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***M6DPi Pentium Pro***  
***PCI/ISA***  
***System Board Manual***

**MICRONICS**  
COMPUTERS INC.

Document Number: 06-00285-01, Rev. 3A

June 1997

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## ***Introduction***

Thank you for choosing the M6DPi system board. The M6DPi supports the most advanced Dual Pentium® Pro processor technology to provide the latest high-performance high-capacity server and workstation solution.

The M6DPi features Wide SCSI, Universal Serial Bus (USB), RAID-ready support and optional 64-bit graphics accelerator. The USB interface has a maximum bandwidth of 12Mbps and can connect as many as 127 devices to a host system. USB supports both standard devices that operate at the full 12Mbps rate and low-end devices that use only a 1.5Mbps subchannel. Based on the Intel 440FX PCIset and i960® processor, the M6DPi supports the PCI to PCI Bridge and I<sub>2</sub>O technology that sets valuable resources free.

Designed to fit into the AT form factor, the versatile M6DPi features support for Fast Page Mode (FPM) and Extended Data Out (EDO) DRAM advanced memory, and Error Checking and Correction (ECC) when using parity memory.

Micronics builds all products to exacting standards, using the highest quality components available. We are proud to provide this system board and believe you will be pleased with your purchase.

# Features

The M6DPi includes the following features:

- ▲ Dual ZIF Socket 8  
Intel Pentium® Pro - 150-200MHz  
Two VRM headers to supply CPU-specific voltages
- ▲ PCI-to-PCI Bridge  
Intelligent I/O (I<sup>2</sup>O)  
i960RP - 33MHz or  
i960RD - 66MHz  
Inter-integrated circuit (I<sup>2</sup>C) onboard
- ▲ Seven 32-bit PCI slots  
Two 16-bit ISA slots  
One is a shared PCI/ISA slot  
One RAID Port (ARO 1130) attached to PCI slot
- ▲ Maximum memory - 1 Gbyte (primary memory)  
Four 3.3V unbuffered 64/72-bit 168-pin DIMM sockets  
Maximum memory - 128MB memory (for i960® processor)  
Two 32/36-bit 72-pin SIMM sockets
- ▲ Supports FPM and EDO DRAM memory  
ECC support via chipset when using parity memory
- ▲ Fast/Wide SCSI Bus Mastering controller w/ 50-pin SCSI connector, 68-pin SCSI connector and EZ-SCSI drivers (optional)
- ▲ Cirrus Logic 5436/5440 PCI graphics accelerator (optional)
- ▲ Two Universal Serial Bus (USB) headers



## **Software Compatibility**

The M6DPi system board has been thoroughly tested for compatibility with a variety of operating systems and environments, including:

- ▲ Microsoft
  - DOS 5.0
  - DOS 6.2
  - Windows 95
  - Windows NT 3.51
  - Windows NT 4.0
- ▲ IBM
  - OS/2 Warp 3.0
  - OS/2 Warp 4.0
- ▲ SCO
  - UNIXWare 2.1.1
  - Open Server 5.02
  - UNIX 3.2, 4.2
- ▲ Novell NetWare 3.12
  - Novell NetWare 4.11

## **Before You Begin**

This manual will familiarize you with the features, installation and use of your M6DPi. There are several symbols and conventions used throughout this manual to help draw your attention to a feature or to focus on important information:



When you see the Magnifying Glass, it refers to something you should take a closer look at before proceeding further.



When you see the Exclamation Mark, it gives important information on avoiding damage.

### ***Common Names***

<b>DIMM</b>	Dual Inline Memory Module
<b>DRAM</b>	Dynamic Random Access Memory
<b>DTMF</b>	Desktop Management Task Force
<b>ECC</b>	Error Checking and Correction
<b>EDO</b>	Extended Data Out
<b>FPM</b>	Fast Page Mode
<b>IDE</b>	Integrated Drive Electronics
<b>PCI</b>	Peripheral Component Interconnect
<b>RAID</b>	Redundant Array of Inexpensive Disks
<b>SCSI</b>	Small Computer System Interface
<b>SIMM</b>	Single Inline Memory Module
<b>USB</b>	Universal Serial Bus
<b>VRM</b>	Voltage Regulator Module

Chapter

# 1

## 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 to get up and running quickly.

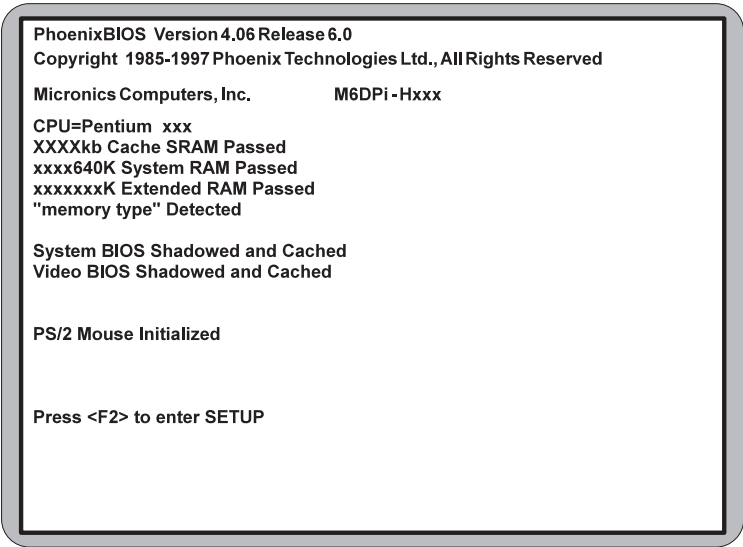


**STATIC!**

*Before handling the M6DPi, be properly grounded by using a special wrist or ankle strap, or touch a safely grounded object.*

### Installing the M6DPi

1. Make backup copies of your installation and configuration diskettes.
2. Ground yourself to prevent damaging static discharge, then remove the M6DPi from its packaging.
3. Configure and verify the system board's jumper settings (refer to Jumper Settings in Chapter 2).
4. Install the CPU and the system memory (refer to Chapter 3).
5. Install the system board into the chassis and make all necessary case connections.
6. Install any ISA and/or PCI add-on peripherals (refer to Chapter 3).
7. Now you can connect any optional devices (refer to Chapter 3).
8. Turn the computer on and press the <F2> key when you see the screen in Figure 1.1.

The image shows a screenshot of a BIOS power-up screen. The text is displayed in a monospaced font within a rectangular frame. The text includes the BIOS version (4.06 Release 6.0), copyright information (1985-1997 Phoenix Technologies Ltd.), and system configuration details such as Micronics Computers, Inc., M6DPi-Hxxx, CPU=Pentium xxx, and memory tests (Cache SRAM Passed, System RAM Passed, Extended RAM Passed). It also indicates that the system BIOS and video BIOS are shadowed and cached, the PS/2 mouse is initialized, and prompts the user to press <F2> to enter the SETUP menu.

```
PhoenixBIOS Version 4.06 Release 6.0
Copyright 1985-1997 Phoenix Technologies Ltd., All Rights Reserved

Micronics Computers, Inc.      M6DPi-Hxxx
CPU=Pentium xxx
XXXXKb Cache SRAM Passed
xxxx640K System RAM Passed
xxxxxxxK Extended RAM Passed
"memory type" Detected

System BIOS Shadowed and Cached
Video BIOS Shadowed and Cached

PS/2 Mouse Initialized

Press <F2> to enter SETUP
```

Figure 1.1: Power-Up Screen

9. 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 (refer to Chapter 4).
10. 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 (see Chapter 4).
11. Install the video controller device drivers (optional). Refer to Chapter 5.
12. Install the SCSI device drivers (optional). Refer to Chapter 5.

