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LPX54 PCI/ISA
Integrated System Board Manual

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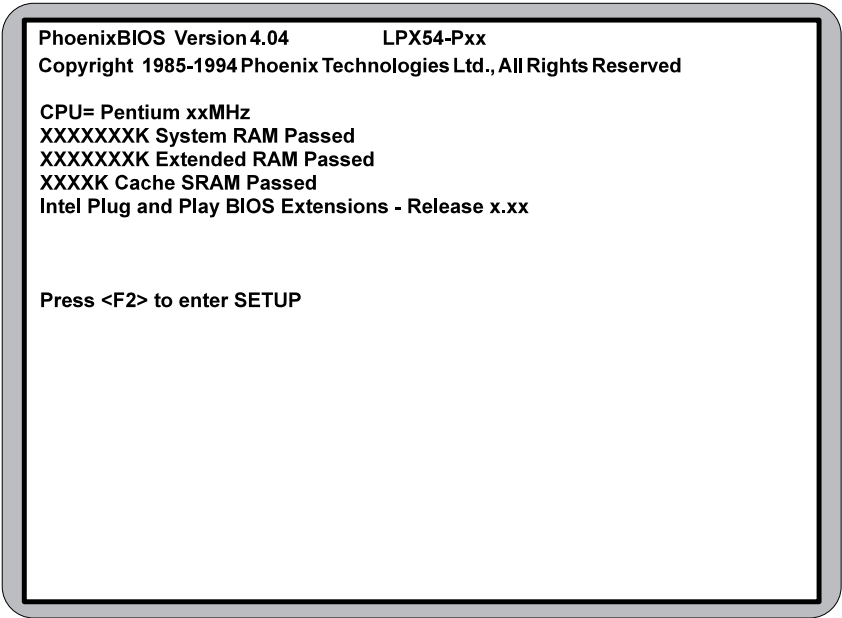
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Micronics Quick Installation

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 LPX54 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 the riser card and any peripherals (Chapter 3).

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

```
PhoenixBIOS  Version 4.04          LPX54-Pxx
Copyright  1985-1994 Phoenix Technologies Ltd., All Rights Reserved

CPU= Pentium xxMHz
XXXXXXXK System RAM Passed
XXXXXXXK Extended RAM Passed
XXXXK Cache SRAM Passed
Intel Plug and Play BIOS Extensions - Release x.xx



Press <F2> to enter SETUP
```

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).

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1 Introduction

Congratulations for choosing the Micronics LPX54! The LPX54 is a high-performance system board designed to be the foundation for advanced systems and applications.

The LPX54 is a Pentium based board which is one of the most powerful processors on the market.

The LPX54 comes with many on-board features. These include on-board in 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 LPX54 includes the following features:

⊕ Support for 90MHz or 100MHz Pentium processors.

⊕ LPX form factor system board (13.25" X 8.5").

⊕ L2 Buffer Write-through cache support (256K or 512K).

⊕ Supports up to 128MB of on-board system memory.

⊕ On-board local bus video adapter, using the ATI 88800 GX *mach64* LX video controller with an 8-bit RAMDAC.

⊕ 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 which is EPP and ECP compatible (see Specifications).

⊕ Upgradeable Flash Phoenix BIOS.

Software Compatibility

The LPX54 system board was thoroughly tested for compatibility with a variety of operating systems and environments, including:

⊕ Windows and Windows NT
⊕ OS/2
⊕ SCO UNIX and Open Desktop
⊕ Novell NetWare
⊕ MS-DOS
⊕ PC-DOS
⊕ NeXTStep 3.2

Click here to continue to the next chapter.....

2 Configuring the LPX54

Although the LPX54 system board is packaged in protective materials, it is important to use care while unpacking and setting up.

Static Electricity

The LPX54 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 LPX54 via the solder pads surrounding one of its mounting holes.

Once the LPX54 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.

LPX54 Components
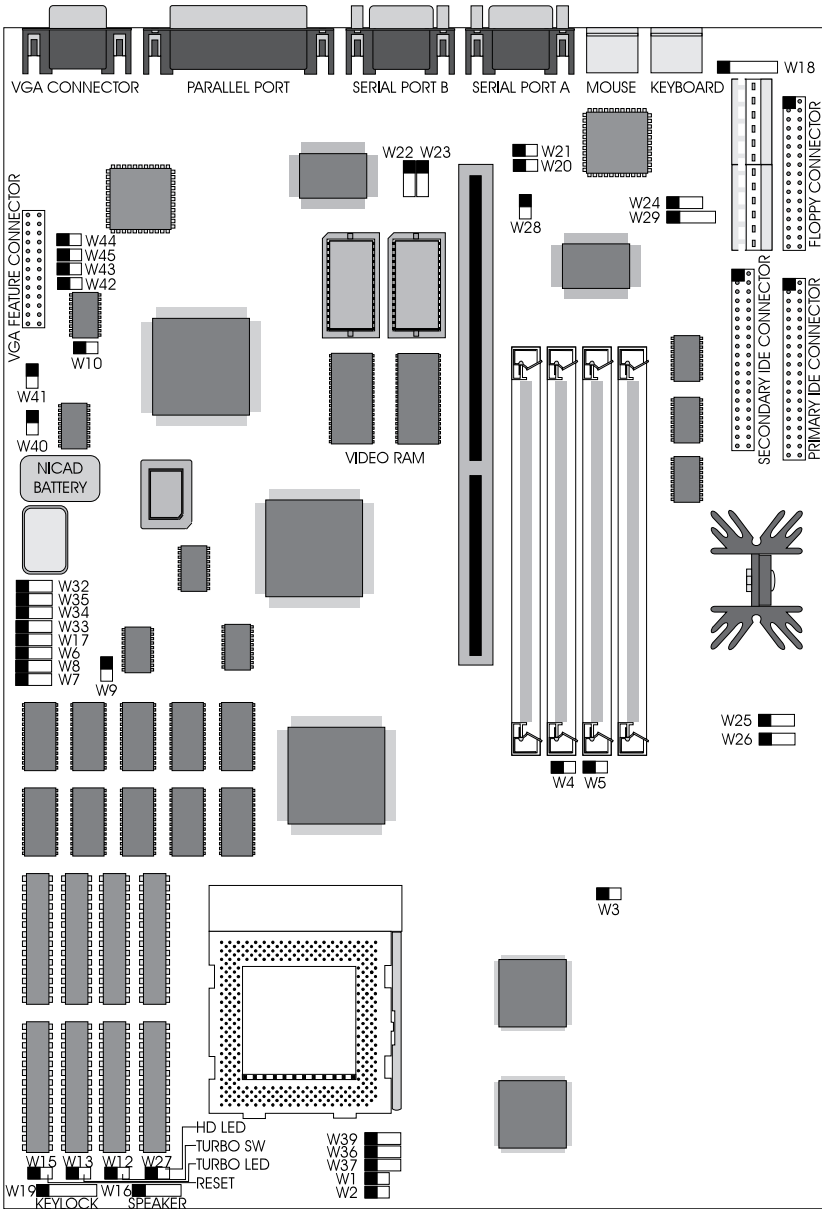
Figure 2-1 LPX54 System Board

Jumper Settings

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

Jumper	CPU Speed Bus Speed	75MHz 50MHz	90MHz 60MHz	100MHz 66MHz
W3		close	close	open
W4		close	open	close
W5		open	close	open
W38		open	open	close

Table 2-1 CPU Speed Selection

Table 2-2 lists the jumper settings to set the board speed to CPU speed ratio.

Jumper	Function	Setting
W2	2/3 (1.5X) Clock (default)	open
	1/2 (2.0X) Clock	close

Table 2-2 CPU Bus Speed Selection

Note:
The setting for the Pentium 50/75 (board speed/CPU speed), the Pentium 60/90, and the Pentium 66/100 is 1.5X Clock.

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

Jumper	Cache	256K	512K
W6		1-2	2-3
W7		1-2	2-3
W8		1-2	2-3

Table 2-3 Cache Size Selection

Table 2-4 lists the jumper settings to select between write-back and write-through internal cache.

Jumper	Function	Setting
W1	Write-back (default)	open
	Write-through	close

Table 2-4 Cache Type Selection

Table 2-5 lists the jumper settings to select the type of video installed.

Jumper	Function	Setting
W20	Color (default)	close
	Monochrome	open

Table 2-5 Video Selection

Table 2-6 lists the jumper settings for installing a PS/2 mouse.

Jumper	Function	Setting
W21	PS/2 mouse installed (default)	close
	No PS/2 mouse installed	open

Table 2-6 PS/2 Mouse Selection

Table 2-7 lists the jumper settings to set the IRQs for the IDE controllers. Leave the PCI IDE hard disk controller for IRQ14 unless you are using a SCSI controller and need to free up an unnecessary IRQ.

