



# 486MBS Series Product Manual

MANUAL NUMBER : 41209-103-1B





## FOREWORD

This product manual provides information to install, operate and/or program the referenced product(s) manufactured or distributed by ICS Advent. The following pages contain information regarding the warranty and repair policies.

Check our Web site (<http://www.icsadvent.com/techsupport>) for technical information, manual, and BIOS updates. Technical assistance is also available at: **800-480-0044** (U.S. and Canada) or **858-677-0877** (international).

**Manual errors, omissions, bugs, and/or comments:** A Customer Comments section is included at the end of this manual. If you experience any problems with the manual or just want to give us some feedback, please review the information in this section. It will tell you how to easily access our web site and provide immediate feedback online.

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A thirty day money-back guarantee is provided on all **standard** products sold. **Special order products** are covered by our Limited Warranty, *however they may not be returned for refund or credit. EPROMs, RAM, Flash EPROMs or other forms of solid electronic media are not returnable for credit - but for replacement only. Extended Warranty available. Consult factory.*

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In order to receive refund on a product purchase price, the product must not have been damaged by the customer or by the common carrier chosen by the customer to return the goods, and the product must be returned complete (meaning all manuals, software, cables, etc.) within 30 days of receipt and in as-new and resalable condition. The **Return Procedure** must be followed to assure prompt refund.

## Restocking Charges

Product returned *after* 30 days, and *before* 90 days, of the purchase will be subject to a **minimum** 20% restocking charge and any charges for damaged or missing parts.

Products not returned within 90 days of purchase, or products which are not in as-new and resalable condition, are not eligible for credit return and will be returned to the customer.

## Limited Warranty

Effective April 1, 1998, all products carry a two-year limited warranty with the exception of the "Performance Series" I/O products, which are warranted to the original purchaser for as long as they own the product, subject to all other conditions below, including those regarding neglect, misuse and acts of God. Within two years of purchase, ICS Advent will repair or replace, at our option, any defective product. At any time after two years, we will repair or replace, at our option, any defective "Performance Series" I/O product sold. This does not include products damaged in shipment, or damaged through customer neglect or misuse. ICS Advent will service the warranty for all standard catalog products for the first two years from the date of shipment. After the second year, for products not manufactured by ICS Advent, the remainder of the manufacturer's warranty, if any, will be serviced by the manufacturer directly.

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The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than ICS Advent or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of ICS Advent or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the owners' manual.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. ICS Advent reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.



**Shipments not in compliance with this Guarantee and Limited Warranty Return Policy will not be accepted by ICS Advent.**

*Mission Critical Applied Computing Solutions*

## Return Procedure

For any Limited Warranty or Guarantee return, please contact ICS Advent's Customer Service at **800-480-0044** (U.S. and Canada) or **858-677-0877** (international) and obtain a Return Material Authorization (RMA) Number. All product(s) returned to ICS Advent for service or credit **must** be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items **must** be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty **must** include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing date of purchase.

To reduce risk of damage, returns of product must be in an ICS Advent shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from ICS Advent Customer Service at a nominal cost.

## Limitation of Liability

In no event shall ICS Advent be liable for any defect in hardware or software or loss or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. ICS Advent liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by ICS Advent or its authorized agent.

Some *Sales Items* and *Customized Systems* are **not** subject to the guarantee and limited warranty. However, in these instances any deviations will be disclosed prior to sales and noted in the original invoice. ***ICS Advent reserves the right to refuse returns or credits on software or special order items.***

## Advisories

Three types of advisories are used throughout the manual to stress important points or warn of potential hazards to the user or the system. They are the Note, the Caution, and the Warning. Following is an example of each type of advisory:

**Note:** The note is used to present special instruction, or to provide extra information which may help to simplify the use of the product.



### CAUTION!



A Caution is used to alert you to a situation which if ignored may cause injury or damage equipment.

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### WARNING!



A Warning is used to alert you of a situation which if ignored will cause serious injury.

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Cautions and Warnings are accented with triangular symbols. The exclamation symbol is used in all cautions and warnings to help alert you to the important instructions. The lightning flash symbol is used on the left hand side of a caution or a warning if the advisory relates to the presence of voltage which may be of sufficient magnitude to cause electrical shock.

Use caution when servicing any electrical component. We have tried to identify the areas which may pose a Caution or Warning condition in this manual; however, ICS Advent does not claim to have covered all situations which might require the use of a Caution or Warning.

You must refer to the documentation for any component you install into a computer system to ensure proper precautions and procedures are followed.









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# Chapter 1: Introduction

Thank you for your purchase of the 486MBS Series Industrial system board. The 486MBS Series system board design was based on providing the ideal platform for getting the most power of the Intel 486MBS processor. With proper installation and maintenance, your 486MBS Industrial will provide years of high performance and trouble free operation.

This manual provides a detailed explanation into the installation and use of the 486MBS Series system board. This manual is written for the novice PC user/installer. However, as with any major computer component installation, previous experience is helpful and should you not have prior experience, it would be prudent to have someone assist you in the installation.

This manual is broken down into 3 chapters and 3 appendixes.

## **Chapter 1 - System Board Configuration**

This chapter provides all the necessary information for installing the 486MBS. Topics discussed include: Installing the CPU (if necessary), DRAM installation, jumper settings for CPU, cache and standard I/O. Connecting all the cables from the system board to the chassis and peripherals.

## **Chapter 2 - WinBIOS Setup**

This chapter discusses the final step in getting your system up and running - running the BIOS SETUP program.

## **Chapter 3 - Upgrading**

The 486MBS provides a number of expansion options including memory and cache. All aspects of the upgrade possibilities are covered.

## **Appendix A - Technical Specifications**

A complete listing of all the major technical specifications of the 486MBS is provided.

## **Appendix B - Flash BIOS Programming**

Provides all the information necessary to program your optional AMBIOS Flash BIOS.

## **Appendix C - Troubleshooting**

This chapter lists the solutions for the most common questions on the 486MBS operation.

## Configuration

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This chapter provides all the necessary information for installing the 486MBS Series into a standard PC chassis. Topics discussed include: installing the CPU (if necessary), DRAM installation, jumper settings for CPU, cache and standard I/O.