## **Configuring the M6DPi**

Although the M6DPi system board is packaged in protective materials, it is important to use care while unpacking and setting up.

### **Static Electricity**

The M6DPi 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 M6DPi via the solder pads surrounding one of its mounting holes.

Once the M6DPi 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.

### **Environment Considerations**

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.

# M6DPi System Board

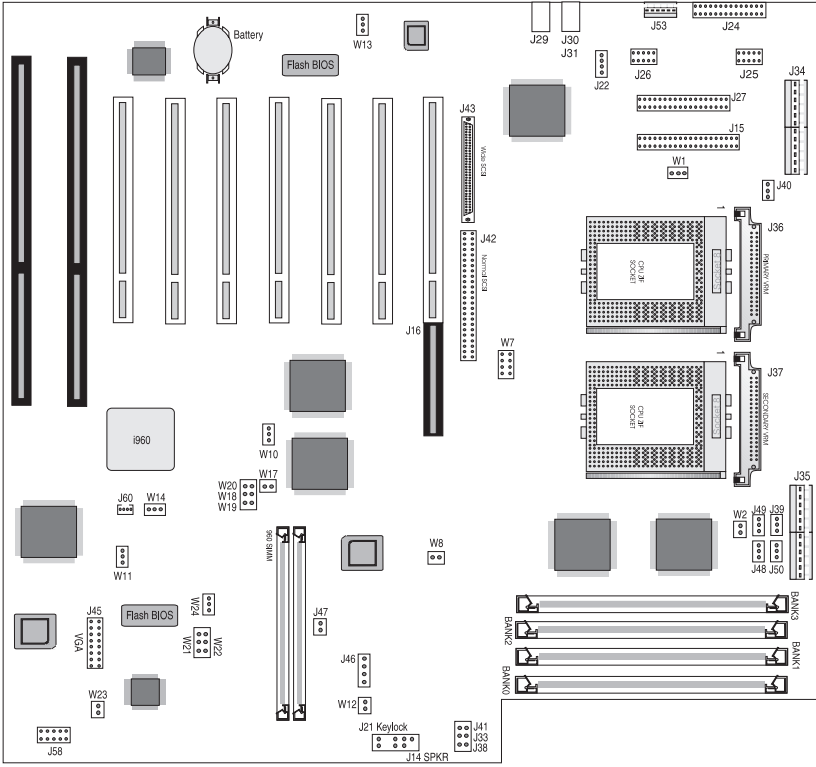


Figure 2.1: M6DPi System Board

## Jumper Settings

This chapter gives you the jumper settings used for the M6DPi system board.

Table 2-1 lists the jumper settings to select the system-speed settings.

System Speed (Intel Processors)	Jumper				
	W7	W7	W7	W7	W8
	1-2	3-4	5-6	7-8	
150 MHz External, 60 MHz Internal	Close	Close	Close	Open	Close
166 MHz External, 66 MHz Internal	Close	Close	Close	Open	Open
180 MHz External, 60 MHz Internal	Close	Close	Open	Close	Close
200 MHz External, 66 MHz Internal	Close	Close	Open	Close	Open

Table 2-1: CPU Speed Selections

Table 2-2 lists the available clock ratios (internal/external) and the corresponding jumper settings. Note that these settings are also included in Table 2-1.

Clock Ratio (Internal:External)								
W7	2:1	2.5:1	3:1	3.5:1	4:1	4.5:1	5:1	5.5:1
1-2	Close	Close	Close	Close	Close	Close	Close	Close
3-4	Close	Close	Close	Close	Open	Open	Open	Open
5-6	Close	Close	Open	Open	Close	Close	Open	Open
7-8	Close	Open	Close	Open	Close	Open	Close	Open

Table 2-2: Clock Ratios

Table 2-3 lists the settings for the Soft Power selection.

Jumper	Soft Power	Setting
W12	Normal	1-2
	Forced Cycling On	2-3

Table 2-3: Soft Power Settings

Table 2-4: Jumper settings to clear the CMOS settings. With your computer's power off, close pins 2-3, wait ten seconds and place the jumper back on pins 1-2. (The jumper must be placed back on pins 1-2 for the system to function properly.)

*NOTE: This will reset all BIOS default settings. Any changes you have made will be lost.*

Reset RTC	W13
Normal (default)	1-2
Reset RTC	2-3

Table 2-4: Clear CMOS Settings

Table 2-5 lists the settings to select the optional onboard VGA.

Video	W11
Normal (default)	1-2
Disable VGA	2-3

Table 2-5: VGA Selection



Table 2-6 lists the settings to select the optional onboard Fast SCSI.

<b>Fast SCSI</b>	<b>W10</b>
Normal (default)	1-2
Disable SCSI	2-3

Table 2-6: Fast SCSI Selection

Table 2-7 lists the settings to select the optional onboard Wide SCSI.

<b>Wide SCSI</b>	<b>W14</b>
Auto-Detect	1-2
Wide SCSI	2-3

Table 2-7: Wide SCSI Selection

Table 2-8 lists the settings to enable or disable Error Checking and Correction.

<b>Memory Error Corrections</b>	<b>W2</b>
Enable ECC	Open
Disable ECC	Close

Table 2-8: ECC Selection

Table 2-9 lists the settings for the i960 processor support.

<b>Jumper</b>	<b>i960</b>	<b>Setting</b>
W17, W18	Normal (default) Disable	Open Close
W19, W20	Mode 3 (default) Mode 0	Open Close
W23	Normal ( <i>do not change setting</i> )	1-2

Table 2-9: i960 Processor Settings

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Table 2-10 lists the connectors and their functions.

Connector	Function	Notes
J3-J6	DIMM Sockets	Unbuffered
J14	Speaker	24 - +5V; 25 - Key; 26 - Speaker Data Connect; 27 - PC Speaker Output
J15	Primary IDE Port	
J16	Raid Port Connector	
J21	Keylock Switch	1 - Power; 2 - No Connect; 3 - Ground; 4 - Keyboard Lock; 5 - Ground
J22	Infrared (IR)	6 - +5V; 7 - Key; 8 - Receive Data; 9 - Ground; 10 - Transmit Data; 11 - No connect
J24	Parallel Port Connector	Can be disabled at the CMOS configuration screen
J26	Serial Port (COM 1) Serial Port (COM 2)	Can be disabled at the CMOS configuration screen
J27	Floppy Drive Connector	
J28	Mouse	PS/2 compatible
J29	External PS/2 Mouse	
J30, J31	PS/2 Keyboard Connector AT Keyboard Connector	Optional
J33	IDE & SCSI LED	13 - +5V; 14 - Key; 15 - HDD Active; 16 - +5V
J34, J53	AT Power Connector	
J35	3.3V AT Power Connector	
J36, J37	Primary & Secondary VRM	
J38	Turbo LED	
J39, J40, J48, J49, J50	Cooling Fan Connectors	
J41	Reset Switch	22 - Ground; 23 - FP_Reset
J42	Normal SCSI Connector	
J43	Wide SCSI Connector	
J45	VGA Connector	
J46	Soft Power Connector	
J47	Soft Power Switch	1 - FPPwr; 2 - Switch On
J58	i960 Serial Port	
J60	I <sup>2</sup> C Bus Connector	Inter-Integrated Circuit

Table 2-10: Connector Settings and Functions

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## Installing the M6DPi

### Introduction

This chapter explains how to install the M6DPi system board, memory, CPU 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 in Chapter 1. Micronics recommends only trained technicians install and configure 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 dealer where you purchased the peripheral or Micronics' Technical Support Department.*

### System Memory Support

The flexibility of the M6DPi is augmented by its support for EDO and FPM DRAM memory and ECC. The M6DPi supports ECC (with 72-bit DIMMs or 36-bit SIMMs) via the chipset.