Primary IDE Interrupt	Secondary IDE Interrupt	W24	W28	W29
none	none	open	open	open
none	ISA IRQ15	2-3	open	open
PCI INT A	none	open	close	open
PCI INT A	ISA IRQ15	2-3	close	open
ISA IRQ14	none	open	open	1-2
ISA IRQ14 (default)	ISA IRQ15	2-3	open	1-2

Table 2-7 IDE IRQ Selection

Table 2-8 lists the jumper settings to select the ISA IDE controller's DMA channel.

Jumper	DMA Channel	None (default)	DMA6	DMA7
W25		open	1-2	2-3
W26		open	1-2	2-3

Table 2-8 ISA IDE DMA Channel Selection

Table 2-9 lists the jumper settings to select the parallel port DMA channel for ECP mode.

Jumper	DMA Channel	None (default)	DMA1	DMA3
W22		open	1-2	2-3
W23		open	1-2	2-3

Table 2-9 Parallel Port DMA Channel Selection

Table 2-10 lists the jumper settings to disable the on-board VGA controller.

Jumper	Function	Setting
W40	On board VGA enabled (default)	open
	On board VGA disabled	close
W42	VGA hardware enabled (default)	open
	VGA hardware disabled	close

Table 2-10 VGA Controller Disable

Table 2-11 lists the jumper settings for BIOS operation.

Jumper	Function	Setting
W9	Normal (default)	2-3
	Recovery mode	1-2
W10	Flash BIOS programmable (default)	close
	Flash BIOS write-protected	open

Table 2-11 BIOS Operation Selection

Note:
Jumper W9 must be reconfigured to update (Flash) the BIOS. If problems occur during the flash procedure, reset W9 to the BIOS Recovery Mode. A special diskette is needed for the recovery mode. Contact your computer dealer for the Flash Utility diskette or call Micronics' BBS number at (510) 651-6837 to download the utility.

Table 2-12 lists the jumper settings to reset the BIOS. With the computer's power off, move the jumper to pins 2 and 3 for about five seconds and place the jumper back on pins 1 and 2.

Jumper	Function	Setting
W17	Normal operation (default)	1-2
	Clear CMOS RAM settings	2-3

Table 2-12 BIOS Reset Jumper

Note:
This will reset all BIOS settings to their defaults. Any changes you have made will be lost.

Table 2-13 lists jumpers with factory reserved settings. **Do not reconfigure these jumpers.**

Jumper	Function	Setting
W32	Reserved	1-2
W33	Reserved	1-2
W34	Reserved	1-2
W35	Reserved	1-2
W36	Reserved	1-2
W37	Reserved	2-3
W39	Reserved	2-3
W41	Reserved	close
W43	Reserved	open
W44	Reserved	open
W45	Reserved	open
W46	Reserved	2-3

Table 2-13 Reserved Jumper Settings

Table 2-14 lists the jumper settings for case and peripheral connections.

Jumper	Function	Notes
J15	PCI IDE Connector	Primary
J14	ISA IDE Connector	Secondary
J10	Floppy Connector	
J13	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.
J18	VGA Connector	
J17	VGA Feature Connector	
J9	PS/2 Keyboard	
J6	PS/2 Mouse	
W18	Ext. Keyboard	1- Clock(Keybd), 2-Data, 3-N/C, 4-Ground, 5-VCC
J2 &J3	Power Supply Connector	
J4 & J5	3.3V Power Connector	
W27	Hard Disk LED	1-+5V DC, 2-Ground
W15	Reset	
W12	Turbo Switch	
W13	Turbo LED	1-+5V DC, 2-Ground
W19	Keylock/Power LED	1-Power; 2-N/C; 3-Ground; 4-Keyboard Lock; 5-Ground
W16	Speaker Connector	1-Speaker; 2-N/C; 3-Ground; 4-5V DC
J1	Reserved	

Table 2-14 Case and Peripheral Connections

Click here to continue to the next chapter.....
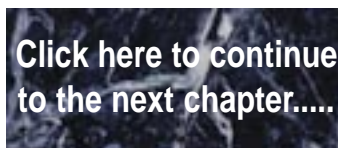
3 Installing the LPX54, System Memory, CPUs and Peripherals

This section explains how to install the LPX54 system board, SIMMs, CPUs, and peripherals.

Warning:
Before installing or removing any peripherals or components, make sure you have a clear work space and 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 LPX54

The installation of the LPX54 system board depends on the type of case you use. The LPX54 is an integrated, low profile LPX system board and should be limited to installation in a low profile chassis.

Prior to installing the LPX54, 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 LPX54:

⊕   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 LPX54 for a typical configuration:

⊕   LPX or Low Profile Chassis.

⊕   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.

⊕   Eight ohm speaker.

⊕   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 LPX54 system board. The LPX54 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 LPX54, give some examples of common memory configurations, and show how to physically install the new SIMMs.

SIMMs Supported
The LPX54 supports the following 72 pin, 60ns or 70ns SIMMs:

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

Note:
For long term reliability, Micronics recommends using SIMMs with gold-plated contacts. The use of tin-plated contacts may conflict with the gold on 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.

⊕ Upgrade SIMMs one bank at a time. Each bank must contain two SIMMs of the same size and preferably from the same manufacturer. To add 16MB of memory to the system board, install two 8MB SIMMs into the same bank.

⊕ When installing SIMMs, fill bank 0, then bank 1.

Common Memory Configurations

The following table (Table 3-1) lists the most common memory configurations. The LPX54 will accept any combination of SIMMs as long as the rules in the previous section are followed.

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

Table 3-1 Common Memory Configurations

Installing the SIMMs

To install the SIMMs, locate the 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).
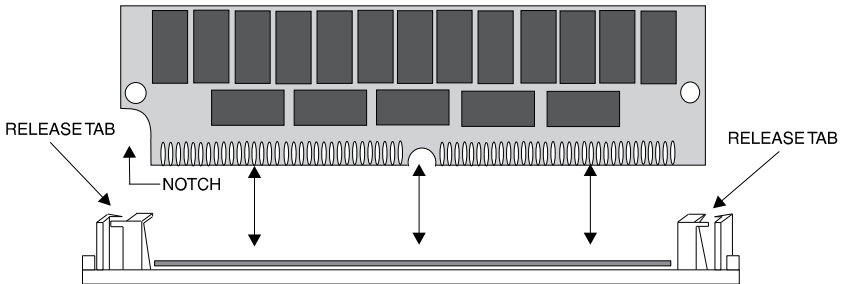
Figure 3-1 Installing a 72-Pin SIMM

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 LPX54 is designed to a variety of Pentium processors. Follow the steps below to install a 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 the speed 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 Cache Memory

In addition to the 16K of internal (L1) cache built into the Pentium processors, the LPX54 also supports external (L2) cache. The LPX54 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 Chapter 2 for the correct external cache jumper settings.
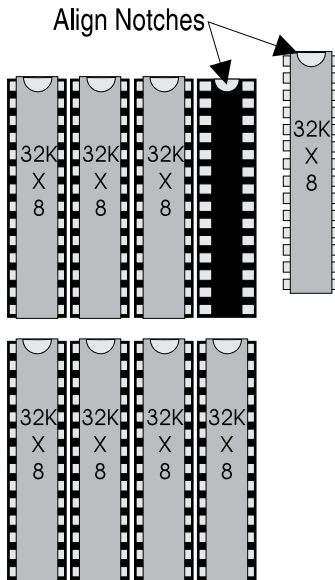
Figure 3-2 Upgrading the External Cache

Installing a Riser Card

The LPX54 may include a riser card if the board is installed in a chassis. If the system board is not installed in a chassis, perform the following steps to install the riser card:

1. Locate the riser card slot (refer to Figure 2-1).

2. Insert the card with the bottom edge level. **Never insert the card at an angle.**

3. Holding the card at the center of the top edge, gently push straight in. Do not force the card. If it does not fit, take it out and try again.

4. Make sure the card is fully inserted.
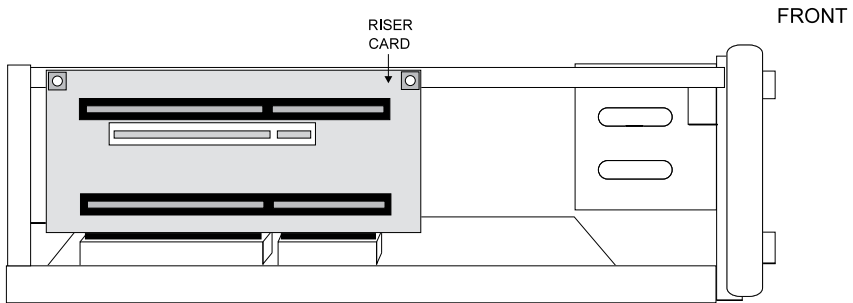
Figure 3-3 Inserting a Riser Card

Installing a PCI Peripheral Card

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

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

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

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

4. Carefully push the card straight in while securing the other side of the riser card with your free hand. Make sure the card is fully inserted.

