



PalmPAD^{SL}™

Computer
User's Guide

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The computer has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. These computers generate, use, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If one of these computers does cause harmful interference to radio or television reception, which can be determined by turning the computer off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Disconnect peripherals and accessories one at a time to determine which device may be causing interference. Contact the peripheral dealer or manufacturer for assistance.
- Ensure that shielded cables are used where required and that cables are properly connected.
- Reorient or relocate the receiving antenna.
- Increase the separation between the computer and receiver.
- Connect the computer to an electrical outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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The computer does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

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ABOUT THIS BOOK

This manual describes how to operate your computer. It shows you how to set up and get started using your computer, and includes detailed information about how to use all of the controls, connectors, and other features of the computer.

These computers are frequently used in situations that require custom application programs, written especially to do a specific job in a particular company. The operation and development of such custom applications is not covered in this manual.

Some software is included with every computer. This software is stored inside the computer in a computer chip called a Read Only Memory (ROM). This internal ROM contains the Microsoft® Disk Operating System (MS-DOS®), which is the computer's operating system software. The MS-DOS ROM also contains other useful utility programs. All of the software contained in the MS-DOS ROM is documented in this manual or in the MS-DOS documentation.

Manual Organization

The information in this manual is organized as follows:

- **Chapter 1** introduces the computer and describes its features.
- **Chapter 2** shows you how to get started using your computer. Read this chapter first if you want to get started quickly.
- **Chapter 3** describes the computer in detail and explains each hardware feature.
- **Chapter 4** describes how to use the different options that are available for powering the computer.

- **Chapter 5** describes and explains how to use the storage PC cards and SunDisk™ cards that are used for storing data and programs in the computer.
- **Chapter 6** provides troubleshooting information and explains what to do if you have problems with the computer. Computer error messages also are described in this chapter.
- **Chapter 7** contains important safety information and describes how to care for and maintain the computer.
- **Chapter 8** provides information about using MS-DOS on the computer.
- **Chapter 9** explains how to use the utility programs supplied in the MS-DOS ROM.
- **Appendix A** provides the computer specifications; and **Appendix B** provides a system memory map and connector pinout information.
- The **Glossary** contains definitions of important terms and all acronyms that are used throughout the text.

Notational Conventions

The following conventions are used to distinguish key elements of text in this manual:

bold	Used for commands, options, switches, and literal portions of syntax that must be entered exactly as shown.
<i>italics</i>	Used for file names, variables and placeholders that represent the type of text to be entered by the user.
<code>monospace</code>	Used for sample command lines, program code and examples, and sample sessions.
keycaps	Used to identify keys or key sequences on the optional computer keyboard or Screen Keyboard.

Occasionally, multi-key operations, such as “press **Shift-Tab**,” are described. When you see a hyphen between two keycap names, press the keys in the order in which they appear. Thus, when you read “press **Shift-Tab**,” you should press the **Shift** key and, while holding it down, press and release the **Tab** key. When you see hyphens between three keycap names, press the first two keys and, while holding them down, press and release the last key.

Note that the symbol **Enter** is used throughout this book to identify the **Enter** key. On some keyboards, this key is labeled **Return**.

CHAPTER 1: INTRODUCTION

This chapter introduces you to your hand-held computer.

This computer is a lightweight, rugged, hand-held computer. It features battery operation, a backlit screen, handwritten input, MS-DOS, and IBM AT compatibility.

Checking the Contents of the Box

The parts included in the computer shipping carton are shown in Figure 1-1.

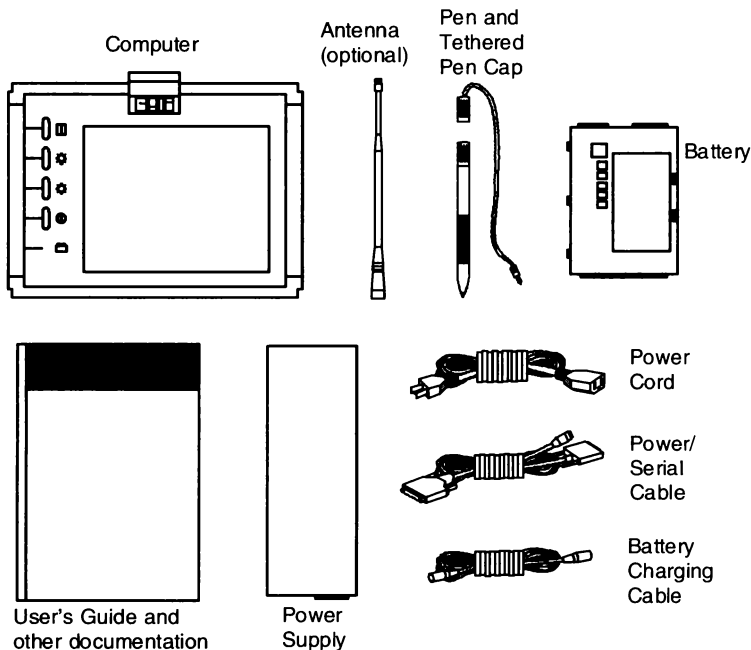


Figure 1-1. Contents of the Box

Check for shipping damage or missing parts. If any equipment is missing or damaged, contact your sales representative or distributor.