EDO memory is designed to keep data available to the processor for an extended period of time. The EDO memory support extends the performance of conventional DRAM memory. The result is an improvement in memory-access performance on the M6DPi system board.

## **Installing the M6DPi**

Installation of the M6DPi system board depends on the type of case you use. The M6DPi is designed for the full-size AT form factor and is likely to be limited to tower cases. NOTE: If you are unfamiliar with installing a system board, Micronics highly recommends that 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 M6DPi:

- 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 M6DPi for a typical configuration:

- Chassis with standard hardware (tower case preferable).
- A high-quality power supply capable of providing continuous power within a 5 volt range. A power filter may be used with a noisy AC power source.
- PS/2 mouse and compatible keyboard.
- Eight ohm speaker.
- Standard ribbon cables for internal connections.
- Standard power cord (grounded).
- Heat sink with cooling fan for each CPU (required).

## System Memory

System memory is necessary to operate the M6DPi system board. The M6DPi supports DIMM modules for the main memory. There are four 168-pin 3.3V unbuffered DIMM sockets for a maximum of 1 Gbyte of memory. Each socket provides a 64/72-bit wide data path.

The M6DPi also supports SIMM modules for the i960 processor. There are two 72-pin SIMM sockets for a maximum of 128MB of memory. Each socket provides a 32/36-bit wide data path. These sockets are needed only when using the i960 processor.

Support is provided for EDO and FPM DRAM memory. This section lists the rules for adding memory to the M6DPi, give some examples of common memory configurations and show how to physically install the memory.

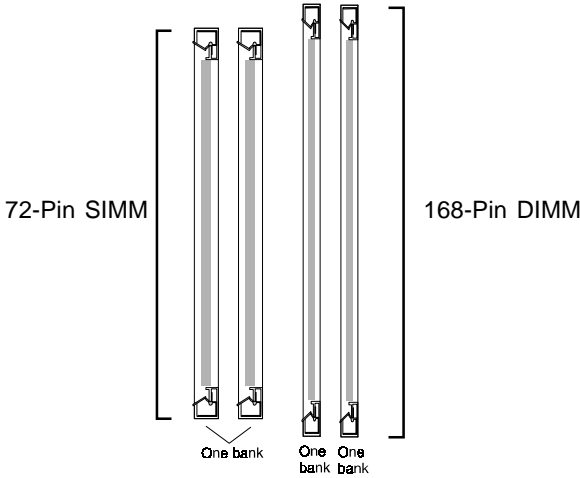
### Adding Memory

The following is a list of rules to follow when upgrading DIMMs and SIMMs. If you follow these rules, your upgrade should be trouble-free:

- ❑ Use 70ns or faster DIMMs and SIMMs. *NOTE: For long term reliability, Micronics recommends using DIMMs with gold-plated contacts and SIMMs with tin-plated contacts.*
- ❑ Both SIMM and DIMM (unbuffered) memory modules support FPM and EDO memory types.
- ❑ Singled-sided and double-sided memory modules supported.
- ❑ Use the same type and size of memory for every bank. Different memory types and sizes in separate banks will cause performance of the memory to run at the speed of the slowest RAM installed.

## Memory Type

SIMM and DIMM memory descriptions are described below. Note that two (2) SIMM slots make up one (1) bank whereas only one (1) DIMM slot makes up one (1) bank.





*There is no need to set any jumpers. When you reboot, the size and type of memory are automatically detected.*

## Memory Configurations

DIMM memory configuration is auto-banking and therefore does not need to be installed in any particular order. The following table lists the most common memory configuration possibilities.

Memory	Bank 1	Bank 2	Bank 3	Bank 4
8MB	1Mx64			
16MB	2Mx64			
16MB	1Mx64	1Mx64		
24MB	2Mx64	1Mx64		
24MB	1Mx64	1Mx64	1Mx64	
32MB	2Mx64	2Mx64		
32MB	4Mx64			
32MB	1Mx64	1Mx64	1Mx64	1Mx64
40MB	2Mx64	2Mx64	1Mx64	
40MB	2Mx64	1Mx64	1Mx64	1Mx64
40MB	4Mx64	1Mx64		
48MB	2Mx64	2Mx64	2Mx64	
48MB	2Mx64	2Mx64	1Mx64	1Mx64
48MB	4Mx64	1Mx64	1Mx64	
56MB	4Mx64	2Mx64	1Mx64	
56MB	4Mx64	1Mx64	1Mx64	1Mx64
64MB	2Mx64	2Mx64	2Mx64	2Mx64

Table 3-1: Memory Configurations



*When installing memory, consider using the same speed. Mixing memory speed will force all memory to operate at the slowest speed.*

<b>Memory</b>	<b>Bank 1</b>	<b>Bank 2</b>	<b>Bank 3</b>	<b>Bank 4</b>
64MB	4Mx64	4Mx64		
64MB	8Mx64			
80MB	4Mx64	2Mx64	2Mx64	2Mx64
80MB	4Mx64	4Mx64	1Mx64	1Mx64
80MB	8Mx64	2Mx64		
80MB	8Mx64	1Mx64	1Mx64	
96MB	4Mx64	4Mx64	2Mx64	2Mx64
96MB	4Mx64	4Mx64	4Mx64	
96MB	8Mx64	2Mx64	1Mx64	1Mx64
112MB	4Mx64	4Mx64	4Mx64	2Mx64
112MB	8Mx64	4Mx64	2Mx64	
112MB	8Mx64	4Mx64	1Mx64	1Mx64
128MB	16Mx64			
128MB	4Mx64	4Mx64	4Mx64	4Mx64
128MB	8Mx64	4Mx64	4Mx64	
128MB	8Mx64	8Mx64		
160MB	16Mx64	2Mx64	1Mx64	1Mx64
160MB	8Mx64	4Mx64	4Mx64	4Mx64
160MB	16Mx64	4Mx64		

Table 3-2a: Memory Configurations



<b>Memory</b>	<b>Bank 1</b>	<b>Bank 2</b>	<b>Bank 3</b>	<b>Bank 4</b>
192MB	16Mx64	4Mx64	4Mx64	
192MB	8Mx64	8Mx64	4Mx64	4Mx64
192MB	8Mx64	8Mx64	8Mx64	
224MB	16Mx64	8Mx64	2Mx64	2Mx64
224MB	16Mx64	8Mx64	4Mx64	
256MB	16Mx64	16Mx64		
256MB	16Mx64	8Mx64	4Mx64	4Mx64
256MB	16Mx64	8Mx64	8Mx64	
256MB	8Mx64	8Mx64	8Mx64	8Mx64
288MB	16Mx64	16Mx64	4Mx64	
320MB	16Mx64	8Mx64	8Mx64	8Mx64
384MB	16Mx64	16Mx64	16Mx64	
384MB	16Mx64	16Mx64	8Mx64	8Mx64
448MB	16Mx64	16Mx64	16Mx64	8Mx64
512MB	16Mx64	16Mx64	16Mx64	16Mx64
1024MB	32Mx64	32Mx64	32Mx64	32Mx64

Table 3-2b: Memory Configurations

**i960 SIMM Memory Configurations**

The i960 I/O processor requires two (2) 72-pin SIMMs to operate. The maximum memory is 128 megabytes. The processor supports 32/36-bit FPM and EDO memory types. Make sure that the memory is the same size and speed. Below are some typical memory configurations.

