



**M5Pi PCI/ISA
60/66MHz 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. Ground yourself to prevent damaging static discharge, then remove the M5Pi from its packaging.
2. Configure and verify the system board's jumper settings. (See Jumper Settings in Chapter 2)
3. Install the CPU and the system memory (Chapter 3).
4. Install the system board into the system case and make all necessary case connections.
5. Install any ISA and PCI peripherals (Chapter 3).
6. Turn the computer on and press <Ctrl>, <Alt>, and <s> simultaneously after you see the screen below.



PhoenixBIOS (TM) for Pentium (TM) CPU - ISA Version 1.03 M5Pi-xx
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Reference ID 08

Pentium (TM) processor detected operating at xx MHz

640K Base Memory xxxxxK Extended

Cache 1 Enabled

Cache 2 Enabled

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 Auto 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).

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1 Introduction

Congratulations for choosing the Micronics M5Pi! The M5Pi is a high-performance system board designed to be a foundation for serious computer applications.

The M5Pi is a 60/66 MHz Pentium based board and is one of the most powerful Intel-based products on the market.

The M5Pi comes with many built in features. These include support for four IDE hard drives, support for 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 M5Pi includes the following features:

- ⊗ Pentium processor support for 60MHz or 66MHz processors.
- ⊗ Two 32-bit PCI slots, four ISA slots, and one shared (PCI or ISA) slot.
- ⊗ 256K of L2 write-back cache.
- ⊗ Supports up to 128MB of on-board system memory.
- ⊗ Primary 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, 720K, and 360K 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 M5Pi system board has been thoroughly tested for compatibility with a variety of operating systems and environments, including:

- ⊗ Windows, Windows for Workgroups, and Windows NT
- ⊗ OS/2
- ⊗ SCO UNIX and Open Desktop
- ⊗ Novell Netware
- ⊗ MS-DOS
- ⊗ PC-DOS
- ⊗ NeXTStep 3.2

2 Configuring the M5Pi

Although the M5Pi system board is packaged in protective materials, it is important to use care while unpacking and setting up.

Static Electricity

The M5Pi 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 M5Pi via the solder pads surrounding one of its mounting holes.

Once the M5Pi 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.

M5Pi Components

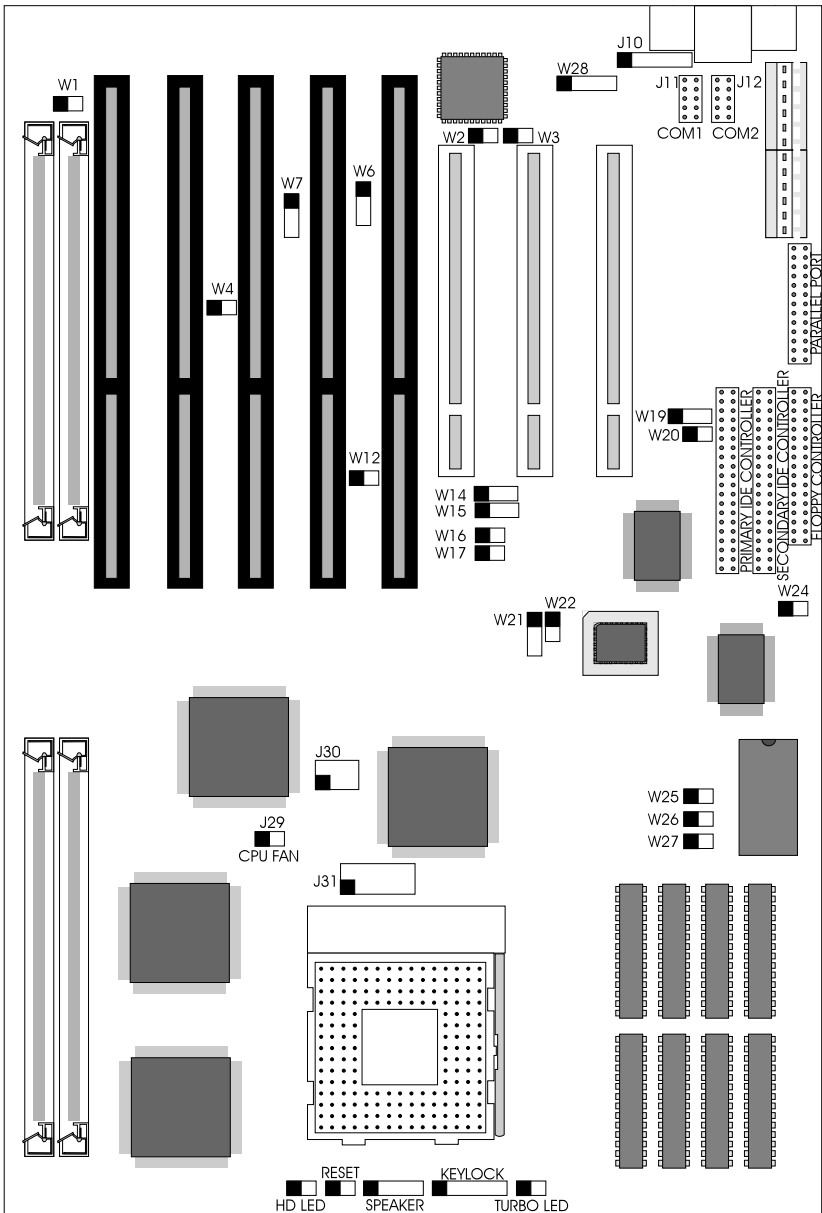


Figure 2-1 M5Pi System Board

Jumper Settings

Table 2-1 lists the jumper settings to select the speed of the CPU installed in your system.

