



LPM30 Multimedia System Board Manual

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232 E. Warren Ave., Fremont, CA 94539-7085

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Micronics Quick Installation

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

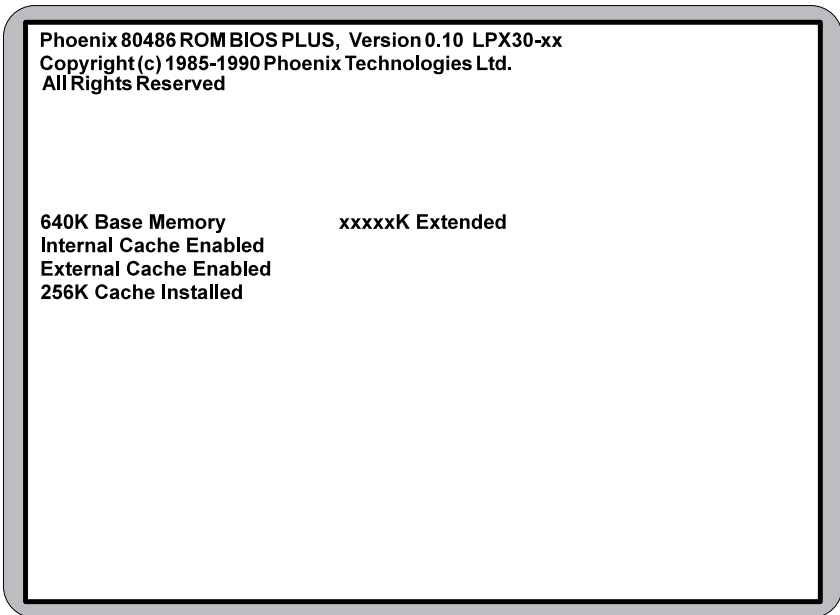
1. Ground yourself to prevent damaging static discharge, then remove the LPM30 from its packaging.
2. Check the voltage of your CPU and install a Power Module, if necessary. See Chapter 2 for information on whether or not you will need a Power Module.

Warning:

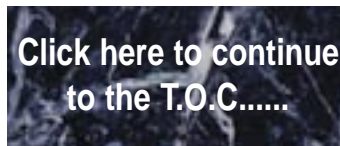
This system board has been factory set to support 5.0V processors. If using a 3.3V or 4.0V processor, you must install a Power Module (Appendix E). Failure to install a Power Module could result in damage to the CPU.

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 of the necessary case connections.
6. Install a riser card (if needed). Install any peripherals or peripheral cards. Connect the power cords, the monitor, the mouse, sound devices, and any other external peripherals to the appropriate port (Chapter 3). Do not replace the computer cover until you have verified the system is working properly.

7. Turn the computer on and press the <Ctrl>, <Alt>, and <Esc> keys simultaneously after you see the screen below:



8. Set the time and date. Adjust the BIOS settings to match what is installed in your system. If installing an IDE drive, select the IDE device you wish to configure. Select AUTO CONFIG and the BIOS will automatically configure the drive for you. (Chapter 4)
9. After you have configured the BIOS settings, press the <Esc> key followed by the <F4> key to save the changes and exit. The system will reboot.
10. Install the video drivers provided with the system (Chapter 5 and 6).
11. If you are installing a CD-ROM, install the drivers that came with the CD-ROM. (Refer to the documentation which came with the CD-ROM).
12. Run the SoundDrive 16 software drivers (Chapter 7).
13. The system is ready for use.



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1 Introduction

The LPM30 is an integrated, low-profile, LPX system board which allows you to create a multimedia system without any add-in cards or IRQ/DMA hassles. The LPM30 features VESA Localbus architecture, a Mode 3 IDE controller, 16-bit Sound Blaster compatible sound, and 64-bit graphics. The Micronics LPM30 system board represents Micronics' third generation of VESA Local Bus system boards and makes an excellent foundation for an advanced personal computer or workstation.

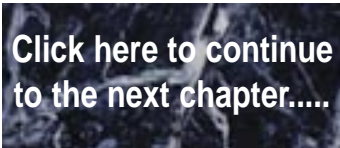
Micronics is a forerunner in VESA Localbus technology. The VESA Localbus Architecture provides high performance for Graphical User Interfaces (GUIs) and peripherals that perform high speed data transfers, such as disks and multimedia.

The LPM30 is also a **“Green Board”** which means it adheres to the Environmental Protection Agency's strict Energy Star efficiency guidelines. **The Green features are not available when a DX4-100MHz is installed.** See Chapter 4 for information and instructions on how to set up the “Green Section” of the BIOS.

Features

The LPM30 includes the following features:

- ⊗ LPX form factor system board.
- ⊗ Micronics' X30 chipset with an on-chip external level 2 cache controller.
- ⊗ One VL slot built onto the system board. Slot will accommodate a riser card which supports up to one VESA and four ISA peripheral cards.
- ⊗ On-board VESA Localbus video adapter, using the 64-bit ATI *mach64* graphics accelerator with 1MB of VRAM (2MB optional).
- ⊗ On-board 16-bit sound controller.
- ⊗ On-board feature connectors accept:
 - 14,400 Faxmodem module (optional).
 - Ethernet network adapter module (optional).
 - 3.3V and 4.0V power modules for low voltage CPU's.
- ⊗ Accepts up to 256K of external cache.
- ⊗ On-board Localbus IDE controller.
- ⊗ Floppy controller (supports 2.88MB, 1.44MB, 1.2MB, 720K, and 360K floppy drive).
- ⊗ Two high speed 16550 compatible serial ports.
- ⊗ Bi-directional parallel port which is EPP and ECP compatible.
- ⊗ Battery-backed real-time clock.
- ⊗ Supports the following processors in the CPU ZIF socket:
 - 486SX2, 50MHz
 - 486DX, 33MHz
 - 486DX2, 50 or 66MHz
 - 486DX4, 75 or 100MHz
 - Cyrix DX2/80 or DX/40
 - AMD DX40, DX2/80, or DX4/100



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

2 Configuring the LPM30

Although the LPM30 system board is packaged in protective materials, it is important to use care while unpacking and setting up.

Static Electricity

The LPM30 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 LPM30 via the solder pads surrounding one of its mounting holes.

Once the LPM30 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.

LPM30 Components

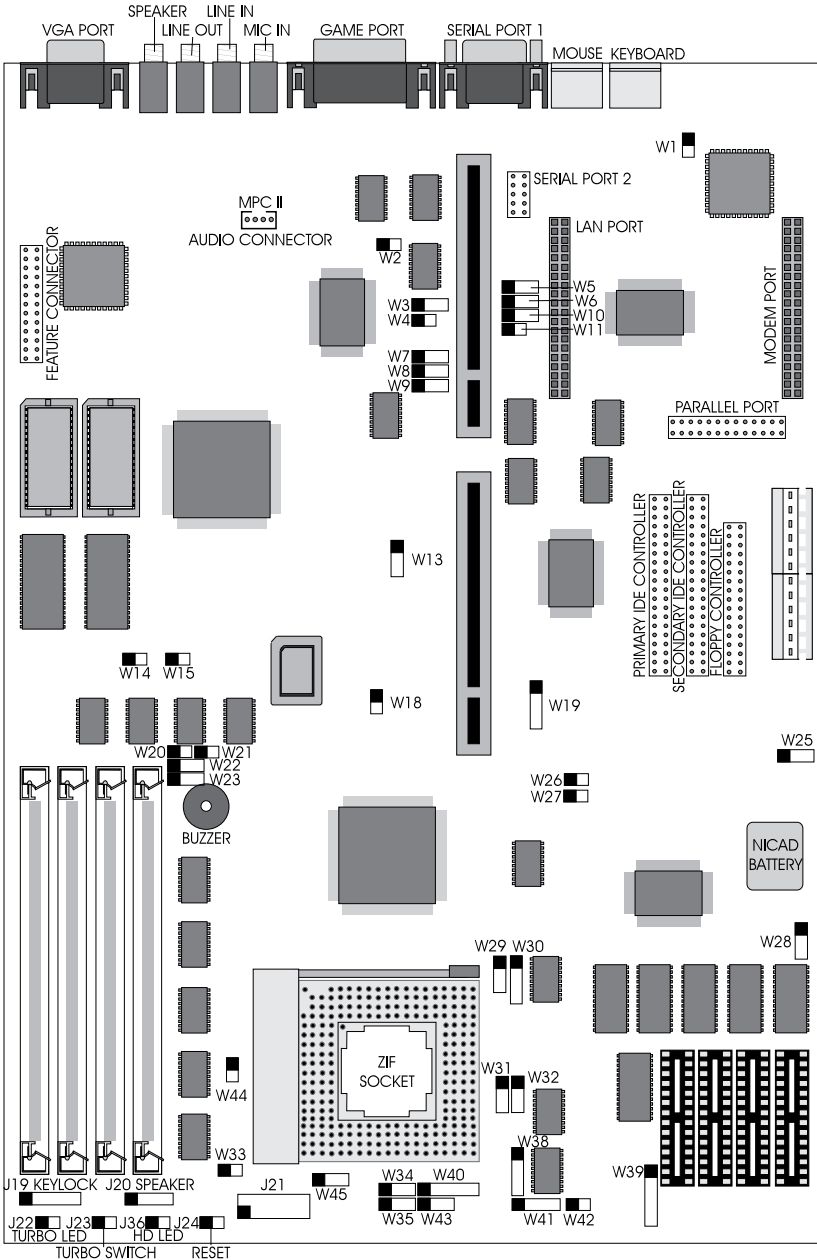


Figure 2-1 LPM30 System Board

CPU Voltage

Warning:

This system board has been factory set to support 5.0V processors. If using a 3.3V or 4.0V processor, you must install a Power Module (Appendix E). Failure to install a Power Module could result in damage to the CPU.

Table 2-1 lists the voltage requirements for CPUs supported by this system board.

| CPU | Manufacturer(s) | Voltage |
|----------------------------|-----------------|--------------|
| 486SX | Intel, AMD | 5.0V |
| 486DX | Intel, AMD | 5.0V |
| 486DX2 | Intel | 5.0V |
| 486DX2 | AMD | 3.3V or 5.0V |
| 486SL-series | Intel | 5.0V |
| Write-Back Enhanced 486DX2 | Intel | 5.0V |
| 486DX4 | Intel, AMD | 3.3V |
| Pentium OverDrive | Intel | 5.0V |
| Cyrix 486DX/DX2 | Cyrix | 5.0V |
| Cyrix 486DX2V-80 | Cyrix | 4.0V |

Table 2-1 CPU Voltage Requirements

Jumper Settings

Table 2-2 and 2-3 list the settings to select the CPU installed in your system.

| CPU | W22 | W23 | W30 | W31 | W32 | W33 | W34 |
|-------------------------------------|-----|-----|-----------|------|-----|-------|------|
| 486SX | 2-3 | 1-2 | 2-3 | 2-3 | 2-3 | open | open |
| 486DX/DX2 | 2-3 | 1-2 | 1-2 & 3-4 | 2-3 | 2-3 | open | open |
| 486SL-series | 2-3 | 1-2 | 1-2 & 3-4 | 2-3 | 2-3 | open | open |
| Intel Write-Back Enhanced 486DX2 | 1-2 | 1-2 | 1-2 & 3-4 | 2-3 | 1-2 | close | 1-2 |
| 486DX4 | 2-3 | 1-2 | 1-2 & 3-4 | 2-3 | 2-3 | open | open |
| Pentium OverDrive | 1-2 | 1-2 | 1-2 & 3-4 | 2-3 | 1-2 | open | open |
| AMD 486DX/DX2 | 2-3 | 1-2 | 1-2 & 3-4 | 2-3 | 2-3 | open | open |
| AMD DXL4 | 2-3 | 1-2 | 1-2 & 3-4 | open | 2-3 | open | 2-3 |
| Cyrix 486DX/DX2 | 1-2 | 2-3 | 1-2 & 3-4 | 1-2 | 2-3 | open | 1-2 |

Table 2-2 CPU Jumper Settings

| CPU | W35 | W38 | W40 | W41 | W43 | W44 | W45 |
|-------------------------------------|------|-----------|-----|--------------|-----|-------|------|
| 486SX | open | 3-4 | 4-5 | 3-4 | 1-2 | open | open |
| 486DX/DX2 | open | 3-4 | 4-5 | 3-4 | 1-2 | open | open |
| 486SL-series | 1-2 | 3-4 | 4-5 | 3-4 | 1-2 | open | open |
| Intel Write-Back Enhanced 486DX2 | 2-3 | 3-4 | 4-5 | 1-2 & 3-4 | 1-2 | open | open |
| 486DX4 | open | 3-4 | 4-5 | 3-4 | 1-2 | open | open |
| Pentium OverDrive | open | 2-3 | 1-2 | 3-4 | 1-2 | open | open |
| AMD 486DX/DX2 | open | 1-2 & 3-4 | 4-5 | open | 1-2 | close | 1-2 |
| AMD DXL4 | open | 1-2 & 3-4 | 4-5 | open | 1-2 | close | open |
| Cyrix 486DX/DX2 | open | 3-4 | 2-3 | 2-3 | 2-3 | open | open |

Table 2-3 CPU Jumper Settings (Cont'd.)