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

6. Replace the computer cover.

7. Read the card's manual for additional instructions concerning installation and software drivers.
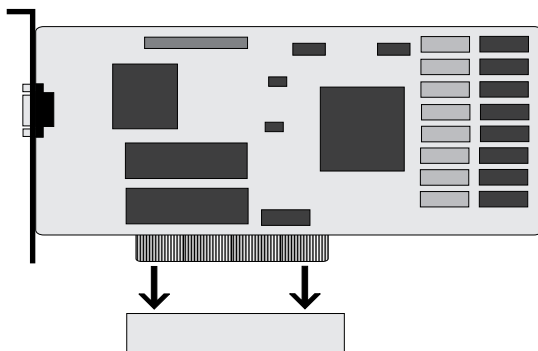
Figure 3-4 Installing a PCI Card

Installing an ISA Peripheral Card

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

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

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

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

4. Carefully push the card straight in while securing the other side of the riser card with your free hand. Make 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.
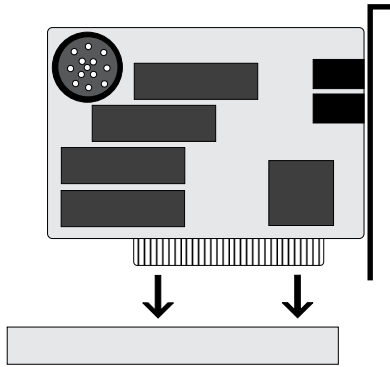
Figure 3-5 Installing an ISA Card

Click here to continue to the next chapter.....
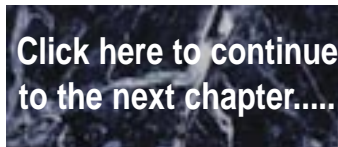
4 The BIOS Setup Utility

Configuration

After the LPX54 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 LPX54. If the system doesn't properly boot, check all your cables and peripherals for bad connections. You may also get beep codes or error messages. If this occurs, consult Appendices A and/or B for a guide to possible solutions.

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

Setup

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

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

```
PhoenixBIOS  Version 4.04            LPX54-xx
Copyright  1985-1994 Phoenix Technologies Ltd., All Rights Reserved

CPU= Pentium xxMHz
XXXXXXXK System RAM Passed
XXXXXXXK Extended RAM Passed
XXXXK Cache SRAM Passed
Intel Plug and Play BIOS Extensions - Release x.xx



Press <F2> to enter SETUP
```
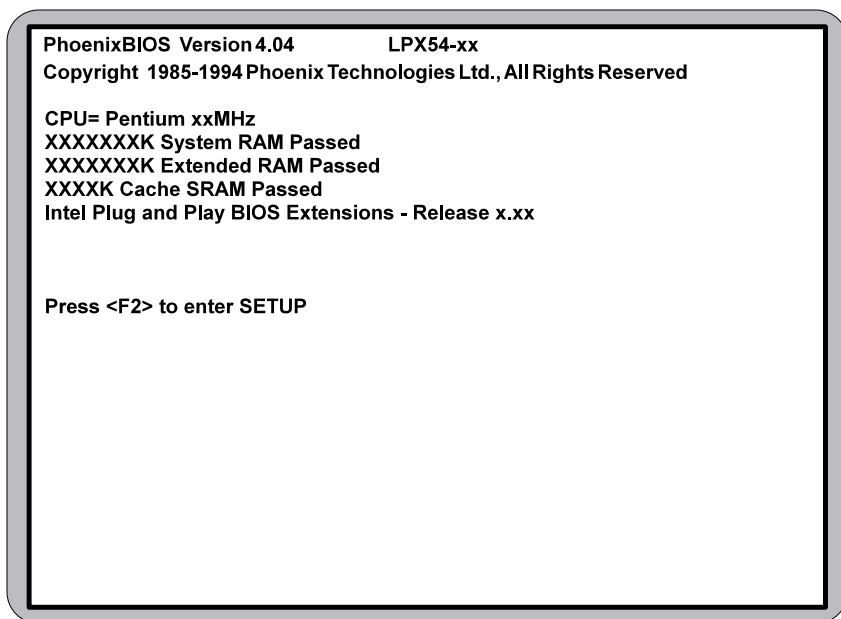
Figure 4-1 Power-Up Screen

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 LPX54 system board has four primary CMOS configuration screens: the Main Screen (Figure 4-2), the Advanced Screen (Figure 4-8), the Security Screen (Figure 4-10), and the Exit Screen (Figure 4-12). To toggle between the screens, press the right arrow <→> and the left arrow < ←> keys.

Setting the Main Screen

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

```
           PhoenixBIOS Setup - Copyright 1985-94  Phoenix Technologies Ltd.
  ┌─────┐
  │ Main│        Advanced      Security       Exit
  └─────┘                                          ┌──────────────────────────┐
                                                   │    Item Specific Help     │
      System Time:           [HH:MM:SS]            │                           │
      System Date:           [MM/DD.YYYY]          │  <Tab>, <Shift-Tab>, or   │
      Diskette A:            [1.44 MB, 3 1/2"]     │  <Enter> selects field.   │
      Diskette B:            [Not Installed]       │                           │
    ▶ IDE Device 0 Master:   [None]                │                           │
    ▶ IDE Device 0 Slave:    [None]                │                           │
    ▶ IDE Device 1 Master:   [None]                │                           │
    ▶ IDE Device 1 Slave:    [None]                │                           │
      Video System:          [EGA/VGA]             │                           │
      Video BIOS:            [Shadowed]            │                           │
    ▶ Boot Sequence:         [A: then C:]          │                           │
      Cache:                 [Both]                │                           │
                                                   │                           │
      System Memory:         640 KB                │                           │
      Extended Memory:       xxx MB                │                           │
      DRAM Parity:           [Enabled]             │                           │
                                                   │                           │
                                                   │                           │
                                                   └──────────────────────────┘
   F1  Help   ↑↓Select Item    -/+ Change Values       F9 Setup Defaults
   Esc Exit   ←→Select Menu    Enter Select Sub-Menu   F10 Previous Values
```

Figure 4-2 CMOS Main Screen

System Time and Date

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

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

Diskette A or B

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

IDE Devices (Hard Disk Setup)

If you are setting up a SCSI hard disk, you will need to select [None] in the IDE Device parameters (see 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).

```
          PhoenixBIOS Setup - Copyright 1985-94  Phoenix Technologies Ltd.
  ┌──────┐
  │ Main │
  └──────┘
        IDE Adapter 0 Master   (C:   xxxx Mb)            Item Specific Help

     Autotype Fixed Disk:       [Press Enter]         Attempts to
                                                      automatically detect
     Type:                      [None]                the drive type for
     Cylinders:                                       drives that comply with
     Heads:                                           ANSI specifications
     Sectors/Track:
     Landing Zone:
     Write Precomp:

     Multi-Sector Transfers:    [Disabled]
     LBA Mode Control:          [Disabled]
     32 Bit I/O:                [Enabled]
     Transfer Mode:             [Standard]



     F1  Help  ↑↓ Select Item    -/+ Change Values     F9 Setup Defaults
     Esc Exit  ←→ Select Menu    Enter Select Sub-Menu  F10 Previous Values
```

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 correct 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

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

Boot Options Submenu

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

```
         PhoenixBIOS Setup - Copyright 1985-94  Phoenix Technologies Ltd.
   Main
                        Boot Options                    Item Specific Help

      Boot Sequence:        [A: then C:]
      SETUP Prompt:         [Enabled]           Order system searches
      POST Errors:          [Enabled]           drives for a boot disk.
      Floppy Check:         [Disabled]
      Numlock:              [Auto]

      F1  Help   ↑↓Select Item    -/+ Change Values     F9 Setup Defaults
      Esc Exit   ←→Select Menu    Enter Select Sub-Menu F10 Previous Values
```

Figure 4-4 Boot Options Submenu

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

A: then C:
C: then A:
C: only

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

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

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

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

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

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

Setting the Advanced Screen

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

```
        PhoenixBIOS Setup - Copyright 1985-94  Phoenix Technologies Ltd.
          Advanced
               Warning!                          Item Specific Help
     Setting items on this menu to incorrect values
     may cause your system to malfunction.

  ▶Integrated Peripherals
    Plug and Play O/S            [No]

    Large Disk Access Mode:     [DOS]




    F1   Help   ↑↓Select Item     -/+ Change Values      F9 Setup Defaults
    Esc Exit    ←→Select Menu    Enter Select Sub-Menu   F10 Previous Values
```

Figure 4-5 Advanced Screen

Integrated Peripherals Submenu

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

```
     PhoenixBIOS Setup - Copyright 1985-94  Phoenix Technologies Ltd.
       Advanced

           Integrated Peripherals                    Item Specific Help

     Serial Port A:              [COM1, 3F8h]        Set COM port address.
     Serial Port B:              [COM2, 2F8h]
     Parallel Port:              [LPT1, 378h]
     Parallel Port Mode:         [AT]
     Diskette Controller:        [Enabled]
     ISA IDE Controller:         [Disabled]
     PCI IDE Controller:         [Enabled]




     F1  Help   ↑↓Select Item     -/+ Change Values       F9 Setup Defaults
     Esc Exit   ←→Select Menu   Enter Select Sub-Menu   F10 Previous Values
```

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), or may be disabled.

