M4Pi PCI/ISA
System Board Manual

MICRONICS
COMPUTERS INC.

M4Pi PCI/ISA
System Board Manual

Document Number: 06-00209-03, Rev. 3A
November 1995
221 Warren Ave., Fremont, CA 94539-7085

Copyright Notices

Micronics Computers, Inc.

The information contained in the M4Pi system board manual has been carefully checked and is believed to be accurate. Micronics assumes no responsibility for any inaccuracies that may be contained in this document. Micronics makes no commitments to update or to keep the information in this manual at a current level when changes are made to the product.

Micronics reserves the right to make improvements to this document and/or product at any time and without notice.

Portions of the Manual

Portions of this manual were copied (with permission) from Phoenix Technologies, Ltd.

Trademarks

IBM is a registered trademark of International Business Machines. Microsoft, Microsoft Word, Windows are registered trademarks of Microsoft Corporation. Intel and PCI are registered trademarks of Intel Corporation. UNIX is a registered trademark of AT&T Corporation. Lotus 1-2-3 is a registered trademark of Lotus Development Corp. All other product names mentioned herein are used for identification purposes only and may be the trademarks of their respective companies.

Micronics Quick Installation

We know that many experienced people prefer to read as little of the documentation as possible. If this sounds like you, here's the short form:

1. Make backup copies of your installation and configuration diskettes.

2. Ground yourself to prevent damaging static discharge, then remove the M4Pi from its packaging.

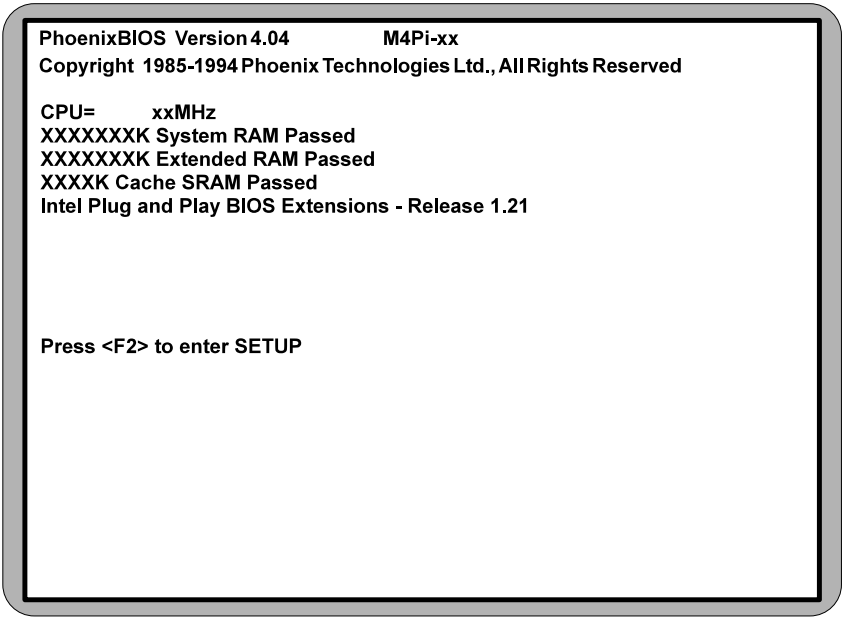
3. Configure and verify the system board's jumper settings. (See Jumper Settings in Chapter 2)

4. Install the CPU and the system memory (Chapter 3).

5. Install the system board into the chassis and make all necessary case connections.

6. Install any peripherals (Chapter 3).

7. Turn the computer on and press the <F2> key when you see the screen below:



8. Set the time and date. Adjust the BIOS settings to match your configuration. If installing an IDE drive, select the IDE device you wish to configure. Press <Enter> with Autotype Fixed Disk selected and the BIOS will automatically configure the drive for you. (See Chapter 4)

9. After you have configured the Main Setup menu, make any desired setting configurations in the Advanced and Security menu. When finished, go to the exit screen, select “Save Changes and Exit,” and you are finished with the BIOS configuration (Chapter 4). The system is ready to be loaded with software and used.

Contents

List of Figures

List of Tables

1 Introduction

The M4Pi is an integrated system board featuring PCI Local Bus architecture and a Mode 3 IDE controller. The PCI architecture provides high performance for Graphical User Interfaces (GUIs) and peripherals which perform high speed data transfers, such as disks and multimedia. It will make an excellent foundation for an advanced personal computer or workstation.

The Micronics M4Pi system board represents Micronics' continuing commitment to the PCI architecture. The M4Pi has been successfully satisfying the most demanding of users for over a year. The latest revision features Phoenix 4.04 BIOS and advanced power management.

The M4Pi's advanced power management features makes it a **"Green Board"** which means it adheres to the Environmental Protection Agency's strict Energy Star efficiency guidelines. See Chapter 4 for information and instructions on how to set up the "Green Section" of the BIOS.

Features

- Intel Saturn Chipset.
- Baby AT size system board (13.25" X 8.5").
- L2 Buffer Write-back cache support (128K or 256K).
- Supports up to 128MB of on-board system memory.
- Two PCI, five 16-bit ISA, and one shared slot.
- PCI Mode 3 IDE controller (supports two drives).
- Secondary ISA IDE controller (supports two drives).
- Floppy controller (2.88MB, 1.44MB, 1.2MB, 720K, and 360K floppy drives).
- Two high speed NS16550 compatible serial ports.
- Bi-directional parallel port which is EPP and ECP compatible.
- Upgradeable Phoenix Flash BIOS.
- Supports the following processors:

  - 486DX, 33MHz.
  - 486DX2, 50 or 66MHz.
  - 486DX4, 75 or 100MHz.
  - Intel Pentium Overdrive processor.

Software Compatibility

The M4Pi system board has been thoroughly tested for compatibility with a variety of operating systems and environments, including:

- Windows, Windows NT, and Windows 95.
- OS/2.
- SCO UNIX and Open Desktop.
- Novell Netware.
- MS-DOS and PC-DOS.

2 Configuring the M4Pi

Although the M4Pi system board is packaged in protective materials, it is important to use care while unpacking and setting up.

Static Electricity

The M4Pi is shipped from the factory in an antistatic bag. To reduce the possibility of damage, it is important to neutralize any accumulated static charges on your body before handling the board. The best way to do this is to ground yourself using a special wrist or ankle strap. If you do not have a strap, you should touch both of your hands to a safely grounded object. After you have grounded yourself, ground the M4Pi via the solder pads surrounding one of its mounting holes.

Once the M4Pi is removed from its packaging, place it on top of the antistatic bag. Carefully inspect the board for damage which may have occurred during shipment.

Office Environment

Make sure the finished computer system is in an area with good ventilation. The system should not be in direct sunlight, near heaters, or exposed to moisture, dust, or dirt.

M4Pi Components

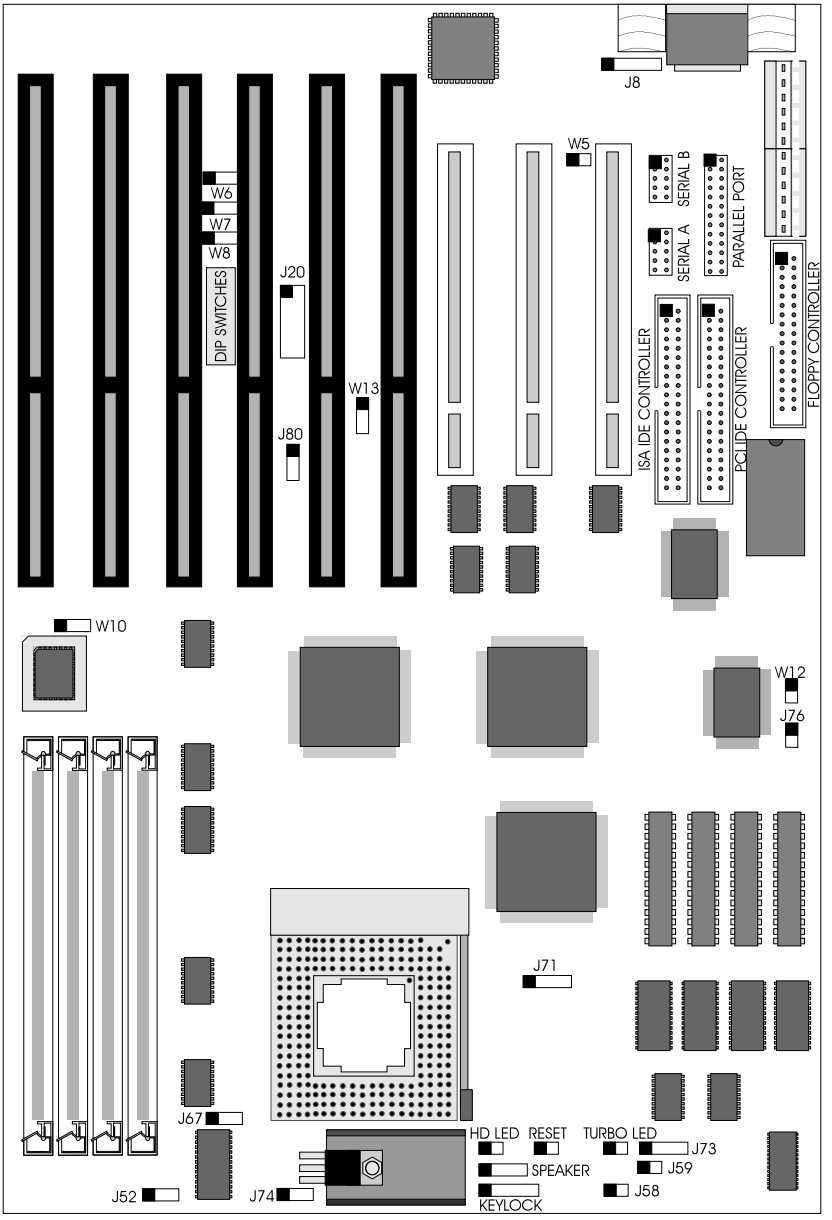


Figure 2-1 M4Pi System Board

Note:
The black square indicates pin one of the component or jumper.

Jumper Settings

Table 2-1 lists the jumper settings to select the type of CPU installed.