Keep the shipping carton and original packing materials in case you need to return your computer for upgrading or service. Do not return your computer until you have received prior authorization from your sales representative or distributor.

A New Kind of Hand-Held Computer

The computer is a new kind of hand-held computer. It incorporates some features of existing hand-held computers:

- It is lightweight and easily held in one hand.
- It is powered by internal rechargeable batteries.

The computer also contains new features that are *not* common to other hand-held computers:

- The standard input device is a pen, with which you write directly on the computer screen.

Because it does not need a keyboard, the computer is easier to use than most computers. You enter data into the computer by using the pen directly on the screen. Since typing skill is not required, the computer is used easily by anyone who can use a pen.

- Its screen can display 25 lines of 80 characters.

Using the computer is as easy as filling in a paper form with a pen. The computer screen can display forms much like the paper forms that you are used to filling in. You use the pen to write information in blanks on the forms. The computer translates your handwriting into typewritten characters that it can work with and store.

- It runs the Microsoft Disk Operating System (MS-DOS) and is IBM AT compatible.

- Internal storage options provide data storage on storage PC Cards or on SunDisk cards.
- The computer is expandable into a full-function AT-compatible computer by attaching a keyboard.
- The computer makes it easy to transfer files to PC-compatible computers because it includes a serial port and communications software.
- Optionally, it may include one of the several communications options. These options make it easy to exchange data over telephone lines or radio frequencies with remote computers, such as a corporate mainframe computer.

Feature Highlights

Here are the main features of the hand-held computer:

- The computer is small and lightweight; it measures 6.2 by 9 inches and weighs 2.9 pounds, including the battery pack. It can be held easily in one hand and is well-suited to mobile data collection.
- The computer has a battery life of up to four hours in normal use before it needs to be recharged. (Battery life depends greatly on the computer configuration and individual use.)
- The rubberized coating on the base of the computer provides cushioning and makes it more comfortable to hold.
- The pen is used for data entry; no keyboard is needed. This saves weight and makes data entry easier and more natural, especially for those not accustomed to a keyboard. The computer automatically translates handwritten characters into characters that it understands, as if you had typed them in. You can attach a keyboard if you wish.

- The computer is IBM AT compatible. It runs most popular MS-DOS software (except a very few programs that require a numeric coprocessor). It also runs Microsoft Windows™ software.
- The computer has a 5.5-inch by 3.4-inch backlit Liquid Crystal Display (LCD) screen with 640 by 400 pixel resolution. It supports the Video Graphics Array (VGA) graphics standard. Standard MS-DOS applications can display at least 25 lines of 80 characters on the screen.
- The computer contains 4 MB—over four million characters—of Random Access Memory (RAM), or main memory. Up to 640 kilobytes (kB) of this is “working” memory used for program execution; the remainder is extended memory.
- It contains one slot for storage. Either storage PC Cards or SunDisk cards can be used.
- The MS-DOS operating system and utility programs are built into each computer in a computer chip called a Read Only Memory (ROM).
- The serial port, built-in data transfer utility, and optional modems provide flexibility for connecting the computer to other computers for exchanging data and programs.
- A port supports an external keyboard or barcode reader.
- The computer contains an integrated power management system that extends battery life by automatically shutting down computer subsystems during periods of inactivity.
- The computer contains a small internal battery (called the bridge battery) that maintains standby power while you change battery packs. You do not need to turn off the computer or exit your work to replace an exhausted battery pack with a fresh one; simply put your computer into standby mode to change the batteries.

CHAPTER 2: GETTING STARTED

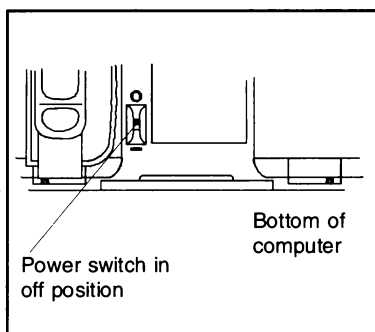
This chapter shows you how to get started quickly with your computer.

