MICRONICS
COMPUTERS INC.

# M54Pe PCI/EISA
# Dual Pentium Processor
# System Board Manual

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# *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 M54Pe from its packaging.

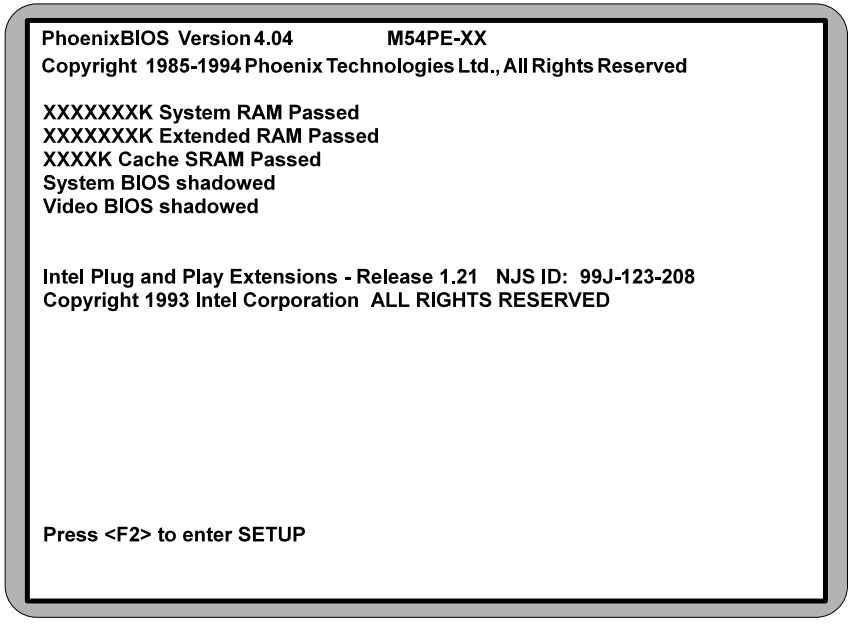
3. Configure and verify the system board's jumper settings. (See Jumper Settings in Chapter 2)

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

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

6. Install any ISA, PCI, and EISA add-on 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).

10. Insert the MCS EISA Configuration Utility into Drive A or Drive B and type:

    a:cf <Enter>
    or
    b:cf <Enter>

    Follow the directions to install the necessary drivers for your EISA peripherals (Chapter 5).

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# 1 Introduction

Congratulations for choosing the Micronics M54Pe! The M54Pe is a high-performance system board designed to be a foundation for advanced systems and applications.

The M54Pe is a dual Pentium processor board and is the most powerful Intel-based product on the market. You can operate the M54Pe with a single Pentium processor or add a second matching processor for increased performance.

The M54Pe comes with many built in features. These include on board support for four IDE hard drives, two floppy drives, a bi-directional parallel port, and two high speed serial ports.

Micronics builds all products to exacting standards, using the highest quality components available. We are proud to provide this system board and hope it brings you years of reliable service.

# Features

The M54Pe includes the following features:

- Dual Pentium processor support for 90MHz or 100MHz processors.
- Two 32-bit PCI slots, five EISA slots, and one shared (PCI or EISA) slot.
- L2 Write-back cache support (256K or 512K).
- Intel 82430 Neptune chipset.
- Support for up to 512MB of on-board system memory.
- PCI Mode 3 IDE controller (supports two drives).
- Secondary ISA IDE controller (supports two drives).
- Floppy controller for two floppy drives (Supports 2.88MB, 1.44MB, 1.2MB, 720KB, and 360KB floppy drives).
- Two high speed NS16550 compatible serial ports.
- Bi-directional parallel port that is EPP and ECP compatible (see Specifications).
- Upgradeable Flash Phoenix BIOS.

# Software Compatibility

The M54Pe system board has been thoroughly tested for compatibility with a variety of operating systems and environments, including:

- Windows and Windows NT
- OS/2 version 2.11 & SMP
- SCO UNIX and Open Desktop
- Novell Netware
- MS-DOS
- PC-DOS
- NeXTStep 3.2

# 2 Configuring the M54Pe

Although the M54Pe system board is packaged in protective materials, it is important to use care while unpacking and setting up.

## Static Electricity

The M54Pe 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 M54Pe via the solder pads surrounding one of its mounting holes.

Once the M54Pe 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.

# M54Pe Components

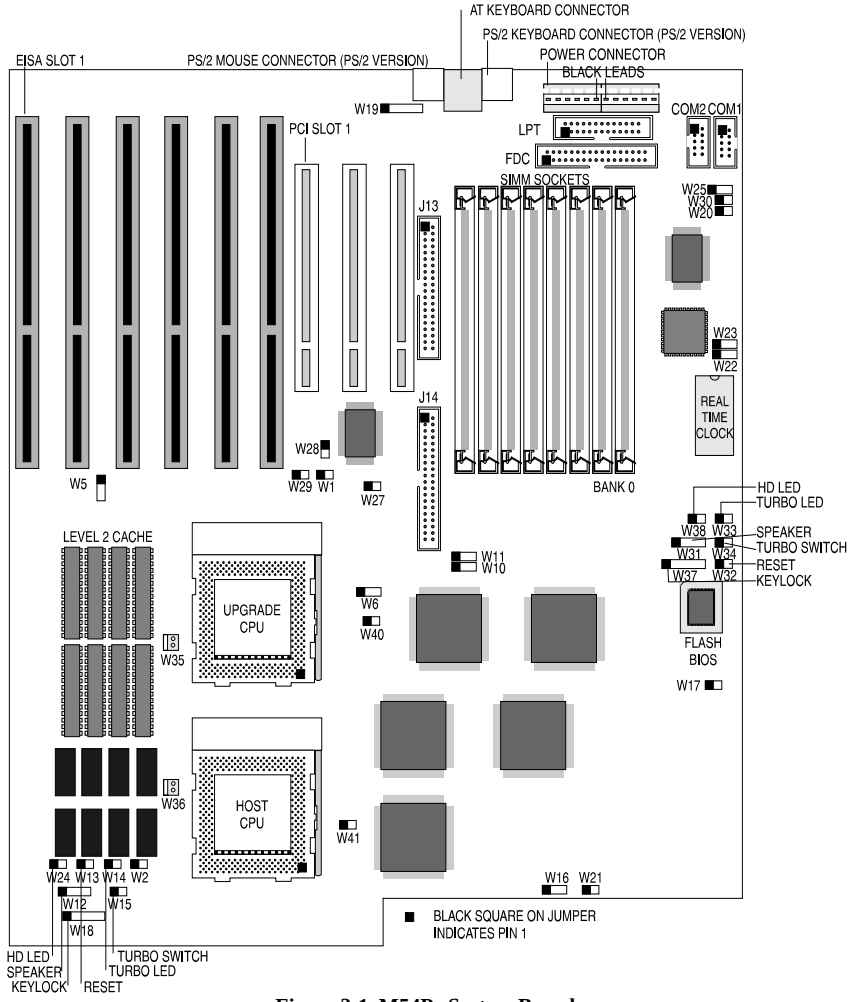



**Figure 2-1 M54Pe System Board**

# Jumper Settings

Table 2-1 lists the jumper settings to select between write-back and write-through cache.

| Jumper | Function | Setting |
|---|---|---|
| W1 | write-through<br>write-back (default) | close<br>open |