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

ISA IDE Controller

The secondary ISA IDE controller may be enabled or disabled.

ECP

The LPX54's parallel port is compatible with the Extended Capabilities Parallel Port standard developed by Hewlett Packard and Microsoft. You should set this for disabled (default) unless your peripheral requires it.

Integrated IDE Controller

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

Large Disk Access Mode

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

Security Screen

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

```
┌─────────────────────────────────────────────────────────────────────┐
│       PhoenixBIOS Setup - Copyright 1985-94  Phoenix Technologies Ltd. │
│   Main          Advanced      Security       Exit                     │
│                                              Item Specific Help       │
│   Supervisor Password is     Disabled                                 │
│   User Password is           Disabled        Press <Enter> to set a   │
│   Set Supervisor Password    [Press Enter]   new supervisor level     │
│   Set User Password          Press Enter     password.  The setup     │
│                                              will then be password    │
│   Password on Boot:          [Disabled]      protected.  The          │
│                                              supervisor password can  │
│   Diskette access:           [User]          only be changed by the   │
│   Fixed disk boot sector:    [Normal]        supervisor.  Once a      │
│                                              password is entered the   │
│                                              password feature will be  │
│                                              enabled.  The password    │
│                                              feature can not be        │
│                                              disabled.  Please write   │
│                                              down the password in a    │
│                                              safe place.               │
│                                                                        │
│   F1  Help  ↑↓Select Item    -/+ Change Values    F9 Setup Defaults   │
│   Esc Exit  ←→Select Menu    Enter Select Sub-Menu  F10 Previous Values│
└─────────────────────────────────────────────────────────────────────┘
```

Figure 4-7 Security Setup Screen

Supervisor Password is

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

User Password is

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

Set Supervisor Password

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

```
┌──────────────────────────────────────────────────────────────┐
│   PhoenixBIOS Setup - Copyright 1985-94  Phoenix Technologies Ltd. │
│  Main          Advanced      Security      Exit               │
│                                                                │
│                                                                │
│                                                                │
│                    Set Supervisor Password                     │
│               Enter new password:    [            ]           │
│              Re-enter new password:  [            ]           │
│                                                                │
│                                                                │
│                                                                │
│                      Enter Accepts                             │
│                       ESC Aborts                               │
└──────────────────────────────────────────────────────────────┘
```

Figure 4-8 Supervisor Password Submenu

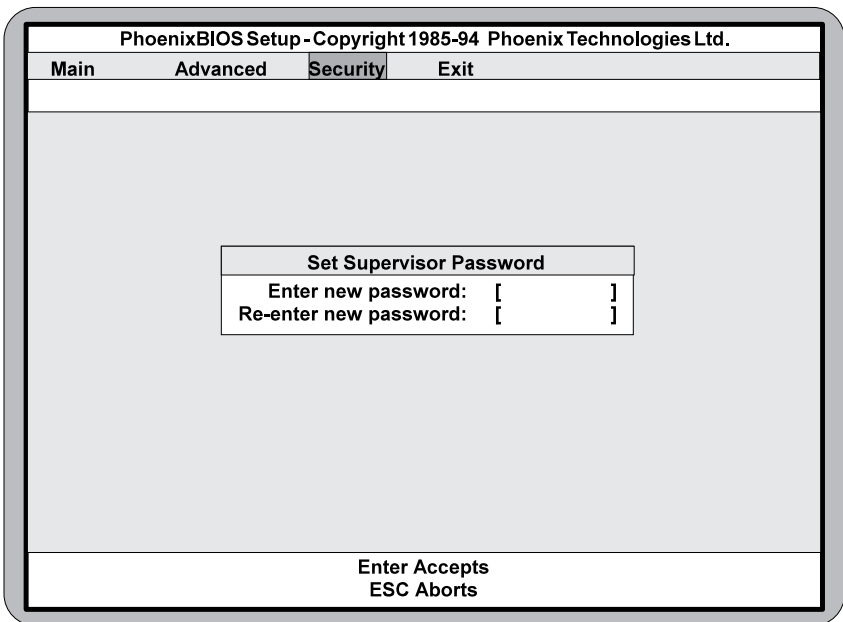Type the password and press the <Enter> key. Retype the password and press the <Enter> key again. Write down the password somewhere safe so it will not be forgotten. The password may be disabled by setting the new password to nothing (pressing the <Enter> key without first typing a password).

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

Set User Password

Follow the same procedure used to set the Supervisor Password.

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

Password on Boot

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

Diskette Access

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

Fixed Disk Boot Sector

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

Power Screen

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

```
        PhoenixBIOS Setup - Copyright 1985-94  Phoenix Technologies Ltd.
    Main          Advanced       Security      Power       Exit

                                                     Item Specific Help
    APM:                          [Disabled]
    Power Management Mode:        [Disabled]

    Standby Timeout:              [Disabled]
    Suspend Timeout:              [Disabled]
    Standby CPU Speed:            [Disabled]
    Fixed Disk Timeout:           [Disabled]
    CRT Standby:                  [Disabled]

    Standby Break Events:

    IRQ3:                         [Disabled]
    IRQ4:                         [Disabled]
    IRQ5:                         [Disabled]
    IRQ7:                         [Disabled]
    IRQ9:                         [Disabled]
    IRQ10:                        [Disabled]
    IRQ11:                        [Disabled]
    IRQ12:                        [Disabled]

    F1  Help   ↑↓Select Item    -/+ Change Values      F9 Setup Defaults
    Esc Exit   ←→Select Menu    Enter Select Sub-Menu  F10 Previous Values
```
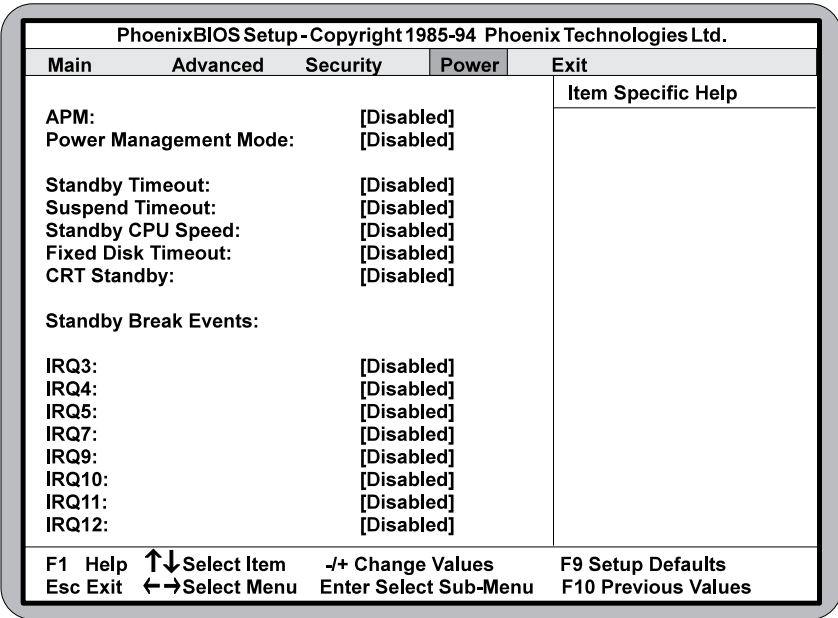
Figure 4-9 Power Screen

APM

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

Power Management Mode

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

Standby Timeout

The Standby Timeout category is used to set the amount of time that must elapse for the system to enter the power saving mode. The options are

Disabled (default), 1 min., 15 min., 30 min., 45 min., 60 min., 2 Hr., 3 Hr., or 4 Hr.. Before making changes, "Customized" must be selected in the Power Management Mode category.

Suspend Timeout

The Suspend Timeout category is used to set the amount of time that must elapse after the Standby Timer is activated. The options are Disabled (default), 1 min., 15 min., 30 min., 45 min., 60 min., 2 Hr., 3 Hr., and 4 Hr.. Before making changes, "Customized" must be selected in the Power Management Mode category.