Note:

If you are using a 3.3V or 4.0V processor, you will need to install a special Power Module. See Appendix E for more information.

Table 2-4 lists the jumper settings to select the speed of the CPU installed in your system.

| Jumper \ Speed | 25MHz | 33MHz (default) | 40MHz |
|----------------|-------|--------------------|-------|
| W26 | open | open | close |
| W27 | open | close | open |

Table 2-4 CPU Speed Selection

Table 2-5 lists the jumper settings to select the size of the external cache.

| Jumper | Function | Setting |
|--------|----------|-----------|
| W39 | 128K | 1-2 & 3-4 |
| | 256K | 2-3 & 4-5 |
| W42 | 128K | open |
| | 256K | close |

Table 2-5 External Cache Size Selection

Table 2-6 lists the jumper settings to enable or disable the IDE controller.

| Jumper | Function | Setting |
|--------|---------------------------------|---------|
| W28 | Enable IDE controller (default) | 1-2 |
| | Disable IDE controller | 2-3 |

Table 2-6 Enabling the IDE Controller

Table 2-7 lists the jumper settings to enable or disable the on-board I/O controller.

| Jumper | Function | Setting |
|--------|--------------------------------|---------|
| W11 | On-board I/O enabled (default) | open |
| | On-board I/O disabled | close |

Table 2-7 Enabling the I/O Controller

Table 2-8 lists the jumper settings to enable or disable the game port.

| Jumper | Function | Setting |
|--------|-----------------------------|---------|
| W2 | Game port enabled (default) | close |
| | Game port disabled | open |

Table 2-8 Enabling the Game Port

Table 2-9 lists the jumper settings to set the parallel port for IRQ7 or IRQ5.

| Jumper | Function | Setting |
|--------|----------|---------|
| W5 | IRQ7 | 1-2 |
| | IRQ5 | 2-3 |

Table 2-9 Parallel Port IRQ Selection

Table 2-10 lists the jumper settings to select the DMA channel for the parallel port ECP/EPP mode.

| Jumper \ DMA Channel | None (default) | DMA1 | DMA3 |
|----------------------|----------------|------|------|
| W6 | open | 1-2 | 2-3 |
| W10 | open | 1-2 | 2-3 |

Table 2-10 ECP/EPP Mode DMA Selection

Table 2-11 lists the jumper settings to select the type of video installed.

| Jumper | Function | Setting |
|--------|-------------------------|---------|
| W1 | Color monitor (default) | close |
| | Monochrome monitor | open |

Table 2-11 Video Selection

Table 2-12 lists the jumper settings to enable or disable the on-board VGA controller

| Jumper | Function | Setting |
|--------|--------------------------------|---------|
| W14 | On-board VGA enabled (default) | open |
| | On-board VGA disabled | close |

Table 2-12 VGA Controller Selection

Table 2-13 lists the jumper settings to enable or disable VGA controller's feature connector.

| Jumper | Function | Setting |
|--------|---------------------------------|---------|
| W15 | RAMDAC enabled (default) | open |
| | RAMDAC disabled/Feature enabled | close |

Table 2-13 Enabling the VGA Feature Connector

Table 2-14 lists the jumper settings to enable or disable the on-board sound controller.

| Jumper | Function | Setting |
|--------|----------------------------------|---------|
| W4 | On-board sound enabled (default) | open |
| | On-board sound disabled | close |

Table 2-14 Enabling the On-Board Sound Controller

Table 2-15 lists the jumper settings to set the sound controller's address.

| Jumper | Function | Setting |
|--------|--------------------------------------|---------|
| W3 | On-board sound address 240 (default) | 1-2 |
| | On-board sound address 220 | 2-3 |

Table 2-15 Sound Controller Address Selection

Table 2-16 lists the jumper settings to set the sound controller's IRQ.

| Jumper | Function | Setting |
|--------|-------------------------------|---------|
| W7 | On-board sound IRQ5 (default) | 1-2 |
| | On-board sound IRQ9 | 2-3 |

Table 2-16 Sound Controller IRQ Selection

Table 2-17 lists the jumper settings to set the sound controller's DRQ.

| Jumper \ DRQ Setting | DRQ0 | DRQ1 (default) | DRQ3 | None |
|----------------------|------|----------------|------|------|
| W8 | 1-2 | 2-3 | 1-2 | 2-3 |
| W9 | 2-3 | 1-2 | 1-2 | 2-3 |

Table 2-17 Sound Controller DRQ Selection

Table 2-18 lists the jumper settings to enable or disable the buzzer.

| Jumper | Function | Setting |
|--------|--------------------------|---------|
| W20 | Buzzer enabled (default) | close |
| | Buzzer disabled | open |

Table 2-18 Buzzer Selection

Table 2-19 lists the jumper settings for BIOS operation.

| Jumper | Function | Setting |
|--------|--------------------------------------|---------|
| W18 | Flash BIOS write protected (default) | open |
| | Flash BIOS programmable | close |

Table 2-19 BIOS Operation Selection

Table 2-20 lists the jumper setting to reset the CMOS. 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 |
|--------|----------------------------|---------|
| W25 | Normal Operation (default) | 1-2 |
| | Reset CMOS | 2-3 |

Table 2-20 CMOS Reset Jumper

Table 2-21 lists reserved jumper settings. **Do not reconfigure these jumpers.**

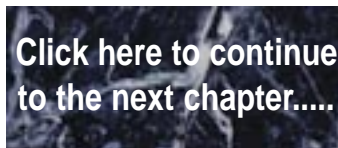
| Jumper | Function | Setting |
|--------|------------------|-----------|
| W13 | Reserved | 1-2 |
| W17 | Reserved | open |
| W19 | Reserved | 1-2 & 3-4 |
| W21 | Standard 5V DRAM | open |
| | Micron 12V DRAM | close |
| W29 | Reserved | 2-3 |

Table 2-21 Reserved Jumpers

Table 2-22 lists the jumper settings for case and peripheral connections.

| Jumper | Function | Notes |
|-----------|-------------------------|-------------------------------------|
| J15 | VL IDE Connector | Primary |
| J16 | ISA IDE Connector | Secondary |
| J17 | Floppy Connector | |
| J2 | VGA Connector | |
| J12 | Parallel Port Connector | Can be disabled in CMOS. |
| J5 | Serial Port (Com 1) | Can be disabled in CMOS. |
| J7 | Serial Port (Com 2) | Can be disabled in CMOS. |
| J1 | Game Port | |
| J4 | PS/2 Keyboard | |
| J3 | PS/2 Mouse | |
| J10 | LAN Connector | Contact Micronics to order |
| J11 | Modem Connector | Contact Micronics to order |
| J14 & J18 | Power Supply Connectors | |
| SPKR | Speaker | Sound Controller |
| LINE OUT | Line Level Output | Sound Controller |
| LINE IN | Line Level Input | Sound Controller |
| MIC IN | Microphone Input | Sound Controller |
| J8 | Audio Connector | Connect to CD-ROM |
| J20 | Speaker Connector | 1-Speaker; 2-N/C; 3-Ground; 4-5V DC |
| J22 | Turbo LED | 1-5V DC; 2- Ground |
| J23 | Turbo Switch | |
| J24 | Reset | |
| W36 | HD LED | 1-5V DC; 2- Ground |
| J19 | Keylock/ Power LED | 1-Power; 2-N/C; 3-Ground; 4-5V DC |
| J21 | Power Module Connector | See Appendix E |

Table 2-22 Case and Peripheral Connections



3 Installing the LPM30, System Memory, CPUs, and Peripherals

This section explains how to install the LPM30 system board, SIMMs, CPUs, and peripherals.

Warning:

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

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

Installation of the LPM30

The installation of the LPM30 system board depends on the type of case you use. The LPM30 is an integrated, low profile LPX system board which should be limited to installation in a low profile chassis.

Prior to installing the LPM30, 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 LPM30:

- ⊗ 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 LPM30 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 style keyboard and mouse.
- ⊗ Eight ohm speaker.
- ⊗ Standard ribbon cables for internal connections.
- ⊗ Standard power cord (grounded).
- ⊗ Heat sink with cooling fan.

System Memory

System memory devices, commonly known as SIMMs (Single Inline Memory Modules) are necessary to operate the LPM30 system board. The LPM30 has four SIMM sockets and can be upgraded to 128 Megabytes of RAM. This section will explain the type of SIMMs supported, list the memory configurations supported, and show how to physically install the new SIMMs.

SIMMs Supported

The LPM30 supports the following 72 pin, 60 or 70ns SIMMs:

4MB (1Mx36 or 1Mx32)

8MB (2Mx36 or 2Mx32)

16MB (4Mx36 or 4Mx32)

32MB (8Mx36 or 8Mx32)

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.

Memory Configurations

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

| Memory | Bank 0 | Bank 1 | Bank 2 | Bank 3 |
|--------|--------|--------|--------|--------|
| 4MB | 1MBx36 | | | |
| 8MB | 2MBx36 | | | |
| 8MB | 1MBx36 | 1MBx36 | | |
| 12MB | 1MBx36 | 1MBx36 | 1MBx36 | |
| 16MB | 1MBx36 | 1MBx36 | 1MBx36 | 1MBx36 |
| 16MB | 4MBx36 | | | |
| 16MB | 2MBx36 | 2MBx36 | | |
| 24MB | 2MBx36 | 2MBx36 | 2MBx36 | |
| 24MB | 2MBx36 | 2MBx36 | 1MBx36 | 1MBx36 |
| 32MB | 8MBx36 | | | |
| 32MB | 4MBx36 | 4MBx36 | | |
| 32MB | 2MBx36 | 2MBx36 | 2MBx36 | 2MBx36 |
| 40MB | 4MBx36 | 4MBx36 | 1MBx36 | 1MBx36 |
| 48MB | 4MBx36 | 4MBx36 | 2MBx36 | 2MBx36 |
| 48MB | 4MBx36 | 4MBx36 | 4MBx36 | |
| 64MB | 8MBx36 | 8MBx36 | | |
| 64MB | 4MBx36 | 4MBx36 | 4MBx36 | 4MBx36 |
| 72MB | 8MBx36 | 8MBx36 | 1MBx36 | 1MBx36 |
| 80MB | 8MBx36 | 8MBx36 | 2MBx36 | 2MBx36 |
| 96MB | 8MBx36 | 8MBx36 | 8MBx36 | |
| 96MB | 8MBx36 | 8MBx36 | 4MBx36 | 4MBx36 |
| 128MB | 8MBx36 | 8MBx36 | 8MBx36 | 8MBx36 |

Table 3-1 Common Memory Configurations

Installing the SIMMs

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

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

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

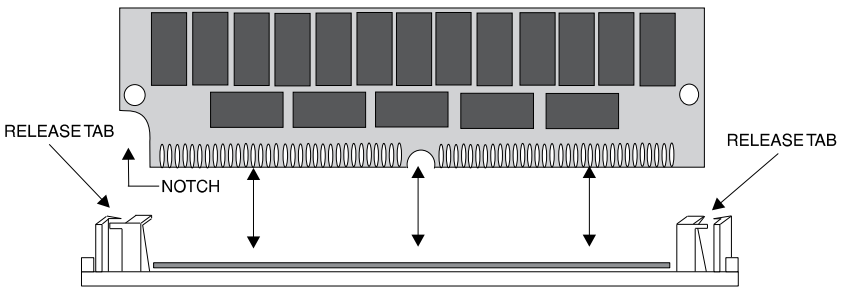


Figure 3-1 Installing a 72-Pin SIMM

Removing SIMMs

Perform the following steps to remove SIMMs, if necessary:

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

Installing a CPU

The LPM30 is specifically designed to support a large variety of CPU's from Intel, AMD, and Cyrix. To install an upgrade processor, perform the following steps:

1. Locate the ZIF socket on the board (Figure 3-2).
2. Lift the lever of the socket.
3. Insert the new processor into the socket. Make sure pin 1 on the CPU lines up with pin 1 on the socket. Refer to Figure 3-2 for pin 1 location.
4. Push the lever down to its original position.
5. Configure the board using the tables in Chapter 2.

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

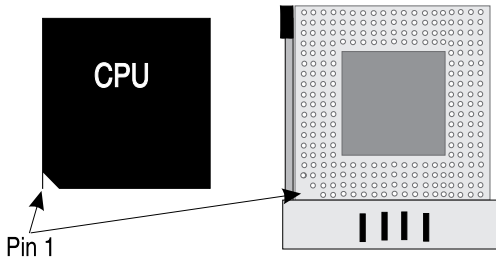


Figure 3-2 Installing a CPU

Warning:

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

Upgrading to 256K of Cache Memory

To upgrade to 256K cache, carefully install four 32Kx8-15ns SRAMs into the open SRAM sockets on the lower right-hand corner of the system board (Figure 3-3). After installing the cache upgrade, refer to Table 2-4 for the correct external cache jumper settings.

