Setup program described in the Setup Chapter.

Caching of System ROM

It is possible to cache the BIOS in addition to shadowing it. Caching would copy the BIOS into the fast cache RAM where it can be used much faster than from normal memory. The Setup Guide explains how the Setup program can be used to implement this feature.

External Controls

There are several controls that may be located on the front panel of your system case. These controls are for processing speed, resetting the computer and locking the keyboard.

Changing the Processing Speed

Depending on your model 33MHz or 25MHz, the processor clock speed can be changed between Turbo and Non-turbo Mode, if you are using a 33MHz 80486:

To change speeds: Hold down the <Ctrl> and <Alt> keys simultaneously and press the

+ (plus) key for 33MHz (Turbo) speed, or

- (minus) key for Non-turbo (or for approximately 8MHz) (low) speed

If you are using a 25 MHz 80486:

To change speeds: Hold down the <Ctrl> and <Alt> keys simultaneously and press the

+ (plus) key for 25MHz (Turbo) speed, or

- (minus) key for Non-turbo (or for approximately 8MHz) (low) speed.

This is done by using a keyboard command sequence. If your hardware is set to the low speed then these commands will not work.

Normally you will always want to use the high speed mode unless you have software compatibility problems. These problems occur when executing or installing some older software, games and communication software.

The Reset Switch

The mainboard has a connector for a Reset switch. If the Reset switch has been connected to the front panel of the system case, the switch will cause the system to restart without turning the power off. You must have your operating system software available for the system to start up again.

The Keyboard Lock

The mainboard has a connector for a keyboard lock. If this is connected to the front panel of the system case you can use this lock to electrically disconnect the keyboard. This will stop a casual intruder from entering your computer. It will not stop someone determined to get into the system.

Peripheral Connectors

Keyboard

The ISA-486C Main Board has a standard keyboard connector port at the rear of the board.

Power Supply

The power supply may have a "Power Good" signal or the main board can supply its own "Power Good" signal. If you are not sure or if you are buying a new power supply then ask your dealer. If you want to have the main board provide its own "Power Good" signal then a jumper must be set correctly. The Setup Chapter will explain this in detail.

Case Connectors

Features mounted on the front panel or inside the case can be connected to the ISA-486C Main Board. These include:

* a RESET connector
* a KEY LOCK connector
* a "TURBO" processor speed LED indicator connector
* a "TURBO" processor speed switch connector
* a SPEAKER connector
* an external battery connector

Read the Setup Chapter for more information on how to connect these to the main board.

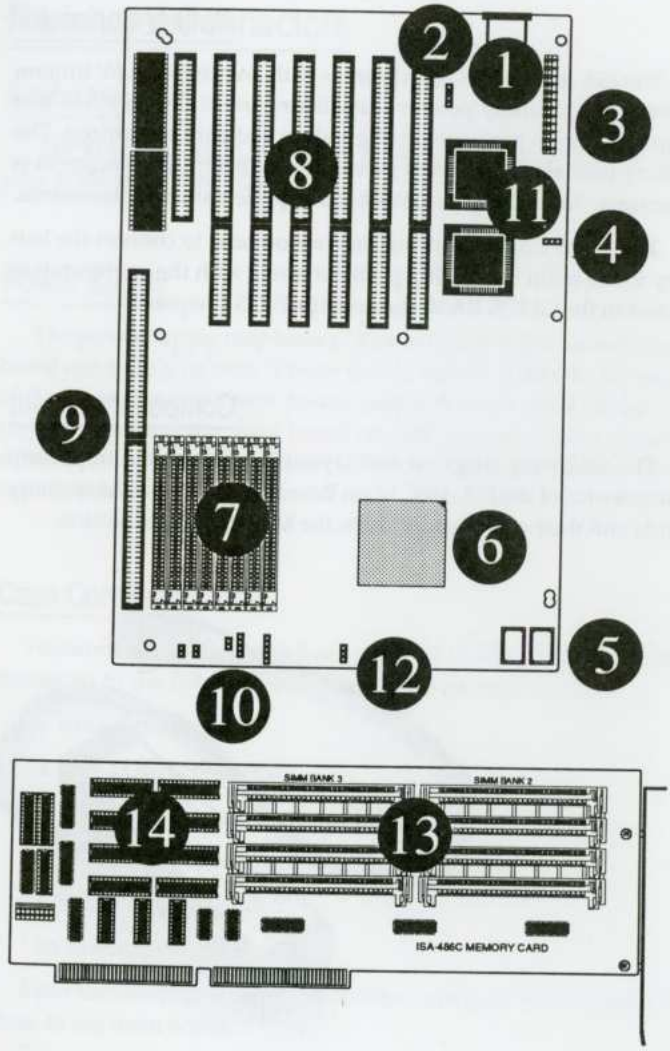
Battery Connector

The ISA-486C Main Board comes with an external 3.6V lithium battery. This battery powers a small amount of CMOS RAM that contains system hardware configuration and chip set settings. The battery will last an extended period of time before a replacement is necessary. Most computer stores and suppliers stock replacements.

The Setup Chapter has instructions on how to connect the battery to the main board. If a problem arises with the configuration stored in the CMOS RAM then see the BIOS Chapter.

Component Layout

The following diagram and layout key shows the important components of the ISA-486C Main Board. Diagrams of the memory cards and their components are in the Memory Guide section.


2
1
3
8
11
4
9
7
6
5
12
10
SIMM BANK 3
SIMM BANK 2
14
13
ISA-486C MEMORY CARD

1. Standard 5-pin Keyboard connector jack.
2. External Battery connector.
3. Power supply connectors.
4. Power Good selection Jumper JP2.
5. 25MHz OSC and 33MHz OSC
6. The Intel 80486 CPU, contains internal 8KB cache RAM.
7. Sockets for on board memory modules, support 1~32MB.
8. Expansion slots, one 8-bit and six 16-bit.
9. The 32-bit proprietary memory card slot for optional RAM card.
10. Case funtion connectors: Reset switch, Turbo switch, Turbo LED, Keylock, and Speaker connectors.
11. PC/AT bus control Logic: Intel 82230 and 82231 chips.
12. 25MHz and 33MHz processor speed selection Jumper JP4.
13. Optional, additional 1~32MB DRAM.
14. Optional cache RAM: 64/128/256KB.

Setup Guide

The first step in installing the ISA-486C Main Board is to prepare the board by setting the jumper switches and attaching the various connectors. If the main board has already been installed this section will be helpful if you make a change to the system. This section does not include the setup and instructions for the memory. The Memory Chapter contains that information. If you are installing the ISA-486C Memory Board you should read the Memory Chapter before proceeding.