Standby CPU Speed

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

Fixed Disk Timeout

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

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

CRT Standby

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

Exit Screen

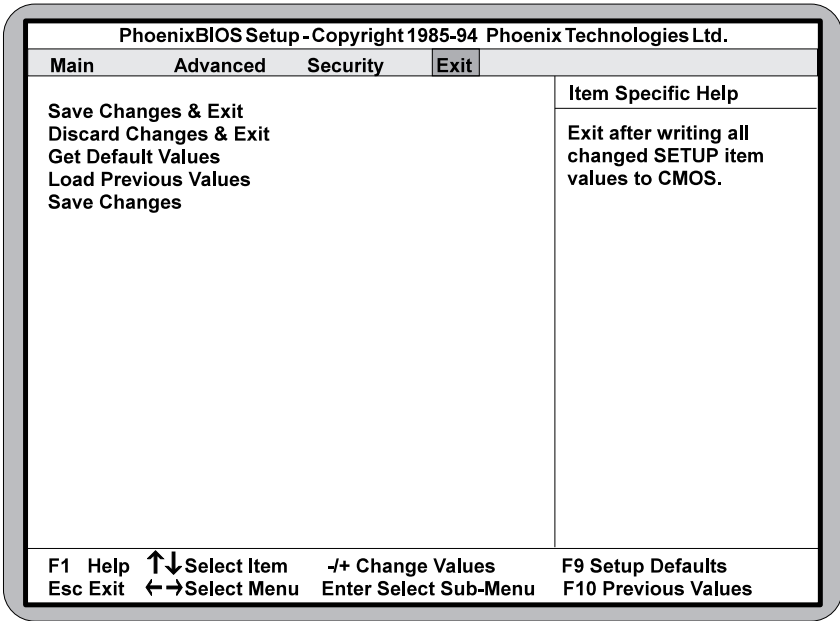After you have completed configuring the BIOS, select the Exit Screen (Figure 4-10).

```
    PhoenixBIOS Setup - Copyright 1985-94  Phoenix Technologies Ltd.
   Main          Advanced      Security      Exit
                                                    Item Specific Help
   Save Changes & Exit
   Discard Changes & Exit                   Exit after writing all
   Get Default Values                       changed SETUP item
   Load Previous Values                     values to CMOS.
   Save Changes




   F1  Help   ↑↓ Select Item   -/+ Change Values      F9 Setup Defaults
   Esc Exit   ←→ Select Menu   Enter Select Sub-Menu  F10 Previous Values
```

Figure 4-10 Exit Screen

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

Click here to continue to the next chapter.....
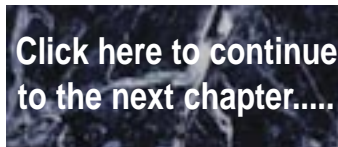
5 Installing Graphics Accelerator Software

The LPX54 comes standard with the ATI *mach64* video chip on board. The *mach64* chip is a 64-bit graphics accelerator offering superior video performance. Certain utilities must be run before using the *mach64*. For optimal performance, install the utilities completely.

Preparation

Make sure that no hardware (internal modems, fax cards, or LAN cards) are using addresses between the range of 2E0 to 2EF, such as COM 4 (2E8). If they are occupied, change the device(s) to a different range outside of 2E0 through 2EF.

Make sure LAN cards, scanner cards and other adapters are not using memory addresses between C0000 and C7FFF. Check and record the amount of memory installed on the system board.

Review the CONFIG.SYS file to determine if a Memory Manager Device driver is loaded. Memory Manager Device drivers (for example; EMM386, QEMM, and 386MAX) may interfere with the *mach64* installation. Install the Memory Manager after the *mach64* is completely loaded.

Installation

Perform the following steps to install *mach64* graphic utilities:

1. Turn on the monitor and then the computer. (This allows *mach64* to read the monitor type from the monitor during power-up for proper card operation).

2. From the DOS prompt, insert Disk 1 of the utilities into the appropriate floppy drive.

3. From the drive where the utilities diskette is located, type INSTALL and press <Enter>.

4. After the INSTALL program is initialized and loaded, the Main Menu appears (see Figure 5-1).
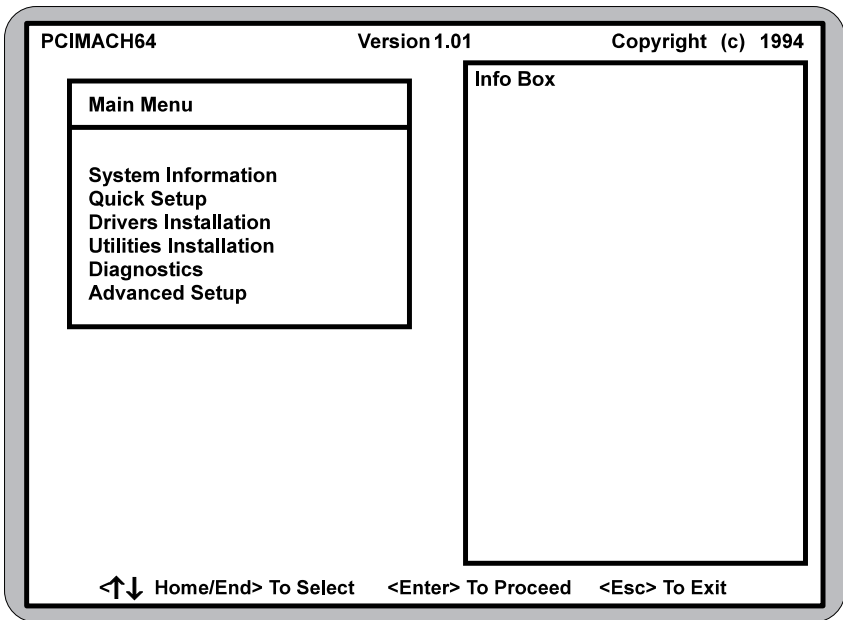
```
 PCIMACH64                  Version 1.01            Copyright  (c)  1994

                                          Info Box
         Main Menu

         System Information
         Quick Setup
         Drivers Installation
         Utilities Installation
         Diagnostics
         Advanced Setup









         ↑↓ Home/End> To Select    <Enter> To Proceed    <Esc> To Exit
```

Figure 5-1 Main Menu

Main Menu Options

System Information-Checks your system configuration, displays detailed information, including boot-up files and any possible conflicts, based on your current system configuration and the card you are installing.

Quick Setup-Sets the card to an optimal configuration using the information acquired during system checking.

Drivers Installation-Installs enhanced graphics and multimedia drivers for popular operating system checking.

Diagnostics-Tests the proper functioning of your card in both VGA and accelerated display modes.

Advanced Setup-Should only be attempted by experienced computer users. Although some settings may improve the performance of your card, they may not be fully compatible with your system or specific software applications.

System Information

This program checks the system for possible conflicts and displays the card configuration in the INFO BOX. If a conflict exists, it issues a warning and suggests possible corrective actions. Perform the following steps to check your system:

1.   From the Main Menu, select SYSTEM INFORMATION by highlighting the selection and pressing <Enter>**.**

2.   Review the information in the INFO BOX and take any necessary action as directed.

Quick Setup

You must specify a monitor in QUICK SETUP. Proper monitor selection is necessary for correct resolution and refresh rate operation. Information on display modes supported by the highlighted monitor are displayed in the INFO BOX. Perform the following steps to install the monitor type:

1.   Select QUICK SETUP from the Main Menu by highlighting the selection and pressing <Enter>. A Monitor Selection Menu will appear (see Figure 5-2).

2.   Using the <↑/↓> keys, scroll the monitor list to highlight your monitor. If found, press <Enter> to select. If your monitor is not listed, follow step a) or b) described below:

        a) If a VESA Display Information Format file (VDIF) is available for your monitor, INSTALL can read it and get the necessary parameters to set up the card for optimal monitor operation. To do so, insert the disk containing the VDIF file into your floppy drive. Select READ VDIF... from the Monitor Selection Menu.

Change the DOS directory prompt to the drive containing the disk. INSTALL will   read the file and configure *mach64* to support your monitor.

b) Select CUSTOM... to set up the card to any supported monitor specifications. You will need to manually test and configure each display mode separately. To do so, select CUSTOM... and press <Enter>. Select a resolution and press <Enter>. Pick a refresh rate that matches the specification of your monitor and press <Enter> to bring up the Adjustment Screen. If the monitor does not display a proper Adjustment Screen at the lowest refresh rate, set the resolution to Not Supported.

Warning:
Do not exceed the monitor specifications. Using a refresh rate (i.e., vertical frequency) that is higher than specified may damage your monitor.