Starting Up

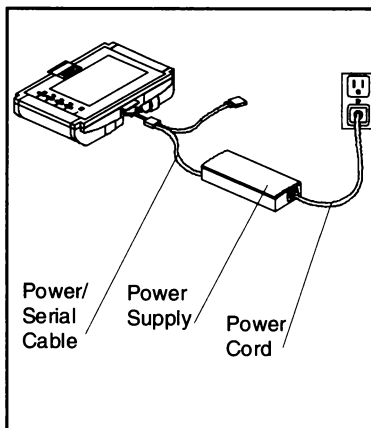
When you first receive your computer, the battery pack is not installed in the computer or charged. You will need to use the power supply included with the computer to operate the computer and charge the battery pack. Refer to Chapter 4 for information on inserting and charging the battery pack.

After unpacking your computer from its shipping materials, follow these simple steps to get started:

1. **Make sure the power switch on the bottom of the computer is off.** Slide this switch up (toward the center of the computer, marked “O”) to turn the computer off.

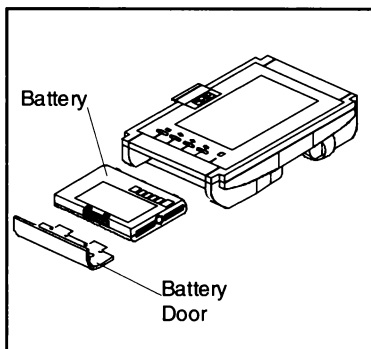


2. **Connect the power supply to the computer and plug it into a power outlet.** Lift the cover to access the 25-pin power/serial connector. Plug the 25-pin D-shaped connector on the computer power/serial cable into the power/serial connector on the side of the computer; plug the 8-pin round end of the cable into the power supply. The 9-pin D-shaped connector on the power/serial cable is

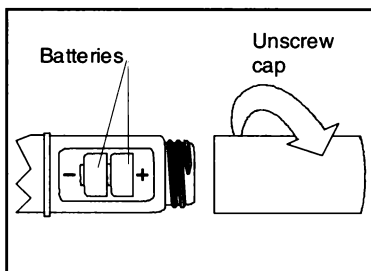


described on page 3-9. Plug one end of the power cord into the power cord socket on the power supply; plug the other end into a power outlet that accepts a three-prong plug. If you use a plug adapter, make sure it is properly grounded.

3. **Install the battery pack.** This lets you charge your battery pack while using your computer. Remove the battery door and slide the battery into the computer. The battery latch will click when it is locked into place. Replace the battery door. Refer to page 4-8 for more details.

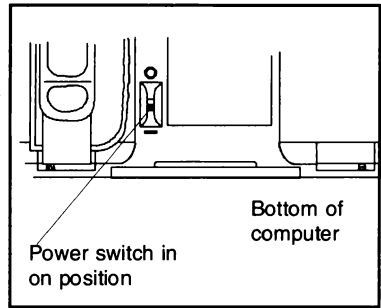


4. **Install the batteries in the pen.** Unscrew the pen cap. Insert the battery cells. Be sure the positive ends of the batteries point toward the top of the pen. Replace the pen cap. Tighten the cap only until it is secure, do not force it.



5. Turn on the computer.

Slide the computer power switch down (toward the edge of the computer, marked "I") to turn it on.



When you turn on the power, the computer runs a self-test and loads the MS-DOS operating system into its system memory. Then the Executive Menu is displayed on the screen. Executive Menu allows you to pick a task that you want the computer to perform. Refer to the section Executive Menu, beginning on page 9-1, for information on how to use this program.

NOTE: If your computer was purchased and set up for you by your company, it may be set up to automatically run some other program when it starts up.

Hold the computer with the screen facing you so that the buttons and switches are at the left side of the screen, as shown in Figure 2-1.

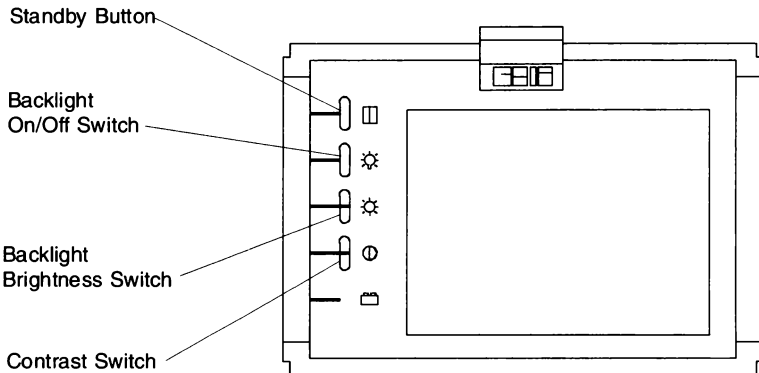


Figure 2-1. Landscape Orientation of the Computer

You may need to adjust the contrast and brightness of the screen so that you can see it clearly. The screen backlight is turned on and off with the second switch (see Figure 2-1). If the backlight is off, press the switch to turn on the backlight; if the backlight is on, press the switch to turn off the backlight.