Jumper Switches

Using jumper switches you can select between two possible choices. They either enable/disable a feature or toggle between two modes of operation. The switches have three pins projecting up from the main board. Placing the cap, which has a metal inside, over the two pins on the appropriate side of the switch makes a selection.

Jumpers with pins 1&2
or 2&3 shorted

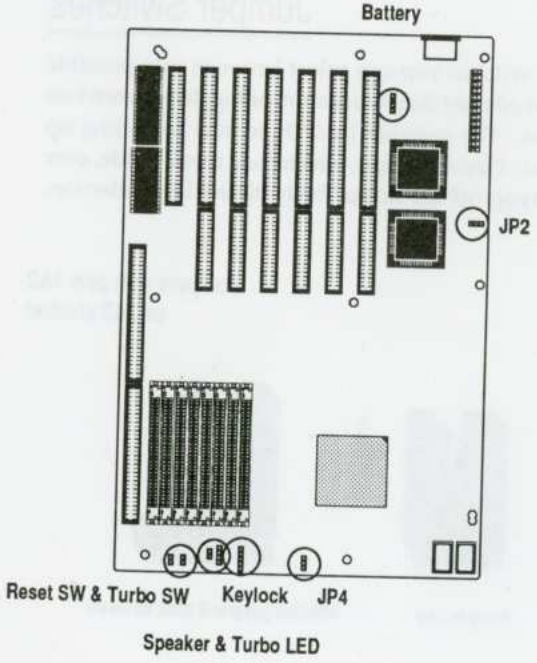
Jumper Jumper cap Shorted jumper-2 pins covered

There are two jumpers on the main board: JP2 and JP4.

Jumper JP2 selects the type of "Power Good" signal used. An on-board or a power supply "Power Good" signal can be selected. The default setting is the on-board "Power Good" signal.

Jumper JP4 selects between 25 MHz and 33 MHz processor speeds. This will be set depend on the 80486 CPU speed is 25NHz or 33MHz.

Jumper and connecctor locations



Connectors

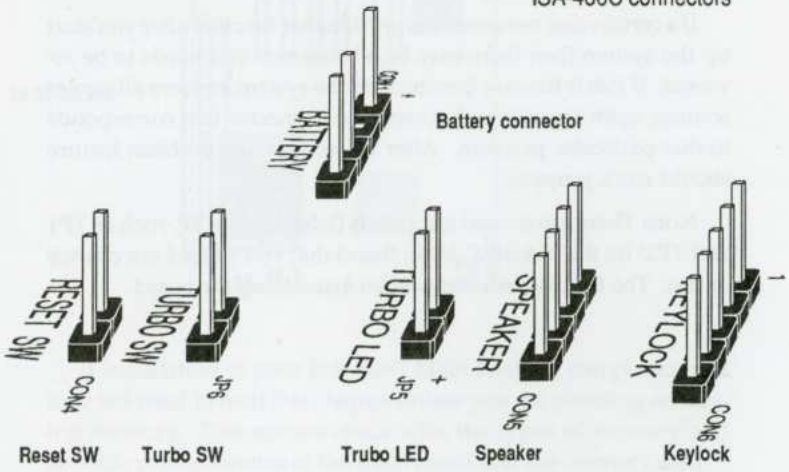
Connectors are for connecting the main board to other parts of the system. Some connectors have two pins, others have four or five pins.

There are six connectors labelled CON1, CON4, CON5, CON6, JP5, and JP6 on the main board.

CON1 is to connect an external battery for powering the CMOS RAM that contains the configuration information. The battery has a red and a black wire coming from it. Plug the connector so that the red wire is at the side where there is a plus (+) sign.

CON4 is for the reset switch. Connection of the front panel reset switch here allows you to reset the computer by pressing and releasing the reset switch. This gives you another method besides pressing the <Ctrl+Alt+Del> keys to reset the computer.

ISA-486C connectors



CON5 is the connector for the speaker.

CON6 is for the key lock switch. Connected to the key lock on the front panel you can disable the use of the keyboard by setting the switch to the off position. Correct orientation of the connector is very important.

JP5 connects the "Turbo" LED on the front panel. When the system is in the "Turbo" mode the LED will be lighted.

Correct orientation of the connector is also very important.

JP6 is the "Turbo" mode speed switch connector. This allows you to switch between the slow processor speed of approximately 8MHz PC/AT and the "Turbo" speed, if you are using a 25MHz 80486 CPU, the Turbo Mode will get full 25MHz 80486 speed gain. If you are using a 33MHz 80486 CPU, theTurbo Mode will get full 33MHz 80486 speed gain. The "Turbo" LED will light showing selection of the "Turbo" mode. The orientation of this connector is not important.

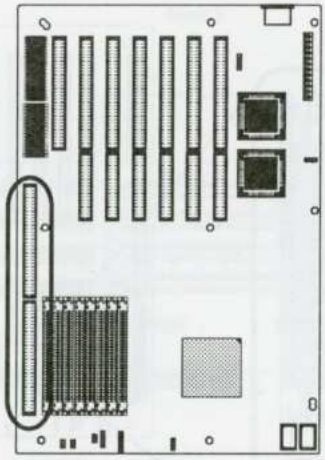
If a certain case mounted feature does not function after you start up the system then there may be a connector that needs to be reversed. If this is the case then turn off the system, remove all power sources, open the case and reverse the connector that corresponds to that particular problem. After reassembly the problem feature should work properly.

Note: There are several test points (labeled with TP, such as TP1 and TP2) on the ISA-486C Main Board that you should not change or use. The factory uses these when assembling the board.

Memory Guide

The ISA-486C Main Board can have 1 to 32MB of system memory on-board. There are also 8KB of static cache memory within the 80486 chip itself. There is an optional 32-bit memory card that can have an additional 1 to 32MB of extended DRAM and 64KB, 128KB or 256KB of cache memory. This optional memory card fits into the proprietary 32-bit slot for memory on the main board.

The location of the 32bit slot.



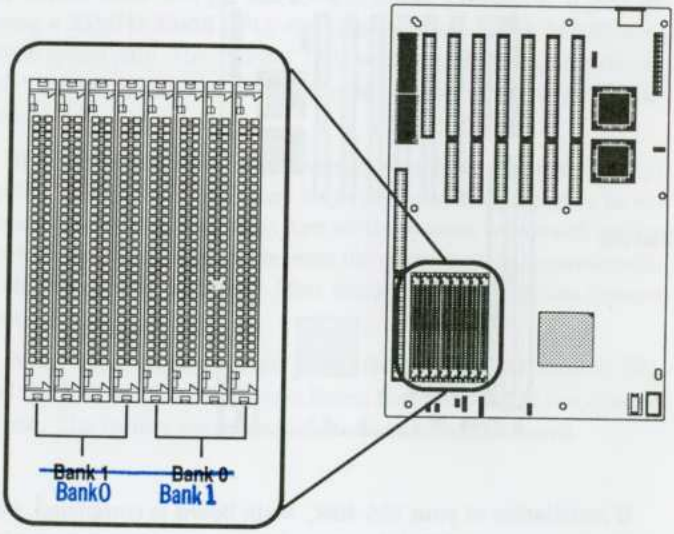
The 32-bit slot

If installation of your ISA-486C Main Board is completed, you may not need to read this chapter unless you are planning on adding memory. This section deals with the types of memory and possible configurations of the main board and the memory card.