A scrambled screen indicates your monitor is not capable of the selected display mode. In which case, immediately press <Esc> to exit.
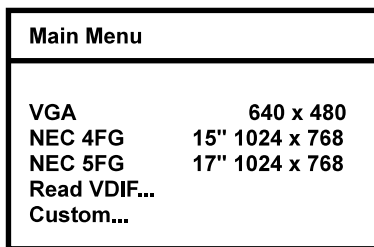
```
Main Menu


VGA                    640 x 480
NEC 4FG        15" 1024 x 768
NEC 5FG        17" 1024 x 768
Read VDIF...
Custom...
```

Figure 5-2 Monitor Selection Menu

Drivers Installation

Selecting this option brings up the INSTALL ENHANCED DRIVERS menu for installing ATI enhanced drivers. See Chapter 6 for detailed instructions.

Utilities Installation

This procedure is for copying the utilities and the INSTALL program to your hard drive. The boot files can be modified automatically so you can run these programs from any directory. Perform the following steps to run the UTILI-TIES INSTALLATION program:

Note:
It is recommended that you accept the defaults suggested during installation.

1.   Select UTILITIES INSTALLATION from the Main Menu by using your arrow keys to highlight it and pressing <Enter>.

2.   Enter the destination drive and directory and press <Enter>.

3.   Enter the source drive and press <Enter>.

4.   Utilities are in the root directory of the Install Disk #1. Accept the prompt for the root directory and press <Enter> to start copying.

5.   When prompted for the boot drive, enter your boot drive (i.e., C) and press <Enter>.

6.   To run the INSTALL program from any directory (in DOS), you must add the location of the utilities to the PATH statement in the AUTOEXEC.BAT file. The default directory name used by this installation is C:\MACH64.

7.   When finished, press <Esc> and exit from the Main Menu.

8.   Changes made to the boot files (CONFIG.SYS and AUTOEXEC.BAT) are active only if you reboot the computer. If you encounter errors or suspect the hard disk is full, refer to the Troubleshooting section in this chapter or your DOS manual for information.

Diagnostics
From this menu, you can test the various operations and circuitry of the *mach64*. The diagnostics screen can be displayed at any supported resolution and color depth for testing. These tests support mouse and keyboard operations and directions are displayed on the screen. Errors found by testing are discussed in the Troubleshooting section of this chapter.

Advanced Setup
The number of options in the Set Power-Up Configuration menu (see Figure 5-3) depends on the card type (i.e., ISA, VLB, or PCI). To set up these options, use the arrow keys to highlight ADVANCED SETUP and press <Enter>, then set the options to match your monitor and system type. If you need help, press <F1>.

Warning:
The Advanced Configuration option allows you to use certain features may add additional performance to your card; however, these options may not be compatible with your system. If problems occur after an advanced option is changed, return the card to factory defaults to correct them.

Set Power-Up Configuration
Monitor Type   VGA 60Hz 640x480 Power-Up Video Mode   VGA (CV80) Color pri.
<Shift>+<F7> Factory Defaults   <F10> Save   <Esc> To Return

Figure 5-3 Set Power-Up Configuration Menu

Advanced Setup Options

Monitor Type-Lets you specify a monitor type as you did in QUICK SETUP.

Power-Up Video Mode-This card can be configured to power up in VGA color or VGA monochrome.

⊕   *Auto Select*-This option automatically chooses a suitable mode for your system.

⊕   *16-bit*-All coprocessor accesses are 16-bit wide. Certain computer systems may lock up when in this mode. If this happens, select 8-bit Host.

⊕   *8-bit Host*-Only data transfers between the host bus and graphics memory are 8-bit; otherwise, coprocessor operations are 16-bit. If your computer has compatibility problems with this setting, select 8-bit.

⊕   *8-bit Host*-I/O operations are 8-bit.

The card can be reset to factory defaults by pressing <Shift><F7>. Once you have finished configuring the necessary parameters described above, save them to the card by pressing <F10>. If you choose not to save the current configuration changes, press <Esc> and choose Discard when prompted. The card then reverts to the previously saved settings in EPROM (or to factory defaults if the card had never been configured).

Troubleshooting

Listed below are several checks you can make to help determine the cause of any problems:

System Lockup

⏣ If you are using a memory manager such as QEMM or 386MAX, you need to modify the command line in the CONFIG.SYS file so the address of the graphics card video BIOS, C0000-C7FFF, is excluded. For example, add "X=C000-C7FF" to the command line

⏣ Remove all unnecessary boards.

⏣ Disable shadow RAM.

⏣ Ensure the board is seated correctly and the card has been installed using proper utilities.

⏣ Try the card in a different system and reset to factory defaults using the INSTALL program. If the card works in another system, the problem is likely due to incorrect configuration.

Test Patterns OK; Applications Do Not Sync

⏣ The wrong monitor type has been selected. Change the settings in the INSTALL program.

Window Driver Not Installing Properly

⏣ Windows must be running in 386 Enhanced Mode. Incompatible commands or options within CONFIG.SYS may prevent Windows from starting in enhanced mode. If this occurs, remove the offending driver or reinstall the memory manager software.

AutoCAD Driver Not Installing Properly

⏣ If using a 386, ensure AutoCAD has been configured for the appropriate ADI driver. The protected mode driver requires extended memory.

Error Codes and Messages

Table 5-1 lists problems and solutions for some common errors found by the test program.

Problem	Solution
EPROM BIOS failure	Try reinstalling or run the diagnostics using the **/F** switch. This returns the card to factory settings: **M64DIAG /F <Enter>**.
Memory aperture test failure, diagnostics program locks, or reboots during test (ISA card only)	If you receive an error message indicating the memory aperture location is conflicting with your system memory, restart the INSTALL program as follows**: INSTALL APMP <Enter>**. Now when you enable Memory Aperture, you must select a location *above but not overlapping* System Memory (S), BIOS (B), or Reserved (R) locations. If the problem is due to address limitations inherent with the ISA bus architecture (i.e., aperture + system RAM exceeds 16MB, disable aperture).
Desired resolution is disabled and displays in gray	A mode displayed in gray means the BIOS is told this mode is not available, based on the card configuration. Reinstall using custom monitor selection.
Menu item is disabled and displays in gray	The test program has determined the mode or test is not available under current configuration. Aperture tests are not available if the aperture is disabled, and CRT mode and pixel depth are determined by current installation, DAC type, and memory size and type.

Table 5-1 Error Codes and Messages

| Problem	Solution
Adapter not detected	This message should only occur when a *mach64* ASIC is not detected. If this message occurs and a *mach64* board is present, it may indicate an I/O conflict exists between Extended Memory Manager (EMM and Video ROM). Try removing all other boards from the system and booting from a plain DOS disk. Try excluding the video BIOS address (C0000-C7FFF) from the memory manager. Refer to the documentation furnished with the memory manager software for information.
Any FIFO test error	The effects of a bad command FIFO should be visible (e.g., the screen does not come up, or it displays garbage.)
Quick memory test error	Run Detailed RAM Test to confirm the error and identify address of the error.
Detailed memory test error	Run Detailed RAM Test several times to confirm the error and take notes of any messages and error codes.
DAC LUT test failure	An error has occurred while testing the DAC LookUp Table. The problem should be visible on the top color bar of any 8bpp mode.
ROM checksum error	An error has been detected in the ROM.
Draw sequence failure	An error has occurred in the draw engine. If the error is intermittent, it might indicate a marginal RAM failure. The effects of this failure may not be immediately apparent.

Table 5-1 Error Codes and Messages (Cont'd)

The information provided in this user guide enables you to solve most problems. For further assistance, please contact your vendor.

The following error message may appear when the INSTALL program is programming the EPROM:

```
Selected Memory Aperture Configuration May Conflict...
```

Ignore this message if the system has 12MB or more system memory and the Memory Aperture feature is disabled. If the system CMOS configuration has Video BIOS Shadowing enabled, reboot the system once the programming of the EPROM has been completed. If this message does not appear, continue the installation procedure.

Click here to continue to the next chapter.....
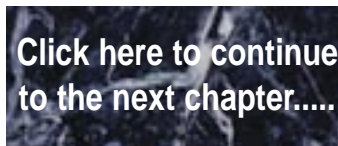
6 Installing Video Drivers

A README file is provided for each application driver in the *mach64* installation disks. These files summarize the latest product revisions, contain directions for installation, and use of enhanced drivers. For added convenience, you can load and print README files using any word processor after their corresponding drivers have been installed.

README files for AutoCAD and MicroStation drivers are automatically displayed as you install the drivers. If you install the driver for Microsoft Windows, a README icon will be installed and placed in a program group called "*mach64* DeskTop." Click on this icon for feature and usage information about the driver.

Installation

Applications use video device drivers to display data on the screen. The *mach64* drivers give you more screen resolutions and color depths than standard device drivers. Furthermore, *mach64* supports IBM standard VGA and VESA drivers that normally come with most major software packages. To fully utilize the enhanced speed, resolution, color depth, and other features of this chip, you should use *mach64* drivers.