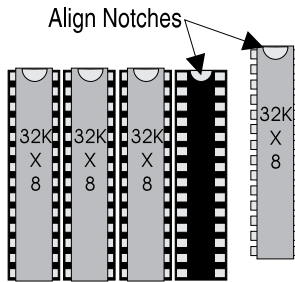


Figure 3-3 Upgrading to 256K External Cache

Video Memory - Upgrading to 2 MB

The LPM30 comes standard with 1MB of video memory. To upgrade to 2MB of video memory, install 256Kx16-60ns video memory chips into Socket U22 and Socket U23 (Figure 3-4).

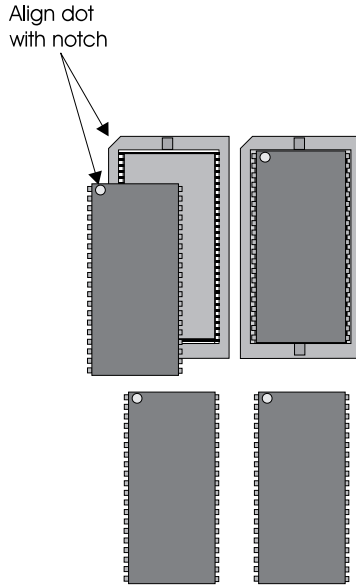


Figure 3-4 Upgrading to 2MB of Video RAM

Note:

Make sure the notches on the video memory match the notches on the sockets.

Installing a VL-Bus Riser Card

To install the LPM30 VL-Bus riser card, perform the following steps:

1. Locate the LPM30's slot (refer to Figure 2-1).
2. Make sure no peripherals are installed on the riser card.
3. Insert the card with the bottom edge level. **Never insert the card at an angle.**
4. 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.
5. Make sure the card is fully inserted and use the case screws to secure the riser card in place.

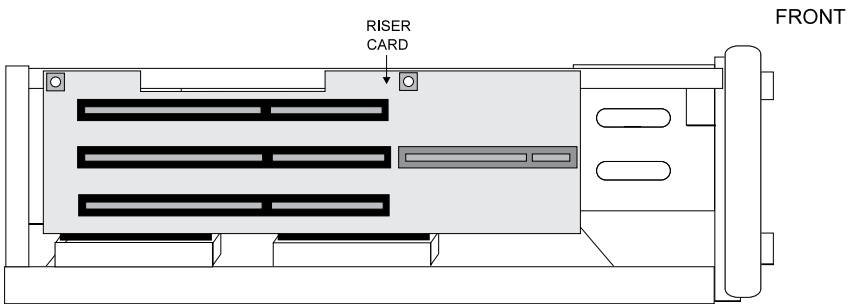


Figure 3-5 Inserting the LPM30 VL-Bus Riser Card

Installing a VL-Bus Peripheral Card

Micronics VL-Bus slots accommodate all VL-Bus cards which meet the VESA specifications. Complete the following steps to install a VL-Bus card:

1. Turn the computer system off and remove the cover.
2. Choose an unused VL-Bus slot on the riser card 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 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 cover.
7. Read the card's manual for additional instructions concerning installation and software drivers.

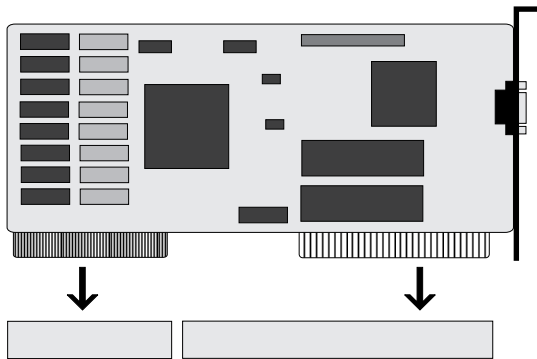


Figure 3-7 Installing a VL-Bus Peripheral Card

Installing an ISA Peripheral Card

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

1. Turn the computer system off and remove the cover.
2. Choose an unused ISA slot on the riser card 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 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 cover.
7. Read the card's manual for additional instructions concerning installation and software drivers.

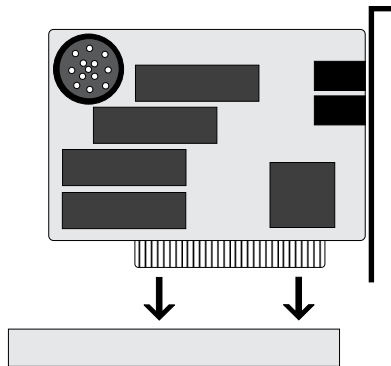


Figure 3-8 Installing an ISA Peripheral Card

Connecting Devices to the Sound Controller

In order to take advantage of the on-board sound controller, it is necessary to connect external devices to the LPM30.

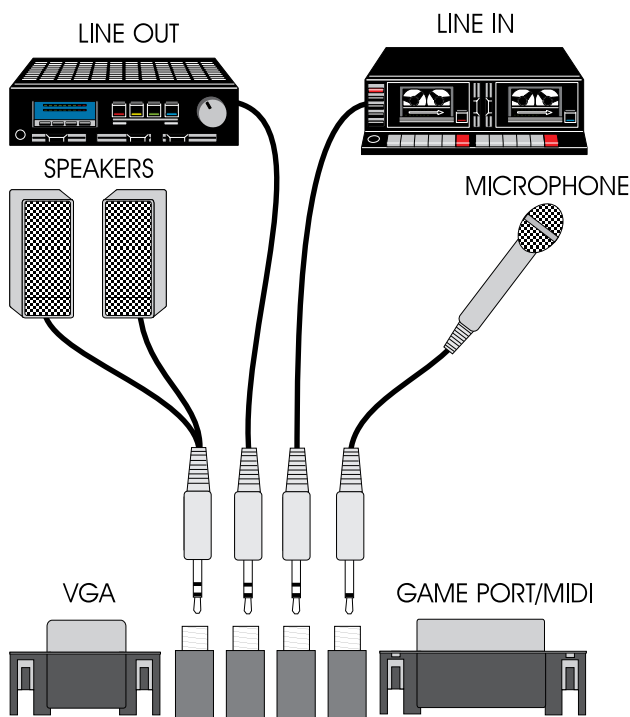


Figure 3-10 Connecting External Devices to the Sound Controller

External Speakers

You can connect 4 or 8 ohm external speakers or headphones to the SoundDrive 16 audio controller. The speakers and headphones plug into the Speaker jack on the back of the LPM30.

Joystick

Plug the joystick into the 15-pin connector on the back of the LPM30.

MIDI

If you purchased the optional MIDI interface kit, you will have an additional cable. This cable plugs into the 15-pin connector and provides MIDI IN and MIDI OUT connections, in addition to a joystick connection. Connect this

cable to the joystick port and connect any MIDI devices to the appropriate cables.

Microphone

You can connect a 300-600 ohm microphone to SoundDrive 16 audio controller. Plug it into the MIC jack on the back of the LPM30.

Line In

You can connect an external mono or stereo audio source to the SoundDrive 16 audio controller, such as a tape player or radio. Use the appropriate converter cable to interface to your external equipment.

Line Out

Allows you to connect the audio output of the SoundDrive 16 audio controller to your home stereo, VCR, or amplified speakers.

Installing the Optional Faxmodem Module

The LPM30 supports an optional faxmodem module which can be ordered from your dealer or directly from Micronics at (510) 651-2300.

Before installing the fax module, it is important to remove the knockout on the back of the case so it may be plugged into the phone outlet (Figure 3-11).

Gently press against the knockout from the inside of the case until it is perpendicular to the back of the case. Wiggle the knockout up and down until it breaks free.

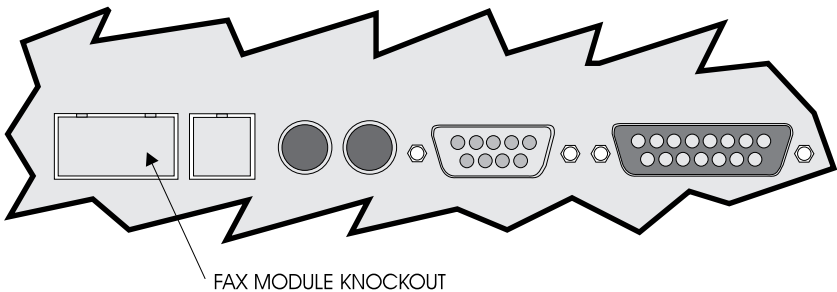


Figure 3-11 Removing the Faxmodem Module Knockout

After you have removed the knockout, follow the steps below:

1. Refer to the antistatic precautions described on page 2-1.
2. Read the faxmodem module's user manual and configure it for installation.
3. Turn the computer system off and remove its cover.
4. Locate the fax connector illustrated in Figure 2-1.
5. Insert the module with the bottom edge level to the connector (Figure 3-12). **Never insert the module at an angle!**
6. Carefully push the module straight down, making sure it is fully inserted.
7. Replace the computer cover.

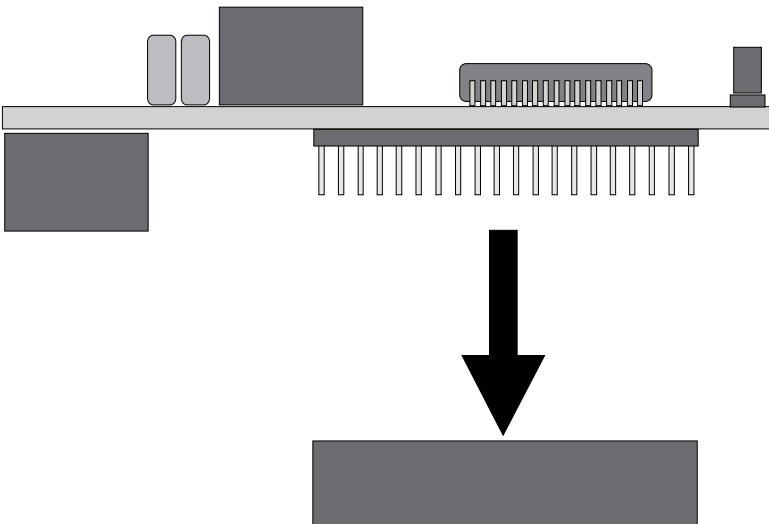


Figure 3-12 Installing the Faxmodem Module

Installing the Optional Ethernet Module

The LPM30 supports an optional Ethernet module which can be ordered from your dealer or directly from Micronics at (510) 651-2300.

Before installing the module, it is important to remove the knockout on the back of the case so the 10 BASE-T connector may be connected to the network (Figure 3-13).

Gently press against the knockout from the inside of the case until it is perpendicular to the back of the case. Wiggle the knockout up and down until it breaks free.

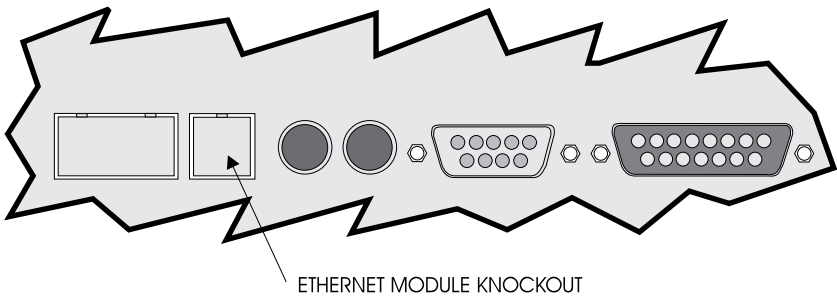


Figure 3-13 Removing the Ethernet Module Knockout

After you have removed the knockout, follow the steps below:

1. Refer to the antistatic precautions described on page 2-1.
2. Read the Ethernet module's user manual and configure it for installation.
3. Turn the computer system off and remove its cover.
4. Locate the Net connector illustrated in Figure 2-1.
5. Insert the module with the bottom edge level to the connectors (Figure 3-14). **Never insert the module at an angle!**
6. Carefully push the module straight down, making sure it is fully inserted.
7. Replace the computer cover.

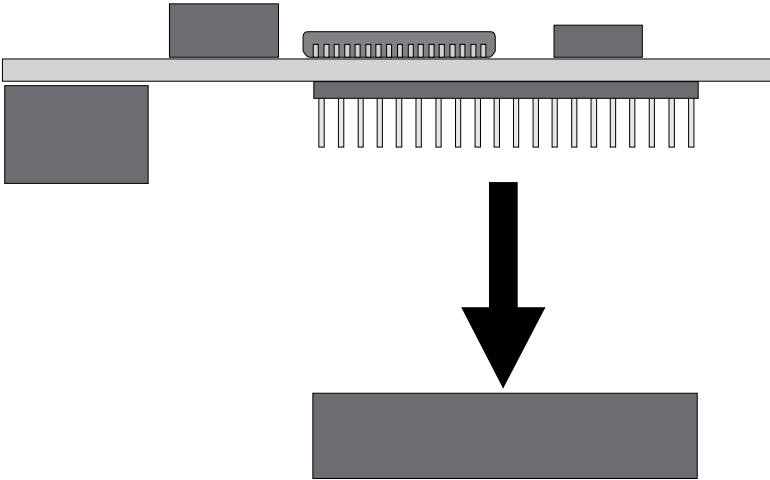


Figure 3-14 Installing the Ethernet Module

[Click here to continue to the next chapter.....](#)

4 The BIOS Setup Utility

Configuration

After the LPM30 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 LPM30. 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 for configuration. The following pages explain the proper procedures for BIOS configuration.