Jumper	Speed	60MHz (default)	66MHz
W25		close	open
W26		open	close
W27		close	open

Table 2-1 CPU Speed Selection

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

Jumper	Function	Setting
W3	color (default)	close
	monochrome	open

Table 2-2 Video Selection

Table 2-3 lists the jumper settings to enable or disable the PCI IDE controller.

Jumper	Function	Setting
W20	PCI IDE enabled (default)	open
	PCI IDE disabled	close

Table 2-3 PCI IDE Selection

Table 2-4 lists the jumper settings to set the PCI IDE hard disk controller's IRQ. 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
W15	IRQ14 (default)	1-2
	IRQ15	2-3

Table 2-4 PCI IDE IRQ14 Selection

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

Jumper	Function	Setting
W14	IRQ15 (default)	2-3
	IRQ14	1-2

Table 2-5 Secondary IDE Controller IRQ Selection

Table 2-6 lists the jumper settings to select the DMA channel for the IDE port.

Jumper	Function	Setting
W16	DMA Channel 6	close
	DMA not used (default)	open
W17	DMA Channel 6	close
	DMA not used (default)	open

Table 2-6 IDE DMA Channel Selection

Table 2-7 lists the jumper settings to set the parallel port's IRQ.

Jumper	Function	Setting
W4	IRQ7 (default)	open
	IRQ5	close
W19	IRQ7 (default)	close
	IRQ5	open

Table 2-7 Parallel Port IRQ Settings

Table 2-8 lists the jumper settings to select a DMA channel for the parallel port.

Jumper	Function	Setting
W6	DMA Channel 1	1-2
	DMA Channel 3	2-3
	DMA not used (default)	open
W7	DMA Channel 1	1-2
	DMA Channel 3	2-3
	DMA not used (default)	open

Table 2-8 Parallel Port DMA Channel Selection

Table 2-9 lists the jumper settings for programming the Flash ROM.

Jumper	Function	Setting
W22	Flash ROM programming disabled (default)	open
	Flash ROM programming enabled	close

Table 2-9 Flash ROM Selection

Table 2-10 lists the jumper settings to reset the CMOS to its default settings. Resetting the CMOS will clear all settings.

Jumper	Function	Setting
W24	Clear CMOS	close
	Normal (default)	open

Table 2-10 BIOS Reset

Table 2-11 lists reserved jumper settings. Do not reconfigure these jumpers.

Jumper	Function	Setting
W1	Normal (default) For Micron DRAM only	open close
W2	Reserved	open
W8	Reserved	1-2
W9	Reserved	1-2
W12	PS/2 Mouse does not use IRQ12 (AT Version) PS/2 Mouse uses IRQ12 (PS/2 Version)	open close
W13	Reserved	1-2
W18	Reserved	1-2
W21	Reserved	2-3
J30	Reserved (60 MHz only)	open
J31	Reserved- do not modify	

Table 2-11 Reserved Jumper Settings

Table 2-12 lists the jumper settings for case and peripheral connections.

Jumper	Function	Notes
J19	PCI IDE Connector	Primary
J20	ISA IDE Connector	Secondary
J21	Floppy Connector	
J18	Parallel Port Connector	Can be disabled at the CMOS configuration screen.
J12	Serial Port (Com1)	Can be disabled at the CMOS configuration screen.
J11	Serial Port (Com 2)	Can be disabled at the CMOS configuration screen.
J9	AT Keyboard	AT Version only
J8 & J15	PS/2 Mouse and Keybd.	PS/2 Version only
J10	Ext. Keyboard	1- Clock(Keybd), 2-Data, 3-N/C, 4-Ground, 5-VCC
J16 & J17	Power Supply Connector	
J34	Hard Disk LED	1-+5V DC, 2-Ground
J35	Reset	
J38	Turbo LED	1-+5V DC, 2-Ground
J37	Keylock/Power LED	1-Power; 2-N/C; 3-Ground; 4-Keylock; 5-Ground
J36	Speaker Connector	1-Speaker; 2-N/C; 3-Ground; 4-5V DC
J29	12V Fan Connector	1-+12V DC, 2-Ground

Table 2-12 Case and Peripheral Connections

3 Installing the M5Pi, System Memory, CPUs and Peripherals

This section explains how to install the M5Pi 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 M5Pi

The installation of the M5Pi system board depends on the type of case you use. The M5Pi is a Baby AT size system board and you should be able to install it in most cases.