Note:
To conserve hard disk space, install only the drivers you use. You may require application software disks during driver installation.

De-Installation

This installation program allows you to effortlessly de-install some *mach64* drivers and return your application or operating environment to VGA support. This feature is available for Windows 3.1 and OS/2 Manager. Details are given in the respective sections.

Microsoft Windows 3.1

The *mach64* driver for Windows delivers increased performance at high resolutions and color depths. You need to install this driver using the steps outlined below.

The DRIVERS INSTALLATION option in the Main Menu sets **FlexDesk+** and **WinSwitch** automatically. FlexDesk+ customizes the operational/display settings of the driver. WinSwitch adds the capability of switching screen resolution and/or colors with a key.

De-Installation Procedure

Skip this section if you have not previously installed any *mach64* window driver. The program removes all existing driver from your hard disk and cleans up all associated Windows and MVA files.

Perform the following steps to de-install driver using Microsoft Windows 3.1:

1.   Record the location of the Windows application.

2.   Run the *mach64* installation program and SELECT DRIVERS INSTALLATION from the Main Menu.

3.   From the list of applications:

        a) Select Microsoft Windows
        b) De-Install Windows 3.1 driver
        c) Follow screen instructions to completion.

Installation Procedure

Perform the following steps to install drivers using Microsoft Windows 3.1:

1.   Ensure your card has been installed and configured as described in Chapter 5 before continuing with this procedure.

2.   Start Microsoft Windows to ensure it is properly installed, then quit Windows.

3.   Run the *mach64* installation program and SELECT DRIVERS INSTALLATION from the Main Menu.

4.   From the list of applications:

      a) Select MICROSOFT WINDOWS.
      b) Select INSTALL WINDOWS 3.1 DRIVER and note the
         messages.
      c) Follow screen instructions to completion.

5.   After copying is done, record the Windows setup instructions, then press <Esc> to exit.

6.   Exit the INSTALL program and restart Windows.

7.   The ATI DeskTop icon is created automatically during driver installation. Select it to customize the look-and-feel of Windows.

AutoCAD 386 R10/R11/R12

Perform the following steps to install driver using AutoCAD 386:

1.   Run AutoCAD 386 (protected mode) to ensure it is properly installed on your system. Note the directory location of the AutoCAD program files before you start the *mach64* installation program. You will need this information later.

2.   Run the *mach64* installation program and SELECT DRIVERS INSTALLATION from the Main Menu.

3.   From the list of applications, select AutoCAD. When asked for source drive and directory, type in the information and insert requested diskettes.

4.   Follow instructions on the screen to install the DLXpress driver.

5.   When driver installation is completed, exit the installation program. Run ADIACAD.BAT to set the necessary driver parameters for the DOS environment as follows:

      ADIACAD <**Enter**>

     ADIACAD.BAT was created by the *mach64* installation program for your convenience. The parameters it sets must be in the environment before you start AutoCAD.

> **TIP:**   If you are using a batch file to start AutoCAD, consider adding ADIACAD to your batch file.

6.   Start AutoCAD and reconfigure it to use the enhanced display list driver. For example, if you start AutoCAD using a batch file called ACADR12.BAT, type:

         ACADR1 -R <**Enter**>

         The "-R" parameter is supported only by AutoCAD release. For other releases, refer to your AutoCAD manuals.

         Documentation for the DLXpress driver is provided on the installation diskette. See the README.DLX file for details.

IBM OS/2 Presentation Manager 2.1

Installation Procedure

Perform the following steps to install driver using the IBM OS/2:

1.   Start OS/2 2.1 to ensure that it uses the Video Graphics Array (VGA) driver before continuing with this procedure.

2.   Insert the *mach64* installation disk #1 into a floppy drive.

3.   Open the DOS Full Screen icon.

         The *mach64* installation program does not run in a DOS window. The DOS Box must be Full Screen for successful operation.

         Do not switch out of Full Screen to run Diagnostic Tests. Doing so will result in a corrupted display.

4.   Type: **A:\INSTALL** <Enter> (For drive B, substitute **B:** for **A:**)

5.   Select DRIVERS INSTALLATION from the Main Menu.

6.   This will copy the *mach64* driver to the MACH_OS2 directory.

7.   Open an OS/2 Window or OS/2 Full Screen icon and type: **DPINSTL** <Enter>.

8.   When the Display Driver Install panel appears, select Primary Display and choose OK to bring up the selection list.

9.   Select ATI Technologies *mach64* from the list and choose OK.

10.   When the source directory panel appears, choose Change. Select the drive and directory where the *mach64* driver resides (e.g., C:\MACH_OS2) then choose Set and Install.

11.   After the driver is installed, do a shut down, then restart OS/2.

12.   The OS/2 driver will first come up as 640x480 in 256 colors. Perform the following steps to change screen resolution and/or color depth:
     a) Open the "OS/2 System" icon.
     b) Open the "System Setup" icon.
     c) Open the "System" icon.
     d) Select the "Screen" tab in the "System-Settings" window.
     e) Select desired resolution and color depth from list.
     f) Close the "System-Settings" window.
     g) Do a shutdown of OS/2, then restart your computer.

Note:
The resolution you select for the OS/2 driver must be a supported and enabled resolution as defined by the Monitor Type setting chosen in the mach64 *installation program.*

De-Installation Procedure

Perform the following steps to de-install driver using IBM OS/2:

1.   Open an OS/2 Window or OS/2 Full Screen icon and type:
       DPINSTL <Enter>

2.   Select "Video Graphics Array (VGA)" as the Primary Display. The Source Directory panel appears.

3.   Insert the OS/2 Display Driver disk in the floppy drive. Select the drive and directory where the VGA driver resides (typically A: or B:), choose Set, then choose Install.

4.   After the driver is installed, do a shutdown of OS/2, then restart your computer.

Continue with the following steps if you wish to remove *mach64* files from your hard disk.

5.   Open the DOS Full Screen icon.

6.   Change to the *mach64* directory and type: **INSTALL**<Enter>

7.   Select DRIVERS INSTALLATION from the Main Menu.

8.   Select IBM OS/2 from the list of applications.

9.   Select UN-INSTALL OS/2 Driver, then follow instructions on the screen.

Intergraph MicroStation 4.0

Perform the following steps to install driver using Intergraph MicroStation.

1.   Ensure that MicroStation is properly installed on your system before continuing with this procedure.

2.   Run the *mach64* installation program and SELECT DRIVERS INSTALLATION from the Main Menu.

3.   From the list of applications, select MicroStation. Enter the source drive and directory information, then insert the disk prompted.

4.   Follow the instructions on screen to complete the driver installation.

5.   When driver installation is completed, press <Esc> to exit.

6.   Refer to the README.USD file that has been copied to your MicroStation directory for instructions and driver configuration details.

Microsoft Windows NT

Installation Procedure

Perform the following steps to install driver using Microsoft Windows NT:

1.   Run the Windows NT Setup program. It is located in the Program
        Manager Main window.

2.   Insert the ATI installation disk marked Windows NT Driver into your
        floppy drive.

3.   Select Other, and supply the Setup program with the location of the
        NT files (i.e., B:\NT if using drive B). The program will install the
        ATI driver.

4.   Restart Windows NT.

Note:
If the NT driver resolution selected is not supported, the display reverts to
640x480 regardless of the resolution setting selected in the Presentation
Manager driver setup.

De-Installation Procedure

You may de-install the *mach64* driver for Windows NT using either of the
following steps:

1.   In the WINNT\SYSTEM32\DRIVERS directory, rename the
        ATI.SYS file, for example, to ATI.ATI. When you restart Windows
        NT, it will not find ATI.SYS, and boot up in VGA.

2.   Run the Windows NT Setup program and select a non-ATI driver, for
        example, a VGA-Compatible driver. When you restart Windows NT,
        it boots up with the non-ATI driver you just selected.

Microsoft Word (for DOS) 5.x, 6.0

Mach64 drivers for Microsoft Word support 640x480, 800x600, and
1024x768 screen resolutions in 16 colors. Perform the following steps to
install driver using Microsoft Word:

1.   Run Microsoft Word to ensure it is properly installed on your
        system before continuing with this procedure.

2.   Run the *mach64* installation program and SELECT DRIVERS
        INSTALLATION from the main menu.

3.   From the list of applications, select Microsoft Word.

4.   Select an appropriate Word program version.

5.   Follow the instructions on screen to complete the driver installation.

6.   When driver installation is completed, press <Esc> to exit.

7.   Refer to the README file that has been copied into your Word
        directory for instructions and driver configuration details.