### Handling Precautions

The 486MBS has been designed to be as rugged as possible but it can be damaged if dropped, jarred sharply or struck. Damage may also occur by using excessive force in performing certain installation procedures such as forcing the system board into the chassis or placing too much torque on a mounting screw.

Take special care when installing or removing the system memory SIMMs. Never force a SIMM into a socket. Screwdrivers slipping off a screw and scraping the board can break a trace or component leads, rendering the board unusable. Always handle the 486MBS Series with care.

#### Special Warranty Note:

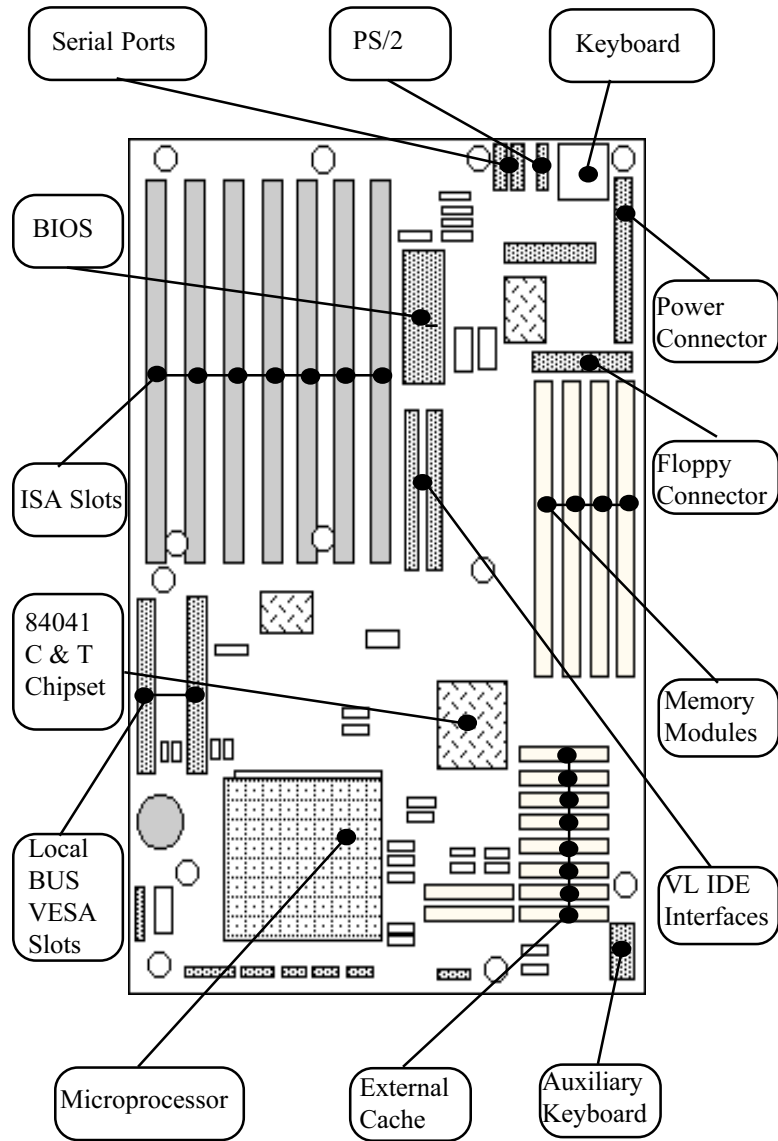
Products returned for warranty repair will be inspected for damaged caused by improper installation and misuse as described in the previous section and the static warning below. Should the board show signs of abuse, the warranty will become void and the customer will be billed for all repairs and shipping and handling costs.

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### STATIC WARNING

The 486MBS Series contains delicate electronic semiconductors that are highly sensitive to static electricity. These components, if subjected to a static electricity discharge, can be weakened thereby reducing the serviceable life of the system board. **BEFORE THE BOARD IS REMOVED FROM ITS PROTECTIVE ANTISTATIC PACKAGING TAKE PROPER PRECAUTIONS!** Work on a conductive surface that is connected to ground. Before touching any electronic device, ground your self by touching an unpainted metal object or, and highly recommended, use a grounding strap.

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**Figure 1-1: 486MBS Series Board**

## Step 1 - Setting the Jumpers

Your 486MBS Series is equipped with a large number of peripherals and has the ability to run at a variety of speeds without the need to change any crystals or oscillators. As such, there is a large number of configuration jumpers on the board. Taken step by step, setting these jumpers is easy. We suggest you review each section and follow the instructions.

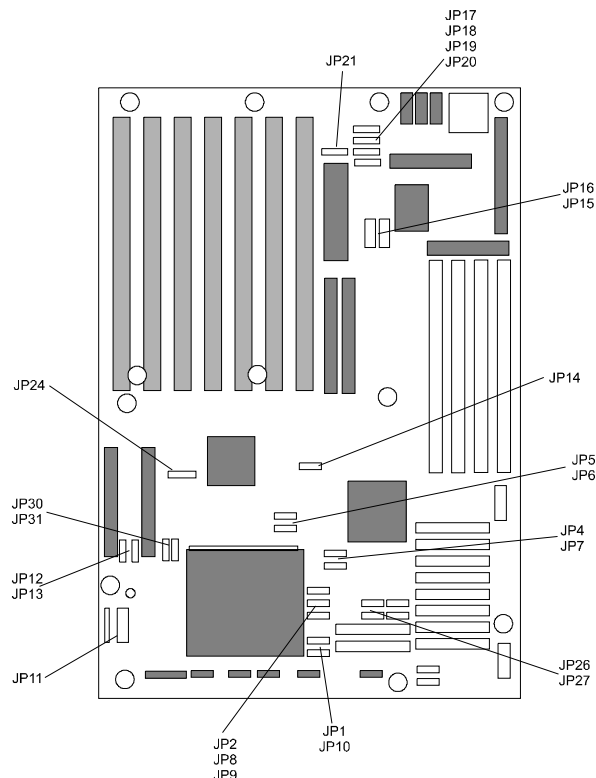
### Jumper Types

Jumpers are small copper pins attached to the system board. Covering two pins with a shunt closes the connection between them. The 486MBS Series examines these jumpers to determine specific configuration information. There are three different categories of jumpers on the Predator 747.