**Table 2-1 Cache Type Selection**

Table 2-2 lists the jumper settings to select the speed of the CPU.

| CPU Speed<br>Bus Speed<br>Jumper | 75MHz<br>50MHz | 90MHz<br>60MHz<br>(default) | 100MHz<br>66MHz |
|---|---|---|---|
| W6 | 2-3 | 1-2 | 2-3 |
| W40 | close | open | open |

**Table 2-2 Host CPU Speed Selection**

Table 2-3 lists the jumper settings to select the size of the external cache.

| Jumper<br>Cache | W5 | W10 |
|---|---|---|
| 256K | 1-2 | 1-2 |
| 512K (default) | 2-3 | 2-3 |

**Table 2-3 Cache Size Selection**

Table 2-4 lists the jumper settings to set the PCI IDE hard disk controller for IRQ14. Leave this 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 |
|---|---|---|
| W28 | IRQ14 (default)<br>disable | close<br>open |

**Table 2-4 PCI IDE Hard Disk IRQ14 Selection**

Table 2-5 lists the jumper settings to set the secondary IDE controller for IRQ14, IRQ15, or Disabled. If you set this for IRQ14, you must disable the PCI IDE controller (Table 2-4).

| Jumper | Function | Setting |
|---|---|---|
| W25 | IRQ14 | 1-2 |
| | IRQ15 (default) | 2-3 |
| | disable | none |

**Table 2-5 Secondary IDE Controller IRQ Selection**

Table 2-6 lists the jumper settings to select the type of video installed.

| Jumper | Function | Setting |
|---|---|---|
| W20 | color | close |
| | monocrome | open |

**Table 2-6 Video Selection**

Table 2-7 lists jumpers with factory reserved settings. **Do not reconfigure these jumpers.**

| Jumper | Function | Setting |
|---|---|---|
| W2 | Reserved | open |
| W11 | Reserved | close |
| W16 | Reserved | 1-2 |
| W17 | Reserved | close |
| W21 | AT Version | open |
| | PS/2 Version | close |
| W22 | Reserved | none |
| W23 | Reserved | none |
| W27 | Reserved | open |
| W30 | Reserved | open |
| W41 | Reserved | close |

**Table 2-7 Reserved Jumpers**

Table 2-8 lists the jumper settings for case and peripheral connections.

| Jumper | Function | Notes |
|---|---|---|
| J14 | PCI IDE Connector | Primary |
| J13 | ISA IDE Connector | Secondary |
| J10 | Floppy Connector | |
| J9 | Parallel Port Connector | Can be disabled at the CMOS configuration screen. |
| J11 | Serial Port (Com1) | Can be disabled at the CMOS configuration screen. |
| J12 | Serial Port (Com 2) | Can be disabled at the CMOS configuration screen. |
| J5 | AT Keyboard | |
| J6 & J8 | PS/2 Mouse and Keybd. | PS/2 Version only |
| W19 | Ext. Keyboard | 1- Clock(Keybd), 2-Data, 3-N/C, 4-Ground, 5-VCC |
| J1 & J2 | Power Supply Connector | |
| J26 | Optional Power Supply Connector | For specially equipped power supplies |
| W24 or W38 | Hard Disk LED | 1-+5V DC, 2-Ground |
| W13 or W32 | Reset | |
| W15 or W34 | Turbo Switch | |
| W14 or W33 | Turbo LED | 1-+5V DC, 2-Ground |
| W18 or W37 | Keylock/Power LED | 1-Power; 2-N/C; 3-Ground; 4-Keyboard Lock; 5-Ground |
| W12 or W31 | Speaker Connector | 1-Speaker; 2-N/C; 3-Ground; 4-5V DC |
| W35 | 12V Fan Connector | 1-+12V DC, 2-Ground |
| W36 | 12V Fan Connector | 1-+12V DC, 2-Ground |
| J25 | Reserved | Not Supported |

**Table 2-8 Peripheral and Case Connections**

# 3 Installing the M54Pe, System Memory, CPUs and Peripherals

This section explains how to install the M54Pe 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 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 M54Pe

The installation of the M54Pe system board depends on the type of case you use. The M54Pe is a Standard AT motherboard and is likely to be limited to tower cases.

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 M54Pe:

- 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 M54Pe 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, plus or minus 5% (eg. 4.75 to 5.25). A power filter may be used with a noisy AC power source.
- PS/2 or compatible keyboard (depends on model).
- AT-compatible keyboard (depends on model).
- 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 devices, commonly known as SIMMs (Single Inline Memory Modules), are necessary to operate the M54Pe system board. The M54Pe has eight SIMM sockets and can be upgraded to 512 Megabytes of RAM. This section will explain the type of SIMMs supported, list the rules of adding memory to the M54Pe, give some examples of common memory configurations, and show how to physically install the new SIMMs.

## SIMMs Supported

The M54Pe supports the following 72 pin, 60 or 70ns SIMMs:

4MB (1Mx36)
8MB (2Mx36)
16MB (4Mx36)
32MB (8Mx36)
64MB (16Mx36)

## Upgrading Rules

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

- Use 70ns or faster SIMMs.
- Upgrade SIMMs one bank at a time. Each bank must contain two SIMMs of the same size and preferably from the same manufacturer. For example, to add 16MB of memory to the system board, install two 8MB SIMMs into the same bank.
- When installing SIMMs, start with bank 0 and work your way up (0,1,2,3).

## Common Memory Configurations

The following table (Figure 3-1) lists the most common memory configurations. The M54Pe will accept any combination of SIMMs as long as the rules in the previous section are followed.

| Memory | Bank 0 | Bank 1 | Bank 2 | Bank 3 |
|---|---|---|---|---|
| 8MB | (2) 1Mx36 | | | |
| 16MB | (2) 1Mx36 | (2) 1Mx36 | | |
| 16MB | (2) 2Mx36 | | | |
| 24MB | (2) 1Mx36 | (2) 1Mx36 | (2) 1Mx36 | |
| 24MB | (2) 2Mx36 | (2) 1Mx36 | | |
| 32MB | (2) 4Mx36 | | | |
| 32MB | (2) 2Mx36 | (2) 2Mx36 | | |
| 32MB | (2) 1Mx36 | (2) 1Mx36 | (2) 1Mx36 | (2) 1Mx36 |
| 48MB | (2) 2Mx36 | (2) 2Mx36 | (2) 2Mx36 | |
| 64MB | (2) 8Mx36 | | | |
| 64MB | (2) 4Mx36 | (2) 4Mx36 | | |
| 64MB | (2) 2Mx36 | (2) 2Mx36 | (2) 2Mx36 | (2) 2Mx36 |
| 64MB | (2) 4Mx36 | (2) 2Mx36 | (2) 2Mx36 | |
| 72MB | (2) 8Mx36 | (2) 1Mx36 | | |
| 80MB | (2) 8Mx36 | (2) 2Mx36 | | |
| 80MB | (2) 4Mx36 | (2) 4Mx36 | (2) 1Mx36 | (2) 1Mx36 |
| 96MB | (2) 4Mx36 | (2) 4Mx36 | (2) 4Mx36 | |
| 96MB | (2) 8Mx36 | (2) 2Mx36 | (2) 2Mx36 | |
| 104MB | (2) 8Mx36 | (2) 2Mx36 | (2) 2Mx36 | (2) 1Mx36 |
| 104MB | (2) 4Mx36 | (2) 4Mx36 | (2) 4Mx36 | (2) 1Mx36 |
| 128MB | (2) 16Mx36 | | | |
| 128MB | (2) 8Mx36 | (2) 8Mx36 | | |
| 128MB | (2) 4Mx36 | (2) 4Mx36 | (2) 4Mx36 | (2) 4Mx36 |
| 192MB | (2) 8Mx36 | (2) 8Mx36 | (2) 8Mx36 | |
| 256MB | (2) 16Mx36 | (2) 16Mx36 | | |
| 256MB | (2) 8Mx36 | (2) 8Mx36 | (2) 8Mx36 | (2) 8Mx36 |
| 384MB | (2) 16Mx36 | (2) 16Mx36 | (2) 16Mx36 | |
| 512MB | (2) 16Mx36 | (2) 16Mx36 | (2) 16Mx36 | (2) 16Mx36 |

**Table 3-1 Common Memory Configurations**

## Installing the SIMMs

To install the SIMMs, locate the memory banks on the system board and perform the following steps:

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).