Setup

The Setup procedure is built into the system. Setup begins after the system is powered up. Once the system is powered up and goes through a memory test, the following screen appears on your monitor:

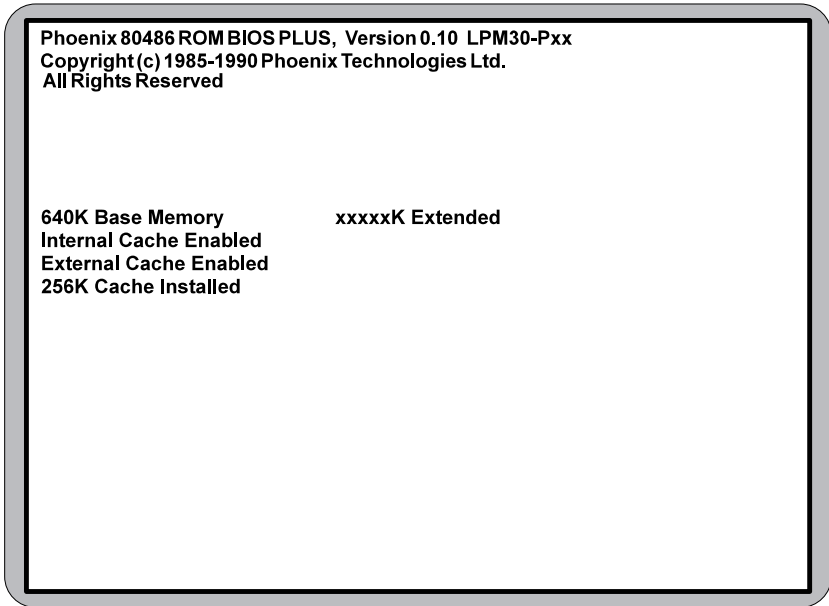


Figure 4-1 Power-Up Screen

If the system 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 <Esc> simultaneously to begin the Setup procedure.

Running the Setup Procedure

Upon pressing <F2>, the CMOS Main Screen (Figure 4-2) will appear and the prompt will be on the time line. If the Power-Up Screen does not appear but a DOS prompt does (i.e., A:\ or C:\), press the <Ctrl>, <Alt>, and <Esc> keys simultaneously to begin the Setup procedure.

The LPM30 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) | | | | | |
|--|--------------------|--------------|--------------|-------------|-------|
| (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 Drive A: | 3.5", 1.44MB | | | | |
| Diskette Drive B: | Not Installed | Cyl | Hd | Pre | LZ |
| Hard-Disk Drive 1: | Auto Config | xxx | xx | xxx | xx |
| Hard-Disk Drive 2: | Not Installed | | | | |
| Hard-Disk Drive 3: | Not Installed | | | | |
| Hard-Disk Drive 4: | Not Installed | | | | |
| Base Memory: | 640KB | | | | |
| Extended Memory: | XXXX KB | | | | |
| Video Card: | VGA/EGA | | | | |
| System Speed: | Normal | | | | |
| Cache State: | Both | | | | |
| Ext. Cache Mode: | Write-Back | | | | |
| CPU Type: | SX-33/DX-33/DX2-66 | | | | |
| Esc | F1 | F2 | ↑↓ | +/- | PgUp/ |
| Menu | Help | Sys Info | Field | Value | 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 change or view any of these parameters, press <Ctrl>, <Alt>, and <Esc> simultaneously. This can be done at any time, but it is recommended after first rebooting the system.

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 Drive 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.

System Speed

This parameter selects two speeds on the computer. When set to NORMAL, the system operates at full speed. When set to SLOW, it runs at about half of the normal speed.

Cache

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

External Cache Mode

This selection sets the secondary cache scheme. Setting the scheme to WRITE-BACK will improve performance up to 4%.

CPU Type

This option selects the CPU installed and has auto detection with corresponding jumper settings on board. You must choose the correct CPU selection with the corresponding CPU. This selection is for user-upgradeable CPUs.

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.

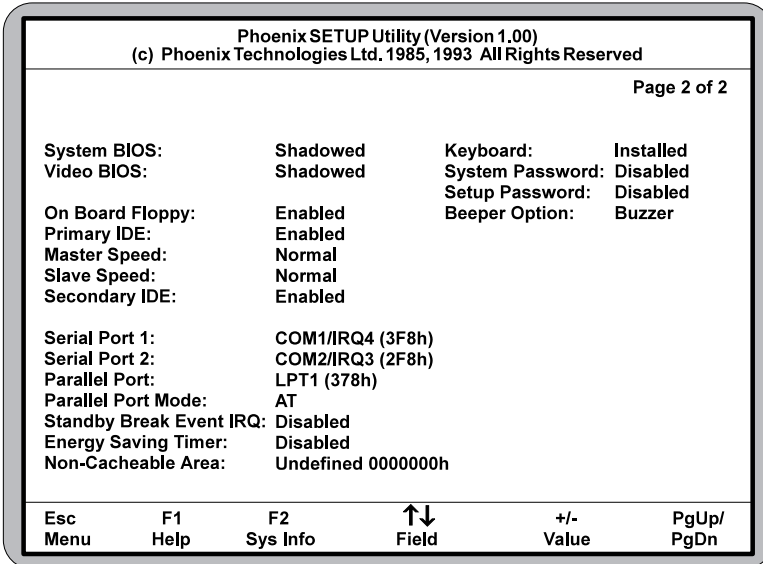


Figure 4-3 CMOS Extended Screen

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.

On-Board Floppy

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

Primary IDE

The VL-Bus IDE controller can be set to ENABLED or DISABLED.

Master Speed

The speed can be set for NORMAL, MEDIUM, or FAST. To improve the performance of your system, see the manufacturer's specifications to determine the optimal setting. The default setting is NORMAL.

Slave Speed

The speed can be set for NORMAL, MEDIUM, or FAST. To improve the performance of your system, see the manufacturer's specifications to determine the optimal setting. The default setting is NORMAL.

Secondary IDE

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

Serial Port 1

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 2

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.

Parallel Port Mode

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

Energy Saving Timer

The Energy Saving Timer conserves energy by putting the system into a “sleep mode.” When the system is in sleep mode, it consumes less energy.

If a specified time elapses and no keystrokes are performed, the computer goes into sleep mode. The timer recognizes keyboard activity only (not mouse movements).

This category can be set for one minute or in increments of fifteen minutes (up to 120 minutes). After the allotted time, the CPU will reduce its speed to 8MHz. **The Energy Saving Timer must be set to DISABLED if a DX4-100MHz is installed.** The Scroll Lock light will flash to indicate reduced speed. To return to full processing speed, press any key.

Non-Cacheable Area

This category allows a block of 32-bit memory to be set as NON-CACHEABLE. The size and address can be selected. The sizes include: 64K, 128K, 256K, 512K, 1M, 2M, and 4M.

To select the memory to be Non-Cacheable, use the <+/-> keys to change the first three zeros to the appropriate address (only these zeros can be changed). It must start from 0000000h to 0FF0000h (15.94MB). The default setting for this category is UNDEFINED.

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.

System Password

When enabled, a password will be required to enter the system.

To set a system password, set this category to ENABLED. After you have finished configuring the BIOS, press the <Esc> key to exit followed by the <F4> key to save the changes and reboot. When the system reboots, it will ask you to enter a new password. After you enter the new password, the System Password feature will be in effect.

Warning:

If you forget your password, it cannot be changed without discharging the CMOS.

Setup Password

When enabled, a password will be required to enter Setup.

To activate the Setup Password, set this category to ENABLED. After you have finished configuring the BIOS, press the <Esc> key to exit followed by the <F4> key to save the changes and reboot. After the system reboots, press <Ctrl>, <Alt>, and <Esc> simultaneously to re-enter the setup program. On re-entering the Setup program, you will be asked to enter a new password. After you enter the new password, the Setup Password feature will be in effect.

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.

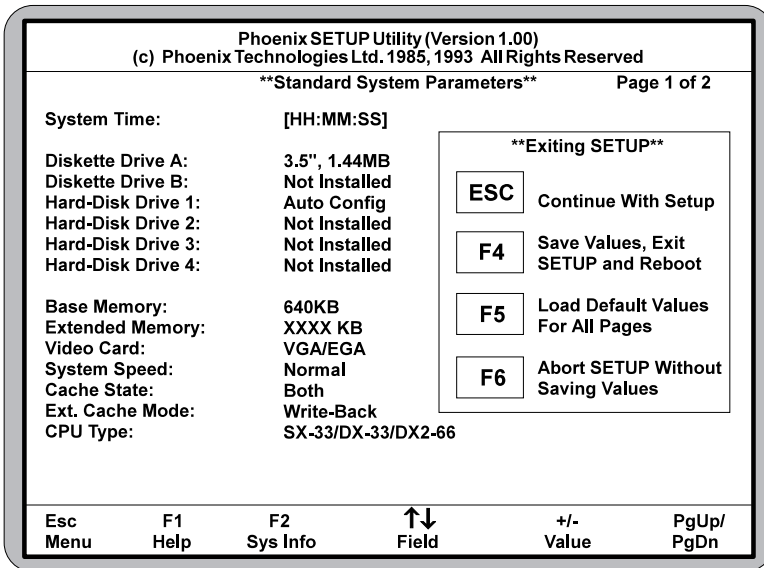
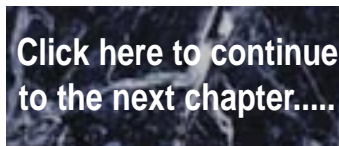


Figure 4-4 Exit Pop-up Screen



5 Installing Graphics Accelerator Software

The LPM30 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 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).

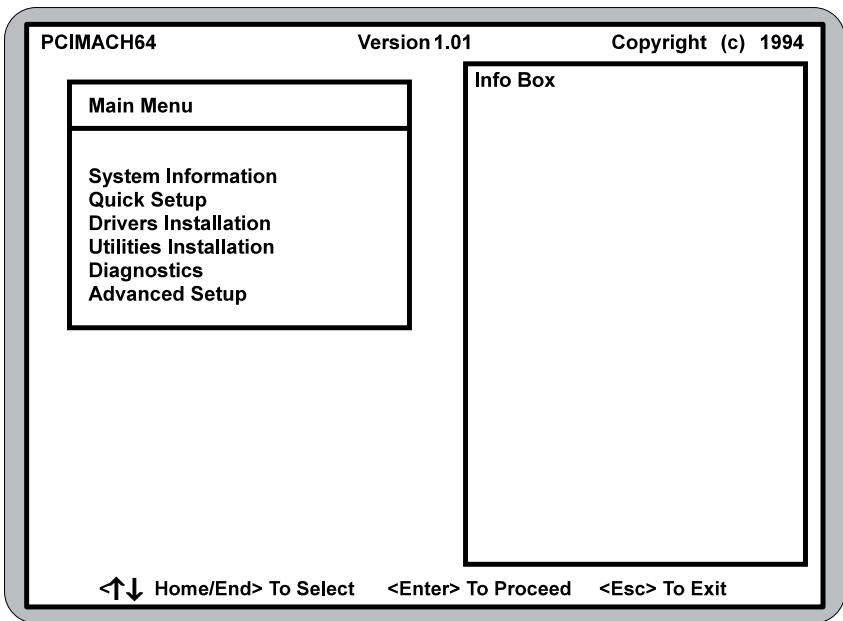


Figure 5-1 Main Menu

Main Menu Options

System Information-Checks your system configuration and displays detailed information, including boot-up files and any possible conflicts. This information is 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 (VDIF) file 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.

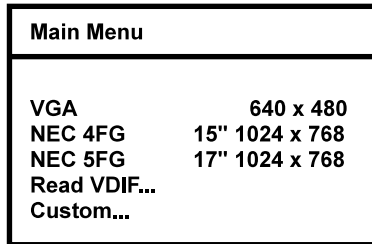


Figure 5-2 Monitor Selection Menu

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 UTILITIES INSTALLATION program:

Note:

It is recommended to accept the defaults suggested during installation.

1. Select UTILITIES INSTALLATION from the Main Menu by using your arrow keys to highlight it and press <Enter>.
2. Enter the destination drive, 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 may 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 <i>above but not overlapping</i> 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. 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 <i>mach64</i> ASIC is not detected. If this message occurs and a <i>mach64</i> 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. |

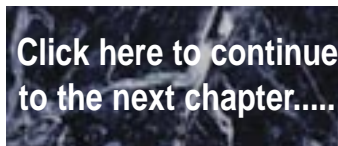
Table 5-1 Error Codes and Messages (Cont'd)

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.



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 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 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 was 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 and 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 which was been copied into your Word directory for instructions and driver configuration details.