<b>Memory</b>	<b>Bank 0</b>	<b>Bank 1</b>
8MB	1MBx32/36	1MBx32/36
16MB	2MBx32/36	2MBx32/36
32MB	4MBx32/36	4MBx32/36
64MB	8MBx32/36	8MBx32/36
128MB	16MBx32/36	16MBx32/36

Table 3.3: i960 Memory Configurations

## Installing the DIMMs

The M6DPi uses DIMM modules for the main memory. To install the DIMMs, locate the memory banks on the system board and follow the steps below:

1. Hold the DIMM so that the notched edge is aligned with the notch on the DIMM socket (Figure 3-1).
2. Insert the DIMM at a 90 degree angle.
3. Gently push the DIMM straight down until it locks into place (past the release tabs).

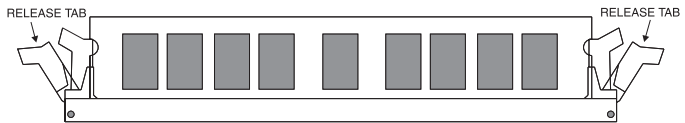


Figure 3-1: Installing a 168-Pin DIMM

## Removing DIMMs

To remove DIMMs, follow the steps below:

1. With both thumbs (or fingers), press the release tabs away from the socket.
2. With the DIMM free from the release tabs, lift the module up and place in an anti-static bag or package.

## Installing the SIMMs

The M6DPi uses SIMM modules only for the i960RP processor. To install the SIMMs, locate the memory banks on the system board and follow the steps below:

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).

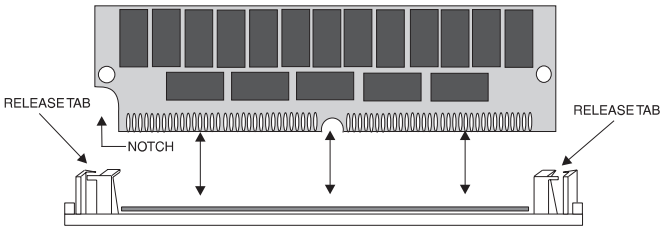


Figure 3-2: Installing a 72-Pin SIMM

## Removing SIMMs

To remove SIMMs, follow the steps below:

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 M6DPi is designed to support dual Pentium Pro processors. Follow the steps below to install the processor(s):

1. Turn off the computer and remove its cover.
2. Locate the ZIF socket illustrated in Figure 2-1.
3. Lift the lever of the socket.
4. Locate pin 1 on the processor and pin 1 on the socket (refer to Figure 2-1). Gently place the processor into the socket, making sure pin 1 on the processor and pin 1 on the socket are aligned.
5. Push the lever down until it locks into place.
6. Make sure the speed and the voltage selection jumpers are set correctly (refer to Chapter 2 - Jumper Settings).
7. If you are installing a second processor, you do not need to change any jumpers or BIOS settings. The system will automatically recognize the new processor.
8. A VRM module must be installed on header J36 (primary CPU) and J37 (secondary CPU) for each CPU installed. In addition, the second processor should have the same speed rating as the main processor.

**WARNING:** *Pentium Pro processors require a heat-sink with a cooling fan. Failure to provide adequate cooling of the processor may seriously affect system performance or cause permanent damage to the processor.*

**NOTE:** *If your operating system supports dual processors, you may need to reconfigure or reinstall your operating system. Refer to your software documentation for more information.*

## Installing a PCI Peripheral Card

Micronics PCI slots accommodate all PCI peripherals that meet the PCI 2.1 specifications. Follow the steps below 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. Refer to the PCI card's documentation additional instructions regarding installation and software drivers.

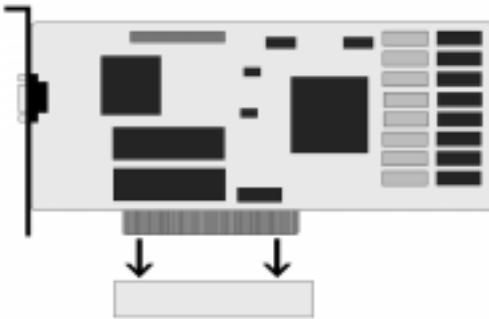


Figure 3-3: Installing a PCI Card

## Installing an ISA Peripheral Card

Micronics ISA slots accommodate all standard ISA peripherals. Follow the steps below to install a PCI card:

1. Turn the computer system off and remove its 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 inserted fully.
5. Replace the screw that holds the card into place.
6. Replace the computer cover.
7. Refer to the ISA card's documentation for additional instructions regarding installation and software drivers.

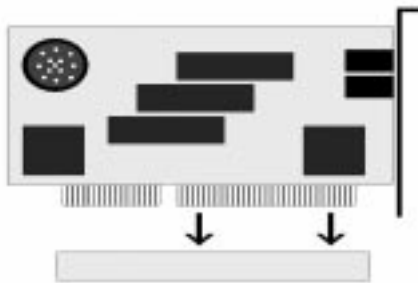


Figure 3-4: Installing an ISA Card

## **Connecting the Graphics Option**

The M6DPi is designed to accommodate an optional VGA video connector and comes with a 15-pin monitor cable. The connector pin-outs for both the 15-pin VGA onboard connector and monitor cable connector are the same as the standard 15-pin D-shell connector pin-outs.

The graphics option comes with 1MB of DRAM memory. The 64-bit graphics processor provides high-speed acceleration in all graphic modes. It uses a full 64-bit non-interleaved DRAM interface, which is twice the throughput of 32-bit controllers. Full motion digital video can be scaled up to full screen at 1024x768 resolution.

### **Connecting the Video Cable**

1. Turn the computer system off.
2. Locate the monitor's power switch and make sure it is turned OFF.
3. Plug the end of the video cable with the 15-pin connector (which is larger than the other connector) into the video socket on the back of your monitor. Then tighten the two thumbscrews on the cable connector.
4. Plug the other end of the video cable into the video socket on the M6DPi and tighten the thumbscrews (see Figure 2.1).

See Chapter 5 for information on installing video device drivers.



## **Connecting the SCSI Option**

Some versions of the M6DPi include an integrated Ultra Wide SCSI PCI throughput (up to 40MBytes/sec data rate). Connectors are provided for Normal SCSI (50-pin connector) and Wide SCSI (68-pin connector).

The Wide SCSI configuration allows up to 15 SCSI peripherals to be connected. The M6DPi SCSI interface is Plug and Play compliant and is fully compatible with the PCI 2.1 specification.

Refer to the "Adaptec AHA-2940Ultra/2940Ultra Wide User's Guide" for information on installing and connecting SCSI devices.



# 4

## Configuration

After the M6DPi 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. This will make it easier to correct any difficulties that might arise.

### Initial Boot Up

Power up the M6DPi. If the system does not 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 B and/or C for a guide to possible solutions.

After the system properly boots, it is ready to be configured. The following information explains 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:

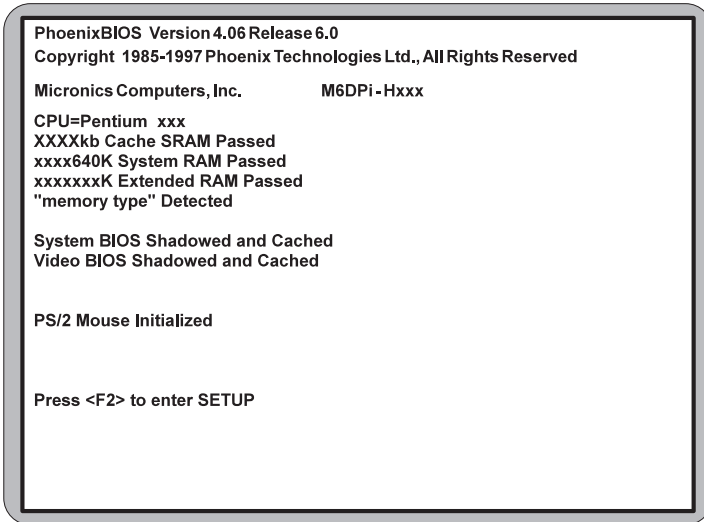


Figure 4-1: Power-Up Screen

When “Press <F2> to enter SETUP” appears at the bottom of the screen, press the <F2> key to start the Setup program. The main CMOS Setup screen (Figure 4-2) appears. The Setup program can only be activated during the boot sequence.