Jumper	Function	Setting
J59	Pentium Overdrive All other CPU's	open close
J71	486SX All other CPU's	2-3 1-2 & 3-4
J73	SL-Enhanced CPU All other CPU	1-2 & 3-4 2-3
J74	SL-Enhanced CPU All other CPU's	close open

Table 2-1 CPU Selection

Table 2-2 lists the jumper settings to select the size of the external cache.

Cache Jumper	128K	256K
J52	2-3	1-2
J58	open	close

Table 2-2 External Cache Size Selection

Table 2-3 lists the jumper settings to select the type of monitor installed.

Jumper	Function	Setting
W5	Color monitor (default) Monochrome monitor	open close

Table 2-3 Monitor Selection

Table 2-4 lists the jumper settings to enable or disable the PCI IDE controller.

Jumper	Function	Setting
W12	PCI IDE Enabled (default) PCI IDE Disabled	open close

Table 2-4 PCI IDE Selection

Table 2-5 lists the jumper settings to set the hard disk controller IRQ's. Leave the PCI IDE controller set to IRQ14 unless you are using a SCSI controller and need to free up an unnecessary IRQ, or if you want to use the ISA IDE controller as the primary IDE controller.

Jumper	Function	Setting
W13	Primary IDE uses IRQ14 (default)	1-2
	Primary IDE uses IRQ15	2-3
J19	Secondary IDE uses IRQ15 (default)	2-3
	Secondary IDE uses IRQ14	1-2

Table 2-5 PCI IDE IRQ Selection

Table 2-6 lists the jumper settings to select the parallel port DMA channel for ECP mode.

DMA Channel Jumper	None (default)	DMA1	DMA3
W6	open	1-2	2-3
W7	open	1-2	2-3

Table 2-6 Parallel Port DMA Channel Selection

Table 2-7 lists the jumper settings to select the parallel port IRQ settings for ECP mode.

Jumper	Function	Setting
W8	Parallel port does not use IRQ (default)	open
	Parallel port uses IRQ5	2-3
	Parallel port uses IRQ7	1-2
J76	Parallel port in Non-ECP mode (default)	open
	Parallel port in ECP mode	close

Table 2-7 Parallel Port IRQ Selection

Table 2-8 lists the settings for the M4Pi's DIP switch.

Switch	Function	Setting
SW 1	Reserved	off
SW 2	Reserved	off
SW 3	Reserved	off
SW 4	Flash BIOS write protected (default) Flash BIOS programming enabled	off on
SW 5	PCI IDE card installed	on
SW 6	33MHz external CPU speed (default) 25MHz external CPU speed	off on
SW 7	Reserved	on
SW 8	On-board PS/2 mouse uses IRQ12 (PS/2 Version)	on

Table 2-8 DIP Switch Settings

Table 2-9 lists reserved jumper settings. *Do not reconfigure these jumpers!*

Jumper	Function	Setting
W10	Reserved	1-2

Table 2-9 Reserved Jumper Settings

Table 2-10 lists the jumper settings for case and peripheral connections.

Jumper	Function	Notes
J81	PCI IDE Connector	Primary
J38	ISA IDE Connector	Secondary
J39	Floppy Connector	
J22	Parallel Port Connector	Can be disabled at the CMOS configuration screen.
J18	Serial Port (Com1)	Can be disabled at the CMOS configuration screen.
J21	Serial Port (Com 2)	Can be disabled at the CMOS configuration screen.
J11	AT Keyboard Connector	AT Version only
J10	PS/2 Keyboard	PS/2 Version only
J7	PS/2 Mouse	PS/2 Version only
J8	Ext. Keyboard	1- Clock(Keybd), 2-Data, 3-N/C, 4-Ground, 5-VCC
J12 &J22	Power Supply Connector	
J54	Hard Disk LED	1-+5V DC, 2-Ground
J55	Reset	
J57	Keylock/Power LED	1-Power; 2-N/C; 3-Ground; 4-Keyboard Lock; 5-Ground
J56	Speaker Connector	1-Speaker; 2-N/C; 3-Ground; 4-5V DC
J67	Reserved	Not installed

Table 2-10 Case and Peripheral Connections

3 Installing the M4Pi, System Memory, CPUs, and Peripherals

This section explains how to install the M4Pi system board, SIMMs, CPUs, and peripherals.

Warning:
Before installing or removing any peripherals or components, make sure you have a clear work space and that you adhere to all anti-static precautions described on page 2-1. Micronics recommends that only trained technicians operate on the system board. Damage which occurs to the board while adding or removing peripherals or components may void the warranty.

If problems arise while installing peripherals, contact the computer outlet where you purchased the peripheral or Micronics' Technical Support Department.

Installation of the M4Pi

The installation of the M4Pi system board depends on the type of chassis you use. The M4Pi is an integrated baby AT size system board and can be installed in most chassis.

Prior to installing the M4Pi, make sure you have a clear work space available and adhere to all anti-static precautions.

If you are unfamiliar with installing a system board, Micronics highly recommends you read the computer user's manual or contact your dealer's technical support department.

Tools Required

Micronics recommends using the following tools to install the M4Pi:

- Small Phillips screwdriver.
- Tweezers or a pair of needle-nose pliers.
- Tray (to hold loose screws).

Equipment Required

Micronics recommends using the following equipment with the M4Pi for a typical configuration:

- Chassis with standard hardware.
- A high quality power supply capable of providing continuous power within a 5 volt range, plus or minus 5% (eg. 4.75 to 5.25). A power filter may be used with a noisy AC power source.
- AT compatible keyboard (AT Version).
- PS/2 compatible keyboard and mouse (PS/2 Version).
- Eight ohm speaker.
- Standard ribbon cables for internal connections.
- Standard power cord (grounded).
- CPU heat sink.

System Memory

System memory devices, commonly known as SIMMs (Single Inline Memory Modules), are necessary to operate the M4Pi system board. The M4Pi has four SIMM sockets and can be upgraded to 128 Megabytes of RAM. This section will explain the type of SIMMs supported, list the memory configurations supported, and show how to physically install the new SIMMs.

SIMMs Supported

The M4Pi supports the following 72 pin, 60 or 70ns SIMMs:

4MB (1Mx36)
8MB (2Mx36)
16MB (4Mx36)
32MB (8Mx36)

Memory Configurations

The following table (Figure 3-1) lists the most common memory configurations supported.

Memory	Bank 0	Bank 1
8MB	(2) 1MBx36	
16MB	(2) 1MBx36	(2) 1MBx36
16MB	(2) 2MBx36	
24MB	(2) 2MBx36	(2) 1MBx36
32MB	(2) 4MBx36	
32MB	(2) 2MBx36	(2) 2MBx36
40MB	(2) 4MBx36	(2) 1MBx36
48MB	(2) 4MBx36	(2) 2MBx36
64MB	(2) 8MBx36	
64MB	(2) 4MBx36	(2) 4MBx36
72MB	(2) 8MBx36	(2) 1MBx36
80MB	(2) 8MBx36	(2) 2MBx36
96MB	(2) 8MBx36	(2) 4MBx36
128MB	(2) 8MBx36	(2) 8MBx36

Table 3-1 Common Memory Configurations

Installing the SIMMs

To install the SIMMs, locate the SIMM sockets on the system board.

Start with bank 0 and perform the following steps to install the SIMMs:

1. Hold the SIMM so that the notched edge is aligned with the notch on the SIMM socket (Figure 3-1).

2. Insert the SIMM at a 45 degree angle.

3. Gently push the SIMM into an upright position until it locks into place (past the release tabs).

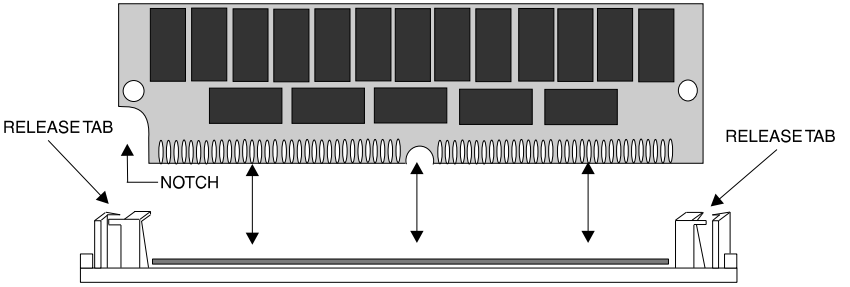


Figure 3-1 Installing a 72-Pin SIMM

Removing SIMMs

Perform the following steps to remove SIMMs, if necessary:

1. With both thumbs (or fingers), press the release tabs away from the socket.

2. With the SIMM free from the release tabs, lift the module up and place in an anti-static bag or package.

Installing a CPU

The M4Pi is specifically designed to support a variety of 486 CPU's. To install an upgrade processor, perform the following steps:

1. Locate the ZIF socket on the board (Figure 3-2).

2. Lift the lever of the socket.

3. Insert the new processor into the socket. Make sure pin 1 on the CPU lines up with pin 1 on the socket. Refer to Figure 3-2 for pin 1 location.

4. Push the lever down to its original position.

5. Configure the board using the tables in Chapter 2.

The new CPU is now ready to operate. The system board detects the installed CPU after it is inserted and configured.

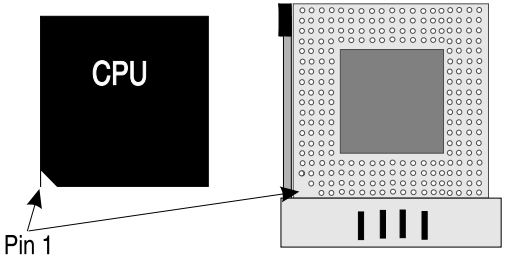


Figure 3-2 Installing a CPU

Warning:
If the new processor includes a heat sink or cooling fan, be certain to install the device according to the manufacturer's instructions. Failure to provide adequate cooling of the processor may seriously affect system performance or cause permanent damage.

Installing 256K of Cache Memory

To upgrade to 256K cache, carefully install four 32Kx8-15ns SRAMs into the open SRAM sockets (Figure 3-3). After installing the cache upgrade, refer to Table 2-2 for the correct external cache jumper settings.