The third switch controls the backlight intensity, or screen brightness. Press the top of the switch to increase the brightness. Press the bottom of the switch to decrease the brightness.

The contrast control is the fourth switch on the left side of the computer display. Press the top of the control to increase the contrast. Press the bottom of the switch to decrease the contrast. Refer to the section *The Top* on page 3-1 for additional information on the switches.

NOTE: The brightness of the screen affects power consumption—the brighter the screen, the greater the power consumption. Therefore, it is a good idea to decrease the backlight brightness or turn the backlight off to conserve power when using a battery pack.

The battery pack recharges fully in about 1.5 hours. You do not need to leave the computer on; the battery pack recharges as long as the computer is plugged in. Refer to Chapter 4 for more information about using the battery pack and other power options.

Internal Storage Devices

Every computer is equipped with an internal ROM that contains the MS-DOS operating system files and utility programs.

In addition, it contains a slot that accepts the following storage devices:

- SunDisk cards.
- Storage PC Cards.

Chapter 5 describes the SunDisk cards and storage cards in detail.

CAUTION

Do not bend or drop storage PC Cards or SunDisk cards. These cards contain delicate electronic circuits that can be damaged by unusual stresses.

Each of the storage devices installed in your computer is assigned a separate drive letter by which it can be accessed. The internal ROM is device A, while the SunDisk card is device C, and the storage PC Card is device D.

Configuring Your Computer

Before you begin using your computer, you may want to change its configuration. The computer configuration includes such items as the device from which the system should start up, system power control, the screen brightness and other attributes, the device names, the speed of the microprocessor, and the status of the standby and autostandby modes. Refer to the section Configurator, beginning on page 9-9, for information on changing your computer configuration.

The Hand Strap

The hand strap is designed to go over the back of your hand to secure the computer during use, as shown in Figure 2-2. Slide your hand under the strap and grasp the end of the computer. Rest the other end of the computer on your forearm.

The hand strap can be loosened or tightened to fit more comfortably. It can also be moved to the other side of the computer if you are left handed. Refer to the section The Bottom on page 3-10 for information on the hand strap.

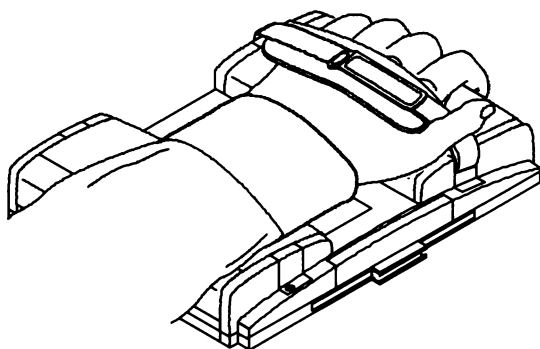


Figure 2-2. Using the Hand Strap

CHAPTER 3: GETTING TO KNOW YOUR COMPUTER

This chapter describes the computer in detail and explains each hardware feature on the top, sides, and bottom of the computer.

The Top

The top of the computer is shown in Figure 3-1. Each item shown in the figure is explained in the following sections.

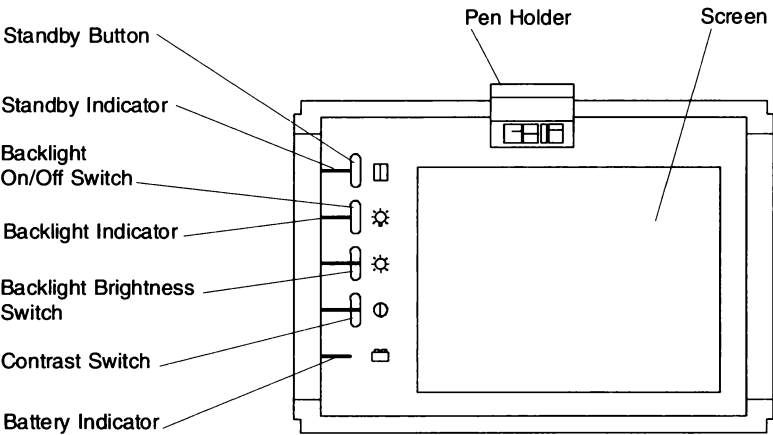


Figure 3-1. Top View

Screen

The screen is a sidelit transfective Liquid Crystal Display (LCD).