WordPerfect (for DOS) 5.x and 6.0

WordPerfect Versions 5.0 and 5.1

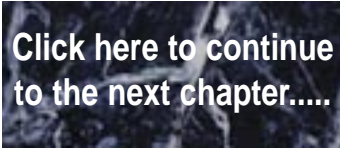
The *mach64* drivers for WordPerfect 5.x support 800x600 and 1024x768 screen resolutions in 16 colors. Perform the following steps to install driver using WordPerfect Versions 5.0 and 5.1:

1. Run WordPerfect to ensure it is properly installed 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.....**

7 Setting up the SoundDrive 16

Designed to be easy to use and easy to install, the SoundDrive 16 sound controller can be used with preset jumper settings. If you need to change the default address settings, see Chapter 2.

Hardware Installation

1. If you previously installed another sound card, remove it and all associated files from your SYSTEM.INI and CONFIG.SYS files.
2. If you are connecting external speakers to the SoundDrive 16, connect the speaker cable to the SPEAKER jack on the back of the system board (Figure 3-10).
3. If you are connecting amplified external speakers to the SoundDrive 16, connect the speaker cable to the LINE OUT jack on the back of the system board (Figure 3-10).
4. If you are connecting a microphone to the SoundDrive 16, connect the microphone cable to the MIC jack on the back of the system board (Figure 3-10).
5. If you are connecting a MIDI device or a joystick to the SoundDrive 16, connect the cable to the joystick port on the back of the system board (Figure 3-10).
6. If you are installing a CD-ROM, you will need a CD-ROM audio cable to play music CD's on your system. Contact your dealer to obtain the correct cable.

Note:

*If you are installing a CD-ROM drive, it is recommended you install it before setting up the SoundDrive 16 sound controller. See **Installing a CD-ROM Drive** at the end of this chapter.*

Software Installation

1. Start Microsoft Windows.
2. Insert the SoundDrive 16 software disk into your floppy drive.
3. From the Program Manager File menu, choose Run.
4. Type the drive letter, then SETUP.EXE; e.g., A:\SETUP.EXE.
5. The SETUP.EXE program automatically copies the SoundDrive 16 software and application programs to your hard drive.
6. Once the software is installed, the SETUP.EXE program automatically updates your CONFIG.SYS and AUTOEXEC.BAT files.
7. At this point, you must exit Windows and reboot your system. The CD-ROM drive is initialized on bootup. If it does not initialize on bootup, check for an I/O, DMA, or IRQ address conflict. Verify the address settings of other peripherals in your system to correct the address conflict(s).
8. If you are installing a CD-ROM drive, refer to the installation procedures provided by the CD-ROM manufacturer.

The SoundDrive 16 hardware and software installations are complete. The application programs installed will be located in the Orchid Audio Applications group on the Windows desktop.

External Devices

External Speakers

You can connect 4 or 8 ohm external speakers or headphones to the LPM30. The speakers and headphones plug into the SPEAKER jack on the back of the system board (Figure 3-10).

Joystick

Plug the joystick into the 15-pin game port connector (Figure 3-10).

MIDI

If you purchased the optional MIDI interface kit, you will have an additional cable. This cable plugs into the 15-pin connector and provides MIDI IN and MIDI OUT connections, in addition to a joystick connection. Connect this cable to the game port and connect any MIDI devices to the appropriate cables.

Microphone

You can connect a 300-600 ohm microphone to the LPM30. Plug it into the MIC jack on the back of the system board (Figure 3-10).

CD-ROM

The LPM30 supports IDE CD-ROM drives and has an MPC Level 2 audio connector for CD audio.

Line In

You can connect an external mono or stereo audio source to the LPM30, such as a tape player or radio. Use the appropriate converter cable to interface to your external equipment.

Line Out

Allows you to connect the output of the SoundDrive 16 audio controller to your home stereo, VCR, or amplified speakers.

The MIDI Interface

An optional MIDI Kit is available for the LPM30. The kit includes a Sound Blaster-type MIDI cable and MIDI software. To purchase the kit call your local dealer or Micronics' Sales department. See the Technical Help and Warranty Information card for Orchid telephone numbers.

Installing a CD-ROM Drive

Micronics recommends the installation of an IDE CD-ROM. *If you are installing a CD-ROM drive these instructions will help you, but you should also refer to the documentation that came with your CD-ROM drive.* Before starting the setup and installation, make sure that your computer is turned OFF and the power cord has been disconnected from the wall outlet. Your CD-ROM drive kit should contain the following items for a successful installation:

- ⊞ CD ROM Drive with optional slide rails.
- ⊞ Interface Cable.
- ⊞ Audio Cable.

Install the CD-ROM hardware as recommended by the CD-ROM manufacturer. Follow the steps below for help on installing the CD-ROM audio cable.

Installing the cable:

1. Connect the ribbon cables as described in the CD-ROM's documentation.
2. Connect the audio cable to the CD-ROM drive's audio connector.
3. Connect the other end of the audio cable to the MPC-2 compatible CD-ROM audio connector on the LPM30 system board (Figure 3-10).
4. You are now ready to setup the SoundDrive 16 sound controller. Follow the "Hardware Installation" and "Software Installation" sections at the beginning of this chapter.

CD-ROM Device Drivers

CD-ROM drives require device drivers to access the drive. These device drivers are generally provided by the manufacturer of the CD-ROM drive. Usually one device driver is added to the CONFIG.SYS file and one to the AUTOEXEC.BAT file.

The device driver added to the CONFIG.SYS file is the CD-ROM device driver. This file configures the CD-ROM drive and initializes the drive on boot up. It is dependent on the type of CD-ROM drive installed. The device driver added to the AUTOEXEC.BAT file is an executable file, which tells the operating system that a CD-ROM drive is installed in the system and what configuration the CD-ROM drive is using. MSCDEX.EXE is a commonly used device driver. There are other versions of this device driver which perform the same function, such as the CORELCDX.COM device driver.

8 SoundDrive 16 Utilities

The On-board SoundDrive 16 comes with DOS and Windows utilities which allow you to send commands to your CD-ROM drive, software volume control, and a mixer. In addition, you have the ability to play instrumental music through your computer keyboard.

Also included are audio applications to take advantage of the multimedia capabilities of SoundDrive 16. The utilities and audio applications are automatically installed using the SETUP.EXE program. Refer to Chapter 7 if you have not installed the SoundDrive 16 software.

Note:

This manual presumes you are already familiar with the basics of Microsoft Windows. Please refer to the Microsoft manual when terminology or installation steps are unfamiliar.

Note 2:

You cannot run the CD-ROM utilities from the Windows MS-DOS prompt. You must first exit Windows.

SCSI CD-ROM Utilities

The following SCSI CD-ROM utilities are DOS programs and must be run from the DOS (C:\) prompt.

FDCDTEST

This utility will test the integrity of the CD-ROM device driver(s) and drive.

FDEJECT

Ejects the CD-ROM disc from the CD-ROM drive. If the drive door is locked, this utility unlocks the door and then ejects the disc. This function is valid only for CD-ROM drives that support a software controlled eject command.

FDLOCK

Locks the door on the CD-ROM drive. On most drives, this disables the eject button on the front of the drive.

FDUNLOCK

Unlocks the CD-ROM door that was locked by FDLOCK or another utility.

FDAUDIO

A Terminate-and-Stay Resident (TSR) utility is used as an audio CD player. Once it is loaded into memory, FDAUDIO may be accessed from within a program by pressing the SHIFT-ALT-CTRL keys simultaneously. Press the ALT-F4 key to terminate the TSR.

The following options are available for FDAUDIO:

- << **Skip Back:** skips back one track.
- >> **Skip Forward:** skips forward one track.
- < **Fast Reverse:** skips back 10 seconds into current track.
- > **Play:** plays the current track if the CD is not currently playing.
- >> **Fast Forward:** skips forward 10 seconds into the current track if the CD is currently playing.
- " **Pause/Resume:** Pauses the current track if the CD is playing or resumes if the CD is paused.
- **Stop:** stops the CD.
- ▲ **Next CD:** goes to the next CD player if there is more than one CD in the system (for example, if the current CD is at drive letter D:, then the next CD will be at E:).

- ▼ **Previous CD:** goes to the previous CD player if there is more than one CD in the system (for example, if the current CD is at drive letter E:, then the previous CD would be D:).

Key-Z Player

Key-Z player allows you to play instrumental music from your computer, using a standard computer keyboard. The unique note mapping feature prevents you from playing an incorrect note in your chosen Key or Scale. Your computer is transformed into an intelligent polyphony (multiple notes at a time) musical instrument which is exhilarating to play.

Key-Z Player incorporates the following features: a standard MIDI file song player, graphic piano keyboard display, graphic mixer with volume, channel, patch, pan and mute control, and over 40 song styles.

To run Key-Z Player

From the Orchid Audio Applications program group, double-click on the Key-Z Player icon. The following screen appears:



Figure 8-1 Key-Z Player Screen

The buttons at the top of the screen are from left to right: File, Key, Scale, Layout, Settings, Player, Piano, Mixer, and Help. To access a feature, click once on the feature.

Key - allows you to choose from 12 different keys. Click on the key of your choice. You can change the key any time by clicking on the Key button and selecting another key.

Note:

After you have made your selection, a check mark appears next to your selection.

Scale - Key-Z Player offers four types of scales: Major, Minor, Blues, and Harmonic Minor. Choose a Scale the same way you choose a Key Signature.

Click once on the preferred scale to start playing music from your computer keyboard.

Layout - maps the notes on your keyboard to your choice of Jagged or Horizontal.

Jagged - maps the keys so that they progress up the scale alternating rows. This mapping also works well for organ solos and arpeggios.

Horizontal - maps the keys so that they progress up the scale from left to right, from the bottom to the top, while increasing the pitch for each row. This mapping works great for quick string-scale runs and playing blues piano.

Setting - offers the following four features:

MIDI Mapper - allows you to view your current MIDI Mapper settings from inside Key-Z Player.

Note:

All notes from Key-Z Player are routed through the Mapper. Refer to the Windows User's Guide for instructions on setting up the MIDI Mapper.

Multimedia Drivers - allows you to view your currently installed multimedia drivers.

Note:

Your multimedia drivers must be installed for Key-Z Player to function.

Patch Names - this feature gives you a list of eight types of sound hardware:

| | |
|--------------|-------------|
| 0-127 | 1-128 |
| General MIDI | Proteus |
| MT-32 | Roland GS |
| U-110 | U-110 Tones |

Keyboard - brings up a dialog box which allows you to adjust Channel, Patch and Volume changes.

Note: You may add to the Patch List by editing the PATCHES-INI file located in your Key-Z Player directory.

Player - opens or hides the Song Player window which includes the controls for playing standard MIDI Song Files. You can also measure the length of a song by using the Bar Control option.

Bar Control - the bar control detects the length of the song, (how many measures the song consists of). For example, if you have a 128 bar song, the bar control will start at Bar Zero, which is the beginning of the song. It will play through the entire song, ending at Bar 128.

Note:

The song must be stopped before using the bar control slider.

Piano - graphically displays all notes which are playing. The graphic keyboard has seven full octaves.

Mixer - features 16 channels and allows you to control the Patch, Volume, Pan and Mute of each track in the Song File. Make sure the patch for each track is set to an appropriate patch for your output device.

Key-Z Player - Solo

Key-Z Player can be used to perform solo compositions, test melodies, play rhythm and bass tracks, and learn scales and arpeggios in various keys.

To play Key-Z Player - Solo:

1. Select the Key and Scale you desire.
2. Select the Patch for the sound you desire.
3. Select the keyboard mapping from the Layout menu.
4. Set your Volume and begin playing by tapping out notes on your computer keyboard.

Keyboard Notes

The playable key is shown in white. You can play multiple notes and chords by pressing several keys at once (this is called polyphony).



Figure 8-2 Playable Keyboard Note

Note Progression

Notes begin with the lowest left row (the Z row) in Horizontal Mapping and the “A” key in Jagged Mapping. This ends with the highest note on the upper right.

Sustain

There are several ways to get sustained notes:

For continuous sustain, press the Caps Lock key. The notes played are sustained until the Caps Lock key is pressed again.

or

Hold down the Shift key while playing various notes.

Key-Z Player - Accompanied

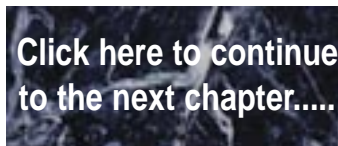
Key-Z Player may perform melodies while being accompanied by any standard MIDI Song File played in real-time.

To play Key-Z Player - Accompanied:

1. Open the Song Player window by clicking on the Player menu button.
2. Click on the Open Song button and select a song to play.
3. When the file is opened, it will use the default settings for Key, Scale, and Tempo. In addition, the track structure of the Song File (including the instrument name and MIDI channel) is set into the Mixer.

Note:

Key-Z Player can read and play Format 0 and Format 1 MIDI files. The standard MIDI files included with Key-Z Player are Format 1 files and contain the optional Key and Scale data.