The ISA-486C Main Board Memory

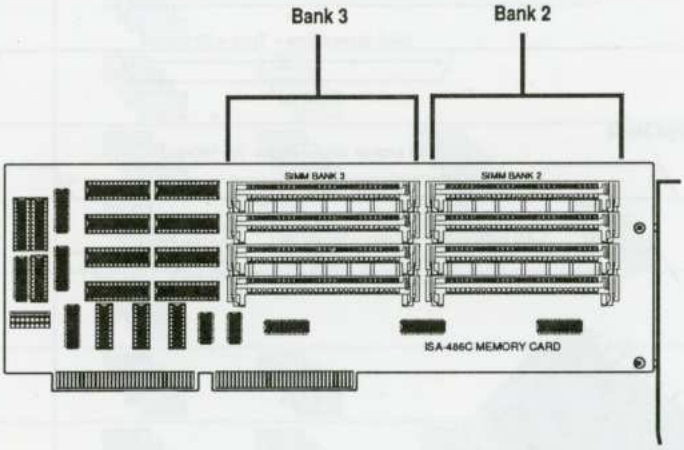
The memory on the main board has two parts, Bank 0 and Bank 1. Each bank has four sockets for SIMM (Single-In-line Memory Module). Each socket can accept either a 256KB, 1MB or 4MB module. This means each bank can have 1MB, 4MB or 16MB of memory installed. A bank must be completely filled in order for it to work properly so the minimum possible amount of memory is 1MB.

The on-board memory



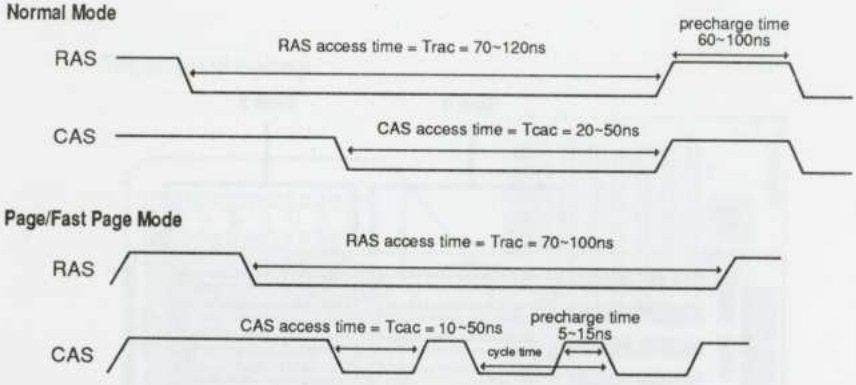
The 32-bit Memory Card

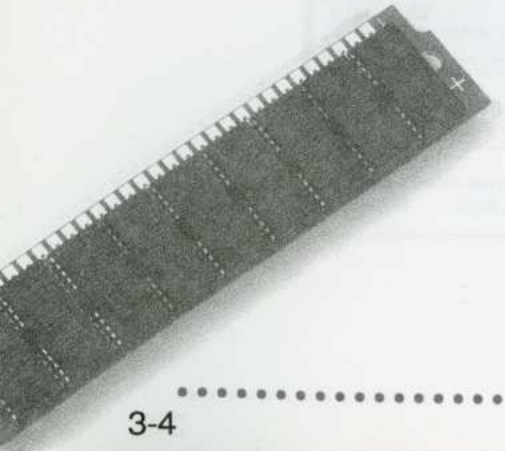
The 32-bit memory card is an optional card that can be installed on the ISA-486C Main Board. This card has two banks of memory, Bank 2 and Bank 3. Each bank has four sockets for SIMM cards. Each socket can accept either a 256KB, 1MB or 4MB module. This means each bank can have 1MB, 4MB or 16MB of memory installed. A bank must be completely filled in order for it to work properly so the minimum possible amount of memory on the card is 1MB.

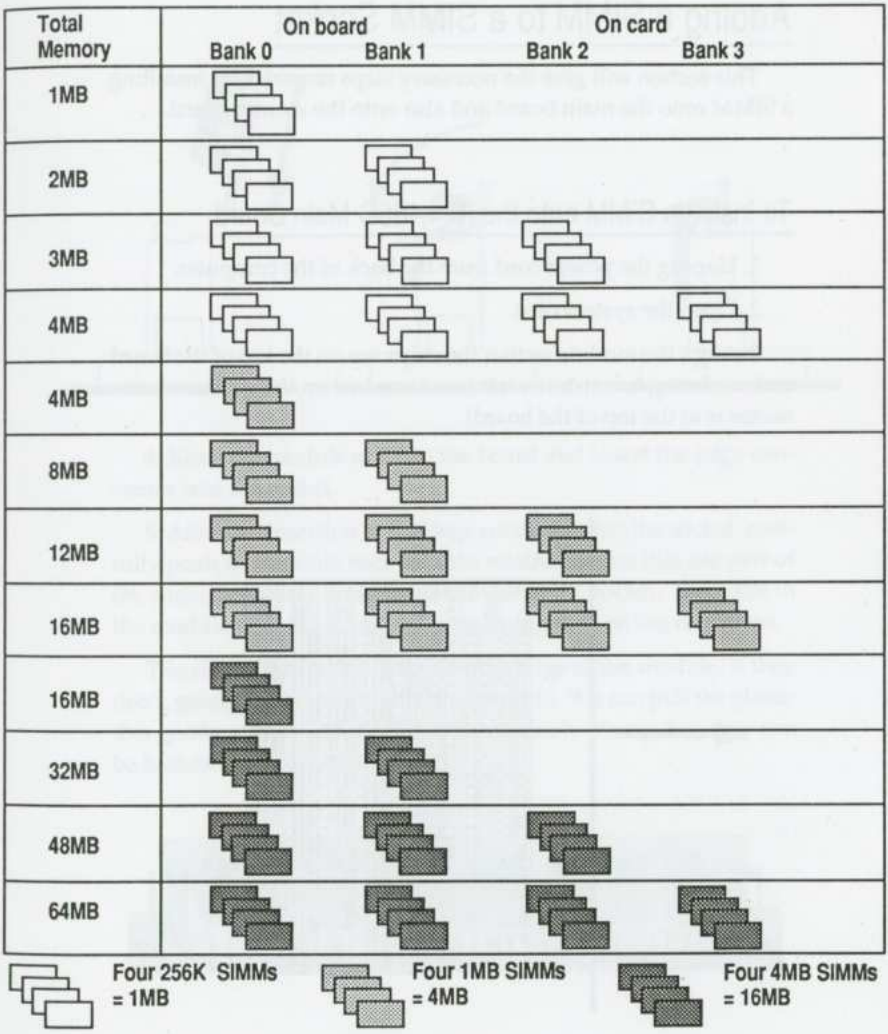


NOTE: All banks have to be completely filled using only one kind of SIM module. See the table for a summary of possible combinations. The SIMM must have a minimum RAS access time of 80ns or faster.