- A. Two pin jumpers are used for binary selections such as enable, disable. Instructions for this type of jumper are open, for no shunt over the pins or closed, when the shunt covers the pins.
- B. Three or four pin jumpers are used for multiple selection. Instructions for these jumpers will indicate which two pins to cover. For example: for JPx 2-3 the shunt will be covering pins 2 and 3 leaving pins 1 and 4 exposed.
- C. Grouped Jumpers are used when a certain function has multiple selections. There are two grouped jumpers on the board and careful attention should be given when setting these jumpers. Instructions for grouped jumpers are similar to those above - Jumper Location and Pin Numbers.

### Jumper Locations

Use the diagram below and the tables on the following pages to locate and set the on-board configuration jumpers.



**Figure 1-2: Jumper Locations**

## Standard I/O Enable

The 486MBS Series standard I/O consists of the two serial ports, the parallel port and floppy disk controller. Jumper JP17 is used to enable or disable these ports.

**Table 1-1: Standard I/O Enable**

## CMOS Reset

This option is provided as a convenience for those who need to reset the CMOS registers. It should always be set to “Normal” for standard operation. If the CMOS needs to be reset turn off the system, move JP24 to 2-3, turn the system on, move JP24 back to 1-2 and reset the motherboard.

**Table 1-2: CMOS Reset**

## I/O Port IRQ Selection

The parallel port and both serial ports must have their IRQs. Normally, these settings can be left in their default settings and only when conflicts arise should they be changed. Jumper JP18 is used to select the parallel port IRQ. Jumper JP19 is used to select the first serial port's IRQ. Jumper JP20 is used to select the second serial port's IRQ. Use Table 1-8 to select the IRQs for these options.

**Table 1-3: I/O Port IRQ Selection**

## **Clock Speed Selection**

The jumper JP14 allows you to choose the appropriate CPU speed, without changing crystals and oscillators.

**Table 1-4: CPU Clock Frequency**

## **CPU Type Settings**

The jumpers JP5 and JP6 allow you to choose the appropriate CPU type, without changing crystals and oscillators.

**Table 1-5: CPU Type Settings**

## **DMA Configuration for ECP Parallel Port**

The jumpers JP15 and JP16 are designated for the configuration of the ECP parallel port.

**Table 1-6: DMA Configuration for ECP Parallel Port**



## **Voltage Regulator Detection**

The jumper JP11 selects the voltage for the CPU. Positions 1-2, 3-4 are auto-select for Intel, AMD and Cyrix 5X86 CPUs.

**Table 1-7: Voltage Regulator Detection**

## **Clock Multiplier**

The jumper JP10 sets the multiplier for the AMD CPUs.

**Table 1-8: Clock Multiplier**

## **Cache Size**

The jumpers JP26 and JP27 allow you to choose the cache size desired.

**Table 1-9: Cache Size Selection**

## **VL Bus Frequency**

The jumpers JP13 and JP31 allow you to choose the frequency on the VL Bus.

**Table 1-10: VL Bus Frequency**

## **VL Bus Wait States**

The jumpers JP12 and JP30 set the wait states for the VL slots.

**Table 1-11: VL Bus Wait States**

## Quick Jumper Settings For Most Used CPUs

**Table 1-12: CPU Jumper Settings**

**Table 1-12A: CPU Jumper Settings**

## **Step 2 - DRAM, CPU and Cables Installation**

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Depending upon how your 486MBS Series is configured you may need to install the following:

- DRAM (SIMMs)
- CPU

### **486MBS Series Memory Configuration**

The 486MBS Series uses standard Fast Page Mode 60ns access speed SIMMs. It is very important that the quality of the SIMMs is good. Undesirable operation of the system may result if poor quality SIMMs are used. Always purchase your memory from a reliable source.

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## IMPORTANT

The 486MBS Series uses standard 32 or 36-Bit SIMMs. They are slight larger than other 9-Bit SIMMs that are also commonly used on systems boards. They are configured into four, 8-Bit (or 1 Byte) sections. Thus, a total of 32 Bits ( no parity) or 36 Bits (with parity) are stored. This is often confusing because these SIMMs are commonly referred to as 256K by 32 or 36 or 1MB by 32 or 36. To determine the actual capacity of the SIMM, simply multiply the 256K, 512K or 1MB by 4. Thus the actual SIMMS capacity is 1MB, 2MB and 4MB respectively.

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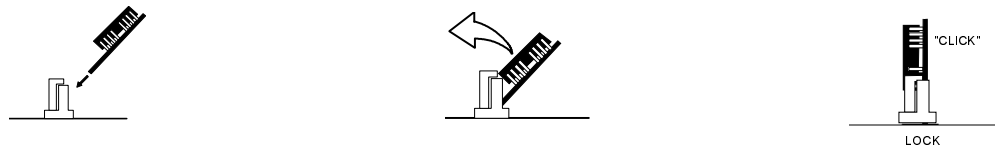
### Installing Memory Modules

The 486MBS Series has 4 memory module sockets. The order in which they should be populated is from the inside of the board outward. Note that each socket is labeled: U15, U16, U17 and U18.

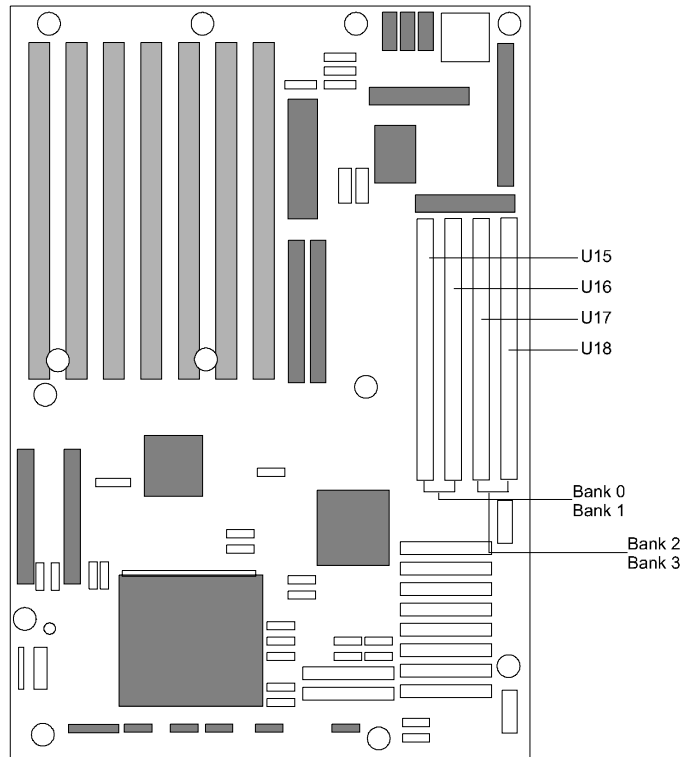
When inserting the memory modules, note the notch on the edge of each module. This notch is designed to permit insertion in only one way. This notch must be pointed towards the keyboard connector.