9 Audio Applications

Using Audio Recorder

The Audio Recorder can record, playback, compress and store voice recordings, and music. It allows you to add and edit voice annotations within Microsoft Windows applications such as Word for Windows, Microsoft Excel, Lotus 1-2-3, and all other application software which support Object Linking and Embedding (OLE).

It provides different settings and compression levels for recording and output level controls. It is compatible with Microsoft Windows Sound Recorder for recording, editing, and playback.

The Audio Recorder can record and playback in .WAV format and .AUD format. The .WAV format is Microsoft Windows 3.1 format for audio files. The .AUD format uses ESPCM/ADPCM compression to produce an audio file.

Different levels of compression are available in the Audio Recorder. Audio Recorder supports linear PCM compression, ADPCM compression, and ESPCM compression at low, medium, and high levels.

To start Audio Recorder:

1. Start Microsoft Windows.
2. From the Orchid Audio Applications window, double-click on the Audio Recorder icon. The following screen appears (Figure 9-1):

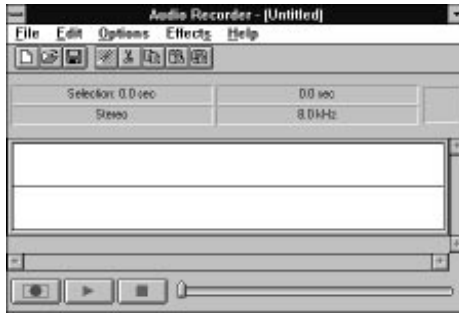


Figure 9-1 Audio Recorder Screen

The buttons at the bottom of the Audio Recorder window are from left to right: Record, Play, and Stop. The Audio Recorder can receive input from microphones, a cassette tape player, a compact disk player, or any other line-in source. The large area in the center of the window shows the waveform of the current audio file.

Recording an Audio File

To record a new file:

1. From the File menu, click on New. The following screen appears:

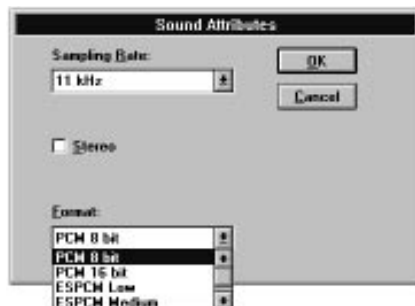


Figure 9-2 Sound Attributes Screen

2. Select your sampling rate, select stereo if desired (default mono), and choose the compression format. For the highest sound quality or to edit or modify the recording with the Effects command before saving, select one of the PCM (uncompressed) formats. Choose one of the ESPCM or ADPCM compression formats if you wish to save disk space and do not mind sacrificing some sound quality.

3. Click on the Record button.
4. Speak into the microphone.
5. When you are done, click on the Stop button.
6. From the File menu, click on Save As. If the file is uncompressed and you wish to save it uncompressed, choose a directory location, enter a name for the audio file, then click on OK button to save it. The uncompressed audio file is saved as a .WAV file.

If the file is uncompressed and you wish to compress it, click on the Options button and select the compression format you want. Click on the OK button. The compressed audio file is saved as a .AUD file.

You can use the Recording Control window to regulate the mix of audio from several sources. See the Recording Control section for more information.

Playing an Audio File

To play a file:

1. From the File menu, click on Open. The following screen appears:

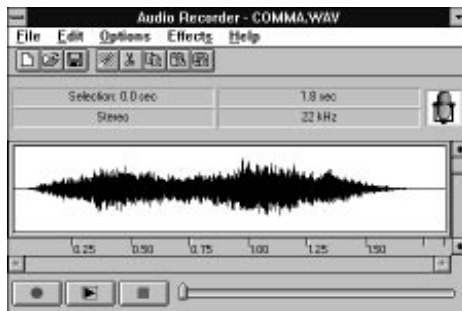


Figure 9-3 Playing a File Display

2. Load an audio file into the Audio Recorder.
3. Click on the Audio Recorder Play button to hear the audio file. The file will play to the end unless interrupted by pressing the Stop button.

While a file is playing, the wave box graphically displays the waveform of the audio file as if shown on an oscilloscope.

Changing the Waveform

The Audio Recorder's waveform display provides a graphic representation of the audio file currently in memory. You can control the display with the vertical and horizontal scroll bars.

- ⊞ To zoom in on (or magnify) the waveform, move the vertical scroll button down. To zoom out, move the vertical scroll button up.
- ⊞ To see more of the waveform ahead or behind the part currently displayed, click the right or left area of the horizontal scroll bar.
- ⊞ To mark a portion of the audio file for playback, use the mouse to select the section in the waveform display. Then choose Play to hear the selected section.
- ⊞ To deselect a selected portion of the waveform, click anywhere in the waveform display.
- ⊞ To select the entire file, double-click anywhere in the waveform display.

Adding the Volume Control and Mixer

You can regulate the playback sound level or stereo balance with the Volume Control. See the Volume Control section for more information.

You can use the Mixer option to play the current audio file together with other sound sources. See the Mixer section for more information.

Adding Sound

The Audio Recorder's drag and drop feature enables you to embed audio files in documents.

1. Load your Windows application and open a document.
2. Load an audio file.
3. Move the cursor to the icon at the top right of the Audio Recorder. The cursor changes into a hand. Press the mouse button down and drag the icon to the document window. Release the button at the place you want the audio icon to appear.

4. To play the audio in your document, double-click on the icon.

You can add audio to a document from the document's application. Place the cursor where you want the audio icon to appear, choose the application's command for inserting an object, then select Audio Recorder in the list box.

Edit Menu Commands

Insert File

Inserts another audio file into the current audio file at the current playing position. Inserting a file increases the length of the current audio file. The maximum length of a file is determined by the amount of memory available. You can also insert audio from the Clipboard.

Mix File

Mixes another audio file with the current audio file at the beginning or at the end. The audio files will blend together and play simultaneously. Mixing a file may increase the length of the current audio file. The maximum length of the new audio file is determined by the amount of memory available. You can also mix with audio from the Clipboard.

Delete File

Deletes the selected portion of the audio file. If you wish to save the deleted section, use the Cut command instead of Delete. To restore a deleted audio section, choose the Undo command before making any other changes to the file.

Changing the Properties

An audio file contains more than sound. You can attach a title, description, and an icon to the audio file.

To change the properties of a file:

1. From the File menu, click on Properties. The following screen appears:

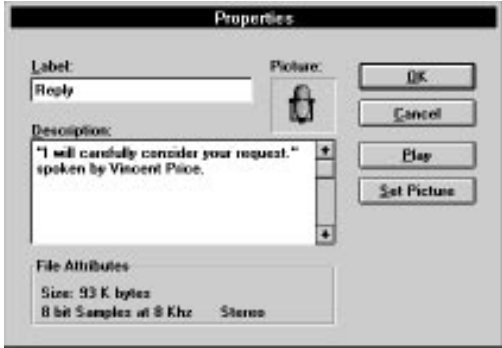


Figure 9-4 Changing the Properties

From this screen, you can place the cursor in the Label or Description area to add or change the label or description for the audio file.

2. Click the Play button to hear the audio file.
3. The Audio Recorder assigns a default picture of a microphone to each audio file. To select another picture more representative of the audio file's contents, click on the Set Picture button.
4. From the Set Picture screen, select the picture to appear with the audio file. Any graphic can be saved in a bitmap (.BMP or .DIB), wave (.WAV), icon (.ICO), executable (.EXE), or library (.DLL) file. The picture selected will appear in the Audio Recorder. It will also appear in any document in which you embed the audio file.
5. When you are finished, click on the OK button.

The Recording Control

An audio file contains more than sound. You can attach a title, description, and an icon to the audio file.

Starting the Recording Control:

From the Orchid Audio Applications program group, double-click on the Recording Control icon. The following screen appears:

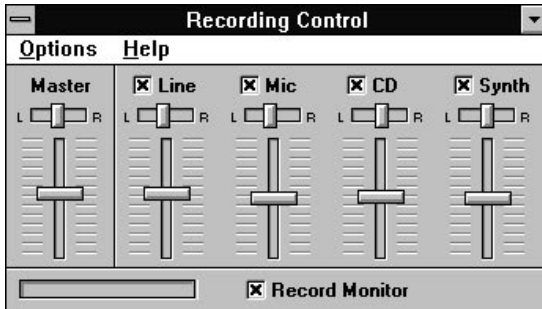


Figure 9-5 Recording Control Screen

The Recording Control can receive input from a microphone, compact disk player, synthesizer, or any other Line-In source. The Recording Control displays the recording level and stereo balance controls for each of your computer's hardware sources.

1. To include a recording source, click on the check box in front of its name.
2. To adjust the stereo balance of any source, drag its top horizontal sliding bar left or right.
3. To adjust the recording level of a source, drag its vertical sliding bar up or down.
4. To monitor a recording in progress, click on the Record Monitor check box.

The Volume Control

Starting the Volume Control:

1. From the Orchid Audio Applications program group, double-click on the Audio Recorder icon or the Mixer icon. From the Options menu, select Volume Control and the following screen appears:

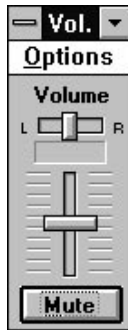


Figure 9-6 Volume Control Screen

The Volume Control enables you to regulate the volume and stereo balance at which sound is played. You can use the Volume Control with the Audio Recorder during playback. If you are playing multiple sources you can use the Mixer to combine them, and use the Volume Control as the master regulator. The Volume Control receives input from a microphone, cassette tape player, compact disk player, or any other Line-In source.

2. To adjust the stereo balance, drag the horizontal sliding bar left or right.
3. To adjust the volume, drag the vertical sliding bar up or down.
4. To turn the sound off, click on the Mute button. The word MUTE appears.
5. To turn the sound back on, click on the Mute button again.

The Mixer

Starting the Mixer:

From the Orchid Audio Applications program group, double-click on the Mixer icon. From the Audio Recorder or Volume Control Window, open the Options menu and select Mixer. The following screen appears:

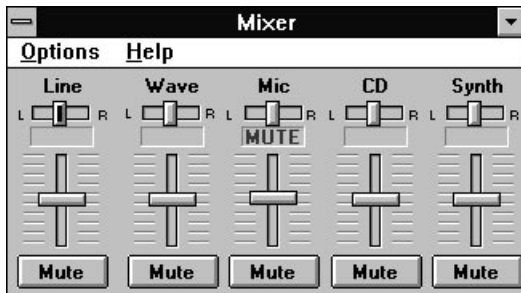


Figure 9-7 Mixer Screen

The Mixer allows you to combine signals from several audio sources during playback, with control over the volume and stereo balance of each source. When you use the Audio Recorder to play an audio file, you can open the Mixer to combine audio from the file with audio from other sources.

The Volume Control acts as a master regulator of the combined signal from the Mixer. The Mixer can receive input from a waveform audio file, a microphone, a compact disk player, a synthesizer or other Line-In source.

1. To adjust the stereo balance of a source, drag its top sliding bar left or right. To adjust the volume of a source, drag its vertical sliding bar up or down.
2. To turn off audio from any source, click on the Mute button. The word MUTE appears. Click the Mute button again to turn the audio back on.
3. To display the Volume Control window with the Mixer window, choose Volume Control from the Options menu.

The Extended Recorder

The Extended Recorder can be used to record meetings and for dictation. Like the Audio Recorder, the Extended Recorder records, compresses, stores, and plays music and other sounds. Unlike the Audio Recorder, the Extended Recorder compresses and stores the audio file directly to your hard disk using ESPCM compression. The recording time is limited only by the amount of hard disk space you have available.

The Extended Recorder can record to and play back from both PCM and .AUD formats. PCM is the Microsoft Windows 3.1 audio file format. The .AUD format uses ESPCM compression to produce an audio file. The Extended Recorder provides a choice of linear PCM (8-bits or 16 bits) and ESPCM low (4-bits) compression.

System Requirements

Use the Extended Recorder with a hard disk compression utility only if you have a high-performance system and are using a low data rate for recording and playback. Otherwise, your computer's CPU may become overloaded.

For Best Results

If you wish to use 16-bit stereo at 44KHz for recording or playback, your system must follow the specifications below:

- ⊗ 486 system running at 50MHz or faster
- ⊗ 8 megabytes of RAM or more
- ⊗ a hard disk access time of 15 milliseconds or faster

Operating a system without these specifications may cause data loss when you attempt 16-bit stereo, 44KHz recording.

Starting the Extended Recorder:

1. From the Orchid Audio Applications program group, double-click on the Extended Recorder icon. The following screen appears:



Figure 9-8 Extended Recorder Window

The buttons at the bottom of the Extended Recorder window are from left to right: Record, Play and Stop. This window shows the current file's name, the current location in seconds, and the total length in seconds.

2. You can display more information on the selected file from the Extended Recorder. From the Options menu, select Expanded View. The following screen appears:



Figure 9-9 extended Recorder Expanded View

The expanded view enlarges the Extender Recorder window to show the length of the recording, sample rate, mono or stereo, bits per sample and the free disk space, and recording time available.