NOTE: "Fast Page Mode" RAM must be used for the memory. The "Fast Page Mode" works like "Page Mode" but provides faster page transfer speed.






Total Memory
On board
On card
Bank 0
Bank 1
Bank 2
Bank 3
1MB
2MB
3MB
4MB
4MB
8MB
12MB
16MB
16MB
32MB
48MB
64MB
Four 256K SIMMs = 1MB
Four 1MB SIMMs = 4MB
Four 4MB SIMMs = 16MB

Adding a SIMM to a SIMM Socket

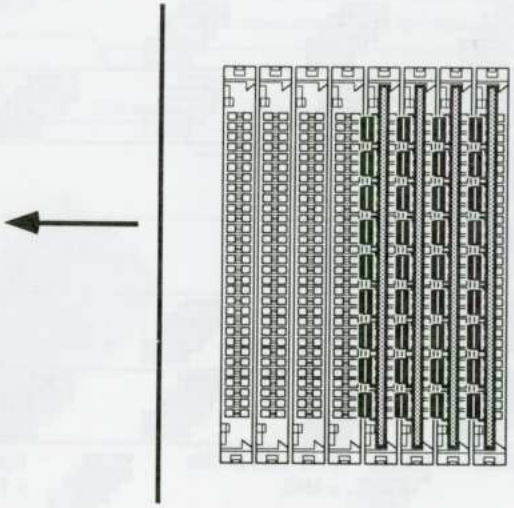
This section will give the necessary steps required for installing a SIMM onto the main board and also onto the memory card.

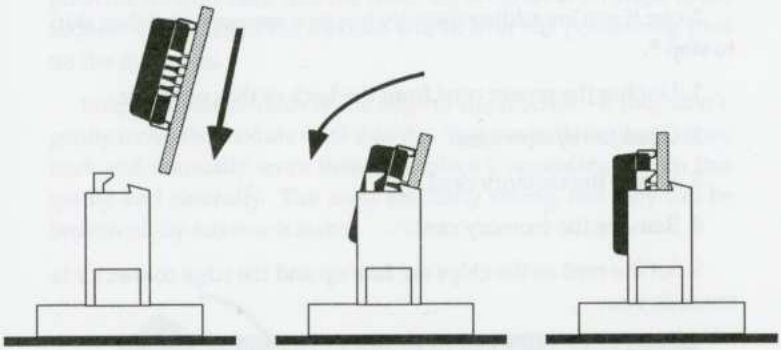
To Install a SIMM onto the ISA-486C Main Board

1. Unplug the power cord from the back of the computer.

2. Open the system case.

3. Align the module so that the chips are on the top of the board and are facing towards the left (as viewed when the keyboard connector is at the top of the board).

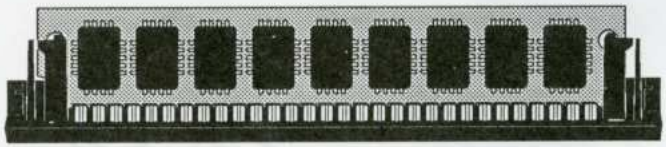




4. Keep the module at 75' to the board and insert the edge connector into the socket.

5. After full insertion of the dege connector into the socket, carefully push the module back into the retaining arms that are part of the socket assembly and set at an angle to the socket. The holes in the module should fit over the positioning pins on the rear arms.

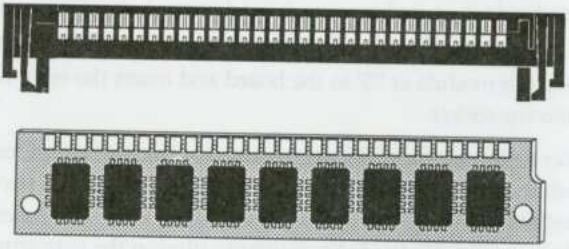
The side arms should snap over the edge of the module. If they don't, gently move the module until they do. You can pull the plastic this gently and carrefully. The arms are fairly strong, but they can be broken off by excessive force.

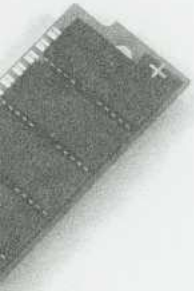


To Install a SIMM onto the Memory Card

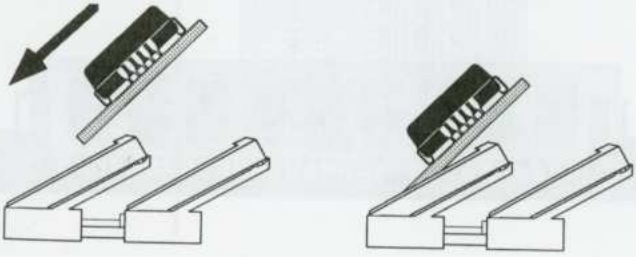
Note: If you are adding memory to a new memory card then skip to step 5.

1. Unplug the power cord from the back of the computer.
2. Open the system case.
3. Locate the memory card.
4. Remove the memory card.
5. Set the card so the chips are face up and the edge connector is towards you.



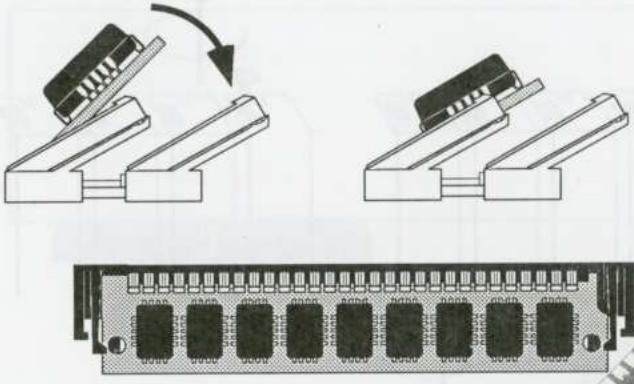


6.The module will insert at an angle to the board. Insert the edge connector into the socket.



After insertion of the edge connector into the socket, carefully push the module back into the retaining arms set at an angle to the socket. The holes in the module will fit over the positioning pins on the rear arms.