Prior to installing the M5Pi, make sure you have a clear work space available and adhere to all anti-static precautions.

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

Tools Required

Micronics recommends using the following tools to install the M5Pi:

- ⊞ 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 M5Pi for a typical configuration:

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

System Memory

System memory devices, commonly known as SIMMs (Single Inline Memory Modules), are necessary to operate the M5Pi system board. The M5Pi has four SIMM sockets and can be upgraded to 128 Megabytes of RAM. This section will explain the type of SIMMs supported, list the rules of adding memory to the M5Pi, give some examples of common memory configurations, and show how to physically install the new SIMMs.

SIMMs Supported

The M5Pi supports the following 72 pin, 60 or 70ns SIMMs:

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

Note:

For long term reliability, Micronics recommends using SIMMs with tin-plated contacts. The use of gold-plated contacts may conflict with the tin alloy of the SIMM socket.

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. Anything slower will not keep up with the Pentium processor.
- ⊞ Upgrade SIMMs two at a time. These SIMMs must be the same size and preferably from the same manufacturer. To add 16MB of memory to the system board, install two 8MB SIMMs into bank 0 and bank 1.
- ⊞ 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 M5Pi will accept any combination of SIMMs as long as the rules in the previous section are followed.

Bank 0	Bank 1	Bank 2	Bank 3	Total
4MB	4MB			8MB
4MB	4MB	4MB	4MB	16MB
8MB	8MB			16MB
4MB	4MB	8MB	8MB	24MB
8MB	8MB	4MB	4MB	24MB
8MB	8MB	8MB	8MB	32MB
16MB	16MB			32MB
4MB	4MB	16MB	16MB	40MB
16MB	16MB	4MB	4MB	40MB
8MB	8MB	16MB	16MB	48MB
16MB	16MB	8MB	8MB	48MB
16MB	16MB	16MB	16MB	64MB
32MB	32MB			64MB
4MB	4MB	32MB	32MB	72MB
32MB	32MB	4MB	4MB	72MB
8MB	8MB	32MB	32MB	80MB
32MB	32MB	8MB	8MB	80MB
16MB	16MB	32MB	32MB	96MB
32MB	32MB	16MB	16MB	96MB
32MB	32MB	32MB	32MB	128MB

Table 3-1 Common Memory Configurations

Installing the SIMMs

To install the SIMMs, locate the memory banks on the system board. Find the lowest bank number available (0,1,2,3) and work your way up.

Perform the following steps to install the SIMMs:

1. Hold the SIMM so that the notched edge is aligned with the notch on the SIMM socket (Figure 3-1).
2. Insert the SIMM at a 45 degree angle.
3. Gently push the SIMM into an upright position until it “locks” into place (past the release tabs).

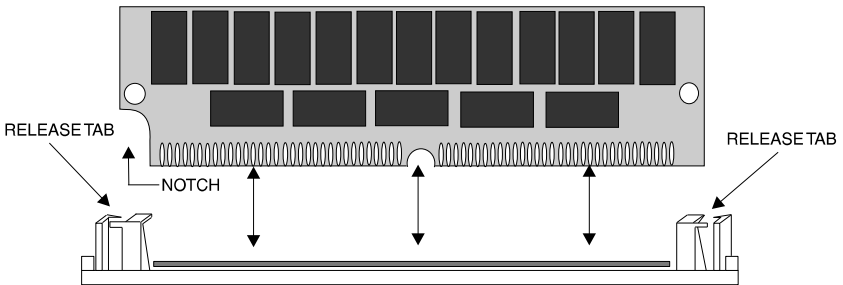


Figure 3-1 Installing a 72-Pin SIMM

Removing SIMMs

Perform the following steps to remove SIMMs, if necessary:

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

Installing a CPU

The M5Pi is designed to support 60 or 66MHz Pentium processors. Follow the steps below to install a processor:

1. Turn off the computer and remove the computer 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 the CPU selection jumpers are set correctly (Chapter 2).

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 a PCI Peripheral Card

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

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

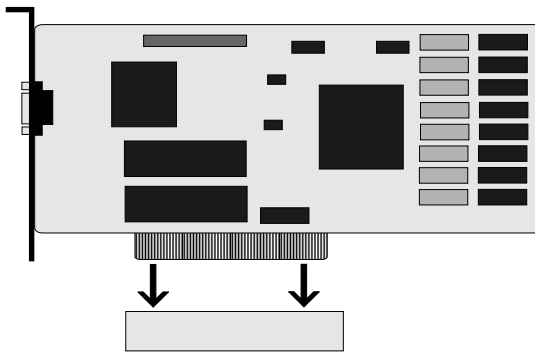


Figure 3-3 Installing a PCI Card

Installing an ISA Peripheral Card

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

1. Turn the computer system off and remove the computer cover.
2. Choose an unused ISA slot and remove the slot cover.
3. Insert the card with the bottom edge level to the slot. **Never insert the card at an angle!**
4. Carefully push the card straight down, making sure the card is fully inserted.
5. Replace the screw which holds the card into place.
6. Replace the computer cover.
7. Read the card's manual for additional instructions concerning installation and software drivers.