The Audio Clip Library

The Audio Clip Library includes music, phrases, and sounds. You can play any audio file in the library by using the Audio Recorder (opened automatically by the Audio Clip Library), the Microsoft Sound Recorder, or other recorders compatible with the Windows .WAV format. You can also add

folders and audio files of your own to the Audio Clip Library.

Starting the Audio Clip Library:

From the Orchid Audio Applications program group, double-click on the Audio Clip Library icon and the following screen appears:

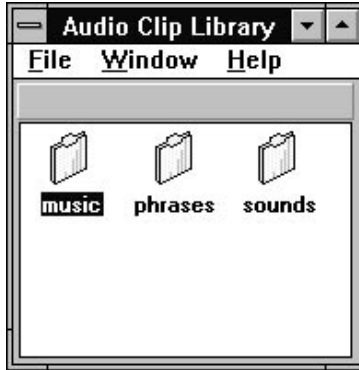


Figure 9-10 Audio Clip Library Window

The Audio Clip Library includes three folders titled Music, Phrases, and Sounds. The Music folder contains short musical interludes. The Phrases folder contains phrases used in business settings. The Sound folder contains a variety of mechanical and animal sound clips.

Talking Calculator

The Talking Calculator is an audio/visual calculator which allows you to perform calculations in Windows 3.1. You can reduce Talking Calculator to an icon so it is readily available whenever you want to perform calculations.

To start Talking Calculator:

From the Orchid Audio Applications window, double-click on the Talking Calculator icon. The following screen appears:

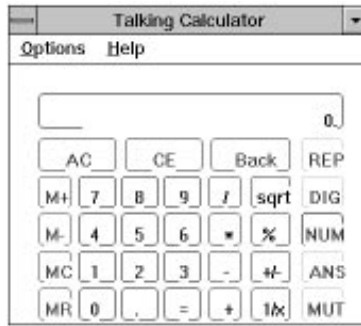


Figure 9-11 Talking Calculator Screen

To perform calculations with your mouse, just point and click. You will hear the number or operation clicked and the resulting answer. You can also use the keyboard by pressing the corresponding keys for each Calculator button. The following table describes each key on the calculator, its keyboard equivalent, and its function.

| <u>Button</u> | <u>Key</u> | <u>Function</u> |
|---------------|------------|---|
| + | + | Addition |
| - | - | Subtraction |
| * | * | Multiplication |
| / | / | Division |
| sqrt | @ | Square root of the displayed value |
| % | % | Calculates percentages |
| = | = | or ENTER performs any operation on the previous numbers |
| +/- | F9 | Changes the sign of the displayed number |
| 1/x | r | Calculates the reciprocal of the displayed number |
| Back | Backspace | Deletes the rightmost digit of the displayed number |
| AC | ESC | Clears the current calculation |
| CE | DEL | Clears the displayed number |
| MC | CTRL+L | Clears any value stored in memory |
| MR | CTRL+R | Recalls the value stored in memory |
| M- | CTRL+M | Stores the displayed value in memory |
| M+ | CTRL+P | Adds the displayed value to any value already in memory |
| NUM | | Directs to announce results as whole number |
| DIG | | Directs to announce results as digit |
| ANS | | Directs to announce answer only |
| MUT | | Directs to not make any announcements |

To access Help, click on Contents from the Help menu in the Talking Calculator window.

The Chime

The Chime announces the time musically. Chime can announce the time or play audio files at different intervals when enabled.

To start Chime:

From the Orchid Audio Applications window, double-click on the Chime icon. The following screen appears:

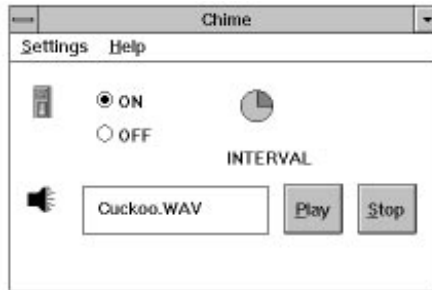


Figure 3-12 Chime Screen

Chime continues to make announcements when you reduce it to an icon. All Chime parameters can be set by selecting the Settings menu. To access Help, click on Contents from the Help menu in the Chime window.

The Timer

The Timer helps you to record time. Whenever you stop the Timer, it announces the amount of time remaining. It continues to display and announce count time remaining when you reduce it to an icon.

To start Timer:

From the Orchid Audio Applications window, double-click on the Timer icon (Figure 9-13).



Figure 9-13 Timer

The Timer window can appear in analog or digital display. Click on the Start button from the Timer window to begin the countdown. If there is zero time on the timer, click on the Reset button. This will reset the timer to the previous countdown. To stop the Timer at any time, click on Stop (the start button switches to stop when the timer is in operation). To access Help, click on Contents from the Help menu in the Timer window.

The Audio Reminder

The Audio Reminder features two alarms with different time, sound and snooze setups. These reminders are set up as alarms which will play the selected audio files at selected times.

To start Auto Reminder:

From the Orchid Audio Applications window, double-click on the Audio Reminder icon. The following screen appears:



9-14 Audio Reminder Screen

When the Audio Reminder is reduced to an icon, it will continue to operate, display, and set off the alarms as required. To access Help, click on Contents from the Help menu in the Audio Reminder window.

The Talking Clock

The Talking Clock helps you keep track of time. It announces the time when you select the Say command. You can display the Talking Clock as an analog or digital clock.

To start Talking Clock:

From the Orchid Audio Applications window, double-click on the Talking Clock icon. The following screen appears:

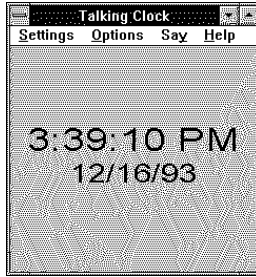


Figure 9-15 Talking Clock Screen

When you start the Talking Clock for the first time, a window with a standard analog clock appears and displays the system time. The next time you start the Talking Clock, the last display mode used will appear.

You can change the size of the Clock window and move it wherever you wish so the current time, including seconds and date, appear on the screen. When the Talking Clock is set to "Always Minimize," it will continue to display and announce the time when you reduce it to an icon. To access Help, click on Contents from the Help menu in the Talking Clock window.

Stopwatch

The Stopwatch allows you to measure duration of time. You can set the Stopwatch to sound a tick each second and announce the amount of time elapsed from the time it was activated. When you start the Stopwatch for the first time, it displays in analog display mode.

To start Stopwatch:

From the Orchid Audio Applications window, double-click on the Stopwatch icon. The following screen (Figure 9-15) appears:

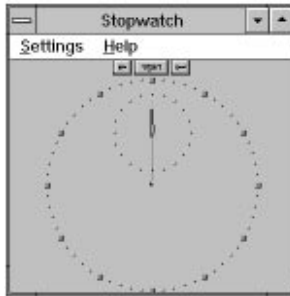


Figure 9-16 Stopwatch Screen

Digital display mode allows you to change the font. From the Settings menu, click on Set Font and select a font. You can change the size of the Stopwatch window and move it wherever you wish so the time lapsed, including minutes and seconds, appears on the screen. Stopwatch continues to display and keep time when you reduce it to an icon. To access Help, click on Contents from the Help menu in the Stopwatch window.

**Click here to continue
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10 SoundDrive 16 Troubleshooting

Troubleshooting

The following information will help diagnose problems you may have with the SoundDrive 16. Following these simple steps serves a twofold purpose:

You may be able to fix your problem and avoid having to contact the Micronics Technical Support Department . . .

or

if these steps do not help you solve your problem, they will most certainly give you a better handle on what to tell technical support once you do contact them.

The information provided here is in symptom/response form. That is, a symptom is given, and a check point response is provided for you.

Symptom 1

System locks up on bootup with the SoundDrive 16 installed.

Check

Check whether another peripheral in your system is using the same I/O address configured by Jumper W3 (Chapter 2) on the SoundDrive 16.

Symptom 2

No sound output.

Check

1. Is the external speaker properly connected to the SoundDrive 16 Speaker jack?
2. Is there another adapter in your system which may be using the same address (I/O Address, DMA Channel, or Interrupt)? If so, change its addressing or select another address for SoundDrive 16. (Refer to Chapter 2 for available addresses).

Symptom 3

Certain applications do not play sound.

Check

1. Verify the SoundDrive 16 and the software application are configured for the same sound emulation modes (for example, Sound Blaster or Sound Blaster Pro for digitized sound).
2. Many software applications require a large amount of base memory, such as 640KB and are unable to operate if any drivers or TSR programs are installed. Try removing all unnecessary drivers and TSRs or load them in high memory (refer to your DOS user's manual for more information).
3. Verify the SET BLASTER statement is in the AUTOEXEC.BAT file.

4. Make sure the application is configured for the same IRQ, I/O, or DMA as the SoundDrive 16.

Symptom 4

Certain applications do not play digitized sound, such as speech or sound effects.

Check

1. Check for a conflict with the Sound Blaster interface configuration settings. Digitized sounds are played back through this interface.
2. Verify the SET BLASTER statement is in the AUTOEXEC.BAT file. Some applications look specifically for this statement to set the Sound Blaster environment. Verify that the settings of the statement match the configuration for the SoundDrive 16 and the software application.
3. Verify there is sufficient base memory to run the software application. If you are configuring the software application for Sound Blaster, the software application may omit digitized sound if there is not enough base memory available.

Symptom 5

My joystick does not work when connected to the SoundDrive 16.

Check

Verify the Joystick Port in the SD16.EXE program is enabled.

Symptom 6

My microphone recording level is too soft or unable to record properly.

Check

1. Verify your microphone has the proper impedance or is too sensitive. The SoundDrive 16 expects a microphone with an impedance of approximately 600-10K ohms.

2. Verify the software used to record, and the Windows temporary directory are not on a drive that is using a disk doubling utility.
3. Turn up the microphone input level.
4. Make sure the microphone is selected as the recording source.

Symptom 7

Wave files do not play correctly in Windows.

Check

1. Verify the settings for the SoundDrive 16 driver in Windows match the hardware settings. This can be done by opening the Driver icon from the Control Panel and double-clicking on the driver.
2. If the .WAV file keeps repeating, this indicates an IRQ conflict.

Symptom 8

I received the error message "Could not load audio driver" or "General Protection Fault."

Check

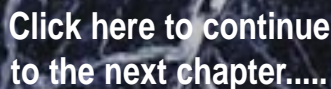
1. Is the SoundDrive 16 audio driver installed in Windows? If no, install the driver. If yes, reinstall the driver. From the Control Panel window, click on the Drivers icon, click on Add, and reload the "SoundDrive 16 WAVE & MIDI" driver. Restart Windows and check the sound again.
2. Did you change the default address settings? If so, you need to reset the address settings in Windows.

Symptom 9

I received the error message "Disk Could Not Keep Up with Digital Audio Rate."

Check

1. Were you recording when you received this error message? Decrease the sample rate or bit resolution. If you were recording in stereo, switch to mono.
2. Are you using a disk doubling utility? When you record, you are recording directly to the hard drive. Disk compression utilities can affect the performance of the hard drive.
3. Have you defragmented your hard drive lately? Your software application may have encountered a performance problem with your hard drive. Use one of the commercial disk optimizing utilities available. Excellent digital audio performance requires you optimize your hard drive often.



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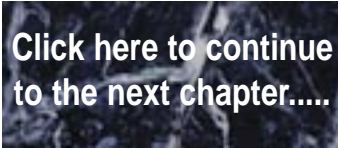
A POST Messages

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. |



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B Beep and POST Codes

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

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

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

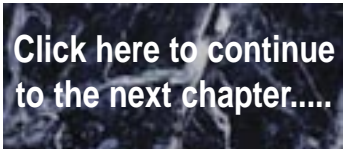
Another way of identifying a POST error is to use a device called a POST card. This peripheral card is inserted into one of the ISA slots and has an LED (or LCD) read out showing the contents of port 80h.