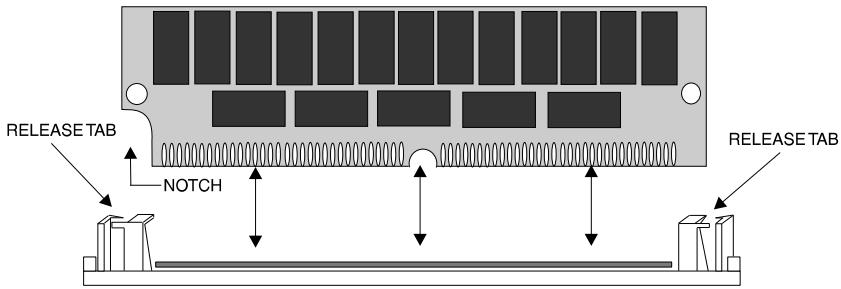



**Figure 3-1 Installing a 72-Pin SIMM**

## 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 M54Pe is designed to support dual Pentium processors. Follow the steps below to install either the host or the upgrade processor:

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 (Figure 2-1). Gently set 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 jumper W6 is set correctly (Chapter 2).

7. If you are only installing the upgrade processor, you do not need to change any jumpers or BIOS settings. The system will automatically recognize the new processor.

***Warning:***
***Pentium 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.***

# Installing Cache Memory

In addition to the 16K of internal (L1) cache built into the Pentium processors, the M54Pe also supports external (L2) cache. The M54Pe is available with 256K or 512K external cache.

To upgrade to 512K cache, install eight 32Kx8-15ns SRAMs into the open SRAM sockets (Figure 3-2). After installing the cache upgrade, refer to Table 2-4 for the correct external cache jumper settings.

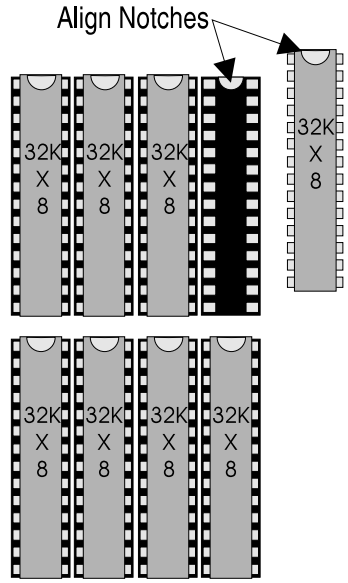



**Figure 3-2 Upgrading the External Cache**

# Installing a PCI Peripheral Card

Micronics PCI slots accommodate all PCI peripherals which meet 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.

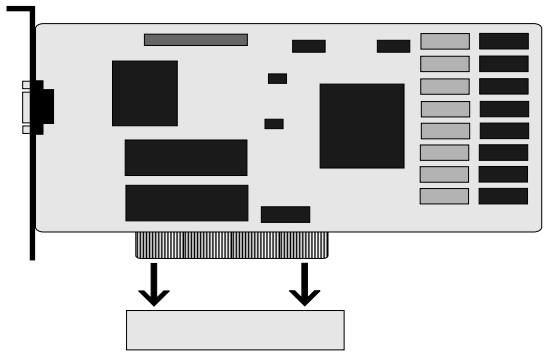


**Figure 3-3 Installing a PCI Card**

# Installing an EISA Peripheral Card

Micronics EISA slots accommodate all EISA peripherals which meet the EISA standard. Complete the following steps to install an EISA card:

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

2. Choose an unused EISA 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.

8. Run the EISA configuration utility discussed in Chapter 5.

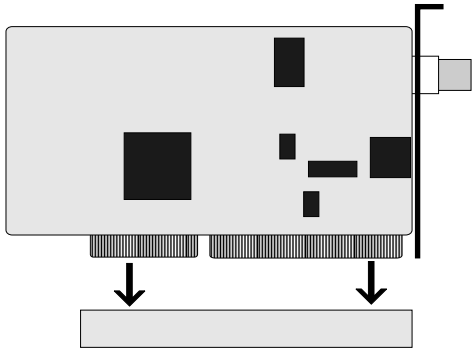


**Figure 3-4 Installing an EISA Card**

# Installing a Plug & Play Peripheral Card

Micronics EISA slots accommodate all ISA Plug & Play peripherals which meet the Plug and Play standard. Complete the following steps to install a Plug and Play card:

1. Turn the computer system off and remove its cover. **Note the slot number where you choose to install the Plug and Play card. You will need this information when you run the EISA configuration utility.**

2. Choose an unused EISA 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.

8. Run the EISA configuration utility discussed in Chapter 5.

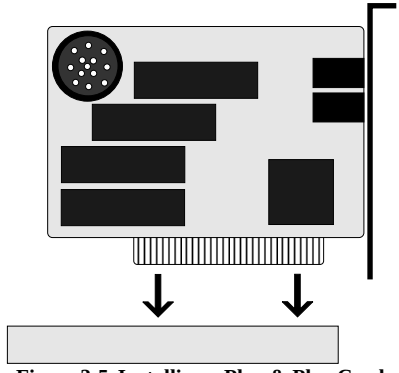


**Figure 3-5 Installing a Plug & Play Card**

# 4 The BIOS Setup Utility

## Configuration

After the M54Pe 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 M54Pe. 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 motherboard 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:

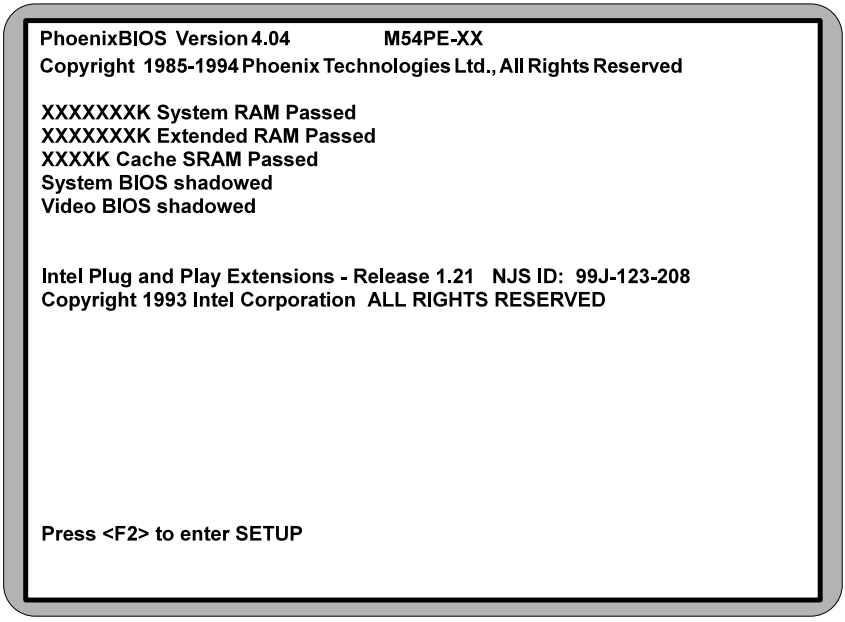



**Figure 4-1 Power-Up Screen**

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 M54Pe system board has four primary CMOS configuration screens: the Main Screen (Figure 4-2), the Advanced Screen (Figure 4-4), the Security Screen (Figure 4-7), and the Exit Screen (Figure 4-9). 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 <↓>.