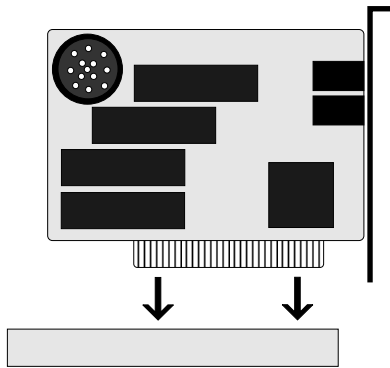


Figure 3-5 Installing a ISA Card

4 The BIOS Setup Utility

Configuration

After the M5Pi 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 M5Pi. If the system doesn't properly boot, check all your cables and peripherals for bad connections. You may also get error messages or beep codes. 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 procedure is built into the system. Setup begins after the completed system is powered up. Once the system is powered up and goes through a memory test, the following screen appears on your monitor:

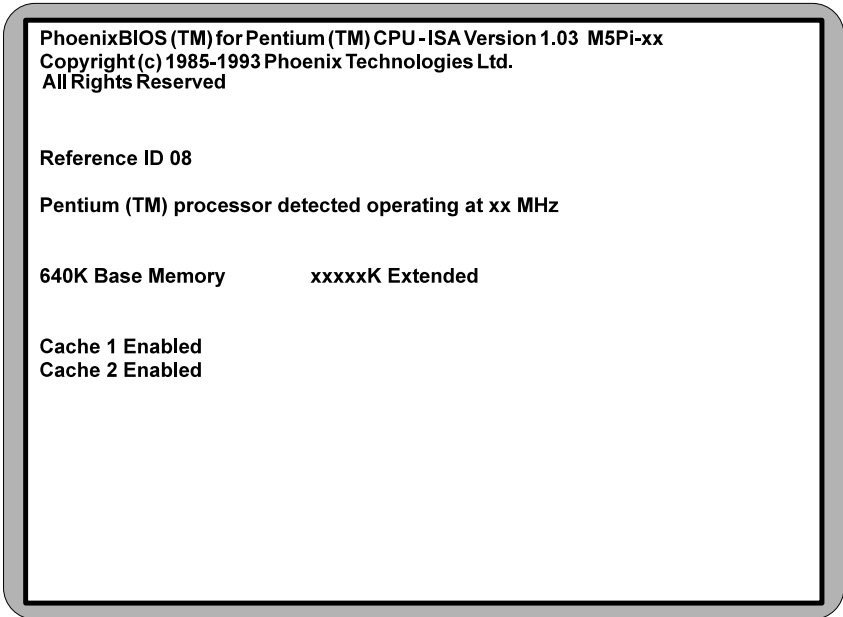


Figure 4-1 Power-Up Screen

If the systems detects a configuration error, it displays an error message. After the error message, another message displays indicating the choice to “press <F1> to continue (boot up), or <F2> to run the Setup procedure.” Normally, you will press <Ctrl>, <Alt>, and <s> simultaneously to begin the Setup procedure.

Running the Setup Procedure

If the system halts while booting, press <F2> and the CMOS Main Screen (Figure 4-2) should appear with the prompt on the time line. If the system does not halt and a DOS prompt does appears (i.e., A:\ or C:\), press the <Ctrl>, <Alt>, and <s> keys simultaneously to begin the Setup procedure.

The M5Pi system board has two CMOS configuration screens: the Main Screen (Figure 4-2) and the Extended Screen (Figure 4-3). To toggle between the screens, press the PgUp/PgDn keys.

Phoenix SETUP Utility (Version 1.00) 00 (c) Phoenix Technologies Ltd. 1985, 1993 All Rights Reserved					
** Standard System Parameters **					Page 1 of 2
System Time:	[HH:MM:SS]				
System Date:	[MM/DD/YYYY]				
Diskette A:	3.5", 1.44MB				
Diskette B:	Not Installed				
Hard Disk 1:	Auto	Cyl	Hd	Pre	LZ Sec Size
Hard Disk 2:	Not Installed	xxx	xx	xxx	xxx xx xxx
Hard Disk 3:	Not Installed				
Hard Disk 4:	Not Installed				
Base Memory:	640KB				
Extended Memory:	XXX KB				
Video Card:	VGA/EGA				
Keyboard:	Installed				
Numlock at boot:	No				
Esc Menu	F1 Help	F2 Sys Info	↑↓ Field	+/- Value	PgUp/ PgDn

Figure 4-2 CMOS Main Screen

Now, configure the parameters to match your specific requirements. See the following pages for procedures on how to set the computer's parameters.

To return to the CMOS configuration screens at any time to change or view any of these parameters, press <Ctrl>, <Alt>, and <s> simultaneously.

Setting the CMOS Parameters

Before running the computer, certain parameters on the CMOS configuration screens must be set so the computer properly operates. First, set the parameters on the CMOS Main Screen, then press the PgUp/PgDn key, and set the parameters on the CMOS Extended Screen.