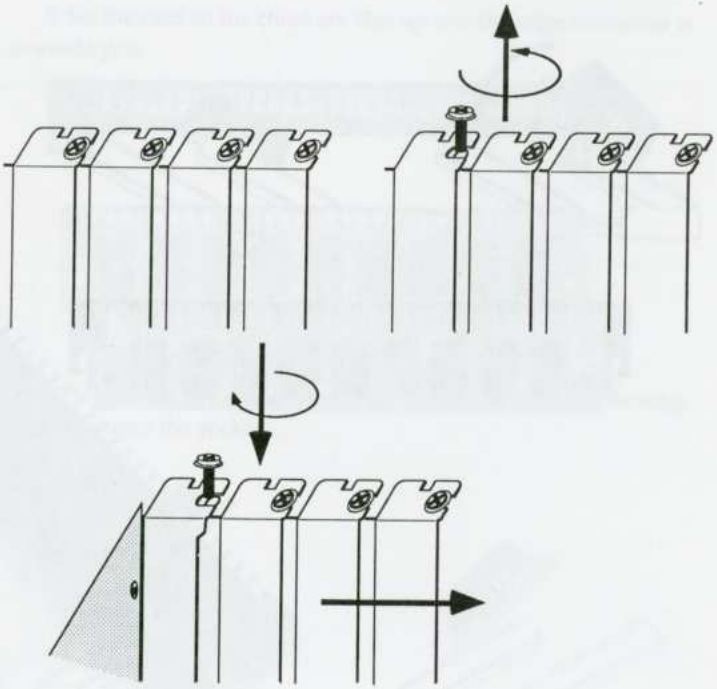
Snap the side arms over the edge of the module. If they don't, gently move the module until they do. You can pull the plastic arms back and manually work them into place if necessary, but do this gently and carefully. The arms are fairly strong, but they can be broken off by too much force.



Installing the Memory Card onto the ISA-486C Main Board

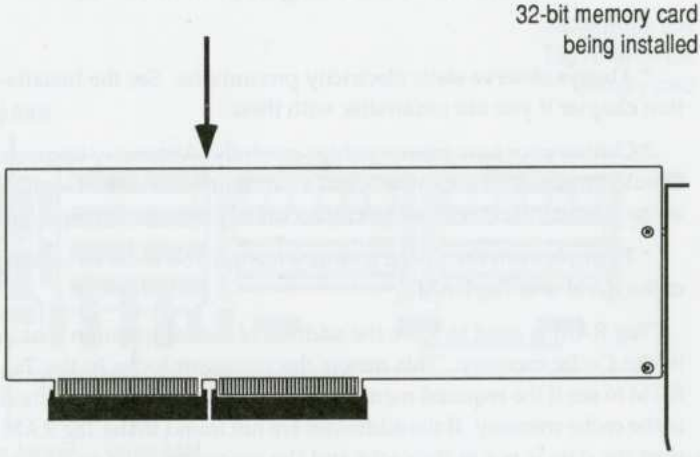
NOTE: If you have just removed the Memory card and installed memory then skip to step 3.

1. Unplug the power cord from the computer.
2. Open the system case.
3. Locate the memory card slot.
4. Align the card so that the modules project towards the right.



5. Carefully press the card into the slot.

If you are not adding any cache memory then you can close the case. If you are adding cache memory then continue to the next paragraph.



Cache Memory

The optional memory card has provision for cache memory to be installed. The cache memory can be 64KB, 128 KB or 256KB. The following section will explain how cache memory can be installed on the memory card and how to configure the card for use.

NOTE:

* Always observe static electricity precautions. See the Installation chapter if you are unfamiliar with these.

* Choose your new memory chips carefully. A memory upgrade should be based on your needs and a careful review of this section of the manual. Be careful to specify accurately the correct chip type.

* To implement the Cache memory feature you must have both cache RAM and Tag RAM.

Tag RAM is used to store the address of the information that is in the Cache memory. This means the processor looks in the Tag RAM to see if the required memory addresses are already contained in the cache memory. If the addresses are not found in the Tag RAM then the data is not in the cache and the processor must go to system memory to get the data.

Installing Cache RAM and Tag RAM onto the Memory Card

NOTE: If the memory card is already removed from the system then skip to step 5.

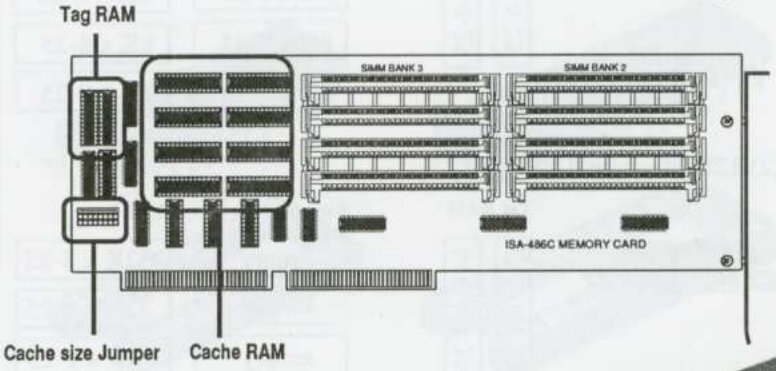
1. Unplug the power cord from the back of the computer.
2. Open the system case.
3. Locate the memory card.

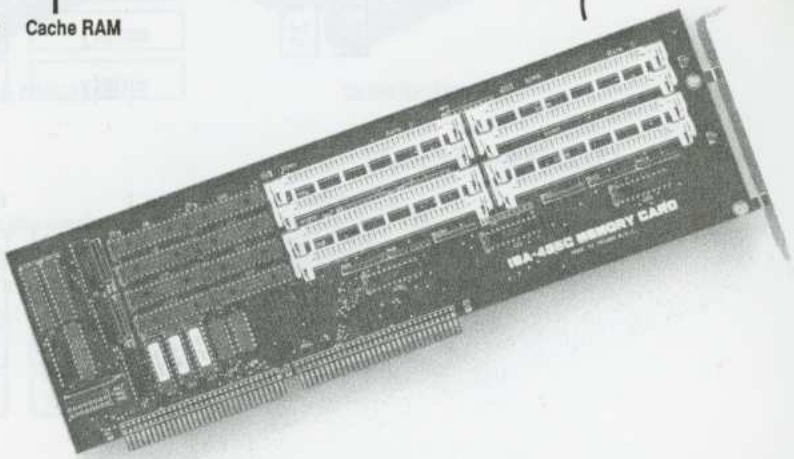
4. Remove the memory card.