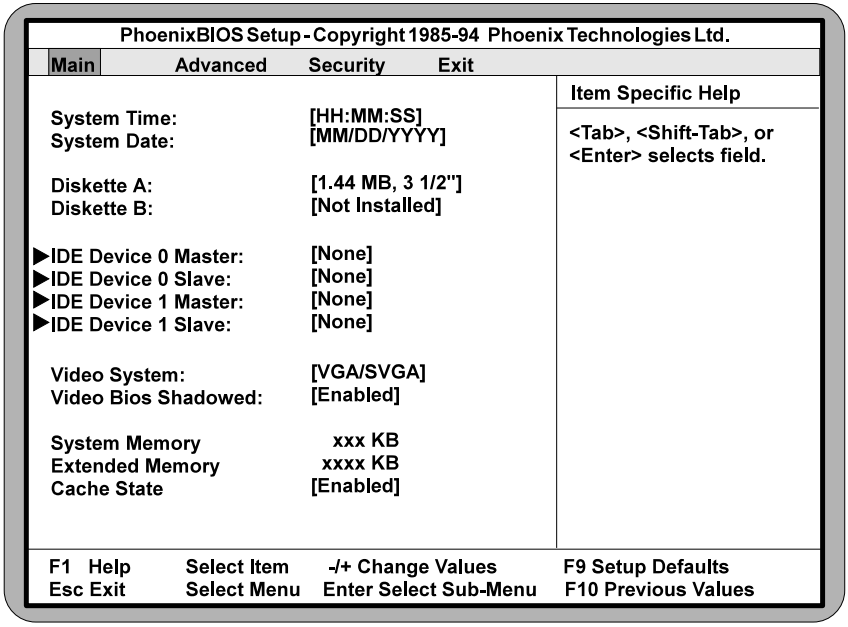



**Figure 4-2 CMOS Main Screen**

## 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 probably need to select [None] in the IDE Device parameters (see you 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).

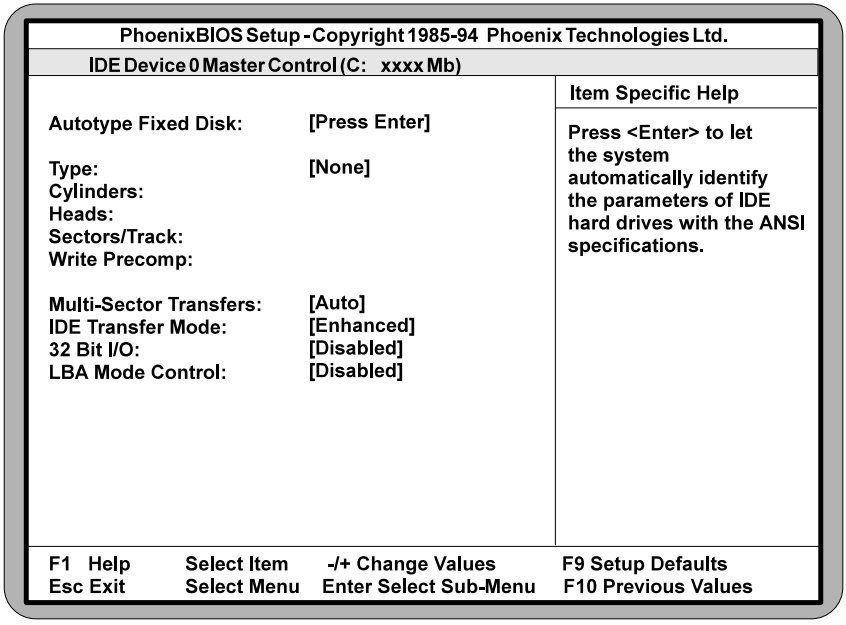



**Figure 4-3 IDE Device Submenu**

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 optimal settings.

### Video System

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

### Video BIOS Shadow

Enabling the category allows you to "Shadow" the BIOS on the video card for faster video performance. Some video cards do not support Video BIOS Shadowing. Disable this option if video problems occur.

### 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.

### Cache State

This category enables or disables the external (L2) cache.

# Setting the Advanced Screen

The first page of the Advanced Screen (Figure 4-4) has two submenus: Boot Options (Figure 4-5) and Integrated Peripherals (Figure 4-6).

Use the up and down arrows <↑/↓> to select a menu and press <Enter>.

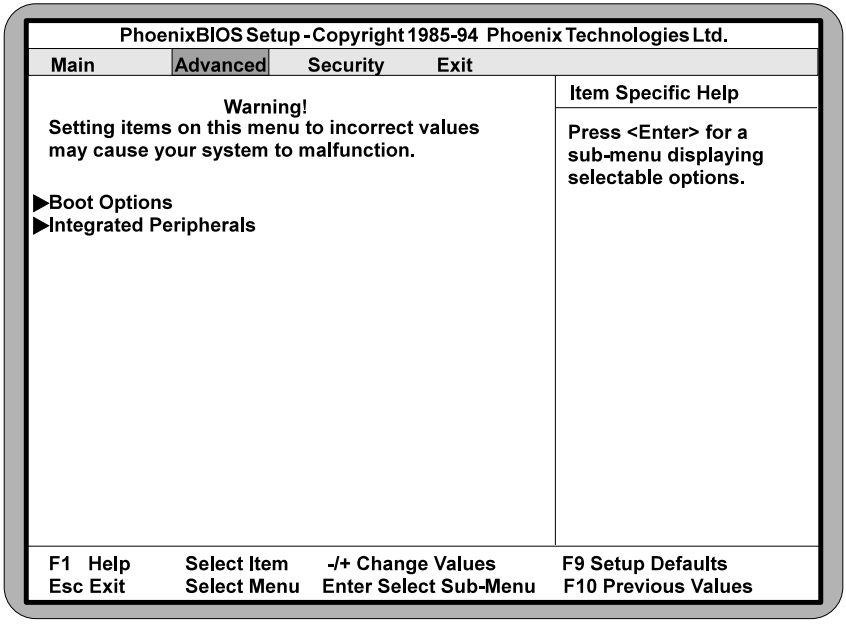



**Figure 4-4 Advanced Setup Screen**

## Boot Options

The Boot Options Submenu (Figure 4-5) has several useful options. Use the up and down arrow keys <↑/↓> to select a category and the plus and minus keys <+/-> to change the settings.