Start with the innermost socket (U15). Gently place the module into the desired socket at a 30-45° angle. Then gently rotate or rock the module into an upright position. **Never force a memory module into its socket.** Rather, double check the notch and gently rock it into place. When the module has been properly installed, the metal latches on either side of the memory module will “click” into place. Repeat the mentioned steps until all memory modules are installed. No jumpers are involved in DRAM configuration.

1. Gently place the SIMM into the desired socket at 30-45 angle.
2. Then gently rotate or rock the SIMM into an upright position. **Never force a SIMM into its socket.**
3. Double check the notch and gently rock it into place. If properly installed, the SIMM will "click"



**Figure 1-3: SIMM Installation**



**Figure 1-4: Memory Modules Socket Locations**

## CPU Installation

The 486MBS Series currently supports the following CPUs:

- Intel P24T
- Intel SX, DX, DX2, DX4 and DX4 overdrive
- Cyrix DX, DX2 and 5X86
- AMD DX, DX2, DX4 and 5X86

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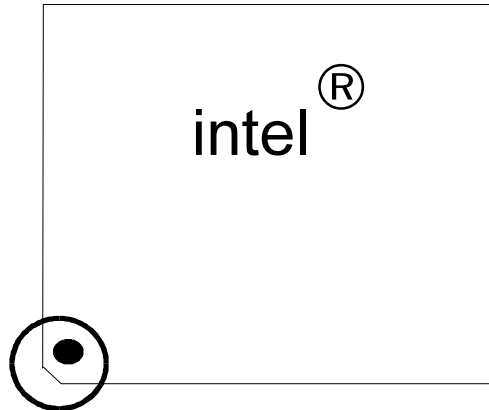
## WARNING

Improper installation of the CPU may cause permanent damage to both the system board and the CPU. -- Void of warranty. Always handle the CPU by the edges, never touch the pins. Always use a heatsink and CPU fan.

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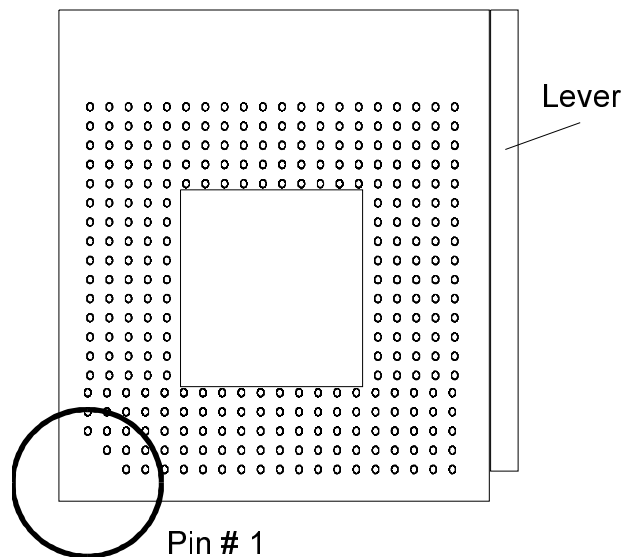
This notch represents pin one. The 486 processor also has small dot as well indicating pin 1. **DO NOT USE THE CHIP LOGO OR LETTERING TO LOCATE PIN ONE.**

Locate the CPU socket on your 486MBS system board. Pin 1 on the socket is located in the lower left hand corner of the socket.



**Figure 1-5: CPU Alignment**

To install the Microprocessor lift the lever of the ZIF socket and gently insert the CPU. Make sure the CPU is inserted all the way. Lower the lever.

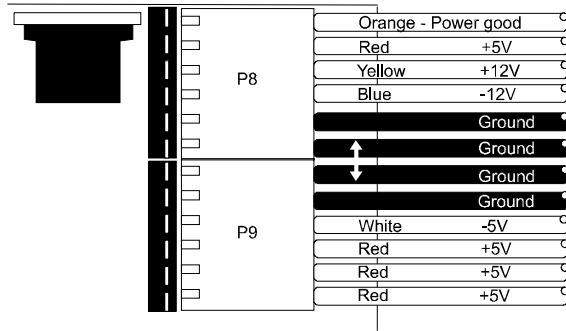


**Figure 1-6: CPU Socket alignment**

This completes the installation of the CPU. Now is a good time to double check both the CPU and SIMM installation to make sure that these devices have been properly installed.

## Installing Cables

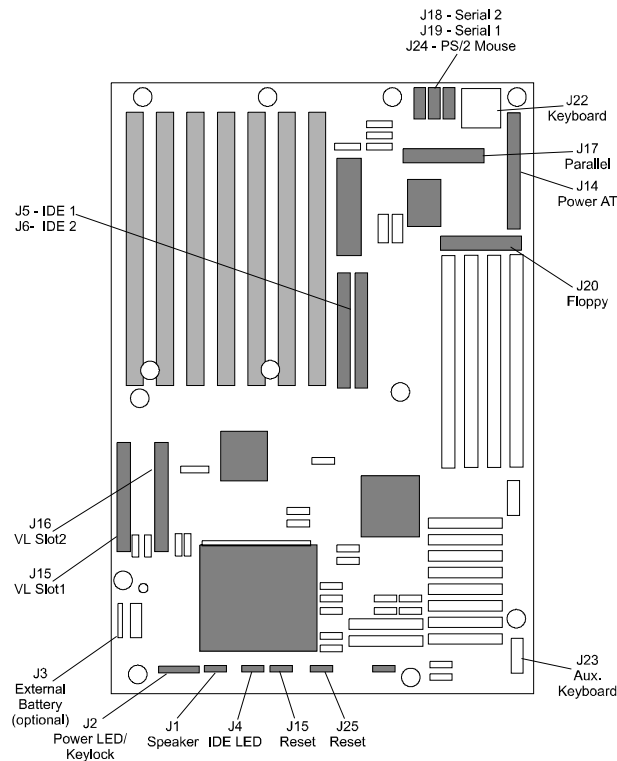
### Power and Control Panel Cables



**Figure 1-7: Power and Control Panel Cables**

Connect the power supply cables to the system board. There is no formal convention for color coding the wires on power supplies except for ground wires which are black. Use figure above to determine the proper cable locations.