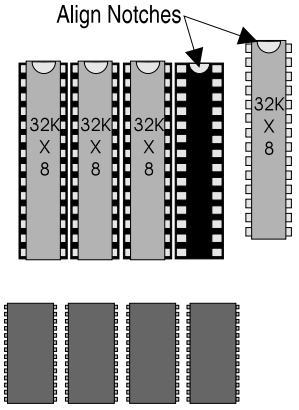


Figure 3-3 Upgrading to 256K of External Cache

Installing a PCI Peripheral Card

Micronics PCI slots accommodate all PCI peripherals which adhere to the PCI 2.0 specifications. Complete the following steps to install a PCI card:

1. Turn the computer system off and remove its cover.

2. Choose an unused PCI slot and remove the slot cover.

3. Insert the card with the bottom edge level to the slot. **Never insert the card at an angle!**

4. Carefully push the card straight down, making sure the card is fully inserted.

5. Replace the screw which holds the card into place.

6. Replace the computer cover.

7. Read the card's manual for additional instructions concerning installation and software drivers.

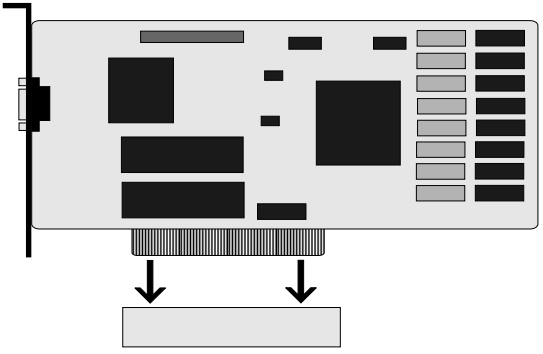


Figure 3-4 Installing a PCI Card

Installing an ISA Peripheral Card

Micronics ISA slots accommodate all standard ISA peripherals. Complete the following steps to install a ISA card:

1. Turn the computer system off and remove the cover.

2. Choose an unused ISA slot and remove the slot cover.

3. Insert the card with the bottom edge level to the slot. **Never insert the card at an angle!**

4. Carefully push the card straight down, making sure the card is fully inserted.

5. Replace the screw which holds the card into place.

6. Replace the cover.

7. Read the card's manual for additional instructions concerning installation and software drivers.

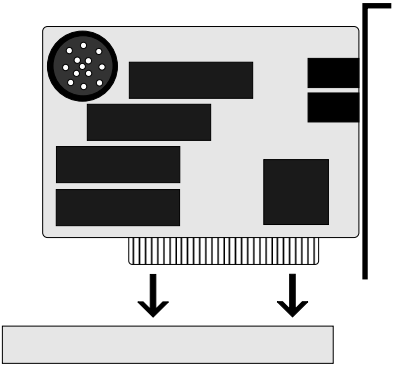


Figure 3-5 Installing a ISA Card

4 The BIOS Setup Utility

Configuration

After the M4Pi system board and all hardware is installed, the system is ready for configuration. Before turning on the computer, make sure all cables are correctly connected and all jumpers are correctly set.

It is recommended you keep the computer cover off the first time you boot the system. If you have any difficulties, they will be easier to correct.

Initial Boot Up

Power up the M4Pi. If the system doesn't properly boot, check all your cables and peripherals for bad connections. You may also get beep codes or error messages. If this occurs, consult Appendices A and/or B for a guide to possible solutions.

After the system properly boots, it is ready to be configured. The following pages explain the proper procedures for BIOS configuration.

Setup

The Setup program is used to configure the computer's BIOS (Basic Input/ Output System). The computer's BIOS is responsible for configuring the system board and providing hardware information to the operating system. In order for the computer to run properly, run the Setup procedure after first installing the system board and whenever you make a hardware change to the system.

After the system is turned on and goes through a memory test, the Power-Up Screen (Figure 4-1) will appear on your monitor:

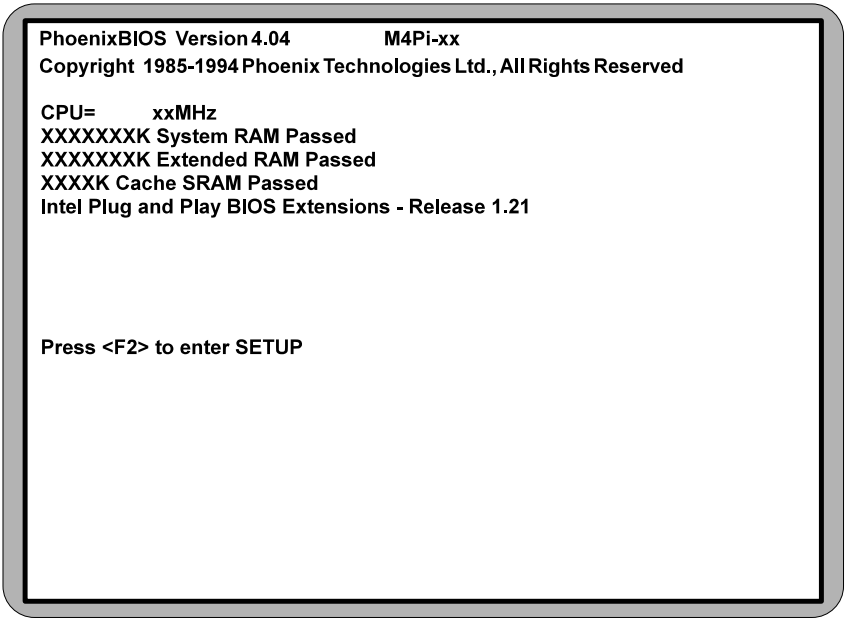


Figure 4-1 Power-Up Screen

When "Press <F2> to enter SETUP" appears at the bottom of the screen, press the <F2> key to begin the Setup procedure. The CMOS Main Screen (Figure 4-2) should appear and the prompt should be on the time line. The Setup procedure can only be activated during the boot sequence.

Running the Setup Procedure

The M4Pi system board has four primary CMOS configuration screens: the Main Screen (Figure 4-2), the Advanced Screen (Figure 4-8), the Security Screen (Figure 4-10), and the Exit Screen (Figure 4-12). To toggle between the screens, press the right arrow <→> and the left arrow < ←> keys.

Setting the Main Screen

The CMOS Main Screen (Figure 4-2) is used to set the time and date, to set the floppy drive types, to configure the hard disks, and to configure the video. This section explains how to configure each of these categories. To move between the categories, use the up arrow <↑> and the down arrow <↓>.

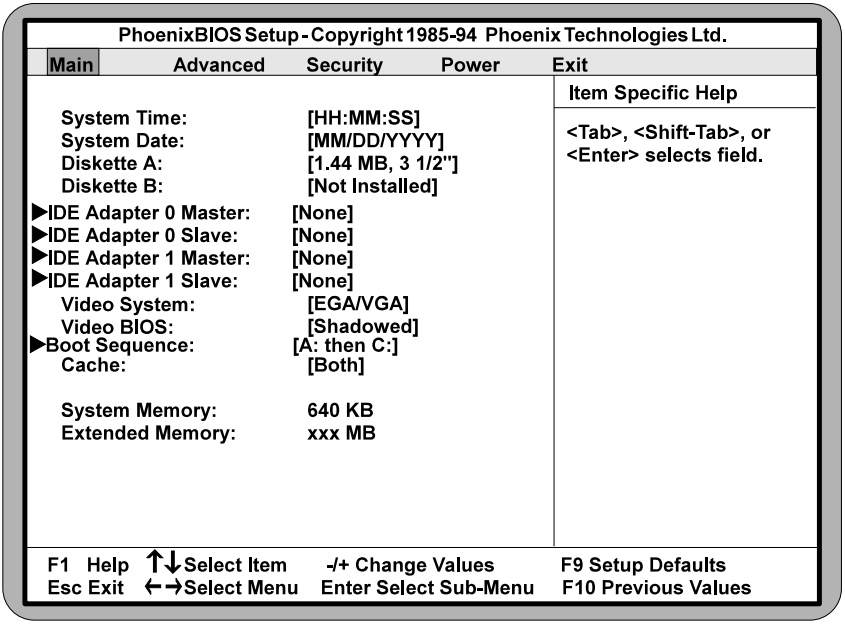


Figure 4-2 CMOS Main Screen

System Time and Date

To set the time, use the <-> key to decrease the number and the <+> key to increase the number. To move the prompt forward, use the <Tab> key; to move the prompt backward, use the <Shift-Tab> key. To set the date, use the

up and down arrows<↑/↓> to highlight the System Date and follow the same procedure used to set the time.

Diskette A or B

To configure a floppy drive added to or removed from your computer, use the up and down arrow keys <↑/↓> to select the drive you wish to set. Use the <+/-> keys to change the setting until it matches the floppy drive you have installed. The BIOS supports 2.88MB, 1.44MB, 1.2MB, 720KB, and 360KB floppy drives.

IDE Devices (Hard Disk Setup)

If you are setting up a SCSI hard disk, you will need to select None in the IDE Device parameters (see your SCSI card manual for more details).

To install an IDE device, select the device you wish to configure and press <Enter>. An IDE Device submenu will appear. (Figure 4-3).

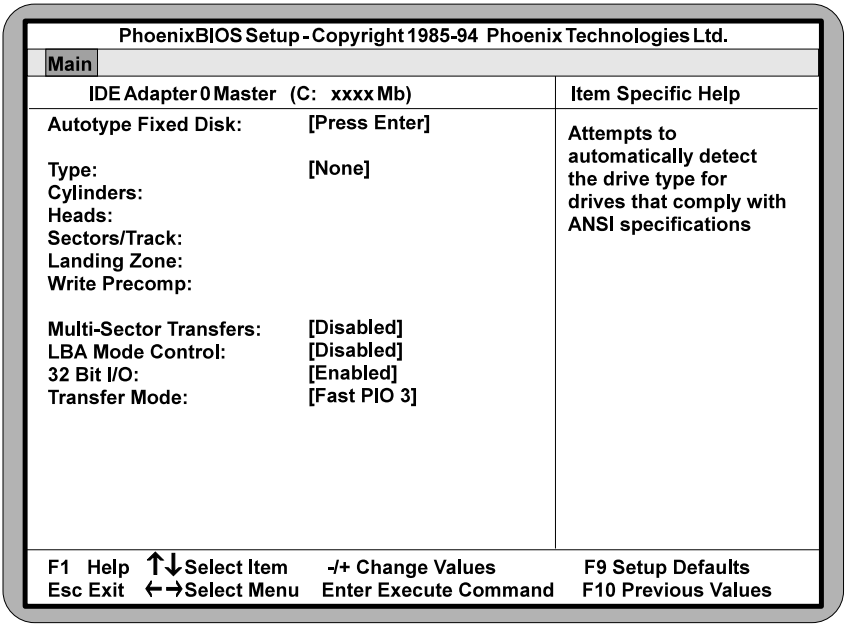


Figure 4-3 IDE Device Submenu

Autotype Fixed Disk

The easiest way to set your IDE devices is to let the BIOS do it for you. When the IDE Device submenu first appears, the Autotype Fixed Disk selection will be highlighted. Simply press <Enter>, and the remaining information will automatically be entered.