## Running the Setup Procedure

The M6DPi system board has six primary CMOS configuration screens: Main Screen, Advanced Screen, Security Screen, Power Screen, Boot Screen and Exit Screen. 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 IDE hard disks and to configure the video. This chapter explains how to configure each of these categories. To move between the categories, use the up and down arrow <↑/↓> keys.

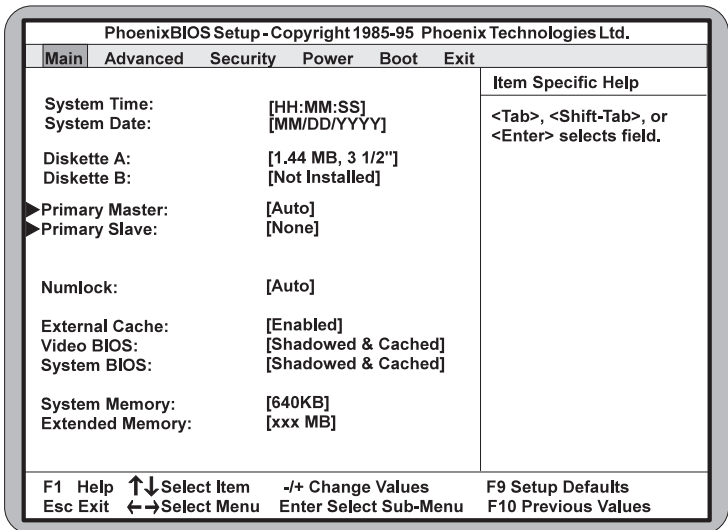


Figure 4-2: CMOS Main Screen

### 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 desired drive. Use the <+/-> keys to change the setting until it matches the floppy drive you installed. The BIOS supports 2.88MB, 1.44MB, 1.2MB, 720KB, and 360KB floppy drives.

### Primary IDE Devices

If you are setting up a SCSI hard disk, select None in the IDE Device parameters (see your SCSI card manual for more details). To install an IDE device, select the device to configure and press ENTER. An IDE Device submenu will appear (see Figure 4-3).

### Numlock

Setting this to ON activates Numlock upon boot. Setting this to Auto (default) activates Numlock if the BIOS detects a numeric keyboard. It may also be set to OFF.

### External Cache

This selection allows you to enable the external memory cache. For optimal performance, select Enabled.

## **Video BIOS**

The Video BIOS category allows you to Shadow or Shadow & Cache the video BIOS. Choosing Shadowed & Cached (default) caches the shadowed video BIOS for even higher performance. Choosing Shadowed copies the video BIOS into RAM for faster execution. To disable the Video BIOS category, select Disabled.

## **System BIOS**

The System BIOS category allows you to Shadow or Shadow & Cache the system BIOS. Choosing Shadowed & Cached (default) caches the shadowed system BIOS for even higher performance. Choosing Shadowed copies the system BIOS into RAM for faster execution.

## **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.

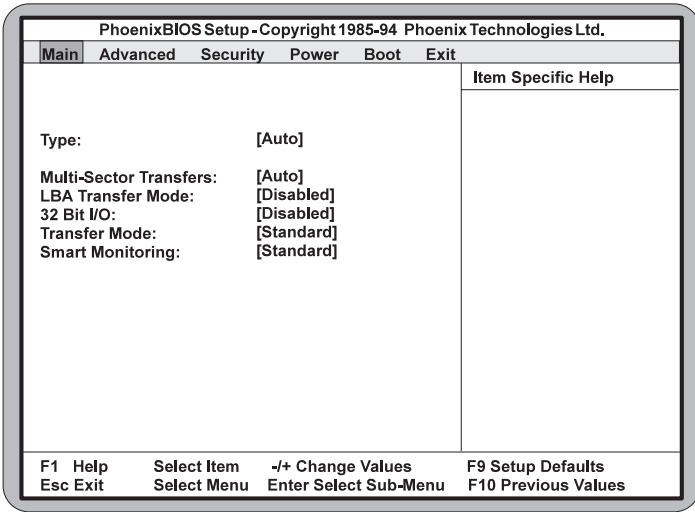


Figure 4-3: IDE Device Submenu

## Type

This category selects the drive type installed in the system. The options are Auto (default), 1-39, User and None. If Autotype Fixed Disk does not find your drive's parameters, fill this information in manually under the User category. This information may be in the manual which 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 to 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 Auto (default), Disabled, 2 Sectors, 4 Sectors, 6 Sectors, 8 Sectors and 16 Sectors.



### **LBA Transfer Mode**

Enabling this selection causes LBA (Logical Block Addressing) to be used in place of Cylinders, Heads and Sectors. The default setting is Enabled.

### **32-Bit I/O**

This category allows you 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 Disabled.

### **Transfer Mode**

This category sets the transfer speeds for IDE devices. The Standard option is the default setting. The Fast PIO 1, Fast PIO 2, Fast PIO 3 and Fast PIO 4 options are for higher speed devices.

### **Smart Monitoring**

This feature will monitor your hard drive and report any problems detected. This option is automatically detected based on the hard drive's ability to support it. This setting cannot be changed.

## Setting the Advanced Screen

To move to the Advanced screen, use the left and right arrow keys <←/→> keys until you see the screen below.

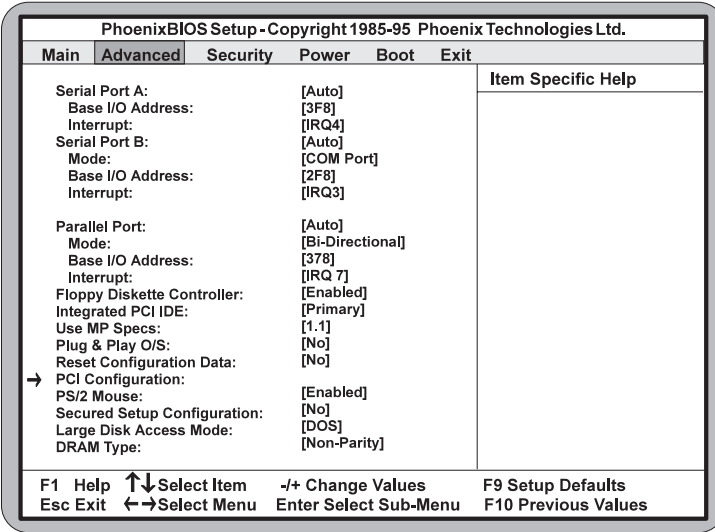


Figure 4-4: Advanced Screen

### Serial Port A

Serial Port A may be configured using the following options: Disabled (No configuration), Enabled (User configuration), Auto (BIOS configuration) and PnP O/S (O/S configuration).

### Serial Port B

Serial Port B may be configured using the following options: Disabled (No configuration), Enabled (User configuration), Auto (BIOS configuration) and PnP O/S (O/S configuration).

### **Parallel Port**

The parallel port may be configured using the following options: Disabled (No configuration), Enabled (User configuration), Auto (BIOS configuration) and PnP O/S (O/S configuration).

### **Floppy Disk Controller**

The selection allows you to enable or disable the floppy disk controller.

### **Integrated PCI IDE**

Enables or disables the integrated Local Bus IDE adapter. The IDE controller may be set for Primary (default) or Disabled.