5. Set the card so the chips are face up and the edge connector is towards you.

6. Locate the cache system at the upper left portion of the card.

Cache RAM and Tag RAM on the memory card





7. Check the chart to see what kind of chips to install.
8. Check the diagram to see where to install the chips.

(1) 64KB cache RAM

Tag RAM		Bank 1	Bank 0
16K x 4-25	16K x 4-25	8K x 8-25	8K x 8-25
		8K x 8-25	8K x 8-25
		8K x 8-25	8K x 8-25
		8K x 8-25	8K x 8-25

(2) 128KB cache RAM

Tag RAM		Bank 1	Bank 0
64K x 4-25	64K x 4-25	empty	32K x 8-25
		empty	32K x 8-25
		empty	32K x 8-25
		empty	32K x 8-25

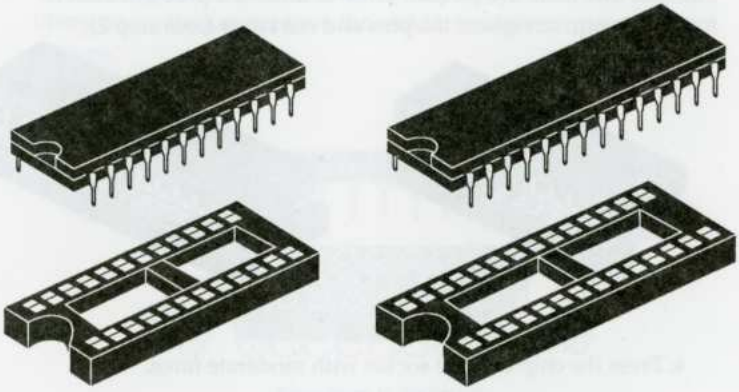
(3) 256KBcache RAM

Tag RAM		Bank 1	Bank 0
64K x 4-25	64K x 4-25	32K x 8-25	32K x 8-25
		32K x 8-25	32K x 8-25
		32K x 8-25	32K x 8-25
		32K x 8-25	32K x 8-25

Installing the chips

Correct orientation of the chips is necessary at the time of installation. The chips will have a curved notch, a dot, or both at one end. This end must be matched to the notch in the chip socket where the chip will be installed.

Tag RAM and
Cache RAM



Tag RAM (24 pins)

Cache RAM (28 pins)

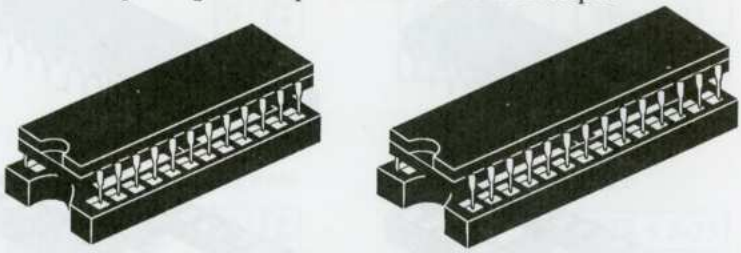
Place the card on a firm and stable surface. Be very careful to protect against static electricity damage when installing the chips. See the Installation chapter for more information about static electricity and how to prevent damage to your computer.

Install the chips individually as follows.

1. Align chip pins in the socket. Place the chip on the correct socket so that all the pins on the chip align with the connections on the socket.

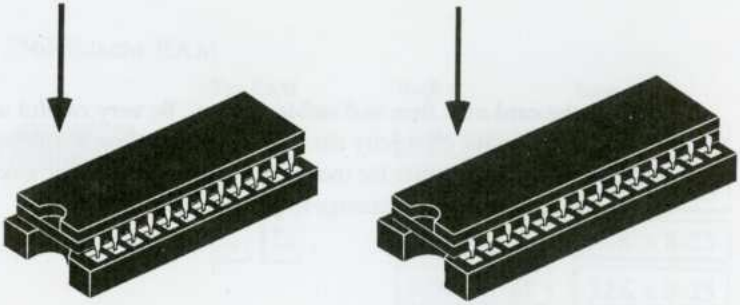
2. Carefully press the chip into the socket. Use enough pressure to barely seat the chip, pressing the chip in 1/3 of the way.

3. Look to see that all the pins are going into the proper connectors and that there are no bent pins. If there is a problem then remove the chip, straighten the pins and start over from step 2.



4. Press the chip into the socket with moderate force.

5. Use this same procedure on all the chips to be installed.



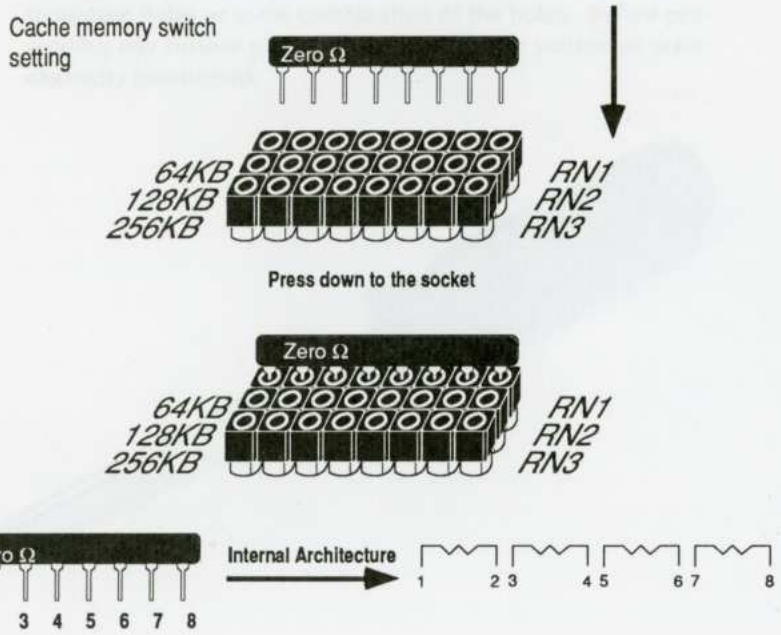
Setting the Cache Memory Size

A jumper must be changed when adding more cache memory to the optional memory board.

There are three possible positions for the jumper.

1. Locate the Zero OHM resistor network jumper, located at the bottom left corner of the memory card.

2. Change the resistor network to the proper location by carefully lifting up on the jumper from the middle to assure an even amount of force.



Installation Guide

If the ISA-486C Main Board is not yet installed in a computer system case then please follow the instructions in this chapter to ensure proper installation.

The design of the ISA-486C Main Board is such that it fits into many different kinds of cases, because of this it is not possible to give exact instructions for each of those cases. This chapter will cover the basic steps for installing the board into the most common cases.

There are nine mounting holes used to mount the board into IBM PC/XT, PC/AT or compatible cases. Most cases will use the same mounting holes or some combination of the holes. Before proceeding any further please read the following section on static electricity precautions.

Static Electricity Precautions

There are two main precautions to be aware of during assembly. The first is static discharges, the second is finger prints on the edge connectors. Both of these are easy to prevent.