WordPerfect (for DOS) 5.x, 6.0

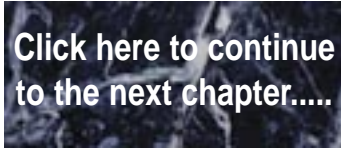## WordPerfect Versions 5.0 and 5.1

The *mach64* drivers for WordPerfect 5.x support 800x600 and 1024x768
screen resolutions in 16 colors. Perform the following steps to install driver
using WordPerfect Versions 5.0 and 5.1:

1.   Run WordPerfect to ensure that it is properly installed on your system
        before continuing with this procedure.

2.   Run the *mach64* installation program and SELECT DRIVERS
        INSTALLATION from the Main Menu.

3.   From the list of applications, select WordPerfect.

4.   When prompted, insert the disk and enter the source drive and
        directory information of the disk.

5.   When asked, enter the directory where WordPerfect is installed.
        Press <Enter> to copy the necessary driver files to that directory.

6.   When driver installation is completed, press <Esc> to exit.

7.   Run the WordPerfect Setup program to select this enhanced driver, as
        follows:

        a) Run WordPerfect, press <Shift><F1> for the Setup option.
        b) Press <D> for Display.
        c) Press <G> for Graphics Screen Type.
        d) Select the *mach64* driver and press <Enter>.

WordPerfect Version 6.0

This chip supports the VESA SVGA BIOS Extension which supports several high resolution display modes. Perform the following steps to install driver using WordPerfect Version 6.0:

1.   The *mach64* accelerator must be set up for the resolution intended to use.

2.   Run the WordPerfect Setup program to select a VESA display mode as follows:

       a) Run WordPerfect, press <Shift><F1> for the Setup option.
       b) Press <D> for Display.
       c) Press <G> for Graphics Screen Type.
       d) Press <S> for Screen Type.
       e) Select VESA VBE (VESA BIOS Extension) and press <S>.
       f) Select one of the displayed modes and press <S>. A Driver
         Warning dialog may appear; if so, consult the WordPerfect
         documentation for information.
       g) Press <Enter> as prompted. When you exit the Setup program,
         you should be in the selected mode. If not, repeat Step1 to check if
         the card is correctly configured for this resolution.

Click here to continue to the next chapter.....

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 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 LPX54 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. 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 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.

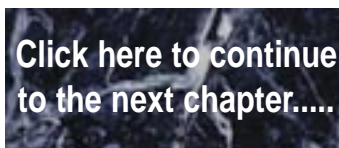| Beep code	Contents Port 80h	Description
2-4-3	1Eh	Bit 14 first 64K RAM failure.
2-4-4	1Fh	Bit 15 first 64K RAM failure.
3-1-1	20h	Slave DMA register failure.
3-1-2	21h	Master DMA register failure.
3-1-3	22h	Master interrupt mask register failure.
3-1-4	23h	Slave interrupt mask register failure.
None	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.

Click here to continue to the next chapter.....

C **Hard Disk Drive Types**

The following table lists the hard disk types supported by LPX54.

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

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

D Specifications

Processor	90MHz or 100MHz Pentium processor.
Chipset	VLSI.
CPU Clock Select	Frequency synthesizer chip. Jumper selectable CPU selection.
Form Factor	Baby AT footprint (8.5" x 13").
Expansion	One ISA/VL slot. Riser card allows 3 ISA and 2 PCI slots (slot configuration may vary depending on case design).
BIOS	Phoenix 4.04 Plug and Play BIOS on 1MB Flash EPROM. Mode 3 IDE drive support. Auto-detection of memory size. Auto-configuration of IDE hard disk drives.
RAM Capacity	128MB.
Keyboard	PS/2.
Mouse	Built-in PS/2 support.
Internal Cache	16K.
External Cache	256K or 512K write-back.

I/O Ports	Built in support.
	Two high speed serial ports (16550 compatible).
	One bi-directional parallel port.
	    Enhanced Parallel Port (EPP) compatible.
	    Microsoft and Hewlett Packard Extended Capabilities Port (ECP) compatible.

Built-in Video	ATI 68800 *mach64* LX
	1MB DRAM frame buffer
	Resolutions Supported:
	640x480 (65,536 colors)
	800x600 (256 colors)
	1024x768 (256 colors)
	1280x1024 (16 colors)
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.
	Multiple sector transfer support.
	LBA support.

Environmental Specifications

The environment in which the LPX54 is located is critical. Micronics recommends the following environmental specifications:

Temperature Range

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

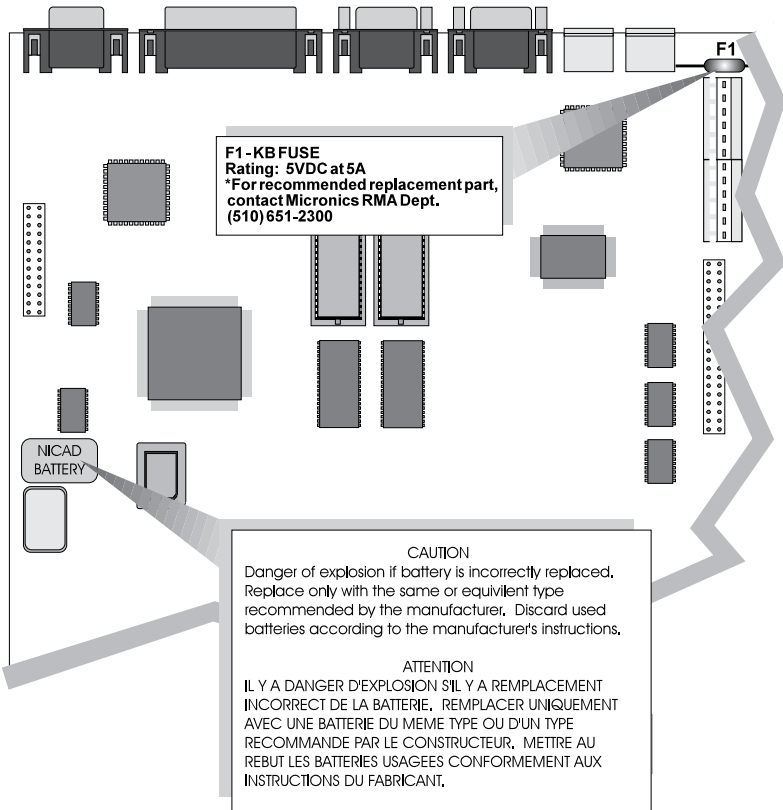Non -Operating: 50 to 140 degrees Fahrenheit (10 to 60 degrees Celsius).

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

Relative Humidity

Operating: 20% to 80%

Non-Operating: 5% to 90%

Battery Disposal

F1 - KB FUSE
Rating: 5 VDC at 5A
***For recommended replacement part,**
contact Micronics RMA Dept.
(510) 651-2300

NICAD
BATTERY

CAUTION
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivilent type
recommended by the manufacturer. Discard used
batteries according to the manufacturer's instructions.

ATTENTION
IL Y A DANGER D'EXPLOSION S'IL Y A REMPLACEMENT
INCORRECT DE LA BATTERIE. REMPLACER UNIQUEMENT
AVEC UNE BATTERIE DU MEME TYPE OU D'UN TYPE
RECOMMANDE PAR LE CONSTRUCTEUR. METTRE AU
REBUT LES BATTERIES USAGEES CONFORMEMENT AUX
INSTRUCTIONS DU FABRICANT.

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.

**Click here to continue
to the next chapter.....**

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.

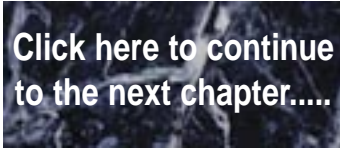To meet FCC requirements, shielded cables and power cords are required.

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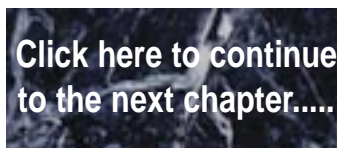
Glossary

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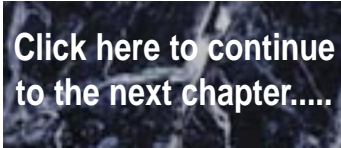
Micronics will not be liable for any lost profits or any indirect, special incidental or consequential damages in connection with the product, even if Micronics has been advised of the possibility of such damages.

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, service is still available for Micronics products. For more information, contact Micronics' RMA department at (510) 683-0428 or (510) 683-0545. The RMA department is open between 8:30 A.M. and 5 P.M. Pacific Standard Time.

User's Comment Form: LPX54

What do you like about this manual?

_____

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What would you change in this manual?

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Mail comments to:
Micronics Computers, Inc.
Technical Publications Department
232 E. Warren Avenue
Fremont, CA 94539

Name: _____   Dealer:_____

Title: _____   Date:_____

Company: _____   Telephone: _____

Address:_____

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