### **Use MP Specs**

Select the Multiprocessor specification. The default setting is 1.1.

### **Plug & Play O/S**

This selection, when set to Yes, allows the system to work with a Plug and Play operating system such as Windows 95. The default setting is No. NOTE: This selection should be set to No when using Windows 3.1 or Windows NT.

### **Reset Configuration Data**

Select Yes if you want to clear the system configuration data. The default setting is No.

## **PCI Configuration**

Use this selection for additional setup menus to configure PCI devices. It's also useful to check whether or not various IRQ's are available for PCI devices or if they are reserved for legacy ISA devices.

## **PS/2 Mouse**

When disabled, this selection prevents the PS/2 mouse from functioning. Selecting Enabled (default) allows the operating system to determine whether to enable or disable the mouse.

## **Secured Setup Configuration**

Select Yes if you want the system settings to be secured from change by a Plug and Play operating system. The default setting is No.

## **Large Disk Access Mode**

If you are using a Microsoft™ operating system (MS-DOS, Windows, NT) or any other form of DOS (Novell DOS or PC-DOS), set to DOS (default). If you are using other operating systems such as OS/2 or Unix, set to Other.

## Security Screen

The Security screen 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 allows access to the system, but not to all Setup features.

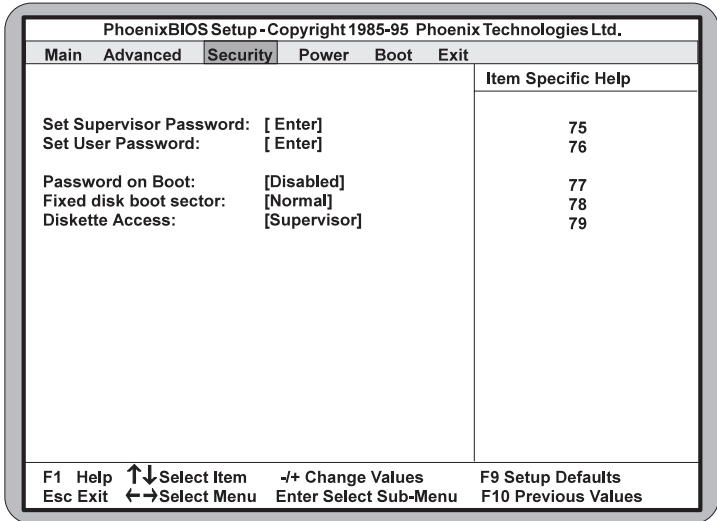


Figure 4-5: Security Setup Screen

### Set Supervisor Password

This selection controls access to the Setup utility. Press the ENTER key to enter the Supervisor Password submenu. The screen on the following page appears.

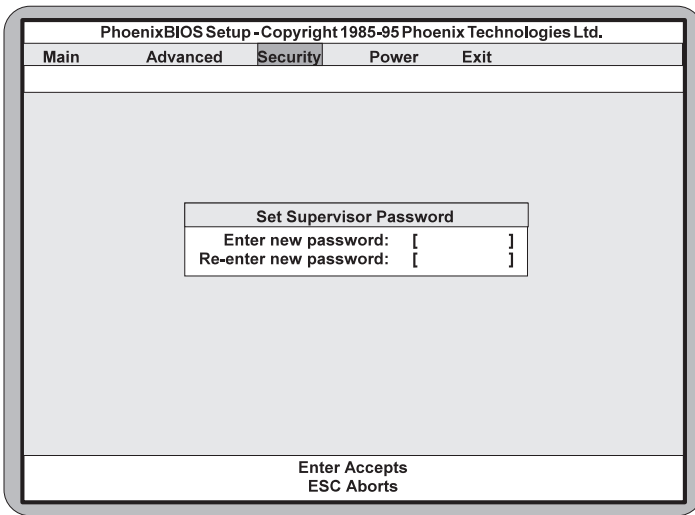


Figure 4-6: Supervisor Password Submenu

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

This selection controls access to the Setup utility. Follow the same procedure used to set the Supervisor Password.

*NOTE: After a password is entered, it is saved immediately. All other changes may still be discarded (see Exit Screen).*

### **Password on Boot**

When enabled, the system requires a password upon power up. Either the Supervisor or User Password may be entered.

### **Fixed Disk Boot Sector**

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

### **Diskette Access**

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

## Power Screen

The Power screen controls the power management functions of the system. To move to the Power screen, use the left and right arrow <←/→> keys until it appears. To move between the categories, use the up and down arrow keys <↑/↓>.

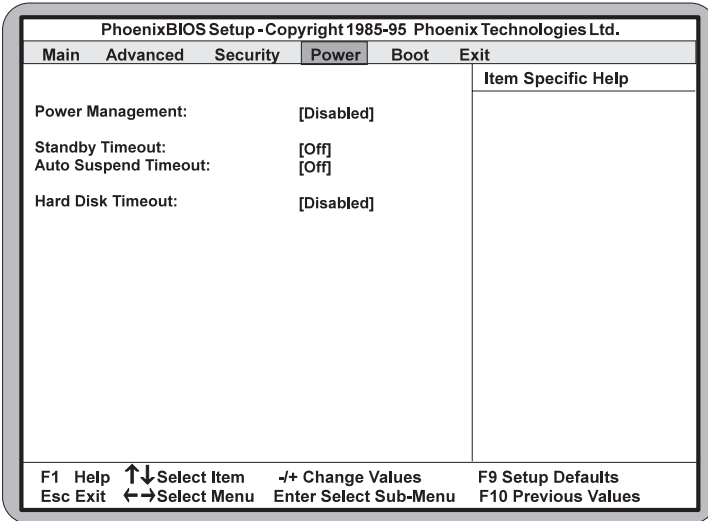


Figure 4-7: Power Screen

## Power Management

This selection allows you to change the system power management settings. Maximum Power Savings conserves the greatest amount of system power. Maximum Performance conserves power but allows greatest system performance. To alter these settings, choose Customize. To turn off power management, choose Disabled (default).



### Standby Time-out

The Standby Time-out selection sets the amount of time that elapses for the system to enter Standby Mode. Standby Mode turns off various devices in the system, including the display screen, until you start using the system again. The options are Off (default), 1 min., 2 min., 4 min., 6 min., 8 min., 12 min. or 16 min.

### Auto Suspend Time-out

The Standby Time-out selection sets the amount of time that elapses for the system to enter Suspend Mode. The options are Off (default), 5 min., 10 min., 15 min., 20 min., 30 min., 40 min. or 60 min. Before making changes, "Customized" must be selected in the Power Management Mode selection.

### Hard Disk Time-out

This selection sets the amount of time that elapses before the IDE drive enters spin-down mode to conserve power. The options are Disabled (default), 2 min., 4 min., 6 min., or 8 min., 10 min. and 15 min. Before making changes, "Customized" must be selected in the Power Management Mode selection. *NOTE: Do not enable this selection unless your IDE drive supports spin-down mode.*

## Boot Screen

The Boot screen allows you to configure the power up system configuration settings.

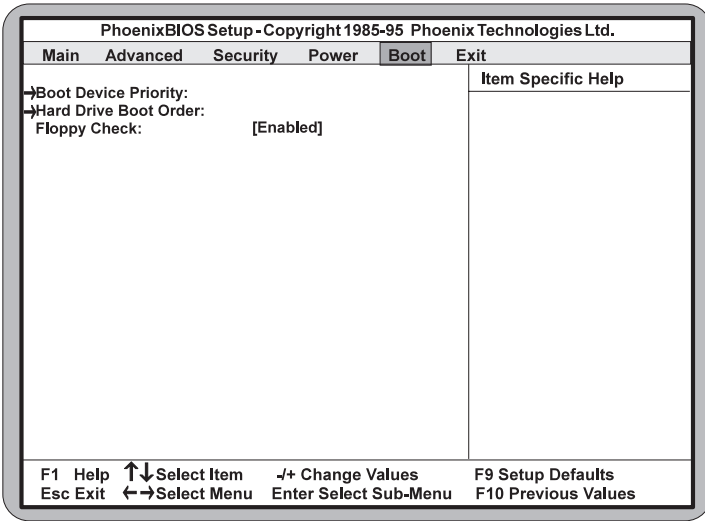


Figure 4-8: Boot Screen

### Boot Device Priority

This feature will set the search order for the types of bootable devices.