Note:

Some of the parameters are already set and should not be changed. Only change the settings if necessary.

Setting the CMOS Main Screen

System Time and Date

To set the time, use the minus <-> key to decrease the number and the plus <+> key to increase the number. To move the prompt forward, use the right arrow <-> key; to move the prompt backward, use the left arrow <-> key. Follow the same procedure for the date.

Diskette Drive A or B

This allows you to configure a diskette drive added or removed from your computer. Use the <+/-> keys to toggle between the options.

Hard Disk 1-4 (IDE Drives Only)

This selection allows you to configure a hard disk installed in your system. Use the <+/-> keys to toggle between the options. See Appendix C for a complete listing of all possible hard drive types.

To install most SCSI hard drives, select NOT INSTALLED. To manually configure the hard drive, select USER CONFIG. Press the down arrow <↓> key and type in the appropriate parameters. To automatically configure an IDE hard drive, select AUTO CONFIG. Drives that can be Auto-Configured report parameters to the BIOS.

Base Memory and Extended Memory

Both of these memory settings are automatically configured. Press the down arrow <↓> key to move to the next selection.

Video Card

This sets the type of monitor required for your computer. The display peripheral supports VGA/EGA, CGA80, CGA40, Monochrome (MONO), or no monitor at all. Use the <+/-> keys to toggle between the options.

Keyboard

If the keyboard category is set to INSTALLED, the computer will test the keyboard during boot. If set for NOT INSTALLED, the system will ignore any keyboard errors and always attempt to boot. Set this for INSTALLED unless using the system board in an application which does not require a keyboard.

Setting the CMOS Extended Screen

You can toggle between the Main screen and the Extended screen (Figure 4-3) using the PgUp and PgDn key.

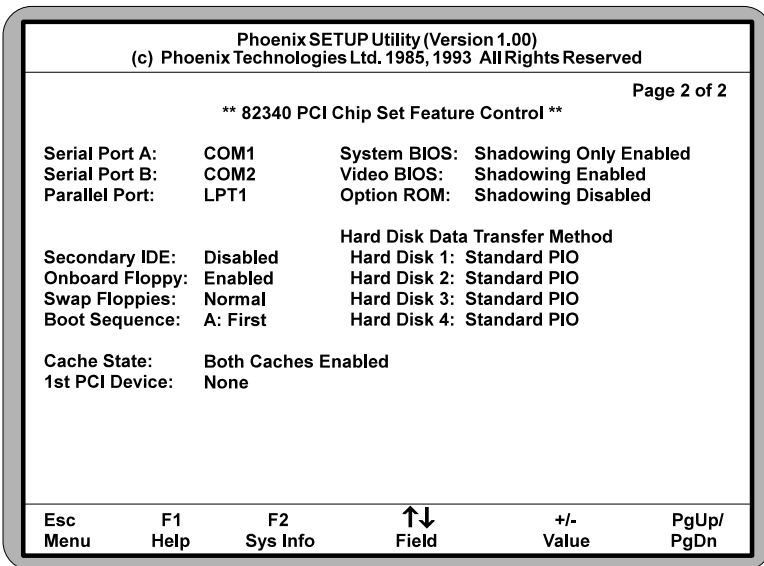


Figure 4-3 CMOS Extended Screen

Serial Port A

Serial Port 1 may be set for COM1 (default), COM3, or may be disabled. Be sure this setting does not conflict with any other peripherals.

Serial Port B

Serial Port 2 may be set for COM2 (default), COM4, or may be disabled. Be sure this setting does not conflict with any other peripherals.

Parallel Port

The parallel port may be set for LPT1 (default), LPT2, or may be disabled. Be sure this setting does not conflict with any other peripherals.

Secondary IDE

The ISA IDE controller can be set to ENABLED or DISABLED.

Onboard Floppy

The On Board Floppy controller can be set to ENABLED or DISABLED.

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:.

Boot Sequence

This category selects the order the system searches for a boot disk and can be set for “A: First” or “C: First.”

Cache State

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

Note:

External cache must be installed in order to select BOTH.

1st PCI Device

This selection allows you to set the IRQ of the 1st PCI device to IRQ9, IRQ11, or IRQ15. The next IRQ will automatically be assigned to the next peripheral. (eg. If slot 0 is empty, slot 1 has a SCSI controller, and slot 2 has a network card, setting 1st PCI Device for IRQ9 will assign the SCSI controller to IRQ9 and the network card to IRQ11.)

Note:

Not all PCI peripherals require an IRQ and most video cards do not. Even if slot 0 had a video card installed in the above example, the system would still assign IRQ9 to the SCSI controller.

System BIOS

The System BIOS Option allows you to Shadow, Shadow & Cache, or Disable the BIOS Shadow on the system board. Choosing SHADOWED copies the system's BIOS into RAM for faster execution. Choosing SHADOWED & CACHED caches the shadowed system BIOS for even higher performance. This allows you to take advantage of the high-speed 32-bit bus and the 70 nanosecond RAM. Use the <+/-> key to toggle between the options.