Do not adjust the rest of the settings unless absolutely necessary. The BIOS will automatically enter the correct settings.

Type
This category selects the drive type installed in the system. The options are 1-39, User, and none. It is doubtful you will find your drive in 1-39.

If Autotype Fixed Disk does not find your drive's parameters, you will need to fill this information in manually under the User category. This information may be in the manual that came with your system. If not, contact your dealer or the hard drive manufacturer to fill in this category.

If you are using a SCSI hard drive, select None and refer the documentation which came with the SCSI adapter.

Multiple-Sector Transfers
This category determines the number of sectors per block for multiple sector transfers. The options are Disabled (default), 2 Sectors, 4 Sectors, 8 Sectors, and 16 Sectors. If you used Autotype Fixed Disk, this section will automatically be filled in.

LBA Mode Control
Enable LBA (Logical Block Addressing) to support IDE drives larger than 528MB in size. The default setting is Disabled.

32-Bit I/O
This category allows the user to enable the 32-bit I/O function of the PCI IDE controller. Select Disabled if your drive will not run at this speed. The default setting is Enabled. *This option is not available on ISA IDE Adapter 1.*

Transfer Mode
This category provide the transfer modes for the PCI IDE controller. The options are Fast PIO 3, Fast PIO 2, Fast PIO 1, and Standard (default).

Fast PIO 3 is equivalent to Mode 3 supporting a minimum cycle time of 180ns (11.1 MB/sec.). Fast PIO 2 supports a minimum cycle time of 240ns (8.33 MB/sec.). Fast PIO 1 supports a minimum cycle time of 383ns (5.22 MB/sec.). Standard supports a minimum cycle time of 600ns (3.3 MB/sec.).

See your drive specifications before setting this category. *This option is not available on ISA IDE Adapter 1.*

Video System

This sets the type of video board installed into the system. You may choose from: EGA/VGA (default), CGA 80x25, MONO, and Not Installed.

Video BIOS

The Video BIOS Option allows you to Shadow, Shadow & Cache, or Disable the BIOS Shadow on the system board. Choosing SHADOWED copies the system's video BIOS into RAM for faster execution. Choosing SHADOWED & CACHED caches the shadowed video BIOS for even higher performance.

Boot Options Submenu

Move the prompt to Boot Sequence and press <Enter>. The following screen (Figure 4-4) will appear.

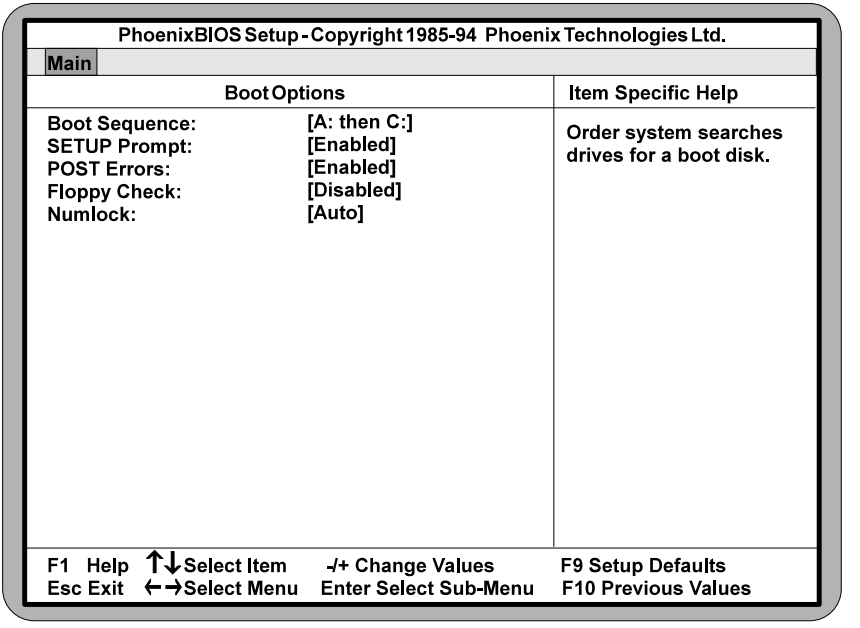


Figure 4-4 Boot Options Submenu

Boot Sequence

This category selects the order the system searches for a boot disk and can be set for:

A: then C:

C: then A:

C: only

SETUP Prompt
When enabled, this category allows the system to display the "Press <F2> to enter SETUP" message during boot.

Post Errors
When enabled, this category allows the system to display the "Press <F1> to resume, <F2> to SETUP" and pause if errors occur during boot. If disabled, the system will ignore any errors and will always attempt to boot.

Floppy Check
When enabled, this category verifies the floppy drive is installed on boot. For faster booting, select DISABLED.

Numlock
Setting this to Enabled will activate Numlock upon boot. Setting this to Auto will activate Numlock if the BIOS detects a numeric keyboard. It may also be disabled.

Cache
This category allows you to enable both the internal and the external cache, enable the internal cache only, or disable both caches. For optimal performance, select Both.

System Memory
The System Memory category identifies the size of the base memory. It cannot be changed.

Extended Memory
The Extended Memory category automatically detects the amount of memory installed above the amount in the System Memory category. Because the BIOS automatically calculates the amount of memory installed in your system, you cannot change this category without adding or removing memory.

Setting the Advanced Screen

To move to the Advanced Screen, use the left and right arrow keys <←/→> keys until you see the screen below (Figure 4-5).

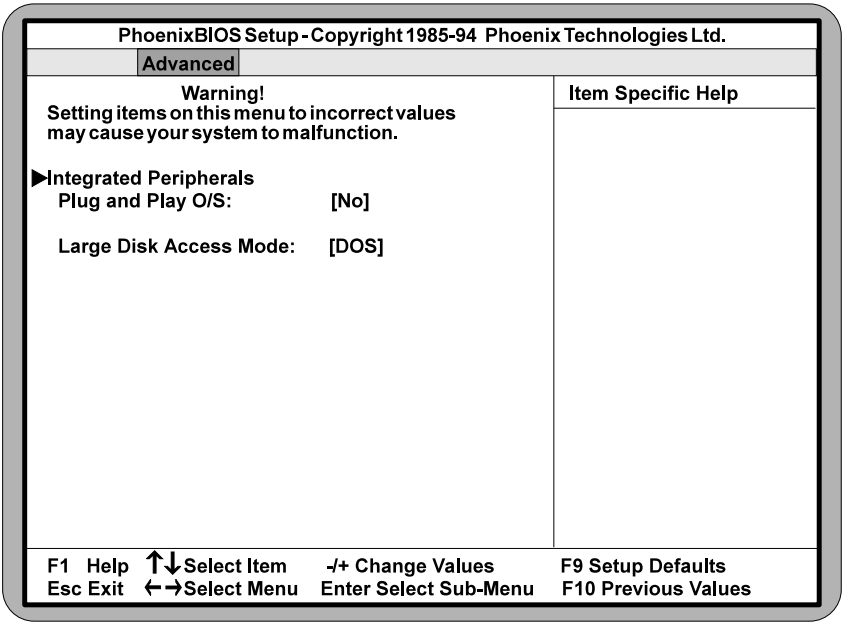


Figure 4-5 Advanced Screen

Integrated Peripherals Submenu

The Integrated Peripherals submenu (Figure 4-6) allows you to individually enable or modify the drives, I/O ports, and other settings. Use the up and down arrow keys <↑/↓> to select a category and the plus and minus keys <+/-> to change the settings.

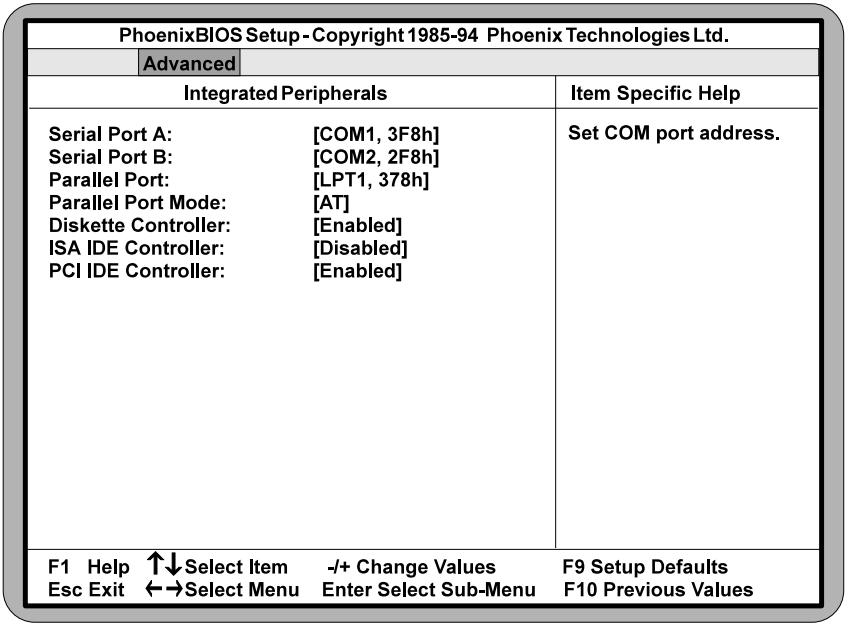


Figure 4-6 Integrated Peripherals Submenu

Serial Port A

Serial Port A may be set for COM1 (default), COM3, or may be disabled.