Static discharge occurs when your body has a buildup of static electricity. This can be caused by walking on carpet, the clothing you are wearing or by touching other things that have a static charge. Static discharges are most common in a dry environment.

To prevent a static discharge while you are assembling the system there are several things that can be done to remove the static. One way is to wear a static wrist strap, this device fits around your wrist and is connected to a natural earth ground. The second way is to walk over and touch a fixture that you know has a natural earth ground, such as a water faucet. Either of these methods will remove any static buildup.

While assembling the system 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 just to be careful not to touch the connector surfaces that might be damaged.

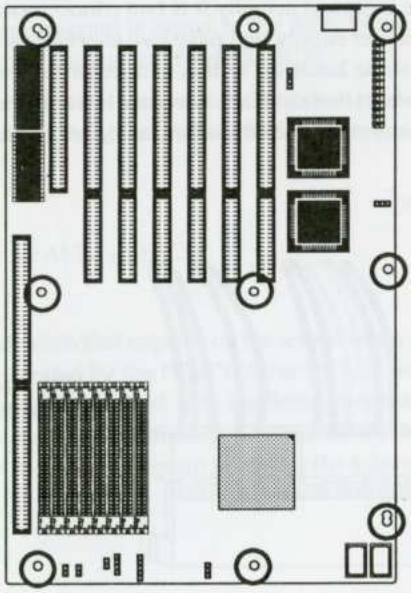
Mounting Holes

There are nine mounting holes drilled into the ISA-486C Main Board. Some or all of these will line up with the mounting points in the case. There will be some mounting hardware for securing the mainboard to the case. Some cases have a metal flange that the long inside edge of the mainboard fits under instead of being screwed down.

Mounting Fasteners

Your case probably came with a variety of mounting hardware or if you are using an existing case then there is hardware from the previous installation. Some of the hardware will be first screwed into the case and then the mainboard will fit on top of those fittings and screwed down. You may have plastic fasteners that snap onto the case and then snap onto the mainboard mounting holes. A case may have both metal and plastic type hardware. Try to use as many mounting points as possible in order to provide a secure mounting for your mainboard.

ISA-486C mounting holes



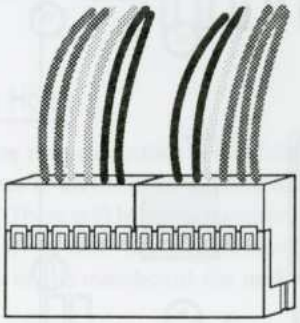
External Connections

System cases will have controls and indicators on the front panel and may have a speaker mounted inside the case. The Setup Guide has information about the connectors built on to the ISA-486C Main Board.

Refer to the Setup Guide and connect the necessary connectors coming from the system case to the mainboard. If unlabeled wires are coming from the case that you do not know what they are for you can trace the wire back to the control or indicator.

Connect the power supply leads to the mainboard. Locate the power supply connectors on the mainboard, refer to the component layout in the Introduction if necessary. The connector on the board looks like one piece but actually it is two connectors mounted end to end. The power supply will have two short leads, each with six wires. Plug these leads on to this connector on the mainboard. Orient the leads so that the black wires are towards the inside of the mainboard connector. The connector can only plug on one way.

Power Connector



The black wires should be to the inside

Firmware

All computer mainboards of this type have a set up program stored in the ROM BIOS. This program creates a record of the basic system hardware present and some settings that control some functions of the board. If you received the ISA-486C mainboard installed as part of a system the proper entries have probably already been made and should be noted inyour system documentation. If this is the case you might want to open the Setup program as described later to take a look at it 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.

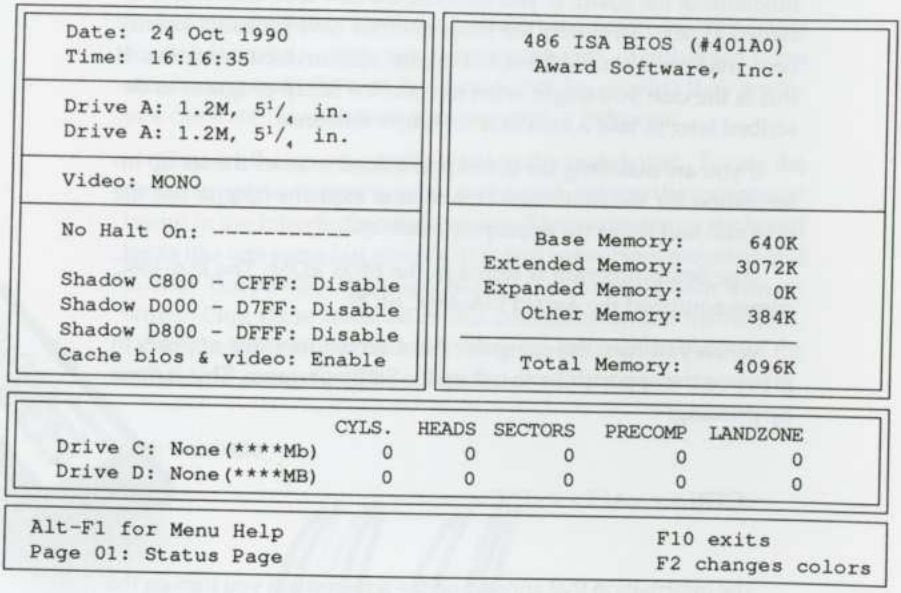
The Setup program is stored in the BIOS ROM. The ISA-486C comes equipped the Award ISA-486C BIOS.

When you turn the computer on, a screen message appears to give you the opportunity to call up the Setup program. This is done by pressing:

<CTRL> + <ALT> + <ESC>

The information that appears on the screen when you turn on the computer is created by the POST (Power On Self Test). During this test the information created with the Setup program is checked. If a problem is discovered a message will appear on the screen asking you to enter the Setup program to correct the informatiuon there.

When you call up the Award BIOS setup program you will see a screen similar to the screen below. It is an example of the settings for a possible system.



If you do not call up the BIOS setup program, the computer will automatically load its operating system if there is an available system disk.

To select the field of information you wish to alter, use the cursor arrows to move the cursor up, down, left or right. Make settings in the highlighted field.

You can use the "+" and "-" keys of the numeric keypad or the "+" key on the typewriter pad to choose among the settings.

If you need information about what changes to make press the "F1" key. The help window will then give you information about the field you have highlighted.

The first section lets you set the date and time. Use the "+" and "-" keys to change the numerical values. Use the left, right, up and down arrows to move between hours, minutes, days etc.