### Hard Drive

The system will attempt to boot to the operating system from the first hard drive listed. If no operating system is found, the system will attempt to boot from the next drive listed until an operating system is found.

## Exit Screen

After you complete configuring the BIOS, select the Exit screen.

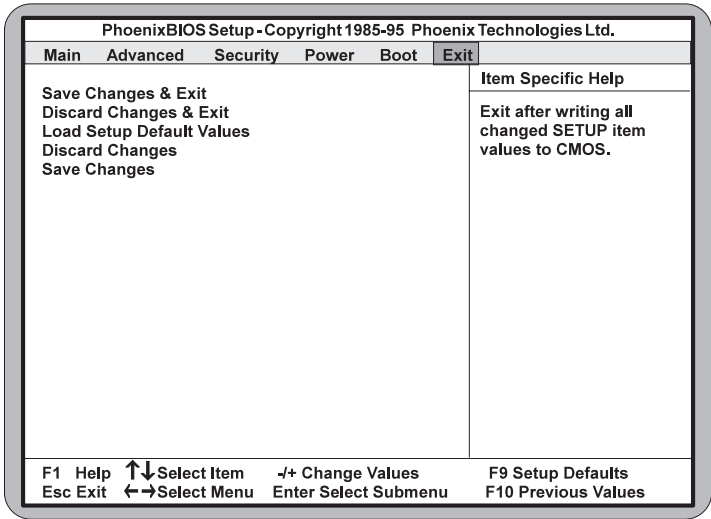


Figure 4-9: Exit Screen

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



## **Installing Device Drivers**

This chapter explains how to install the software device drivers and utilities necessary to utilize the optional graphics and Fast/Wide SCSI support. Other drivers and utilities are available through our online services.

### **About Device Drivers**

Device drivers are necessary for the computer system to communicate with devices such as CD-ROM drives, sound controllers, graphics adapters or devices that are not natively supported by the system BIOS. Once started, device drivers remain active in the background of the computer system. Usually a device driver is added to the CONFIG.SYS file, the AUTOEXEC.BAT file or both.

## **Installing the Graphics Drivers**

### **Windows 95**

1. Start Microsoft Windows 95. The New Hardware Found screen appears.
2. Insert the M6DPi Drivers and Utilities disk into your floppy drive.
3. From the New Hardware Found screen, select the Driver From Disk Provided by Hardware Manufacturer option. Click on Next.
4. Type in the driver location: A:\ (where A is the floppy drive letter). Click on OK.
5. Windows 95 copies the M6DPi video drivers and utilities to your hard drive.

### Windows NT

1. Boot Windows NT in VGA mode.
2. From the Main group, double-click on Control Panel, then double-click on Display.
3. Select Change Display Type.
4. From the Change Display Type screen, select Change for the adapter type.
5. Select the Other button.
6. Insert the M6DPi Drivers and Utilities disk into your floppy drive. Click on OK.
7. Click on the Install button.
8. Click on Yes to install the driver.
9. When the Windows NT Setup dialog box appears, select drive A:\, then click on Continue.
10. When a message appears stating that the drivers were successfully installed, click on OK.
11. Restart your computer for the changes to take effect.

### Installing the SCSI Drivers

Refer to the "Adaptec 7800 Family Manager Set User's Guide" for information on installing and configuring drivers for your operating system.

Appendix **Specifications**

# A

Part Number:	09-00285
Processor:	Dual ZIF Socket 8 Intel Pentium® Pro 150-200MHz Two VRM headers to supply CPU-specific voltages.
i960RP:	PCI-to-PCI Bridge Intelligent I/O (I <sup>2</sup> O) Inter-integrated circuit (I <sup>2</sup> C) onboard
Chipset:	Intel 440FX PCIset Intel i960RP - 33MHz or Intel i960RD - 66MHz. SMC FDC37C93x Ultra I/O chip
CPU Clock Select:	Support for 60 and 66MHz CPU bus speeds.
Form Factor:	Full AT form factor (12"x 13.8")
Expansion:	Seven 32-bit PCI slots Two 16-bit ISA slots One is a shared PCI/ISA slot One RAID Port (ARO 1130) attached to PCI slot.
BIOS:	Phoenix 4.0X Plug and Play BIOS on 2MB Flash. Auto-detection of memory size. Auto-detection and display of ECC and EDO memory. Auto-configuration of IDE hard disk types. PCI auto-configuration Soft Power Down DMI/SMI Multi-boot

Memory Capacity:	Maximum memory - 1 Gbyte (primary memory) Four 3.3V unbuffered 64-bit/72-bit 168-pin DIMM sockets. Supports FPM and EDO DRAM memory ECC supported via chipset when using parity  Maximum memory - 128MB memory (for i960) Two 32/36-bit 72-pin SIMM sockets
Onboard Video:	Cirrus Logic 5436/5440 PCI graphics accelerator with 1MB of memory (optional). Video cable with VGA monitor connector
Fast/Wide SCSI:	Adaptec 7880 Fast/Wide SCSI Bus Mastering controller (optional). 50-pin SCSI connector 68-pin SCSI connector
Keyboard/Mouse:	PS/2 compatible AT keyboard connector (optional)
Cache:	16K Level 1 Write Back on CPU chip 256K, 512K or 1MB Level 2 cache in CPU package.
I/O Ports:	Two high speed serial ports (16550 compatible) Enhanced Parallel Port with ECP and EPP support. IrDA compliant IR header Two USB headers
Floppy Port:	Auto-detection and support of two floppy drives (2.88MB, 1.44MB, 1.2MB, 720K, 360K).
PCI IDE:	One 40-pin IDE connectors (Primary IDE). Multiple sector transfer support Auto detection of add-in IDE board



## **Environmental Specifications**

The environment in which the M6DPi is located is critical. 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. 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%.

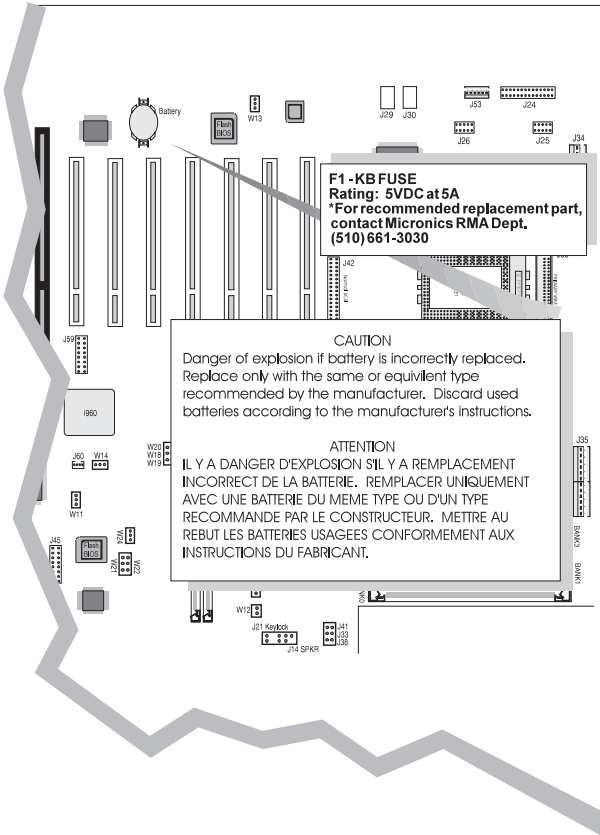
Non-Operating: 5% to 90%.