Video BIOS

The Video BIOS Option allows you to Shadow, Shadow & Cache, or Disable the BIOS Shadow on the system board. Choosing SHADOWED copies the system's video BIOS into RAM for faster execution. Choosing SHADOWED & CACHED caches the shadowed video BIOS for even higher performance. Use the <+/-> key to toggle between the options. The System BIOS Shadow option must be set to SHADOW or SHADOW & CACHE before enabling the Video BIOS Shadow options.

Option ROM

Some peripheral cards such as low-priced SCSI controllers and network adapters which do not have their own BIOS require this feature. Check the documentation of your peripheral cards to see if they need this feature.

Re-Configuring Your Computer

Press the <Esc> key to reach the Exit Pop-Up Screen. Now select <F4> to save and initialize the new Setup.

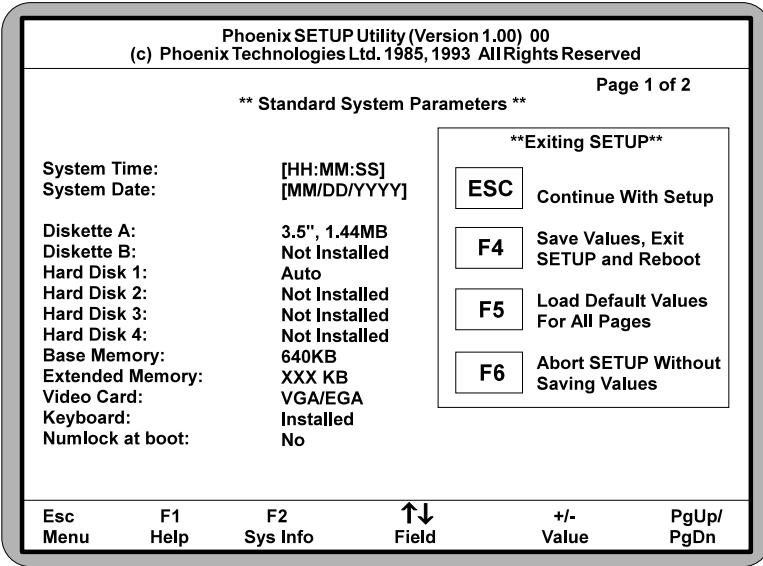


Figure 4-4 Exit Pop-up Screen

A POST Messages

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

Message	Possible Cause	Solution
NO DISKETTE CONTROLLER	Disk controller not found.	Change the Configuration.
DISKETTE DRIVE RESET FAILED	Disk adapter has failed or is improperly configured.	Check the disk adapter.
DISKETTE DRIVE A FAILURE	Drive A failed or is missing.	Check the A drive.
DISKETTE DRIVE B FAILURE	Drive B failed or is missing.	Check the B drive.
DISKETTE READ FAILURE; STRIKE F1 TO RETRY BOOT	Disk is not formatted or is defective.	Replace the diskette with a formatted diskette and retry.
DISPLAY ADAPTER FAILED USING ALTERNATE	The color/monochrome switch is not set correctly, or the primary video adapter failed.	Change the switch to the correct setting, or check the primary video adapter.
ERRORS FOUND; DISK X FAILED INITIALIZATION	Hard disk configuration information is incorrect.	Rerun SETUP and enter the correct hard disk information.
ERRORS FOUND; INCORRECT CONFIGURATION INFORMATION; MEMORY SIZE MISCOMPARE	The size of the base or the expansion memory, does not agree with configuration information.	Enter correct memory size and rerun SETUP procedure.

Message	Possible Cause	Solution
FIXED DISK CONFIGURATION FAILURE	The specified configuration is not supported.	Correct the hard disk configuration.
FIXED DISK CONTROLLER FAILURE	The controller card has failed.	Replace controller card.
FIXED DISK X FAILURE (where X =0 or 1)	The hard disk crashed.	Press F1 to reboot or rerun SETUP. If this does not work, replace hard disk.
HARD READ FAILURE- STRIKE F1 TO RETRY BOOT	The hard disk failed.	Press F1 to reboot or rerun Setup. If this does not work, replace hard disk.
FDD CONTROLLER FAILURE	Diskette controller failed.	Replace controller card.
FDD A IS NOT INSTALLED	Cannot find diskette controller for drive A.	Install or replace controller card.
FDD B IS NOT INSTALLED	Cannot find diskette controller for drive B.	Install or replace controller card.
KEYBOARD CLOCK LINE FAILURE or KEYBOARD DATA LINE FAILURE	Keyboard logic failed.	Make sure the keyboard cable is connected correctly.
KEYBOARD STUCK KEY FAILURE	A key is jammed or was held down during boot.	Make sure the keys are not jammed or dirty.
REAL TIME CLOCK FAILURE	The real-time clock logic failed.	Check battery and replace, if necessary
TIME-OF-DAY NOT SET- RUN SETUP PROGRAM	The real-time clock time-of-day is not running.	Run SETUP utility.
BIOS XXXX ROM BAD CHECKSUM (where XXXX=C8000 to E0000)	The optional ROM checksum is bad.	Replace add-on card.