Next install the control panel cables for each of the control panel headers. These headers are located along the bottom of the board. Again, there is no standard convention for color coding these cables. However, the connectors for “Key lock/Power LED” and “Speaker” are keyed. While the actual connector on the cable harness may not be keyed, there will probably be a wire missing.



**Figure 1-8: On-Board Connectors Location**



**Table 1-13: Control Panel Connectors**

### **Installing Peripheral Cables**

Begin with the top of the 486MBS Series system working left to right. Now it is a good time to install the internal peripherals such as floppy and hard disk drives. Do not connect the power cable to these peripherals as it is easier to attach the bulky ribbon cables before the smaller power connectors. If you are installing more than one IDE drive double check your master/slave jumpers on the drives. Review the information supplied with your drive for more information on this subject.

Connect the floppy cable (not included) to the system board. Then connect remaining ends of the ribbon cable to the appropriate peripherals.

Finally, connect the IDE cable (not included) to the system. Then connect remaining ends of the ribbon cable to the appropriate peripherals. This concludes the hardware installation of your 486MBS system. Now it is a good time to re-check all of the cable connections to make sure they are correct. It is also a good idea to label each of the external peripheral connectors - COM1, COM2, Mouse and Parallel.

# Chapter 2: WinBIOS Setup

Your 486MBS Industrial features an AMI BIOS with a new type of system BIOS Setup utility. WinBIOS Setup has a graphical user interface that permits mouse access, and is so compact that it can reside on the same ROM as the system BIOS. The system configuration parameters are set via WinBIOS Setup. Since WinBIOS Setup resides in the ROM BIOS, it is available each time the computer is turned on.

## Starting WinBIOS Setup

As POST executes, the following appears:

Hit <DEL> if you want to run SETUP

## Using a Mouse with WinBIOS Setup

WinBIOS Setup has a built-in mouse driver and can be accessed by either a serial or PS/2-type mouse.

## Using the Keyboard with WinBIOS Setup

WinBIOS Setup has a built-in keyboard driver that uses simple keystroke combinations:

<b>Keystroke</b>	<b>Function</b>
<Tab>	Move to the next window or field.
Arrow keys	Move to the next field to the right, left, above, or below.
<Enter>	Select in the current field.
+	Increments a value.
-	Decrements a value.
<Esc>	Closes the current operation and return to previous level.
<PgUp>	Returns to the previous page.
<PgDn>	Advances to the next page.
<Home>	Returns to the beginning of the text.
<End>	Advances to the end of the text.
<Alt> <H>	Access a help window.
<Alt> <Spacebar>	Exit WINBIOS Setup.
Alphabetic keys	A to Z are used in the Virtual Keyboard, and are not case-sensitive.
Numeric keys	0 to 9 are used in the Virtual Keyboard and Numeric Keypad.

## WinBIOS Setup Main Menu

The WinBIOS Setup main menu is organized into four windows. Each window corresponds to a section in this chapter.

Each section contains several icons. Clicking on each icon activates a specific function. The WinBIOS Setup icons and functions are described in this chapter. The sections are:

Setup:	Described in Section 1. This section has five icons that permit you to set system configurations: standard setup, advanced setup, chipset setup, power management setup and peripheral setup.
Utility:	Described in Section 2. This section has three icons that perform system functions.
Security:	Described in Section 3. This section has two icons that control WinBIOS security features.
Default:	Described in Section 4. This section has three icons that permit you to select a group of settings for all WinBIOS Setup options.

## Default Settings

Original:	Returns settings to previous settings.
Optimal:	These settings provide the best performance characteristics.
Fail-Safe:	These settings are more likely to configure a workable computer when something is wrong. If you cannot boot the computer successfully, select the <i>Fail-Safe WinBIOS Setup</i> options and try to diagnose the problem after the computer boots. These settings do not provide optimal performance.

## Section 1: Setup

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WINBIOS Setup can have up to six separate screens. Different types of system configuration parameters are set on each screen.

### Standard Setup

Standard Setup options are displayed by choosing the Standard icon from the WINBIOS Setup menu. All Standard Setup options are described below.

### Date/Time

Select the Date/Time option to change the date or time. The current date and time are displayed. Enter new values through the displayed window.

### Floppy Drive A, B

Choose the Floppy Drive A or B icon to specify the floppy drive type. The settings are *Not Installed*, *360 KB 5¼*, *1.2 MB 5¼*, *720 KB 3½*, *1.44 MB 3½*, or *2.88 MB 3½*.

**Pri Master    Pri Slave**

**Sec Master    Sec Slave**

Choose these icons to configure the hard disk drive named in the option. When you click on an icon, the following parameters are listed: Type, LBA/Large Mode, Block Mode, 32Bit Mode, and PIO Mode. All parameters relate to IDE drives except **Type**.

### Configuring an MFM Drive

If configuring an old MFM hard disk drive, you must know the drive parameters (number of heads, number of cylinders, number of sectors, the starting write precompensation cylinder, and drive capacity). Choose **Type** and choose the appropriate hard disk drive type (1 - 46). The old MFM hard drive types are listed on appendix A. If the drive parameters of your MFM drive do not match any drive type listed, select *User* in the **Type** field and enter the drive parameters on the screen that appears.