Serial Port B

Serial Port B may be set for COM2 (default), COM4, or may be disabled.

Parallel Port

The parallel port may be set for LPT1 (default), LPT2, or may be disabled.

Parallel Port Mode

The parallel port may be set for output mode (AT) (default), bidirectional mode (PS/2), or may be disabled.

Diskette Controller

The on board floppy disk controller may be enabled or disabled.

ISA IDE Controller
The secondary ISA IDE controller may be enabled or disabled.

PCI IDE Controller
The on board PCI IDE controller may be enabled or disabled.

Plug and Play O/S

This category, when enabled, allows the system to work with Windows 95. The default setting is disabled.

Large Disk Access Mode

If you are using the DOS operating system, set this to DOS. If you are using anything else, set this to OTHER.

Security Screen

The Security Screen (Figure 4-7) controls access to the computer. The security screen allows for settings of two passwords. The Supervisor Password allows access to the system and Setup. The User Password will allow access to the system, but not to all Setup features.

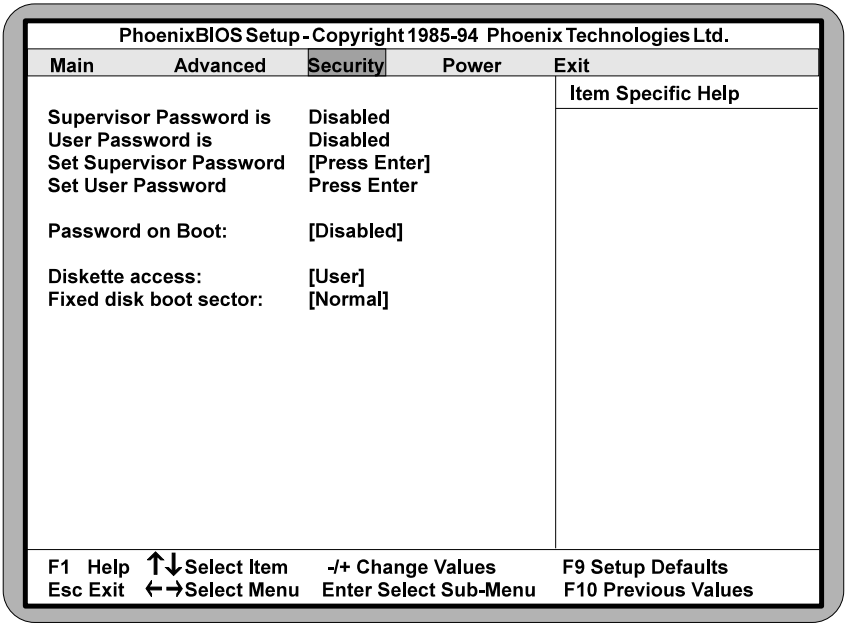


Figure 4-7 Security Setup Screen

Supervisor Password is

If a Supervisor Password has been set up for the system, it will read "Supervisor Password is ENABLED." If the password has not been set up, it will be disabled (default).

User Password is

If a User Password has been set up for the system, it will read "User Password is ENABLED." If the password has not been set up, it will be disabled (default).

Set Supervisor Password

Press the <Enter> key to enter the Supervisor Password submenu (Figure 4-8).

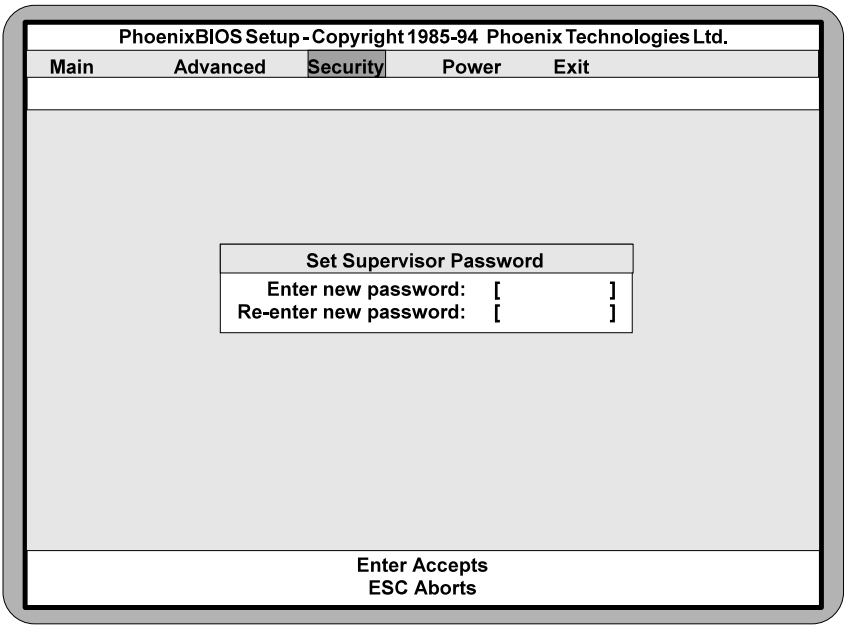


Figure 4-8 Supervisor Password Submenu

Type the password and press the <Enter> key. Retype the password and press the <Enter> key again. Write down the password somewhere safe so it will not be forgotten. The password may be disabled by setting the new password to nothing (pressing the <Enter> key without first typing a password).

Warning:
If you forget the Supervisor Password, it cannot be disabled without discharging the CMOS.

Set User Password

Follow the same procedure used to set the Supervisor Password.

Note:
When a password has been entered, it is saved immediately. All other changes may still be discarded (see Exit Screen).

Password on Boot

When enabled, the system will require a password to be entered upon boot. Either the Supervisor or User Password may be entered.

Diskette Access

This category allows floppy disk access with an option of the supervisor or user. Selecting Supervisor will give floppy disk access to the supervisor only. Selecting User (default) will give floppy disk access to both the user and the supervisor. If the passwords are enabled, this option may only be changed by the supervisor.

Fixed Disk Boot Sector

This category allows the boot sector of the fixed disk to be write protected. The default setting is Normal. When set for Write Protect, it serves as a form of virus protection. If the passwords are enabled, this option may only be changed by the supervisor.

Power Screen

The Power Screen controls the power management functions or the “Green Section” of the system. To move to the Advanced Screen, use the left and right arrow keys <←/→> keys until you see the screen below (Figure 4-9) .

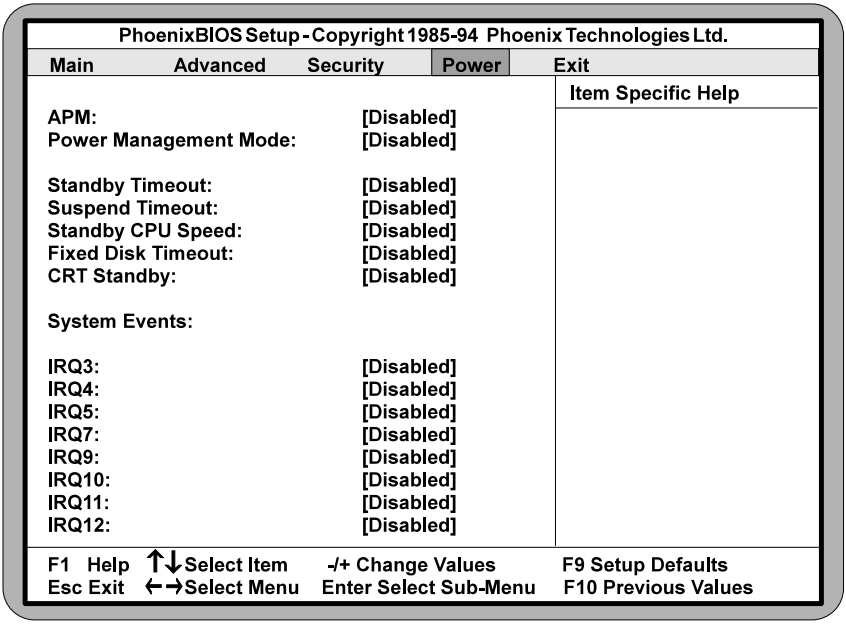


Figure 4-9 Power Screen

APM

When enabled the power management features are active. The default setting is Disabled. If you enable this category, you must also set the other power management options below.

Power Management Mode

This category may be set for Maximum Power Savings, Medium Power Savings, Minimum Power Savings, Customized, or Disabled (default). If you set this category for Maximum, Medium, or Minimum power savings, you do not need to make any more adjustments. If you select Customized, you must set the following five categories.

Standby Timeout

The Standby Timeout category sets the amount of time that elapses for the system to enter the power saving mode. The options are Disabled (default), 1

min., 15 min., 30 min., 45 min., 60 min., 2 hr., 3 hr., or 4 hr.. Before making changes, “Customized” must be selected in the Power Management Mode category.

Suspend Timeout

The Suspend Timeout category sets the amount of time that elapses for the system to enter the Suspend Mode. The timer starts when the Standby Mode is activated. The options are Disabled (default), 1 min., 15 min., 30 min., 45 min., 60 min., 2 hr., 3 hr., and 4 hr.. Before making changes, “Customized” must be selected in the Power Management Mode category.

Standby CPU Speed

This category is used to set the CPU speed during power saving mode. The options are Maximum, Medium, Minimum, and Slowest (default). Before making changes, “Customized” must be selected in the Power Management Mode category.

Fixed Disk Timeout

This category is used to set the amount of time which must elapse before the IDE drive enters spin-down mode to conserve power. The options are Disabled (default), 1 min., 2 min., 5 min., 10 min., or 15 min. Before making changes, “Customized” must be selected in the Power Management Mode category.

Note:
Do not enable this category unless your IDE drive supports spin-down mode.

CRT Standby

Selecting Enabled will power down the display while the system is in power saving mode. The default setting is disabled. Before making changes, “Customized” must be selected in the Power Management Mode category.

Exit Screen

After you have completed configuring the BIOS, select the Exit Screen (Figure 4-10).