Message	Possible Cause	Solution
DISKETTE READ FAILURE, or NOT A BOOT DISKETTE, or NO BOOT DEVICE AVAILABLE	Hard/floppy disk failed or is not bootable.	Replace the diskette with a bootable diskette and retry.
DECREASING AVAILABLE MEMORY, or MEMORY FAILURE AT AAAAAAAAAA READ XXXX EXPECTING YYYY (where AAAAAAAAAA = failing address, XXXX=data read, and YYYY=data written)	The memory data integrity failed.	Check contact points between memory modules and system board. Replace memory modules if necessary.

B Beep Codes

Beep codes are a series of beeps sent through the speaker which indicate a problem during POST. If text appears on the video screen, the M5Pi 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 three sets 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. With no video card installed, or if the video card 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 probable causes.

Beep code	Contents Port 80h	Description
None	01h	CPU register test in progress.
1-1-3	02h	CMOS read/write failure.
1-1-4	03h	ROM BIOS check failure.
1-2-1	04h	Programmable interval timer failure.
1-2-2	05h	DMA initialization failure.
1-2-3	06h	DMA page register write/read failure.
1-3-1	08h	RAM refresh verification failure.
None	09h	First 64K RAM test in progress.
1-3-3	0Ah	First 64K RAM chip or data line failure (multi-bit).
1-3-4	0Bh	First 64K RAM odd/even logic failure.
1-4-1	0Ch	Address line failure first 64K RAM.
1-4-2	0Dh	Parity failure first 64K RAM.
2-1-1	10h	Bit 0 first 64K RAM failure.
2-1-2	11h	Bit 1 first 64K RAM failure.
2-1-3	12h	Bit 2 first 64K RAM failure.
2-1-4	13h	Bit 3 first 64K RAM failure.
2-2-1	14h	Bit 4 first 64K RAM failure.
2-2-2	15h	Bit 5 first 64K RAM failure.
2-2-3	16h	Bit 6 first 64K RAM failure.
2-2-4	17h	Bit 7 first 64K RAM failure.
2-3-1	18h	Bit 8 first 64K RAM failure.
2-3-2	19h	Bit 9 first 64K RAM failure.
2-3-3	1Ah	Bit 10 first 64K RAM failure.
2-2-4	1Bh	Bit 11 first 64K RAM failure.
2-3-1	1Ch	Bit 12 first 64K RAM failure.
2-4-2	1Dh	Bit 13 first 64K RAM failure.

Beep code	Contents Port 80h	Description
2-4-3	1Eh	Bit 14 first 64K RAM failure.
2-4-4	1Fh	Bit 15 first 64K RAM failure.
3-1-1	20h	Slave DMA register failure.
3-1-2	21h	Master DMA register failure.
3-1-3	22h	Master interrupt mask register failure.
3-1-4	23h	Slave interrupt mask register failure.
None	25h	Interrupt vector loading in progress.
3-2-4	27h	Keyboard controller test failure.
None	28h	CMOS power failure and checks calculation in progress.
None	29h	CMOS configuration validation in progress.
3-3-4	2Bh	Screen initialization failure.
3-4-1	2Ch	Screen retrace test failure.
3-4-2	2Dh	Search for video ROM in progress.
None	2Eh	Screen running with video ROM.
None	30h	Screen operable.
None	30h	Screen running with video ROM.
None	31h	Monochrome monitor operable.
None	32h	Color monitor (40 column) operable.
None	33h	Color monitor (80 column) operable.

C Hard Disk Drive Types

The following table lists the hard disk types supported by M5Pi.

Type	Cyl	Hd	Pre	LZ	Sec	Size (MB)
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	30
4	940	8	512	940	17	62
5	940	6	512	940	17	46
6	615	4	-1	615	17	20
7	462	8	256	511	17	30
8	733	5	-1	733	17	30
9	900	15	-1	901	17	112
10	820	3	-1	820	17	20
11	855	5	-1	855	17	35
12	855	7	-1	855	17	49
13	306	8	128	319	17	20
14	733	7	-1	733	17	42
15	x	x	x	x	x	x
16	820	6	-1	820	17	40
17	977	5	300	977	17	40
18	977	7	-1	977	17	56
19	1024	7	512	1023	17	59
20	733	5	300	932	17	30
21	733	7	300	932	17	42
22	733	5	300	933	17	30
23	1024	5	-1	1023	17	42
24	925	9	-1	925	17	69
25	699	7	256	700	17	40
26	1024	4	-1	1023	17	34
27	1024	5	-1	1023	17	42
28	1024	8	-1	1023	17	60