### User-Defined Drive

If you are configuring a SCSI drive or an MFM, RLL, ARLL, or ESDI drive with drive parameters that do not match drive types 1-46, you can select the *User* in the **Type** field. You must then enter the drive parameters on the screen that appears. The drive parameters include:

Cylinder (number of cylinders),  
 Hd (number of heads),  
 WP (starting write precompensation cylinder),  
 Sec (number of sectors),  
 Size (drive capacity).

### Configuring IDE Drives

If the hard disk drive to be configured is an IDE drive, select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Select the IDE Detect icon to automatically detect all drive parameters.

AMIBIOS automatically detects the IDE drive parameters (including ATAPI CD-ROM drives) and displays them. Click on the OK button to accept these parameters Or you can set the parameters manually if you are absolutely certain that you know the correct IDE drive parameters.

- Click on **LBA/Large Mode** and choose *On* to enable support for IDE drives with capacities greater than 528 MB.
- Click on **Block Mode** and choose *On* to support IDE drives that use Block Mode.
- Click on **32Bit Mode** and click on *On* to support IDE drives that permit 32-bit accesses.
- Click on **PIO Mode** to select the IDE Programmed I/O mode. PIO programming also works with ATAPI CD-ROM drives. The settings are *Auto*, *0*, *1*, *2*, *3*, *4*, or *5*. Click on *Auto* to allow AMIBIOS to automatically find the PIO mode that the IDE drive being configured uses. If you select *0-5* you must make absolutely certain that you are selecting the PIO mode supported by the IDE drive being configured.

## Configuring a CD-ROM Drive

Select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the **Type** parameter and select CDROM. You can boot the computer from a CD-ROM drive. You can also choose *Auto* and let AMIBIOS will automatically set the correct drive parameters.

## Advanced Setup

Advanced Setup options are displayed by choosing the Advanced icon from the WINBIOS Setup main menu. All Advanced Setup options are described in this section.

### Quick Boot

Set this option to *Enabled* to instruct AMIBIOS to boot quickly when the computer is powered on. This option replaces the old **Above 1 MB Memory Test** Advanced Setup option. The settings are: *Enabled* and *Disabled*. The Optimal and Fail-Safe default settings are *Enabled*.

### BootUp Sequence

This option sets the sequence of boot drives (floppy drive A:, hard disk drive C:, or a CD-ROM drive) that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *C:,A:,CDROM,A:,C:*, *CDROM:* or *CDROM,A:,C:*. The default settings are *C:,A:,CDROM*.

### BootUp Num-Lock

Set this option to *Off* to turn the Num Lock key off when the computer is booted so you can use the arrow keys on both the numeric keypad and the keyboard. The settings are *On* or *Off*. The default settings are *On*.

### Floppy Drive Swap

Set this option to *Enabled* to permit drives A: and B: to be swapped. The settings are *Enabled* or *Disabled*. The default settings are *Disabled*.

### Mouse Support

When this option is set to *Enabled*, AMIBIOS supports a PS/2-type mouse. The settings are *Enabled* or *Disabled*. The default settings are *Enabled*.

### System Keyboard

This option specifies that a keyboard is attached to the computer. The settings are *Present* or *Absent*. The Optimal and Fail-Safe default settings are *Present*.

### Primary Display

This option specifies the type of display monitor and adapter in the computer. The settings are *Absent*, *VGA/EGA*, *CGA40x25*, *CGA80x25* or *Mono*. The Optimal and Fail-Safe default settings are *VGA/EGA*.

**Password Check**

This option enables password checking every time the computer is powered on or every time WINBIOS Setup is executed. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if WINBIOS is executed. The Optimal and Power-On defaults are *Setup*.

**Parity Check**

The settings are *Disabled* or *Enabled*. The defaults are *Disabled*

**OS/2 Compatible Mode**

Set this option to *Enabled* to permit AMIBIOS to run with IBM OS/2. The settings are *Enabled* or *Disabled*. The default settings are *Disabled*.

**Internal Cache**

This option specifies the caching algorithm used for L1 internal cache memory. The settings are: *Disabled* or *Write Thru* (default).

**External Cache**

This option specifies the caching algorithm used for L2 secondary (external) cache memory. The settings are: *Disabled*, *WriteThru* or *WriteBack*. The optimal default setting is *Disabled*. The Fail-Safe default setting is *WriteThru*.

**System BIOS Shadow Cacheable**

When this option is set to *Enabled*, the contents of the F0000h system memory segment can be read from or written to L2 secondary cache memory. The contents of the F0000h memory segment are always copied from the BIOS ROM to system RAM for faster execution. The settings are *Enabled* or *Disabled*. The Optimal default setting is *Enabled*. The Fail-Safe default is *Disabled*.

**C000,32k Shadow****C800,16k Shadow****CC00,16k Shadow****D000,64k Shadow**

These options control the location of the contents of the 16KB of ROM beginning at the specified memory location. If no adaptor ROM is using the named ROM area, this area is made available to the local bus. The settings are: *Enabled* or *Disabled*.

**C0000-FFFFFF, Shadow Cacheability**

The settings are *Disabled* or *Enabled*.

## Power Management Setup

Power Management Setup options are displayed by choosing the Power Mgmt icon from the WinBIOS Setup main Menu. All Power Management Setup options are described in this section.

### Power Management/APM

Set this option to *Enable* to enable the power management and APM (Advanced Power Management) features. AMIBIOS uses the RTC Alarm function to wake the computer at a perspecified time. The settings are *Enabled* or *Disabled*. The default settings are *Disabled*.

### Inst-On Support

This option Enables the standby feature. The settings are *Disabled* or *Enabled*.The default setting is *Disabled*.

### Green PC Monitor Power State

This option specifies the power management state that the Green PC-compliant video monitor enters after the specified period of display inactivity has expired. The settings are *Disabled*, *Stand By*, *Suspend*, or *Off*. The default setting is *Disabled*.

### Video Power Down Mode

This option specifies the power management state that the video subsystem enters after the specified period of display inactivity has expired. The settings are *Disabled*, *Stand By*, or *Suspend*. The default settings are *Disabled*.

### Hard Disk Power Down Mode

This option specifies the power management state that the hard disk drive enters after the specified period of display inactivity has expired. The settings are *Disabled*, *Stand By*, or *Suspend*. The default settings are *Disabled*.