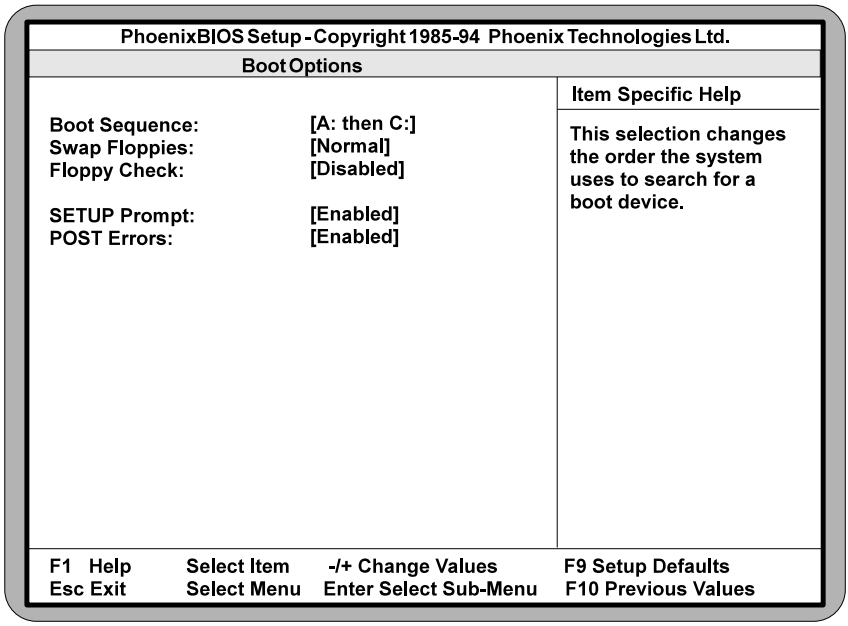



**Figure 4-5 Boot Options Submenu**

**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

**Swap Floppies**
This category can be set to remap the floppy drives. It can be set for NORMAL (default) or SWAPPED. For normal operation, Drive A: and Drive B: work normally. When "Swapped" is selected, Drive A: becomes Drive B:, and Drive B: becomes Drive A:.

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

**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.

## Integrated Peripherals

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.

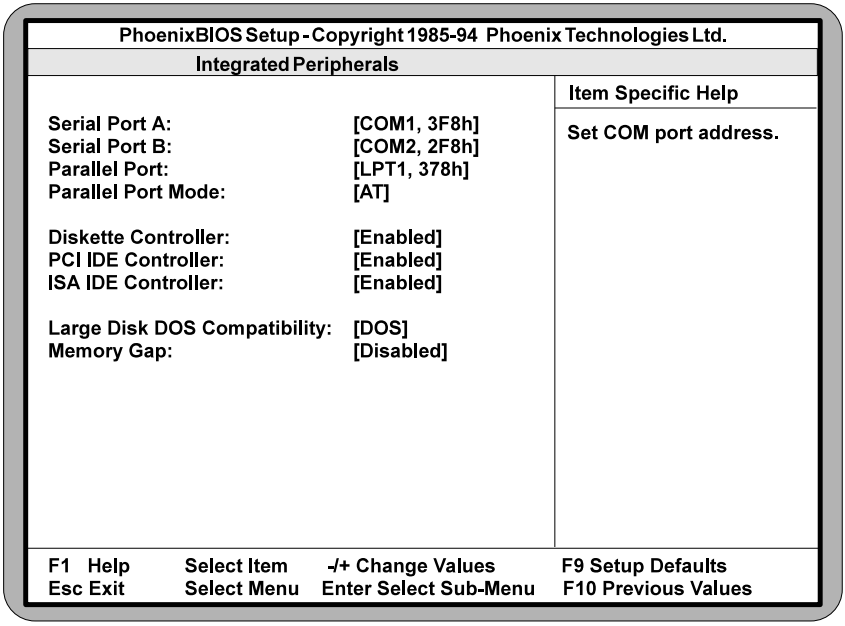



**Figure 4-6 Integrated Peripherals Submenu**

**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), bidirectional mode (PS/2), Enhanced Parallel Port (EPP), Extended Capabilities Port (ECP), or may be disabled.

**Memory Gap**
When enabled, this category removes the memory between 15 and 16 megabytes from the system. This one megabyte hole will allow some ISA network cards to map into this memory space. Banyon network cards require this feature. Enable this feature only if needed.

### Plug and Play O/S
This category, when enabled, allows the system to work with Windows 95. The default setting is disabled.

# 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.

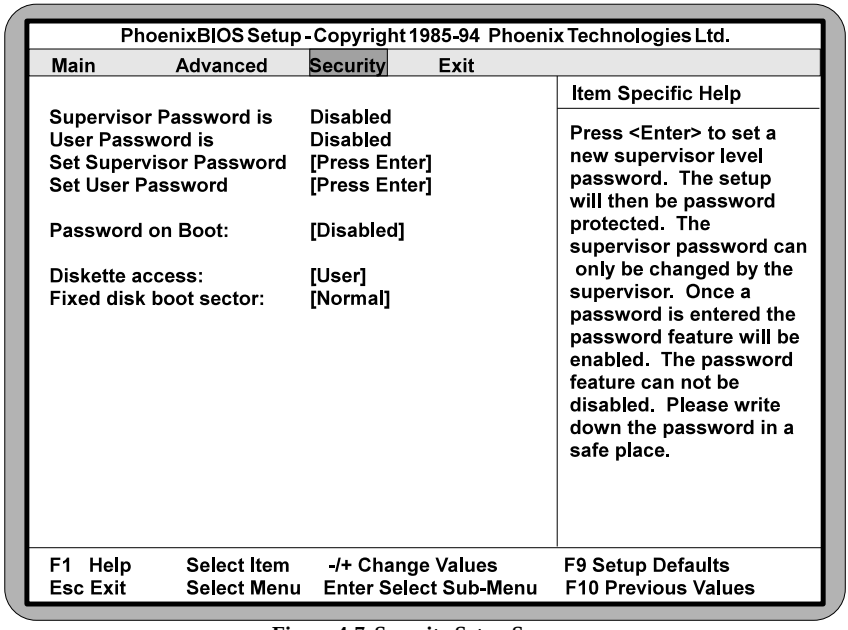



**Figure 4-7 Security Setup Screen**

### 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 2-8).

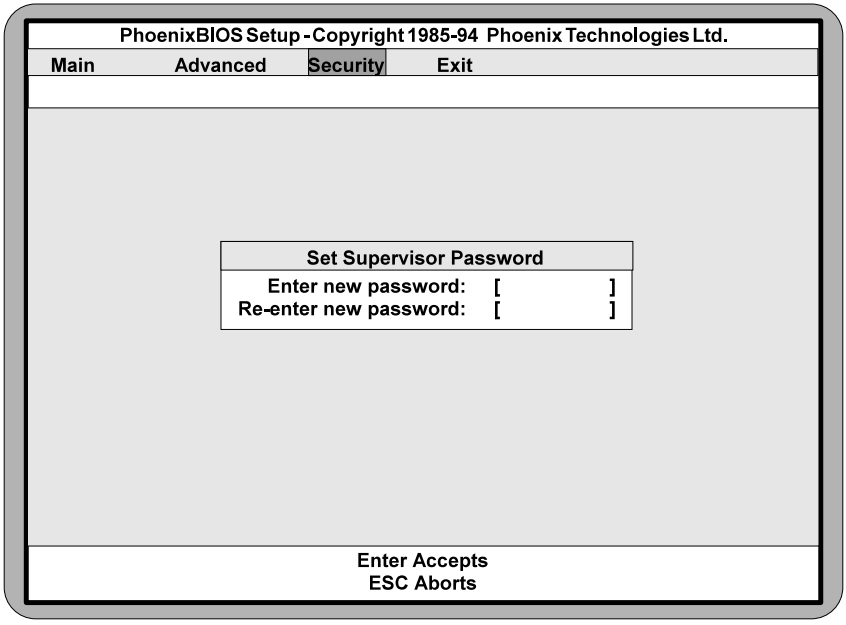



**Figure 4-8 Supervisor Password Submenu**

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.