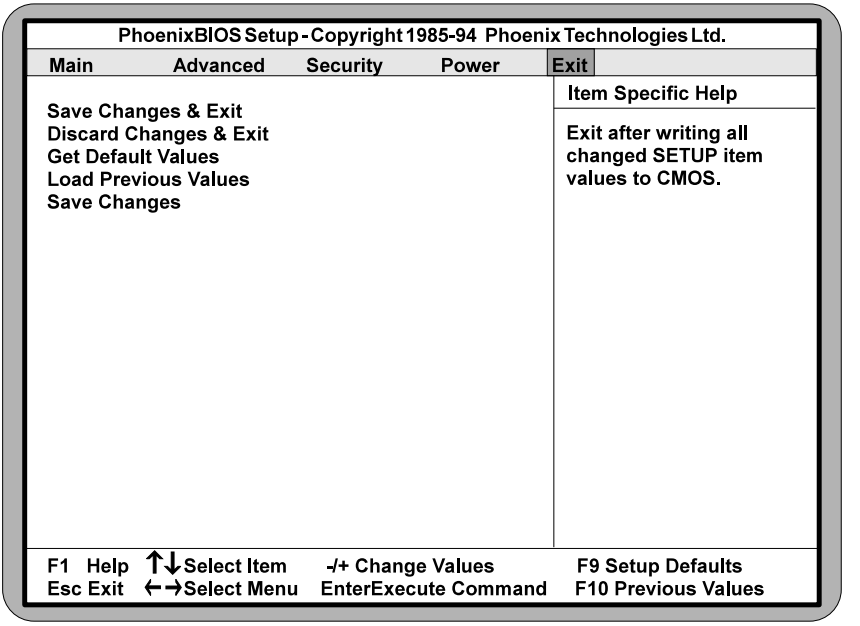


Figure 4-10 Exit Screen

Choose “Save Changes and Exit” and reboot the computer. The computer is ready for use.

A POST Messages

The following table lists the Power On Self Test (POST) messages, possible causes, and solutions.

Message	Possible Cause	Solution
DISKETTE DRIVE A FAILURE	Drive A failed or is missing.	Check Setup and cable connections.
DISKETTE DRIVE B FAILURE	Drive B failed or is missing.	Check Setup and cable connections.
EXTENDED RAM FAILED AT OFFSET: nnnn	Extended memory not working or configured properly.	Replace defective memory.
FAILING BITS: nnnn	Memory failure in System, Extended, or Shadow memory.	Replace defective memory.
FIXED DISK X FAILURE (where X =0 or 1)	The hard disk is not configured or working properly.	Rerun SETUP and check connections, or replace hard disk.
FIXED DISK CONTROLLER FAILURE	The controller card has failed.	Check configuration and connections, or replace controller card.
INCORRECT DRIVE A TYPE	Floppy drive A: not set correctly in Setup.	Run Setup.
INCORRECT DRIVE B TYPE	Floppy drive A: not set correctly in Setup.	Run Setup.
INVALID NVRAM MEDIA TYPE	NVRAM chip is bad.	Requires repair of system board.
KEYBOARD ERROR, or KEYBOARD CONTROLLER ERROR	The keyboard or keyboard controller failed.	Check connections. You may have to replace the keyboard or controller.
KEYBOARD ERROR nn	A key is jammed or was held down during boot.	Make sure the keys are not jammed or dirty.
KEYBOARD LOCKED	Keyswitch on the front of the case is locked.	Unlock the keyswitch.

Message	Possible Cause	Solution
MONITOR TYPE DOES NOT MATCH CMOS	Monitor type not correctly identified in Setup.	Run Setup and enter correct monitor type.
OPERATING SYSTEM NOT FOUND	Operating system cannot be located on Drive C: or Drive A:	Check Setup to see if Drive A: and C: are properly configured, or put a bootable disk in Drive A:
PARITY CHECK 1 nnnn	Parity error found in the system bus.	Check Setup. Board repair may be required.
PARITY CHECK 2 nnnn	Parity error found in the I/O bus.	Check Setup. Board repair may be required.
PREVIOUS BOOT INCOMPLETE - DEFAULT CONFIGURATION USED	Previous POST did not complete successfully.	Run Setup, load default BIOS settings, make any necessary adjustments, and save the changes
REAL TIME CLOCK ERROR	Real-time clock failed BIOS test.	May require battery replacement or board repair.
SHADOW RAM FAILED AT OFFSET	Shadow RAM failed.	May require repair of system board.
SYSTEM BATTERY IS DEAD	System battery died.	Replace the system battery and run Setup to reconfigure the system.
SYSTEM CACHE ERROR - CACHE DISABLED	External (L2) cache failed BIOS test.	System will still run, but slower. Replace cache at convenience.
SYSTEM CMOS CHECKSUM BAD - RUN SETUP	System CMOS has been corrupted or modified incorrectly.	Run Setup and reconfigure the system.
SYSTEM RAM FAILED AT OFFSET: nnnn	System RAM failed.	Replace defective RAM.
SYSTEM TIMER ERROR	Timer test failed.	Requires repair of system board.

B Beep and POST Codes

Beep codes are a series of beeps sent through the speaker which indicate a problem during the Power On Self Test (POST). If text appears on the video screen, the LPM30 has completed POST; any other tone from the speaker indicates something other than a POST error. These tones **are not** described in Table B-1.

The beep error codes are a series of beeps. The duration of the beep tones are constant, but the length of the pauses between the beeps varies. For example: a 1-3-3 beep code will sound like one beep, a pause; three beeps consecutively, another pause; and then three more beeps.

One beep code is often misunderstood. If a video card is not installed or is failing, the system board will generate a long-short-long-short beep code. This is often interpreted as a 1-2-1 beep code. But POST errors always vary in the length of the pause and not the duration of the beep tone.

Another way of identifying a POST error is to use a device called a POST card. This peripheral card is inserted into one of the ISA slots and has an LED (or LCD) read out showing the contents of port 80h.

The following table provides a list of all beep codes and POST routines..

Code	Beeps	POST Routine Description
02		Verify Real Mode.
04		Get CPU type.
06		Initialize system hardware.
08		Initialize chipset registers with initial POST values.
09		Get in POST Reg.
0A		Initialize CPU registers.
0C		Initialize cache initial POST values.
OE		Initialize I/O.
OF		Initialize the localbus IDE.
10		Initialize Power Management.
11		Load alternate registers with initial POST values.
12		Jump to UserPatch0.
14		Initialize keyboard controller.
16	2-2-3	BIOS ROM checksum.
18		8254 timer initialization.
1A		8237 DMA controller initialization.
1C		Reset Programmable Interrupt Controller.
20	3-1-1	Test DRAM refresh.
22	3-1-3	Test 8742 Keyboard Controller.
24		Set ES segment register to 4 GB.
28		Autosize DRAM.
2A		Clear 512K base RAM.
2C	3-4-1	Test 512K base address lines.
2E	3-4-3	Test 512K base memory.
32		Test CPU bus-clock frequency.
34		Test CMOS RAM.
35		Initialize alternate chipset registers.
37		Reinitialize the chipset (MB only).
38		Shadow system BIOS ROM.
39		Reinitialize the cache (MB only).
3A		Autosize cache.
3C		Configure advanced chipset registers.
3D		Load alternate registers with CMOS values.
40		Set initial CPU speed.
42		Initialize interrupt vectors.
44		Initialize BIOS interrupts.
46	2-1-2-3	Check ROM copyright notice.
47		Initialize manager for PCI Option ROMs.
48		Check video configuration against CMOS.
49		Initialize PCI bus and devices.

Code	Beeps	POST Routine Description
4A		Initialize all video adapters in system.
4C		Shadow video BIOS ROM.
4E		Display copyright notice.
50		Display CPU type and speed.
51		Initialize EISA board.
52		Test keyboard.
54		Set key click if enabled.
56		Enable keyboard.
58	2-2-3-1	Test for unexpected interrupts.
5A		Display prompt “Press F2 to enter SETUP”.
5C		Test RAM between 512 and 640k.
60		Test extended memory.
62		Test extended memory address lines.
64		Jump to UserPatch1.
66		Configure advanced cache registers.
68		Enable external and CPU caches.
6A		Display external cache size.
6C		Display shadow message.
6E		Display non-disposable segments.
70		Display error messages.
72		Check for configuration errors.
74		Test real-time clock.
76		Check for keyboard errors.
7C		Set up hardware interrupt vectors.
7E		Test coprocessor if present.
80		Disable onboard I/O ports.
82		Detect and install external RS232 ports.
84		Detect and install external parallel ports.
86		Re-initialize on-board I/O ports.
88		Initialize BIOSData Area.
8A		Initialize Extended BIOS Data Area.
8C		Initialize floppy controller.
90		Initialize hard-disk controller.
91		Initialize localbus hard-disk controller.
92		Jump to UserPatch2.
93		Build MPTABLE for multi-processor boards.
94		Disable A20 address line.
96		Clear huge ES segment register.
98		Search for option ROMs.
9A		Shadow option ROMs.

Code	Beeps	POST Routine Description
9C		Set up Power Management.
9E		Enable hardware interrupts.
A0		Set time of day.
A2		Check key lock.
A4		Initialize typematic rate.
A8		Erase F2 prompt.
AA		Scan for F2 keystroke.
AC		Enter SETUP.
AE		Clear in-POST flag.
B0		Check for errors.
B2		POST done - prepare to boot operating system.
B4		One beep.
B6		Check password (optional).
B8		Clear global descriptor table.
BC		Clear parity checkers.
BE		Clear screen (optional).
BF		Check virus and backup reminders.
C0		Try to boot with INT 19.
D0		Interrupt handler error.
D2		Unknown interrupt error.
D4		Pending Interrupt.
D6		Initialize option ROM error.
D8		Shutdown error.
DA		Extended Block Move.
DC		Shutdown 10 error.
		The following are for boot block in Flash ROM:
E2		Initialize the chipset.
E3		Initialize refresh counter.
E4		Check for Forced Flash.
E5		Check HW status of ROM.
E6		BIOS ROM is OK.
E7		Do a complete RAM test.
E8		Do OEM initialization.
E9		Initialize interrupt controller.
EA		Read in the bootstrap code.
EB		Initialize all vectors.
EC		Boot the Flash program.
ED		Initialize the boot device.
EE		Boot code was read OK.

C Hard Disk Drive Types

The following table lists the hard disk types supported by M4Pi.