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

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

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

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



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

C Hard Disk Drive Types

The following table lists the hard disk types supported by LPM30.

| Type | Cyl | Hd | Pre | Sec | Size |
|------|------|-----|-----|-----|------|
| 1 | 306 | 4 | 128 | 17 | 10 |
| 2 | 615 | 4 | 300 | 17 | 21 |
| 3 | 615 | 6 | 300 | 17 | 30 |
| 4 | 940 | 8 | 512 | 17 | 62 |
| 5 | 940 | 6 | 512 | 17 | 46 |
| 6 | 615 | 4 | -1 | 17 | 20 |
| 7 | 462 | 8 | 256 | 17 | 30 |
| 8 | 733 | 5 | -1 | 17 | 30 |
| 9 | 900 | 15 | -1 | 17 | 112 |
| 10 | 820 | 3 | -1 | 17 | 20 |
| 11 | 855 | 5 | -1 | 17 | 35 |
| 12 | 855 | 7 | -1 | 17 | 49 |
| 13 | 306 | 8 | 128 | 17 | 20 |
| 14 | 733 | 7 | -1 | 17 | 42 |
| 15 | N/A | N/A | N/A | N/A | N/A |
| 16 | 612 | 4 | 0 | 17 | 20 |
| 17 | 977 | 5 | 300 | 17 | 40 |
| 18 | 977 | 7 | -1 | 17 | 56 |
| 19 | 1024 | 7 | 512 | 17 | 59 |
| 20 | 733 | 5 | 300 | 17 | 30 |
| 21 | 733 | 7 | 300 | 17 | 42 |

| Type | Cyl | Hd | Pre | Sec | Size |
|-------------|------|----|-----|-----|------|
| 22 | 733 | 5 | 300 | 17 | 30 |
| 23 | 762 | 8 | -1 | 17 | 116 |
| 24 | 830 | 10 | -1 | 39 | 68 |
| 25 | 1024 | 9 | -1 | 17 | 76 |
| 26 | 918 | 7 | -1 | 17 | 53 |
| 27 | 1024 | 8 | -1 | 17 | 68 |
| 28 | 903 | 8 | -1 | 46 | 162 |
| 29 | 1024 | 4 | -1 | 17 | 34 |
| 30 | 820 | 6 | -1 | 17 | 40 |
| 31 | 969 | 9 | -1 | 34 | 144 |
| 32 | 615 | 8 | -1 | 17 | 40 |
| 33 | 1024 | 5 | -1 | 17 | 42 |
| 34 | 940 | 16 | -1 | 26 | 190 |
| 35 | 1010 | 12 | -1 | 55 | 325 |
| 36 | 903 | 4 | -1 | 46 | 81 |
| 37 | 901 | 5 | -1 | 53 | 116 |
| 38 | 980 | 5 | 128 | 17 | 40 |
| 39 | 966 | 16 | -1 | 17 | 128 |
| 40 | 723 | 13 | -1 | 51 | 234 |
| 41 | 1024 | 16 | -1 | 63 | 504 |
| 42 | 966 | 5 | -1 | 34 | 80 |
| 43 | 965 | 10 | -1 | 17 | 80 |
| 44 | 776 | 8 | -1 | 33 | 100 |
| 45 | 654 | 16 | -1 | 63 | 321 |
| 46 | 683 | 16 | -1 | 30 | 202 |
| 47 | 755 | 16 | -1 | 17 | 100 |
| User Config | | | | | |
| Auto Config | | | | | |

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

D Specifications

| | |
|-------------------|--|
| Processor Options | Intel 486SX, 25 or 33MHz. Intel 486SX2, 50MHz. Intel 486DX, 33MHz. Intel 486DX2, 50 or 66MHz. Intel 486DX4, 75 or 100MHz. Intel 486 DX2 3.3V Support. Intel Pentium <i>OverDrive</i> Processor. 486 OverDrive Processor. Cyrix DX2/80 or DX/40. AMD DX40, DX2/80, or DX4/100. AMD SX, 25 or 33MHz. |
| Expansion | One proprietary slot supports VL-Bus or PCI Riser card (slot configuration varies depending on case design). |
| Chip Sets | Micronics X30 single chip ASIC. CMD 640B Mode 3 Localbus IDE controller. SMC 665 Super I/O. |
| RAM Capacity | 128MB. |
| Form Factor | Mini AT footprint (8.5" x 9.5"). 4 Layer PCB. |
| Keyboard | PS/2 compatible. |
| Mouse | PS/2 compatible. |
| BIOS | Phoenix BIOS on 1MB Flash EPROM. |
| Cache | 8K of internal cache memory (may vary). |
| Cache Upgrade | Optional 256K or 512K of secondary cache memory (write-through or write-back). |

| | |
|----------------|--|
| Built-in Video | ATI 68800 <i>mach64</i> LX. 1MB DRAM frame buffer. Resolutions Supported: 640x480 (65,536 colors). 800x600 (256 colors). 1024x768 (256 colors). 1280x1024 (16 colors). |
| I/O Ports | Built in support. Two serial ports. One bi-directional parallel port. Enhanced Parallel Port (EPP) compatible. Microsoft and Hewlett Packard Extended Capabilities Port (ECP) compatible. |
| Floppy Port | Supports two floppy drive (2.88, 1.44, 1.2, 720K, 360K). |
| IDE Support | Supports two IDE hard disks. LBA support. |
| Burn-in | 48 hours (minimum). |

SoundDrive 16 Controller Specifications

| | |
|------------|---|
| Features | Full compatibility with the following sound and multimedia standards: ⊗ Sound Blaster. ⊗ AdLib. ⊗ Microsoft Windows Sound System. ⊗ MPC Level I and II. |
| Chipsets | ESS688 Audio Drive. Yamaha OPL3 FM Synthesis. |
| Interfaces | DB-15 port for Joystick/MIDI Port. 3.5 mm mono jack for microphone input. 3.5 mm 4W amplified speaker output. 3.5 mm stereo jack for line input. 3.5 mm stereo jack for line out. |

Additional
Features

FM Synthesizer

20-voice Stereo Synthesizer.

Stereo Digital/Analog Mixer (built-in)

Selectable input and mixing of all audio sources for recording:

Line-in.

Stereo CD-Audio.

Mono Microphone.

Synthesizer.

Digital Audio.

Stereo Digitized Audio Playback

8-bit and 16-bit sample modes.

Sampling Rate of:

2KHz to 44.1KHz (mono or stereo) .

Hardware audio decompression ESPCM (ratios of 2:1, 3:1, and 4:1).

Audio Amplifier

Frequency Response: 20Hz to 22KHz.

Stereo Digitized Audio Recording

8-bit and 16-bit sample modes.

Sampling Rate of 2KHz to 44.1KHz.

MIDI

Sound Blaster type Joystick/MIDI cable.

Joystick Port/MIDI Interface

Standard built-in (15-pin D-sub) connector.

Game I/O port for PC analog joystick.

Built-in interface for Sound Blaster MIDI cable. with MIDI IN and MIDI OUT connectors.

MIDI time-stamp for Multimedia extension.

Sound Blaster MIDI compatible.

64-byte FIFO buffer.

Mono Microphone Input

Automatic Gain Control for direct sound input.

14,400 Fax Modem Module Specifications (Optional)

| | |
|-----------------|---|
| Data Mode | V.32bis: 14400bps/9600bps/4800bps. V.22bis: 2400/1200bps. Bell 212A: 1200bps. Bell 103: 300bps. |
| Fax Mode | V.17: 14400bps transmit and receive. V.29: 9600/7200bps transmit and receive. V.27ter: 4800/2400bps transmit and receive. V.21 channel 2: 300bps transmit and receive. |
| Transmit Level | -10 dBm. |
| Receive Level | -10 dBm to -43 dBm. |
| Command Set | Extended AT command set. EIA-578, Service Class 1 commands. |
| Profile Storage | NVRAM allow storage of two user configurations and four 36-digit dial string. |
| Miscellaneous | Supports software V.42/MNP2-4 and V.42bis/MNP5. Communication software compatible. Automatic adaptive/fixed compromise equalization. Full-duplex data mode test capabilities: Analog loop, local digit loop, and remote digit loop. |

Environmental Specifications

The environment where the LPX30WB is located is critical. Micronics recommends the following environmental specifications:

Temperature Range

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

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

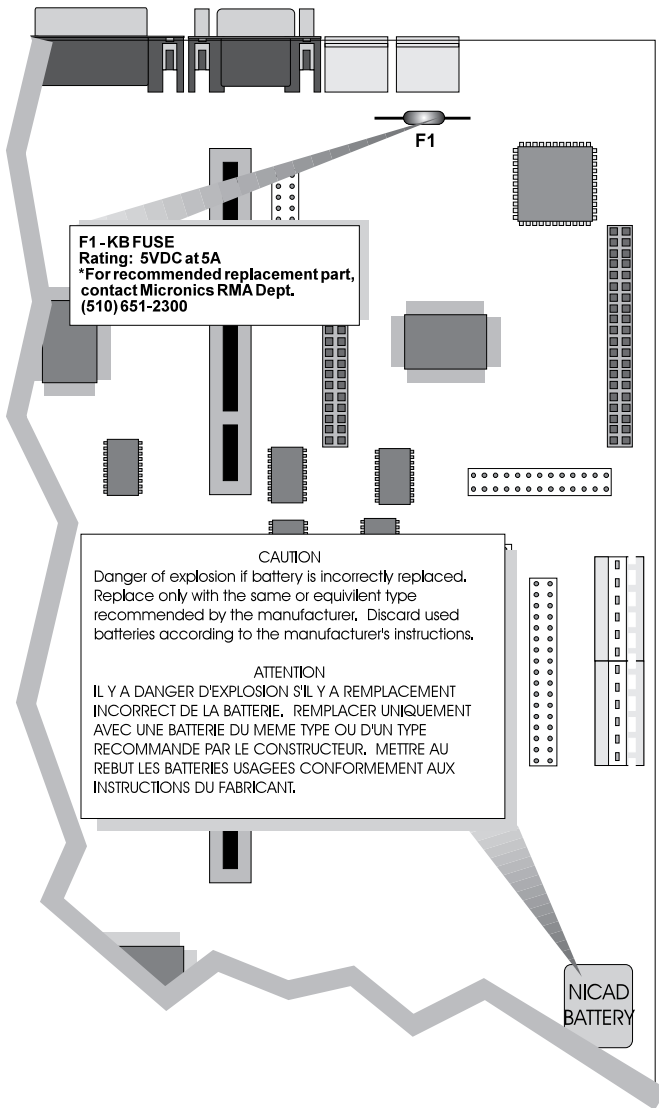
Shipping: -22 to 140 degrees Fahrenheit (-30 to 60 degrees Celsius).

Relative Humidity

Operating: 20% to 80%.

Non-Operating: 5% to 90%.

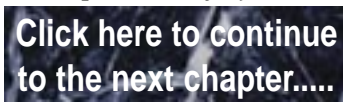
Battery Disposal



Warning:

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

May explode or leak and cause personal injury.



E Installing a Power Module

The LPM30 will accommodate a large variety of 486 processors. When installing a 5.0V processor, locate J21 on your system board (see Figure 2-1), and configure it as shown below (Figure E-1).



Figure E-1 Configuring Jumper J21

To configure your system board for a 3.3V or 4.0V processor, you will need to order a Power Module. If you do not have one, contact Micronics' Customer Service department at (510) 651-2300.

Note:

The Power Module partially obstructs SIMM Socket U45 (bank 3). If installing a SIMM in this socket, it is recommended you install the SIMM prior to installing the Power Module.

If the Power Module is already installed, you will need to temporarily remove it to install the SIMM.

To install a Power Module, remove all jumpers from Jumper J21 and install it as shown below (Figure E-2).

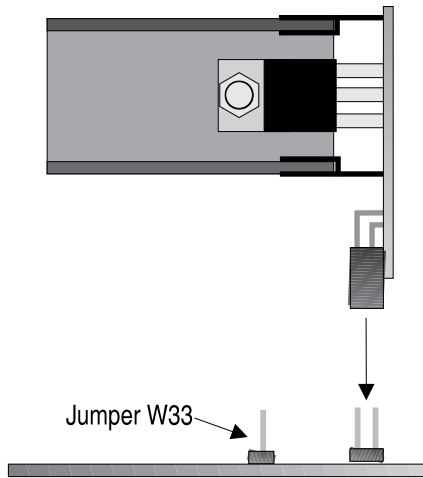


Figure E-2 Installing a Power Module

After you have installed the Power Module, secure it with a tie strap (Figure E-3) and your installation is complete.

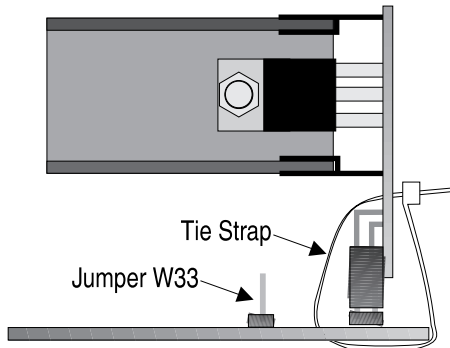
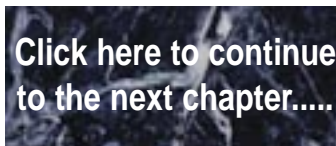


Figure E-3 Securing the Power Module

[Click here to continue to the next chapter.....](#)

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. |



FCC Warning Statement

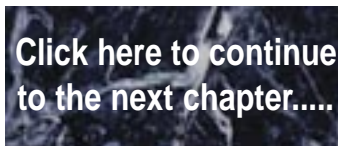
This equipment has been tested and found to comply within the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate 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.



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.

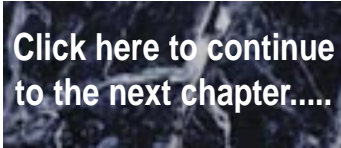
Micronics will not be liable for any lost profits or any indirect, special incidental or consequential damages in connection with the product, even if Micronics has been advised of the possibility of such damages.

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.



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User's Comment Form: LPM30

What do you like about this manual?

What would you change in this manual?

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

Name: _____ Dealer: _____
Title: _____ Date: _____
Company: _____ Telephone: _____
Address: _____