# Exit Screen

After you have completed configuring the BIOS, select the Exit Screen (Figure 4-9).

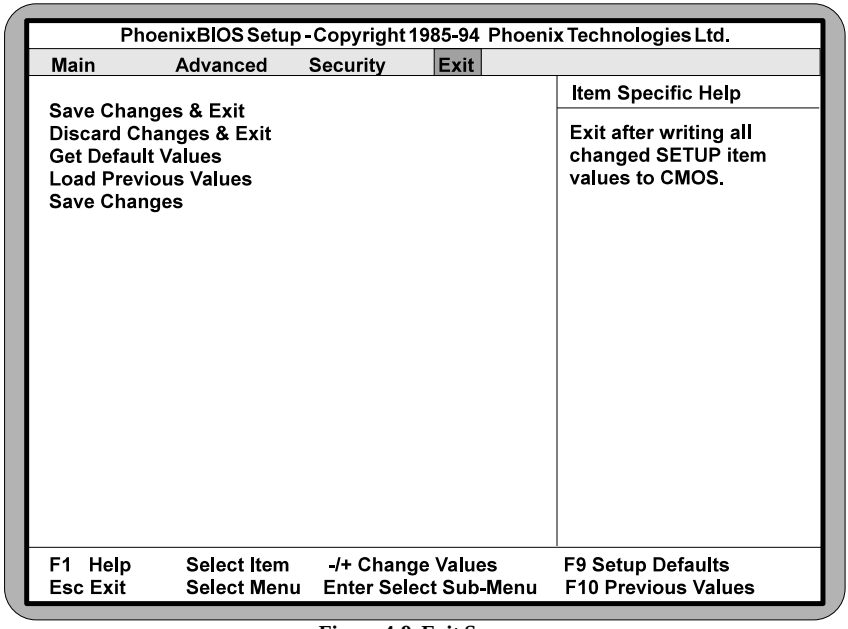



**Figure 4-9 Exit Screen**

Choose “Save Changes and Exit” and reboot the computer. After running the EISA configuration utility explained in Chapter 5, the computer will be ready for use.

# 5 EISA Utility

## Introduction

The M54Pe is shipped with the Micro Computer System EISA Configuration Utility. The EISA Configuration Utility is a software utility designed to configure EISA peripherals.

The MCS EISA utility is designed to optimize the performance of your EISA peripherals and to maintain conflict-free configuration information. This is achieved through a series of initialization commands stored in non-volatile memory. The EISA Utility determines the configuration, creates the initialization commands, and makes sure the configuration is correct.

*Note:*
*For more information on the EISA Configuration Utility, consult the manual on the CF diskette.*

## When Should You Run the EISA Utility?

The EISA utility retains the configuration information in non-volatile memory. If this information is lost, the utility retains a backup copy (the file with the .sci extension) on your hard disk.

Run the EISA utility the first time your computer is booted up and every time you add or remove EISA peripheral cards.

## What You Will Need

Prior to running the EISA utility, you will need to do the following:

Install all peripheral cards.

Locate and set aside the EISA Utility diskette and all diskettes that came with your EISA peripherals. They contain the .cfg and .ovl files necessary for configuration.

# Starting the Utility

Perform the following steps to start the EISA utility:

1. Insert the System Configuration diskette into Drive A (or B).

2. At the A: prompt, type “cf” and press <Enter>. The Configuration Introduction screen will appear (Figure 5-1).

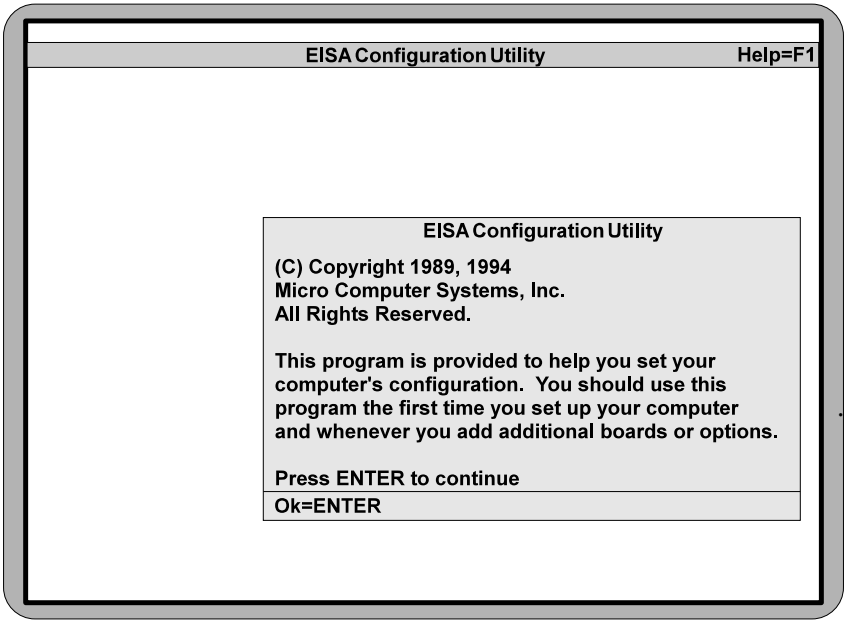



**Figure 5-1 EISA Configuration Introduction Screen**

# Main Menu

After pressing <Enter>, the main menu appears. The main menu lists 5 steps for configuring the system board. To select a step, highlight the appropriate selection, and press <Enter>. Figure 5-2 shows the main menu.

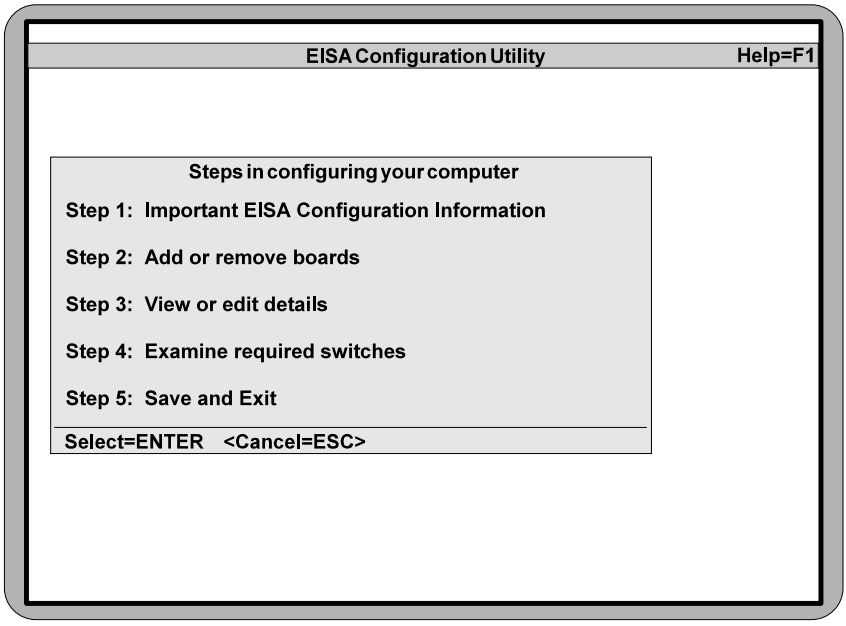



**Figure 5-2 EISA Configuration Main Menu**

# Step 1: Important EISA Configuration Information

Step 1 provides seven pages of useful information on the configuration utility. Read this prior to using the utility.