Type	Cylinders	Heads	Write Precomp	Sectors	Size
1	306	4	128	17	10
2	615	4	300	17	21
3	615	6	300	17	32
4	940	8	512	17	65
5	940	6	512	17	99
6	615	4	none	17	21
7	462	8	256	17	32
8	733	5	none	17	31
9	900	15	none	17	117
10	820	3	none	17	21
11	855	5	none	17	37
12	855	7	none	17	52
13	306	8	128	17	21
14	733	7	none	17	44
15	N/A	N/A	N/A	N/A	N/A
16	612	4	0	17	21
17	977	5	300	17	42
18	977	7	none	17	59
19	1024	7	512	17	62
20	733	5	300	17	31
21	733	7	300	17	94
22	733	5	300	17	31
23	306	4	0	17	10
24	612	4	305	17	21
25	612	2	300	17	10
26	614	4	none	17	21
27	820	6	none	17	42
28	977	5	none	17	42
29	1218	15	none	36	336
30	1224	15	none	17	159

Type	Cylinders	Heads	Write Precomp	Sectors	Size
31	823	10	512	17	71
32	809	6	128	17	42
33	830	7	none	17	50
34	830	10	none	17	72
35	1024	5	none	17	44
36	1024	8	none	17	71
37	615	8	128	17	42
38	1024	8	none	26	109
39	925	9	none	17	72

D Specifications

Processor Options	Intel 486 DX 33MHz, PGA. Intel 486 DX2 50 & 66MHz, PGA. Intel 486DX4 75 & 100MHz. Intel 486 DX2 3.3V Support. Intel Pentium *OverDrive* Processor. 486 OverDrive Processor.
Expansion	Two PCI slots. Five 16-bit ISA slots. One shared PCI/16-bit ISA slot.
Chip Set	Intel Saturn Chipset. CMD 640A PCI IDE. SMC 665 Super I/O controller.
RAM Capacity	128MB.
Form Factor	Baby AT footprint (8.5" x 13"). 4 Layer PCB.
Keyboard	Standard AT keyboard support (AT Version). PS/2 Keyboard and Mouse Support (PS/2 Version).
BIOS	Phoenix BIOS on 1MB Flash ROM.
Cache	8K of internal cache memory (may vary).
Cache Upgrade	Optional 128K, or 256K of secondary cache memory (write-through or write-back).
I/O Ports	Built in support. Two high speed serial ports (16550 compatible). One bi-directional parallel port. Enhanced Parallel Port (EPP) compatible (optional). Microsoft and Hewlett Packard Extended Capabilities Port (ECP) compatible (optional).

Floppy Port	Supports two floppy drive (2.88MB, 1.44MB, 1.2MB, 720K, 360K).
PCI IDE Port	Supports two IDE hard disks. Mode 3 support. Multiple sector transfer support. LBA support.
Secondary IDE Support	Supports two additional IDE hard disks. Multiple sector transfer support. LBA support.
Burn-in	48 hours (minimum).

Environmental Specifications

The environment in which the LX30WB is located is critical. Micronics recommends the following environmental specifications:

Temperature Range

Operating: 50 to 104 degrees Fahrenheit (10 to 40 degrees Celsius).

Non-Operating: 50 to 140 degrees Fahrenheit (10 to 60 degrees Celsius).

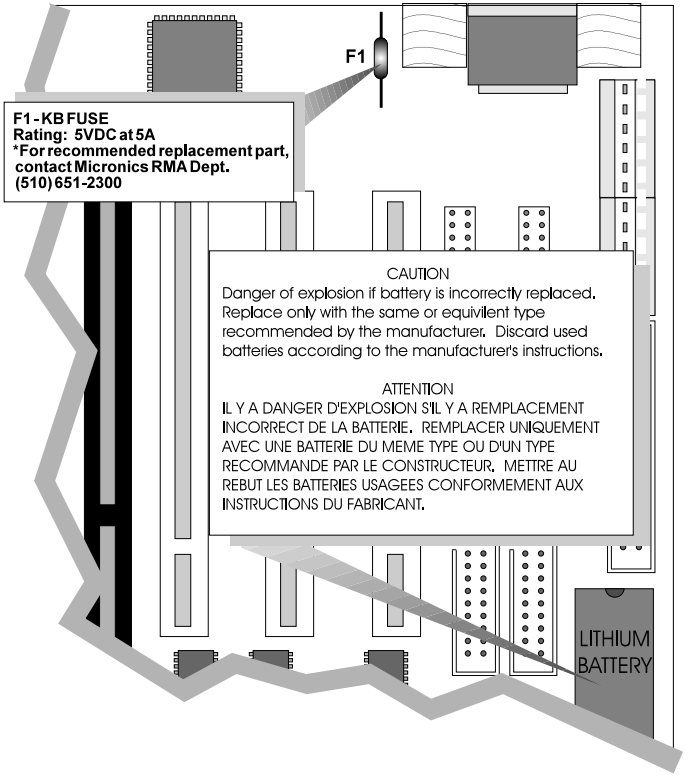
Shipping: -22 to 140 degrees Fahrenheit (-30 to 60 degrees Celsius).

Relative Humidity

Operating: 20% to 80%

Non-Operating: 5% to 90%

Battery Disposal



Warning:
DO NOT: open battery; dispose of in fire; recharge; put in backwards, mix with used or other battery types.

May explode or leak and cause personal injury.

FCC Warning Statement

This equipment has been tested and found to comply within the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not used in accordance with the instructions, may cause harmful interference to radio communications. Interference to radio or television reception can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult your dealer or an experienced radio/TV technician for help.

To meet FCC requirements, shielded cables and power cords are required.

Note:
Changes or modifications not expressly approved by Micronics could void the user's authority to operate the equipment.

Declaration of Conformity

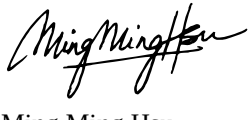
Application of Council Directives 89/336/EEC and 72/23/EEC.

Standards to which the conformity is declared:

EN55022 EN50082-1 EN 60950

Manufacturer's Name:	Micronics Computers, Inc.
Manufacturers Address:	221 Warren Avenue Fremont, California 94539 USA Tel: (510) 651-2300 Fax: (510) 651-9450
Type of Equipment:	486-25/33/50/66/75/100 Tower Personal Computer
Model Name:	M4Pi
Tested by:	Rockford Engineering Services, Inc. 4750 Williams Wharf Road St. Leonard, Maryland 20685 USA Tel: (301) 855-1375 Fax: (410) 586-1460
Test Engineers	Li-Ming Xu (EN55022) Muyiwa Ogunfunmi (EN50082-1) Bandele Adepoju (EN60950)

I, the undersigned, hereby declare that the specified equipment conforms to the directives and standards listed above.



Ming Ming Hsu
Director of Technical Services
November 12, 1995

Declaration of Conformity

Application of Council Directives 89/336/EEC and 72/23/EEC.

Standards to which the conformity is declared:

EN55022 EN50082-1 EN 60950

Manufacturer's Name:	Micronics Computers, Inc.
Manufacturers Address:	221 Warren Avenue Fremont, California 94539 USA Tel: (510) 651-2300 Fax: (510) 651-9450
Type of Equipment:	486-25/33/50/66/75/100 Mini-Tower Personal Computer
Model Name:	M4Pi
Tested by:	Rockford Engineering Services, Inc. 4750 Williams Wharf Road St. Leonard, Maryland 20685 USA Tel: (301) 855-1375 Fax: (410) 586-1460
Test Engineers	Li-Ming Xu (EN55022) Muyiwa Ogunfunmi (EN50082-1) Bandele Adepoju (EN60950)

I, the undersigned, hereby declare that the specified equipment conforms to the directives and standards listed above.

Ming Ming Hsu
Director of Technical Services
November 12, 1995

Declaration of Conformity

Application of Council Directives 89/336/EEC and 72/23/EEC.

Standards to which the conformity is declared:

EN55022 EN50082-1 EN 60950

Manufacturer's Name:	Micronics Computers, Inc.
Manufacturers Address:	221 Warren Avenue Fremont, California 94539 USA Tel: (510) 651-2300 Fax: (510) 651-9450
Type of Equipment:	486-25/33/50/66/75/100 Desktop Personal Computer
Model Name:	M4Pi
Tested by:	Rockford Engineering Services, Inc. 4750 Williams Wharf Road St. Leonard, Maryland 20685 USA Tel: (301) 855-1375 Fax: (410) 586-1460
Test Engineers	Li-Ming Xu (EN55022) Muyiwa Ogunfunmi (EN50082-1) Bandele Adepoju (EN60950)

I, the undersigned, hereby declare that the specified equipment conforms to the directives and standards listed above.

Ming Ming Hsu
Director of Technical Services
November 12, 1995

Glossary

16550 UART - A high speed chip for controlling serial ports. Although unnecessary for a mouse, it is required for modems that are 14,400 baud or faster.

486DX - A type of 32-bit CPU with a built in math-coprocessor and internal cache.

486DX2 - A 486DX CPU where the internal speed of the CPU operates at twice the external speed.

486DX4 - A 486DX CPU where the internal speed of the CPU operates at three times the external speed.

486SX - A 486DX CPU with no math-coprocessor.

Asynchronous - Operations that do not require the clocks of communicating devices to be coordinated. See Synchronous.

Baby AT - A standard system board size measuring approximately 13.25" x 8.5".

Bidirectional Parallel Port - A type of parallel port that can send and receive information.

BIOS - An Acronym for Basic Input/Output System. Configures the system board and provides hardware information to the operating system.

Bit - A contraction of Binary digit. The smallest unit of information in a binary number system. A bit represents a choice between either zero or one.

Boot - To start up the computer and load the operating system software. See *cold boot* and *warm boot*.

Bus - A group of electronic paths used to send data between parts of the system. On a system board, the bus connects the peripheral cards with the microprocessor via the expansion slots.

Bus Mastering - The ability of an peripheral card to control the bus without requiring intervention of the CPU.

Byte - A group of adjacent *bits* treated as a unit. Eight bits are typically considered one byte. Also called a character.

Cache - A process where information is copied from the slower memory (DRAM) to the faster memory (SRAM). Information that is likely to be read or edited is stored in the cache providing significant performance increases.