### Hard Disk TimeOut (Minute)

This option specifies the length of a period of hard disk inactivity. When this period expires, the hard disk drive enters the power-conserving mode specified in the **Hard Disk Power Down Mode** option. The settings are *Disabled*, *1 Min (minutes)*, and all one minute intervals up to and including *15 Min*. The default settings are *Disabled*.

### Standby TimeOut (Minute)

This option specifies the length of the period of system inactivity when the computer is in Full-On mode before the computer is placed in Standby mode. In Standby mode, some power use is curtailed. The settings are *Disabled*, *1 Min*, *2 Min*, and all one minute intervals up to and including *15 Min*. The default settings are *Disabled*.



**Suspend Time Out (minute)**

This option specifies the length of the period of system inactivity when the computer is already in Standby mode before the computer is placed in suspend mode. In suspend mode, nearly all power use is curtailed. The settings are *Disabled*, *1 min.*, *2 min.*, and all one minute intervals up to *15 Min.* The default settings are *Disabled*.

**Display Activity**

This option specifies if AMIBIOS is to monitor activity on the display monitor for power conservation purposes. When this option is set to *Monitor* and there is no display activity for the length of time specified in the value in the Standby TimeOut minute option, the computer enters a power saving state. The settings are *Monitor* or *Ignore*. The default settings are *Ignore*.

**Hard Disk Activity****Misc IRQ (8,10,11,12,15)****Serial and Parallel Ports**

These options enable event monitoring. When the computer is in a power saving mode, activity on the named interrupt request line is monitored by AMIBIOS. When any activity occurs, the computer enters Full On mode. Each of these options can be set to *Monitor* or *Ignore*. The default settings are *Ignore*.

**PCI/PnP Setup**

PCI/PnP Setup options are displayed by choosing the PCI/PnP Setup icon from WINBIOS Setup main menu. All PCI/PnP Setup options are described in this section.

**Plug and play Aware OS**

Set this option to *Yes* if the operating system installed in the computer is Plug and Play-aware. AMIBIOS only detects and enables PnP ISA adapter cards that are required for system boot. The Windows 95 operating system detects and enables all other PnP-aware adapter cards. Windows 95 is PnP-aware. Set this option to *No* if the operating system (such as DOS, OS/2, Windows 3.x) does not use PnP. *You must set this option correctly or PnP-aware adapter cards installed in your computer will not be configured properly.* The settings are *No* or *Yes*. The Optimal and Fail-Safe default settings are *No*.

**DMA Channel 0****DMA Channel 1****DMA Channel 3****DMA Channel 5****DMA Channel 6**

## **DMA Channel 7**

These options specify the bus that the named DMAs and interrupt request lines (IRQs) are used on. These options allow you to specify IRQs and DMAs for use by legacy ISA adapter cards. The settings are *PnP* or *ISA/EISA*. The default settings are *PnP*.

### **IRQ3**

### **IRQ4**

### **IRQ5**

### **IRQ7**

### **IRQ9**

### **IRQ10**

### **IRQ11**

### **IRQ14**

### **IRQ15**

These options determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to BIOS configurable devices. The available IRQ pool is determined by reading the ESCD NVRAM (Flash BIOS ROM only). If more IRQs must be removed from the pool, the end user can use these PCI/PnP Setup options to remove the IRQ by assigning the option to the *ISA/EISA* setting. Onboard I/O is configurable by AMIBIOS. The IRQs used by onboard I/O are configured as *PCI/PnP*. The settings are *PCI/PnP* or *ISA/EISA*.

## **Reserved Memory Size**

This option specifies the size of the memory area reserved for legacy ISA adapter cards. The settings are *Disabled*, *16k*, *32k*, or *64k*. The Optimal and Fail-Safe default settings are *Disabled*.

## **Reserved Memory Address**

This option specifies the beginning address (in hex) of the reserved memory area. The specified ROM memory area is reserved for use by legacy ISA adapter cards.

The settings are *C0000*, *C4000*, *C8000*, *CC000*, *D0000*, *D4000*, *D8000*, or *DC000*. The Optimal and Fail-Safe default settings are *C8000*.

## **Peripheral Setup**

Peripheral Setup options are displayed by choosing the Peripheral Setup icon from the WINBIOS Setup main menu. All Peripheral Setup options are described in this section.

**Onboard FDC**

This option enables the floppy drive controller on the motherboard. The settings are *Enabled*, *Disabled* or *Auto*. The default setting are *Auto*.

**Onboard Serial Port1**

This option enables serial port 1 on the motherboard and specifies the base I/O port address for serial port 1. The settings are *Auto*, *Disabled*, *3F8h*, *2F8h*, *3E8h*, or *2E8h*. The Optimal and Fail-Safe default settings are *Auto*.

**Onboard Serial Port2**

This option enables serial port 2 on the motherboard and specifies the base I/O port address for serial port 2.

The settings are *Auto*, *Disabled*, *3F8h*, *2F8h*, *3E8h*, or *2E8h*. The Optimal and Fail-Safe default settings are *Auto*.

**Onboard Parallel Port**

This option enables the parallel port on the motherboard and specifies the parallel port base I/O port address. The settings are *Auto*, *Disabled*, *378*, *278*, or *3BC*. The Optimal and Fail-Safe default setting are *Auto*.

**Parallel Port Mode**

This option specifies the parallel port mode. ECP and EPP are both bi-directional data transfer schemes that adhere to the IEEE P1284 specifications. The settings are *Normal*, *Bi-Dir*, *EPP*, or *ECP*. The default settings are *Normal*.

**Parallel Port DMA**

This option is only available if the setting for the **Parallel Port Mode** option is *ECP*.

The settings are *0*, *1*, or *3*. The default setting is *3*. Refer to Hardware Jumper settings in Chapter One for JP 15 and JP16 when setting for these options.

**Parallel Port IRQ**

The settings are *5* and *7*. The default setting is *5*.

**Onboard IDE**

This option specifies the onboard IDE controller channels that will be used. The settings are *Disabled*, *Both*, *Primary* or *Secondary*. The Optimal and Fail-Safe default settings are *Primary*.