# Step 2: Add or Remove Boards

When this section is accessed, the utility scans and locates the EISA boards installed.

This section allows you to add or remove any EISA, PCI, and ISA Plug and Play peripherals. Beyond physically adding or removing the boards, it is important that you run this utility in order for your system to run properly.

When you select "Step 2: Add or Remove Boards," the following screen (Figure 5-3) will appear.

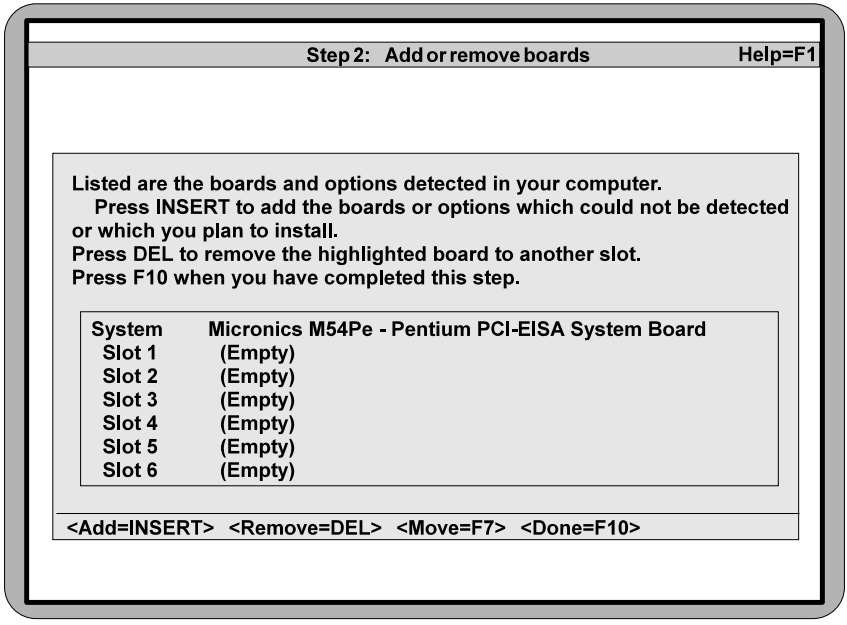



**Figure 5-3 Add or Remove Boards Screen**

Press <Insert> to add the boards which could not be detected or which you plan to install. After you press the <Insert> key, the following screen (Figure 5-4) will appear.

You will need to have the configuration disks that came with each of the add-on cards you are installing. Insert the configuration disk for the peripheral you are installing and press <Enter>.

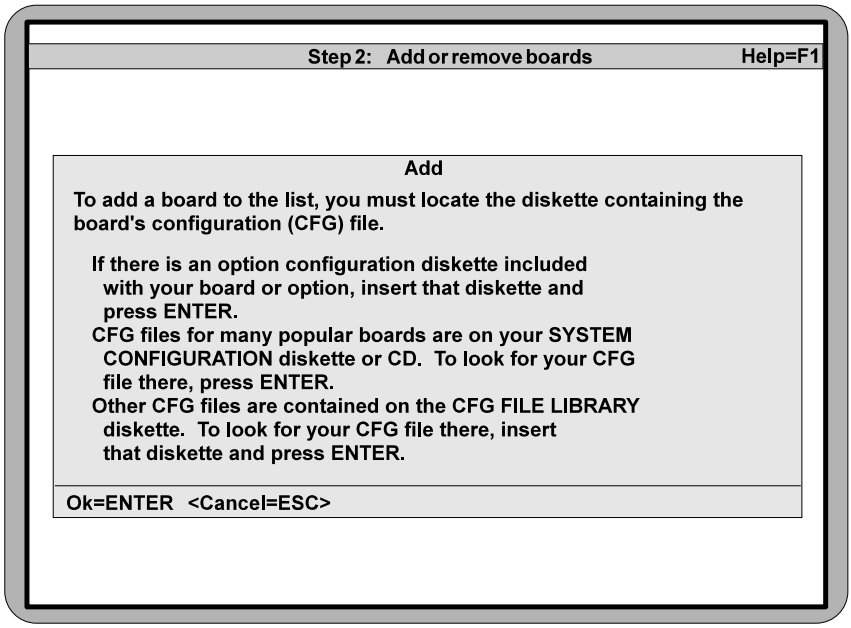



**Figure 5-4 Adding an EISA Configuration (CFG) File**

When you are finished installing the EISA CFG files, press the <F10> key.

# Step 3: View or Edit Details

When you select the “View or Edit Details” menu (Figure 5-5), a display of your system resources appears. You may edit this menu to optimize the system performance and allocation of resources.

If you need to change information on this menu, select the item you wish to change and press <Enter>.

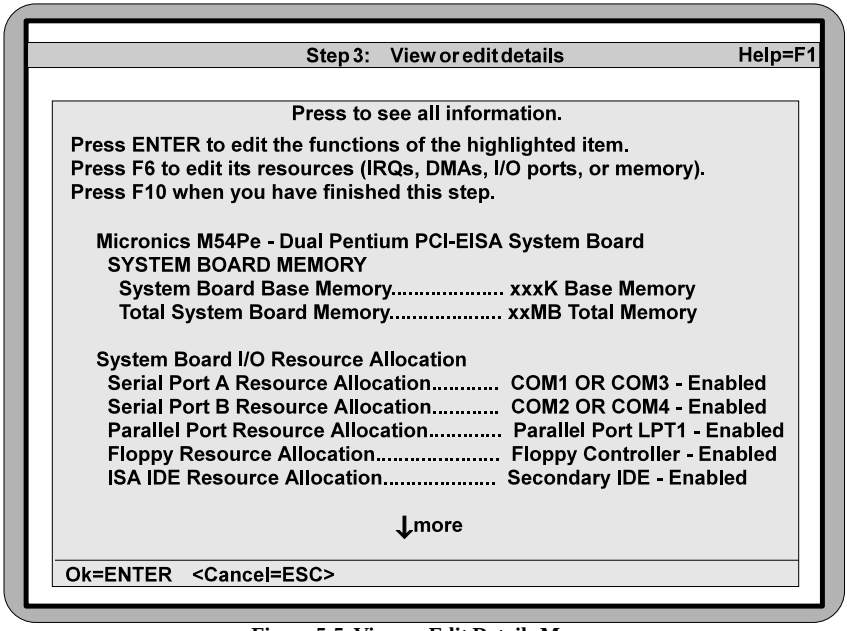



**Figure 5-5 View or Edit Details Menu**

## Advanced Submenu

The Advanced submenu (Figure 5-6) will allow you to make specialized configuration adjustments. To select this menu, press the <F7> key.