Cache hit - The percentage of request for data from memory that can be served from the cache.

Cache miss - A memory access which cannot be supplied from cache.

Cold Boot - Starting the computer by turning on the power or pressing the RESET button. A cold boot makes the processor execute all of the diagnostics. See boot and warm boot.

CPU - An acronym for Central Processing Unit. A CPU performs arithmetic calculations, makes logical decisions, and directs the operation of the computer in conjunction with the operating system.

Disk Drive - A hardware device which provides for the storage of data on diskettes or hard metal disks that have a magnetic coating. A disk drive functions by spinning at high speed while moving a device called the read/write head across the disk's surface in order to read or write data in magnetic code.

DRAM - An acronym for Dynamic Random Access Memory. A type of memory chip that only keeps its memory if supplied with regular clock pulses and a chance to regularly refresh its data. It is slower and more cost effective than SRAM. See SRAM.

ECP - An acronym for Expanded Capabilities Port. A standard set by Hewlett Packard and Microsoft Corporation to expand the capabilities of the parallel port.

EDO Memory - An acronym for Extended Data Output. A type of DRAM with built-in cache.

EISA - An acronym for Extended Industry Standard Architecture. EISA is a bus design standard which is fully backward compatible with the ISA bus. Although it is a 32-bit bus, it only runs at 8MHz. See *PCI, VESA, and ISA.*

EPP - An acronym for Enhanced Parallel Port. A standard which increases the capabilities of the parallel port.

EPROM - Acronym for Erasable Programmable Read Only Memory. A type of ROM chip that can be programmed with relatively simple tools that will retain its data until erased. It can only be erased by exposing the circuitry in the chip to ultraviolet light. See also Flash ROM.

External Cache - Cache which is external to the CPU. See Cache.

Fast SCSI - A SCSI data transfer standard that allows a rate of up to 10MB/sec.

Fast Wide SCSI - A SCSI data transfer that allows a rate of up to 20MB/sec.

Flash ROM - A type of ROM chip that will retain its data until erased. It can be erased or reprogrammed by supplying it with +12V of voltage. See ROM and EPROM.

Full Size - A standard system board size measuring approximately 12" x 13.75".

Gigabyte - A disk storage capacity measurement. Approximately one thousand megabytes or 1,073,741,824 bytes.

IDE - An acronym for Integrated Device Electronics. A standard for communicating between a hard drive and a computer.

Internal Cache - Cache which is built into the CPU. See Cache.

ISA - An acronym for Industry Standard Architecture. A well-established bus standard that originated with the IBM AT. See *PCI, VESA, and EISA.*

Jumper - a small plug that fits over and shorts pins on a circuit board. Jumpers allow the various functions of the board to be enabled or disabled.

Kilobyte (KB) - 1,024 bytes.

L1 Cache - See Internal Cache.

L2 Cache - See External Cache.

LBA - An acronym for Logical Block Addressing. Any IDE hard drive that is larger than 528MB.

Math coprocessor - A microprocessor designed specifically for performing mathematical calculations. A math coprocessor performs these calculations faster than the CPU, and by doing so, frees the CPU for other activities.

Megabyte (MB) - 1,024 Kilobytes or 1,048,576 bytes.

Mini AT - A standard system board size measuring approximately 8.5" x 9.5".

Mode 1 - An IDE data transfer standard that supports transfer rates of up to 5.22 Mbytes/sec.

Mode 2 - An IDE data transfer standard that supports transfer rates of up to 8.33 Mbytes/sec.

Mode 3 - An IDE data transfer standard that supports transfer rates of up to 11.1 Mbytes/sec.

Mode 4 - An IDE data transfer standard that supports transfer rates of up to 15.5 Mbytes/sec.

Parallel - A form of data transmission in which the data is sent one byte at a time over several wires that each carry one byte. In parallel transmission, all the bytes arrive simultaneously, as opposed to serial transmission in which bits arrive one by one.

Parallel Port - A connection for a printer or similar peripheral. Generally, parallel ports are output only. See Bidirectional Parallel Port and ECP.

PCI - An acronym for Peripheral Component Interconnect. A high performance 32-bit or 64-bit bus developed by Intel Corporation. PCI is designed to be independent of the hardware architecture to ensure compatibility with future computer systems. See *VESA, EISA,* and *ISA.*

Pentium- A high performance 64-bit CISC processor designed and manufactured by Intel Corporation. As of this writing, Pentium is the highest performing X86 processor available.

Plug and Play - A standard developed to ensure easy installation of peripherals. Theoretically, a newly installed card will automatically configure itself and work properly without requiring jumper configuration or device drivers.

POST - An acronym for Power On Self Test. A diagnostic program that is run whenever the system is cold booted.

RAM - An acronym for Random Access Memory. A type of memory that is used as the "working memory" of a computer system. See DRAM and SRAM.

ROM - An acronym for Read Only Memory. A type of memory that retains its data without requiring power. Once written, it cannot be modified. See EPROM and Flash ROM.

SCSI - An acronym for Small Computer Systems Interface. An interface standard used to interface hard disk drives, removable cartridge drives, tape drives, and CD-ROMs to the computer system. SCSI allows multiple, high-performance peripheral devices to be connected in a chain. Each has its own address. Data and control signals are sent along the chain and only the specifically addressed device responds.

SCSI II - An interface standard that adds features to the SCSI standard. These include 32-bit data transfer, command queuing, Fast SCSI, and support for a wider variety of peripherals.

SCSI III - A proposed standard that will support transfer rates of up to 40MB/sec.

Serial - A type of data transmission in which the data is sent one bit at a time over a single wire. See parallel.

Serial Port - A communications port used to connect peripherals such as modems and mice.

Setup - A program which allows you to make changes to the system configuration.

Shadow RAM - A technique used to load a duplicate copy of BIOS from slower ROM into faster RAM. This enhances system performance because it provides higher access speed to the BIOS.

SIMM - An acronym for Standard Inline Memory Module. A small printed circuit board containing memory chips.

SRAM - An acronym for Static Random Access Memory. A type of memory that can retain data without requiring a regular clock signal. Although they are faster than DRAM, they hold less data and are more expensive.

Synchronous - Protocols that require the clocks of communicating machines or devices to be coordinated.

Synchronous Cache - A type of cache that uses a clock signal to latch the inputs and the data output. This structure spreads the cache access across two or three cycles while maintaining a bandwidth of one access per cycle. Improves performance by 5-10%.

Terabyte - A measurement for very, very large storage capacity. One Terabyte is equivalent one-thousand gigabytes, one-million megabytes, or 1,099,511,627,766 bytes.

VESA - An acronym for Video Electronics and Standards Association.

VESA Localbus (VL-Bus) - A high performance bus designed by VESA. A 32-bit version of the ISA bus which operates at the speed of the computer's CPU. See *PCI, EISA,* and *ISA.*

VGA - An acronym for Video Graphics Array. A standard for monitor displays.

VR - Pentium CPU voltage ranging from 3.300 - 3.465 Volts.

VRE - Pentium CPU voltage ranging from 3.400 - 3.600 Volts.

Warm Boot - Restarting the system by simultaneously pressing the <Ctrl>, <Alt>, and <Delete> keys.

Write-Back Cache - Upon a cache hit, the cache is updated and the main memory is not affected. Upon a cache miss, only the main memory is updated.

Write-Through Cache - Upon a cache hit, the cache and the main memory are updated. Upon a cache miss, only the main memory is updated.

Limited Warranty

Except as described below, Micronics warrants the products to be free from defects in material and workmanship in normal use for a period of one (1) year from date of purchase. Should any product fail to perform according to this warranty at any time during the warranty period, except as provided below, Micronics or its authorized service centers will, at Micronics' option, repair or replace the product at no additional charge.

The warranty does not cover loss or damage which occurs in shipment or which is due to: (1) improper installation or maintenance, misuse, neglect or any cause other than ordinary commercial application, including without limitation, accidents or acts of God; (2) adjustment, repair, or modification by other than a Micronics authorized service center; (3) improper environment, excessive or inadequate heating or air conditioning, or electrical power failures, surges or other irregularities; (4) any statement about the product other than those set forth in this warranty; or (5) nonconformity to models or samples shown to the purchaser. Any models or samples were for the sole purpose of suggesting the character of the product and are not intended to form the basis of the bargain.

A receipt or copy of the invoice with the date of purchase from a Micronics reseller is required before any warranty service can be rendered. Service can be obtained by calling Micronics for a Return Merchandise Authorization (RMA) Number.

The RMA Number should be prominently displayed on the outside of the shipping carton of the returned product. Returned product should be shipped prepaid or hand carried to Micronics. The purchaser assumes risk of loss or damage in transit, and unless otherwise agreed to in writing by Micronics, will pay inbound shipping charges.

The exclusive remedy of the purchaser under this warranty above will be repair or replace at Micronics' option, but if for any reason that remedy should fail of its essential purpose, the exclusive remedy of the purchaser shall then be actual damages up to amounts paid for the defective product by the purchaser. This limited warranty shall be deemed to "fail of its essential purpose" if, after repeated efforts, Micronics is unable to make the product operate as warranted. Micronics' liability for damages to the purchaser for any cause whatsoever; regardless of the form of action and whether in contract or in tort, shall be limited to the purchase price in effect when the cause of action arose for the product that is the basis of the claim.

Micronics will not be liable for any lost profits or any indirect, special incidental or consequential damages in connection with the product, even if Micronics has been advised of the possibility of such damages.

Micronics makes no warranties or representations as to performance of products or as to service to distributor or to any person, except as set forth in Micronics; limited warranty accompanying delivery of product.

Micronics disclaims all other warranties whether oral, written, expressed, or implied, including without limitation, the warranties of design, merchantability, or fitness for a particular purpose, if applicable, or arising from a course of dealing, usage or trade practice.

Non-Warranty Service

After the one year warranty service is no longer in effect, repair service is still available for Micronics products. For more information, contact Micronics' RMA department at (510) 683-0428 or (510) 683-0389. The RMA department is open between 8:30 A.M. and 5 P.M. Pacific Standard Time.

Document Number: 06-00209-03, Rev. 3A
November 1995
Printed in the USA