## **Power Supply Specifications**

The M6DPi requires a 3.3Volt AT power supply. You can purchase this power supply from most computer vendors. When purchasing this power supply, ask for a (Split Voltage) 3.3 volt AT power supply with the traditional AT connectors to the system board.

This power supply will have the traditional P8 and P9 for standard AT sources and P10 and P11 for the 3.3 volt source. Make sure the power supply also has a +5 volt Standby Power and Soft Power connection (P13), which is the ATX standard. In addition, it would be advisable to request an extra +5 volt source for P12.

# Battery Disposal



## WARNING:

*Please do not open battery, dispose of in fire, recharge, put in backwards or mix with used or other battery types. The battery may explode or leak and cause personal injury.*

## Support and Information Services

Micronics offers a variety of support and information services to help you get the most from your product. The following services are available:

- ▲ Technical Support
- ▲ Electronic Bulletin Board Service (BBS)
- ▲ Return Materials Authorization (RMA)
- ▲ Fax-On-Demand
- ▲ World Wide Web
- ▲ Customer Service

Refer to Table A-1 for details on these services.

### Technical Support

If you need technical assistance, our Technical Support Engineers will be glad to help you. You can contact us via telephone, fax or BBS. Before calling Technical Support please have the following information ready:

- The model name and 09 part number of your Micronics product.
- Your computer information such as CPU type, operating system, amount of installed memory and other peripherals installed in your computer.
- Try to call from the location of your computer.

NOTE: For Return Material Authorization purposes, please keep a copy of your product receipt.

## Appendix A: Technical Information

Service	Hours	Country	Telephone Number
Technical Support - Live phone help from Technical Support Engineers	M-F: 7:00am to 5:00pm (PST)	USA France UK	(510) 661-3000 (510) 651-6982 (Fax) +33 (1) 45 43 56 26 +33 (1) 45 43 17 78 (Fax) +44 (1256) 844899 +44 (1256) 364222 (Fax)
Electronic Bulletin Board Service (BBS) - Information on software upgrades, new releases and other helpful information	24 hours a day 7 days a week  "	USA  UK	(510) 651-6837 14400 baud rate, Parity=N, Data Bits=8, Stop Bits=1 YMODEM and ZMODEM (recommended file transfer protocols) +44 (1256) 363373
RMA (Return Materials Authorization) - Return products for repair	M-F: 8:00am to 4:45pm (PST)	USA	(510) 661-3030 (510) 683-0543 (Fax)
Fax-On-Demand - Automated system for product literature, technical bulletins and other helpful information	24 hours a day 7 days a week	USA	(510) 661-3199
World Wide Web - Product information, technical support, press releases and other helpful information	24 hours a day 7 days a week  "	USA  Europe	<a href="http://www.micronics.com">http://www.micronics.com</a>  <a href="http://www.mcni.com">http://www.mcni.com</a>
Customer Service - Order Micronics and Orchid products	M-F: 8:00am to 5:00pm (PST)	USA France UK Germany Taiwan	(800) 577-0977 (510) 651-3666 (Fax) +33 (1) 45 43 56 26 +33 (1) 45 43 17 78 (Fax) +44 (1256) 479 898 +44 (1256) 364222 (Fax) +49 (89) 58 09 82 55 +49 (89) 58 09 82 25 (Fax) +886 2 918 5005 +886 2 911 5472 (Fax)

Table A1: Support and Information Services

Appendix **POST Messages****B**

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.

<b>Message</b>	<b>Possible Cause</b>	<b>Solution</b>
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.

## Beep and POST Codes

# C

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 M6DPi has completed POST; any other tone from the speaker indicates something other than a POST error. These tones *are not* described in the tables on the following pages.

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 tables list 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.
0E		Initialize I/O.
0F		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.

## Appendix C: Beep and Post Codes

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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.

## Appendix

**Hard Disk Drive Types****D**

The following table lists the IDE hard disk types supported by the M6DPi.

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

## Appendix D: Hard Disk Drive Types

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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

## Updating the System BIOS

# E

The Micronics system boards are designed so that the BIOS can be reprogrammed using a BIOS file. You can easily FLASH a BIOS by following the steps below:

- 1) After downloading the appropriate BIOS file from our BBS or Website, extract it to a bootable MS-DOS 6.X diskette.
- 2) Reboot your system with the MS-DOS 6.X diskette in the A: drive. To make sure a clean DOS environment is loaded, press the F5 key while “Starting MS-DOS” is displayed. After the system has rebooted, the cursor will appear at the A:> prompt.
- 3) Now you can run the FLASH utility. The filename should be “PHLASH.EXE.” Type this filename at the A:> prompt (but don’t include its extension), followed by a space and the BIOS ROM image’s filename. This file will be included in the download and has a file length of about 131K or 262K. For example, to update the M6DPi to BIOS version 01, you would type:

```
PHLASH M6DPi_01.ROM [ENTER]
```

- 4) After the update process has completed and the system reboots, verify that the new BIOS version appears on-screen. If you have problems during this process, or if you have questions about the procedure, please call Technical Support.

NOTE: If you prefer to send your system board in for the upgrade, the Micronics RMA department offers this service free of charge if your system board is under warranty.



*If you encounter any problems during this process, or if you have questions about the procedure, please call Technical Support.*



## Limited Warranty

**F**

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) 661-3030. The RMA department is open between 8:30 A.M. and 4:45P.M. Pacific Standard Time.



## FCC 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. You are 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 are required.

*NOTE: Changes or modifications not expressly approved by Micronics could void your authority to operate the equipment.*

## **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.

**ATX** - A system board size measuring approximately 12" x 9.6".

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

**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.

**DIMM** - An acronym for Dual Inline Memory Module. A small printed circuit board containing memory chips.

**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.

**ECC** - An acronym for Error Checking and Correction. ECC enables parity checking and can detect and correct memory errors on the system board.

**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 Out. A type of DRAM with built-in cache for enhanced performance.

**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 Local Bus 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.

**Fast SCSI** - A SCSI data transfer rate standard that allows a rate of up to 10 MBytes/sec on an 8-bit SCSI bus and up to 20 MBytes/sec on a 16-bit (Wide) SCSI bus.

**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.

**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 Local Bus and EISA*.

**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 *EISA*, *VESA Local Bus* and *ISA*.

**Pentium** - A high performance 64-bit CISC processor designed and manufactured by Intel Corporation.

**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** - Small computer system interface. A bus interface standard that defines physical and electrical characteristics for hardware devices. SCSI provides a standard interface that enables many different kinds of devices, such as disk drives and CD-ROM drives to interface with the host computer.

**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 that 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.

**Small Computer System Interface** - See SCSI.

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

**Unbuffered DIMMs** - The unbuffered DIMM modules do not use any buffer logic chips, thus achieving faster operation due to the elimination of the propagation delay of the logic buffer. This increase in speed comes at the cost of reducing the maximum number of modules on the same system board.

**VESA** - An acronym for Video Electronics and Standards Association.

**VESA Local Bus (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*.

**VRM** - Voltage Regulator Module. Supplies CPU specific voltages for the Secondary CPU.

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

**Wide SCSI** - A SCSI-2 enhancement that allows data to be transferred 16 or 32 bits at a time on the SCSI bus instead of 8 bits at a time.

**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.

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