The next section records the types of floppy disk drives present. The five possible choices for drives A & B are:

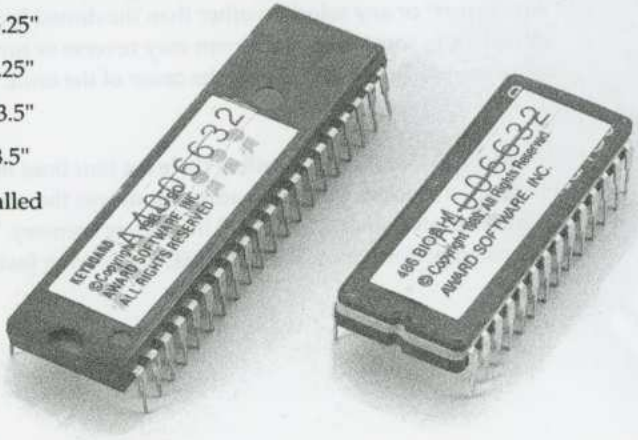
1.2MB, 5.25"

360KB, 5.25"

1.44MB, 3.5"

720KB, 3.5"

Not Installed



Next come the Video choices:

EGA/VGA

CGA 40

CGA 80

MONO

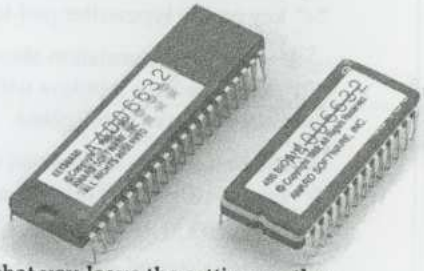
Below the video section is field which controls whether the system stops in case of an error. The "No Halt On" field has the following suggestions:

Any Errors

Keyboard Error

Diskette Error

Disk/Key Error



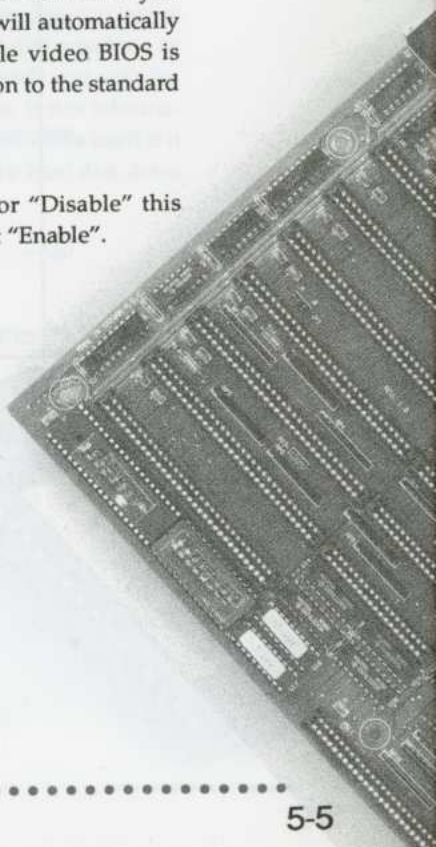
For most purposes we suggest that you leave the setting on the "no default" or dotted line (- - - -) setting. If you set this entry on "Any Errors" or any selection other than the dotted line, and an error occurs, in some cases the screen may reverse or turn red. If this happens you should investigate the cause of the error.

After the "No Halt On" setting there are four lines that setup the ISA-486C's shadow feature. Shadowing moves the contents of the mainboard and other ROM BIOS into faster memory. This speeds up system performance. The ISA-486C shadowing feature has two parts.

The first three lines are addresses reserved for the ROM BIOS of devices other than the mainboard or VGA video display adapter. You can enable these. If you have devices installed that have ROMs that correspond to these addresses their ROM BIOS will be shadowed in the system DRAM.

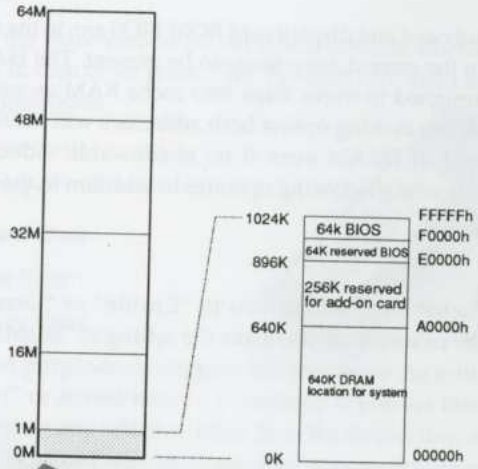
The mainboard and display card ROM BIOS are, in the first case, certain or in the second, very likely to be present. The ISA-486C is therefore designed to move these into cache RAM as well. If you don't enable the caching option both addresses will automatically be shadowed in DRAM even if no shadowable video BIOS is present. The cache shadowing operates in addition to the standard shadowing.

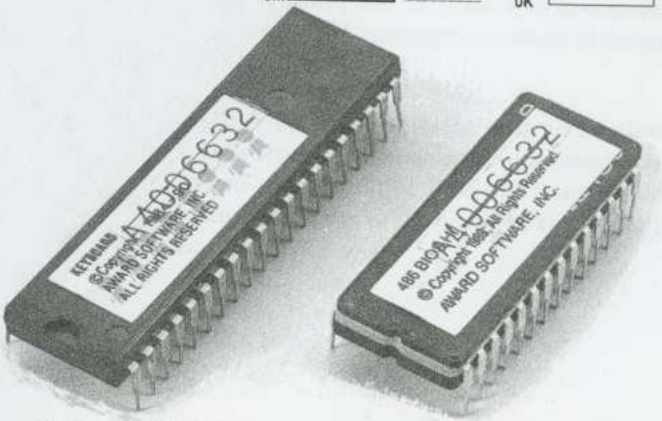
The "Cache" field allows you to "Enable" or "Disable" this function. We recommend you leave the setting at "Enable".



The diagrams below show how is the ISA-486C memory allocation:

Memory map of
ISA-486C





The last section asks you to record the types of hard disks present. Be sure to check the specifications of the drives. It is possible to damage the system if you give incorrect information in this section. There are fifty disk selection options. The first is "None".

Nos. 1-47 are pre-defined

Nos. 48 & 49 are user definable

You must enter the number that corresponds to the hard disk or disks you have installed in the computer. There are five categories of information as shown on the screen. 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 will need to ask your hard disk drive or system vendor for the information.

Note:

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

When you are finished making whatever entries are necessary you must record them for future reference. Every time you turn the computer on this record is checked and compared to what is found.

To record the information and exit the Setup program do as noted below:

Press F10 - This initiates exiting the program.

When you press F10 a message will appear asking you to choose between two options:

Press the F5 key to save the information and exit the program. This records the current settings on the screen.

Press F1 to exit without saving. You might want to do this if you opened the program just to check the settings.

If you decide that you want to return to the setup program instead of exiting, press the Esc key.

ISA-486C