## Section 2: Utility

---

The following icons appear in this section:

Detect IDE and Language

### Detect IDE

This option allows the detection of an IDE hard drive automatically.

### Language

Only English is supported.

## Section 3: Security

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### AMIBIOS Password Support

Three icons appear in this part of the WINBIOS Setup screen:

- Supervisor,
- User,
- Anti-Virus.

#### Two Levels of Passwords

Both the Supervisor and the User icons configure password support. If you use both, the Supervisor password must be set first. The system can be configured so that all users must enter a password every time the system boots or when WINBIOS Setup is executed, using either or both the Supervisor password or User password.

#### If You Do Not Want to Use a Password

Just press <Enter> when the password prompt appears.

#### Setting a Password

The password check option is *Enabled* in Advanced Setup by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when WINBIOS is run). The password is stored in CMOS RAM. The following screen appears when you select the password icon from the WINBIOS Setup main menu.

You can enter a password by:

Typing the password on the keyboard or Selecting each letter via the mouse.

When you select Supervisor or User, AMIBIOS prompts for a password. You must set the Supervisor password before you can set the User password. Enter a 1 – 6 character password. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain CMOS RAM and reconfigure the system.

### Changing a Password

Select the appropriate password icon (Supervisor or User) from the Security section of the WINBIOS Setup main menu. Enter the password and press <Enter>. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press <Enter>.

If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press <Esc> to return to the WINBIOS Main Menu. The password is stored in CMOS RAM after WINBIOS completes. The next time the system boots, you are prompted for the password if the password function is present and is *Enabled*.

### Remember the Password

Keep a record of the new password when the password is changed. If you forget the password, you need to reset the CMOS memory (refer to JP 9 on jumper settings - chapter 1)

### Anti-Virus

When this icon is selected from the Security section of the WINBIOS Setup main menu, AMIBIOS issues a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The settings are *Enabled* or *Disabled*. If *Enabled*, the following appears when a write is attempted to the boot sector. You may have to type *N* several times to prevent the boot sector write.

```
Boot Sector Write!!!
Possible VIRUS: Continue (Y/N)? _
```

The following appears after any attempt to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard Disk Drive Service:

```
Format!!!
Possible VIRUS: Continue (Y/N)? _
```

## Section 4 Default

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The icons in this section permit you to select a group of settings for all WINBIOS Setup options. Not only can you use these icons to quickly set system configuration parameters, you can choose a group of settings that have a better chance of working when the system is having configuration-related problems.

### Original

Choose the Original icon to return to the system configuration values present in WINBIOS Setup when you first began this WINBIOS Setup session.

### Optimal

You can load the optimal default settings for the WINBIOS by selecting the Optimal icon. The Optimal default settings are best-case values that should optimize system performance. If CMOS RAM is corrupted, the Optimal settings are loaded automatically.

### Fail-Safe

You can load the Fail-Safe WINBIOS Setup option settings by selecting the Fail-Safe icon from the Default section of the WINBIOS Setup main menu. The Fail-Safe settings provide far from optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.

# Chapter 3: Upgrading

## Upgrading the System Memory

The 486MBS Series allows an upgrade of the system memory up to 128MB using SIMMs memory modules. Please refer to chapter one for proper memory installation.

## Upgrading the Microprocessor

The 486MBS Series currently supports the following CPUs:

Intel SX, DX, DX2, DX4 and DX4 Overdrive™

Intel P24T™

AMD DX, DX2, DX4 and 5X86™

Cyrix DX, DX2 and 5x86™

To upgrade the Microprocessor, please refer to Chapter 1 for proper installation and jumper settings.

## Cache Memory

The 486MBS is supplied with it's maximum 256k Cache memory. Should you need to replace this memory at any point in the future, use 32k x 8, 15nS SRAM chips only. Watch for polarity when replacing the Cache chips.

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# Appendix A: Technical Specifications

## Chip Sets

### Core Logic

Chips & Technologies 4041

### Peripheral I/O

Chips & Technologies 82C735A or Standard Microsystems FDC37C665

### Micro Processor Support

Intel SX, DX, DX2, DX4 and DX4 Overdrive™

Intel P24T™

AMD DX, DX2, DX4 and 5X86™

Cyrix DX, DX2 and 5x86™

## System Memory

### Memory Capacity

1 to 128MB of FPM DRAM memory.

### Memory Type

Four sockets for JEDEC compatible (72 pin) 32 bit SIMMs, 60ns access speed. All memory configurations is automatic through BIOS.

Supports Fast Page Mode memories.

32 bit SIMMS can be used, but 36 bit is recommended.

## Bios

### System BIOS

AMI WinBIOS with standard CMOS Setup, Peripheral Setup, Power Management, Automatic Hard Disk Detection and Advanced Chipset Setup.

### Flash BIOS

Optional feature for System BIOS. Flash programming done through BIOS.

## **Embedded I/O**

### **IDE**

Two VL EIDE controllers. Supports up to 4 devices

### **Floppy**

Up to two floppy disk drives. Sizes supported are: 5.25" 360K and 1.2MB; 3.5" 720K, 1.44MB and 2.88MB. Floppy Tape and CD ROM compatible. 34 pin header on-board.

### **Serial Ports**

Two high speed 16550 compatible UARTS. BIOS configurable as COM1 - 4.

### **Parallel Port**

One Centronics compatible, bi-directional (PS/2 compatible). Microsoft/HP EPC/EPP high speed.

### **Mouse Port**

One PS/2 compatible mouse controller with 6 pin mini-din connector cable.

### **Expansion Slots**

Seven 16 bit ISA slots, 2 VL slots.

## **Miscellaneous**

### **CMOS/Battery**

RTC with lithium battery. No external battery is required.

### **Control Panel Connections**

Reset, Keylock, Speaker, Turbo. LEDs for power, IDE and turbo.

### **CPU Socket**

Standard ZIF (Zero Insertion Force), socket 3.

### **Form Factor**

Baby AT Size - 8.6" x 13"

### **PCB Construction**

Four Layer, dry film mask.

**Manufacturing Process**

Automated surface mount.

**Reliability**

MTBF: Higher than 48,000 hours