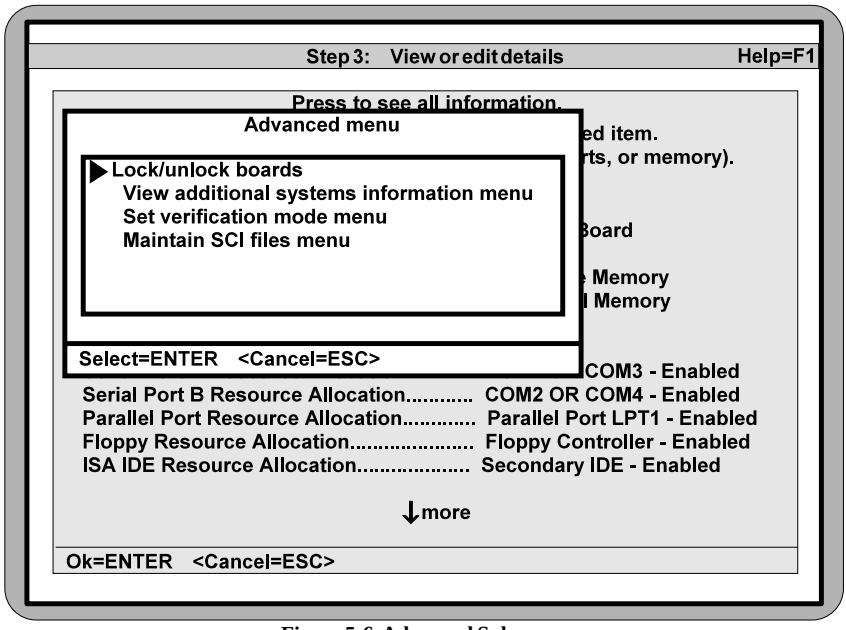



**Figure 5-6 Advanced Submenu**

**Lock/Unlock Boards**
Locking a board will prevent changes from being made to a board's settings. You may lock or unlock each board individually.

**View Additional Systems Information Menu**
This is another submenu which will allow you to view board specifications, system specifications, used resources, and available resources.

**Set Verification Mode Menu**
You may set this for Automatic (default) or Manual. Automatic Verification turns on automatic detection and resolution of resource conflicts caused by configuration changes.

**Maintain SCI Files Menu**
'Open' will allow you to load a SCI file to replace your existing EISA configuration.

When you have finished making changes to the Advanced Submenu, press <F10> until you are back to the Main Menu.

# Step 4: Examine Switches or Print Report

### Examine Switches

This section displays a listing of the motherboard jumper settings.

### Print Report

This feature is not currently supported.

# Step 5: Save and Exit

Save the new configuration when you exit the utility. When you select Step 5, the Save and Exit Screen appears. It will give you the option of saving the new configuration or returning to the Main menu. If you have finished configuring your EISA utility, select “Save the configuration and restart the computer.”

The Reboot Screen will then appear. Press the <Enter> key and the computer will reboot. Now the changes are complete and you are ready to use your computer.

# 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 M54Pe.

| 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

| | |
|---|---|
| Host Processor | 90MHz or 100MHz Pentium processor. |
| Upgrade Processor | 90MHz or 100MHz Pentium processor. |
| Chipset | Intel Neptune Chipset. |
| CPU Clock Select | Frequency synthesizer chip. Jumper selectable CPU selection. |
| Form Factor | Full size (12" x 13.75"). 6 layer PCB. |
| Expansion | Five 32-bit EISA slots.<br>Two 32-bit PCI slots.<br>One shared EISA/PCI slot. |
| BIOS | Phoenix 4.04 Plug and Play BIOS on 1MB Flash EPROM.<br>Mode 3 IDE drive support.<br>Auto-detection of memory size.<br>Auto-configuration of IDE hard disk drives. |
| RAM Capacity | 512MB |
| Keyboard | PS/2 (PS/2 version).<br>AT-Compatible (AT version). |
| Mouse | Built-in PS/2 support (PS/2 version only). |
| Internal Cache | 16K (per processor). |
| External Cache | 256K or 512K write-back. |
| I/O Ports | Built in support.<br>Two high speed serial ports (16550 compatible).<br>One bi-directional parallel port.<br>Enhanced Parallel Port (EPP) compatible.<br>Microsoft and Hewlett Packard Extended Capabilities Port (ECP) compatible. |

| | |
|---|---|
| Floppy Port | Supports two floppy drives<br>(2.88, 1.44, 1.2, 720K, 360K). |
| PCI IDE Port | Supports two IDE hard disks.<br>Mode 3 support.<br>Multiple sector transfer support.<br>LBA support. |
| Secondary IDE Support | Supports two additional IDE hard disks.<br>LBA support. |
| Clock | Benchmarq Real Time Clock. |

# Environmental Specifications

The environment in which the M54Pe is located is critical. Micronics recommends the following environmental specifications:

## Temperature Range

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

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

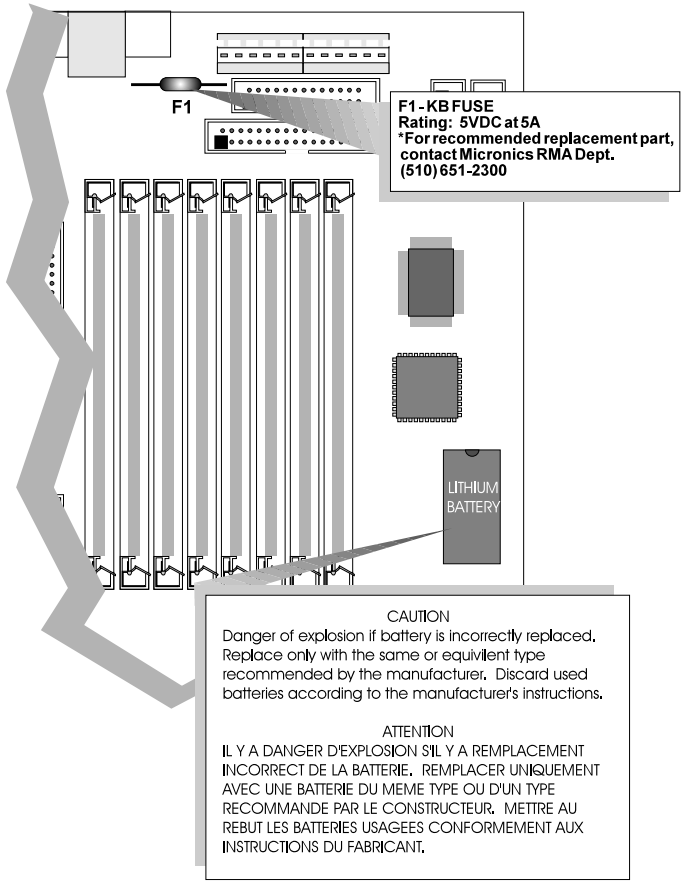
Shipping: -22 to 140 degrees Fahrenheit (-30 to 60 degrees Celsius).

## 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<br>Fremont, California 94539<br>USA<br><br>Tel: (510) 651-2300<br>Fax: (510) 651-9450 |
| Type of Equipment: | 586-75/90/100/120/133<br>Tower Personal Computer |
| Model Name: | M54Pe |
| Tested by: | Rockford Engineering Services, Inc.<br>4750 Williams Wharf Road<br>St. Leonard, Maryland 20685<br>USA<br><br>Tel: (301) 855-1375<br>Fax: (410) 586-1460 |
| Test Engineers | Li-Ming Xu (EN55022)<br>Muyiwa Ogunfunmi (EN50082-1)<br>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.