Type	Cyl	Hd	Pre	LZ	Sec	Size (MB)
29	512	8	256	512	17	34
30	615	2	615	615	17	10
31	989	5	0	909	17	41
32	1020	15	-1	1024	17	127
33	615	4	-1	615	26	31
34	820	6	-1	820	26	62
35	1024	9	1024	1024	17	76
36	1024	5	512	1024	17	42
37	1024	5	512	1024	26	65
38	823	10	256	824	17	60
39	615	4	128	664	17	20
40	615	8	128	664	17	40
41	917	15	-1	918	17	114
42	1023	15	-1	1024	17	127
43	823	10	512	823	17	60
User 1						
User 2						
User 3						
User 4						
Auto						
Not Installed						

D Specifications

Processor	60MHz or 66MHz Pentium processor.
Chipset	Intel 82430 PCI Set.
CPU Clock Select	Frequency synthesizer chip. Jumper selectable CPU selection.
Form Factor	Baby AT size (8.5" x 13.75"). 4 layer PCB.
Expansion	Four 16-bit ISA slots. Two 32-bit PCI slots. One shared ISA/PCI slot.
BIOS	Phoenix BIOS on 1MB Flash EPROM. Multiple sector transfer support. IDE speed selection.
RAM Capacity	128MB
Keyboard	PS/2 (PS/2 version). AT-Compatible (AT version).
Mouse	Built-in PS/2 support (PS/2 version only).
Internal Cache	16K.
External Cache	256K.
I/O Ports	Built in support. Two high speed serial ports (16550 compatible). One bi-directional parallel port. Enhanced Parallel Port (EPP) compatible. Microsoft and Hewlett Packard Extended Capabilities Port (ECP) compatible.
Floppy Port	Supports two floppy drives (2.88, 1.44, 1.2, 720K, 360K).
PCI IDE Port	Supports two IDE hard disks.

Mode 3 support.
Multiple sector transfer support.
LBA support.

Secondary IDE Support Supports two additional IDE hard disks.
LBA support.

Environmental Specifications

The environment in which the M5Pi 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).

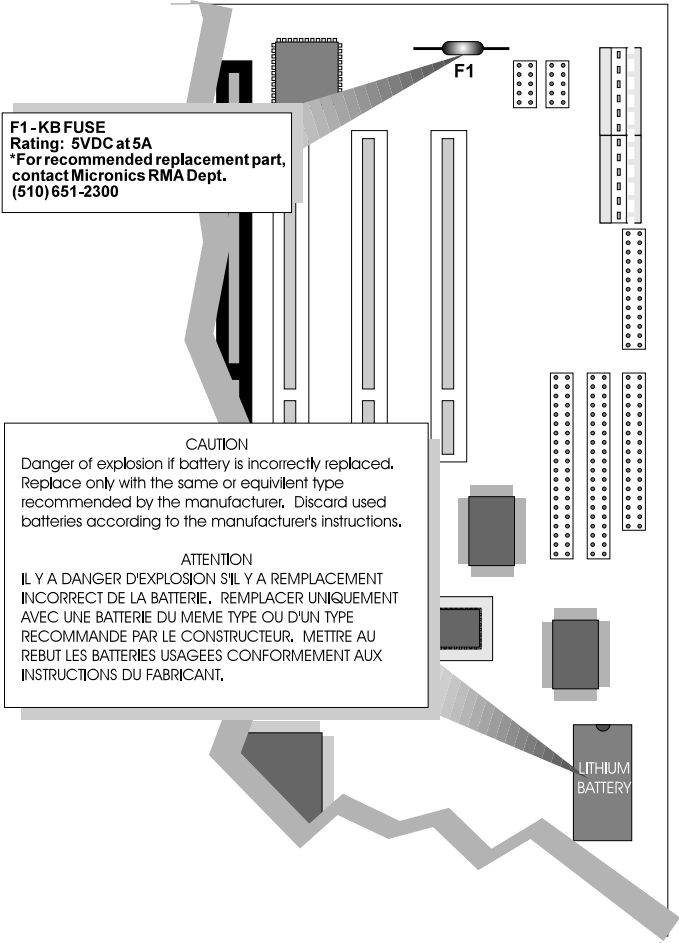
Shipping: -22 to 140 degrees Fahrenheit (-30 to 60 degrees Celsius).

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:

- ④ Reorient the receiving antenna.
- ④ Increase the separation between the equipment and the receiver.
- ④ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ④ 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.

Glossary

BIOS:	Basic Input Output System. Maintains and controls the entire functions of the computer.
Cache:	Fast memory used to enhance the efficiency and speed of the computer.
CPU:	Central Processing Unit. Essentially, the “brains” of the computer.
Disk Drive:	Either a hard disk or a floppy diskette.
DRAM:	Dynamic Random Access Memory.
EISA:	Extended Industry Standard Architecture.
ISA:	Industry Standard Architecture.
Jumpers:	A device on the system board used to configure certain information on the board.
POST:	Power On Self Test. The computer’s self-diagnostic test, which is executed whenever the system is booted.
Setup:	Steps used to configure the system board.
SIMM:	Single In-line Memory Module. SIMMs are banks of memory used to increase the performance of the computer.
SRAM:	Static Random Access Memory.

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.