The screen acts as both a display and a data input device. The computer displays information on the screen, and you give information to the computer by writing on the screen with the pen.

The screen has a resolution of 640 by 400 pixels. (A pixel is one dot.) It supports the Video Graphics Array (VGA) graphics standard.

Because the screen is monochrome, it uses shades of gray to represent colors. This is called color mapping. The LCD screen can display up to 64 different shades of gray simultaneously. The computer automatically selects the shades of gray that give you the best screen display.

The brightness and screen contrast are controlled by switches on the left side of the screen. They can also be controlled by the **config brightness** and **config contrast** commands; for information on changing the screen brightness or contrast, refer to the section Configurator, beginning on page 9-9, and the sections Backlight Brightness Switch and Contrast Switch on pages 3-4 and 3-5.

Buttons and Switches

The buttons and switches on the left side of the display control standby mode, the backlight, the backlight brightness, and the screen contrast.

Standby Button

The standby button puts the computer into and out of *standby mode*. Standby mode is used to save battery power.

In standby mode, all of the computer subsystems are turned off, except for the system RAM and core processor. This both preserves your work and saves a great deal of battery power. Because the computer system RAM continues to receive power, all of your work is maintained and you can return to it exactly as you left it.

We recommend that you save the file you are working on before pressing the standby button. Standby does not automatically save your files onto a permanent storage device.

You can use standby mode if you are going to stop using the computer for a while, but you do not want to turn the computer off. When you press the standby button, the screen goes blank and the computer appears to be off, but your work is still preserved in system RAM. The standby indicator glows green to remind you that the computer is in standby. To return to normal operation, press the standby button again; the screen will turn on and show the same thing that was displayed before you first pushed the standby button.

NOTE: Standby mode has been tested with a wide range of “off-the-shelf” MS-DOS and Windows applications and generally is reliable. However, it is possible that it may not work properly with some applications; some applications may not be able to return from standby mode. Before using it with a new application, we suggest that you test it yourself to protect yourself against data loss. It is a good idea to save the file you are working on before pressing the standby button.

If you find that standby mode does not work properly with an application, and you have enabled the automatic standby feature, you should disable it.

Automatic Standby

To conserve power automatically and make your batteries last longer, you can set up your computer so that it goes into standby mode when you have not touched the pen to the screen (or typed on a attached keyboard) for a certain number of minutes. For example, you could set it so that it goes into standby mode if you have not written anything for five minutes. When you want to start working again, just press the standby switch and continue from where you stopped.

An application program that is continually updating the display prevents automatically standby from occurring. This could happen if a clock is displayed, for example.

Refer to the section Configurator, beginning on page 9-9, for information on using the **config autostandby** command to set your computer to automatically enter standby.

The computer also automatically enters standby mode in an attempt to preserve your work in system RAM if you are operating on battery power and the battery pack becomes nearly exhausted. You are alerted by the battery indicator and a beeping sound (unless the computer is in standby mode) when the battery is low.

Backlight On-Off Switch

This switch turns the screen backlight on and off (see Figure 3-1). If the backlight is off, press the switch to turn on the backlight; if the backlight is on, press the switch to turn off the backlight.

The screen backlight can also be controlled with the **config backlite** command. However, the switch on the computer overrides the **config** settings. Refer to the section Configurator, beginning on page 9-9, for details.

Backlight Brightness Switch

The screen backlight brightness can be increased by pressing the top of the switch (see Figure 3-1). Press the bottom of the switch to decrease the backlight brightness. There are three brightness settings: low, medium, and high. The backlight must be on for this switch to have any effect.

The backlight brightness can also be controlled with the **config brightness** and the **config brightlimit** commands. Refer to the section Configurator, beginning on page 9-9, for more details.

NOTE: The brightness of the screen affects power consumption—the brighter the backlight, the greater the power consumption. Therefore, it is a good idea to decrease the brightness to conserve power when using a battery pack.

Contrast Switch

The screen contrast can be adjusted by pressing the contrast switch (see Figure 3-1). Press the top of the switch to increase the contrast; press the bottom of the switch to decrease the contrast.

The contrast can also be adjusted with the **config contrast** command. Refer to the section Configurator, beginning on page 9-9, for more details.

NOTE: The contrast does not affect battery life.

Indicators

The indicators are light-emitting diodes (LEDs) located to the left of the switches (refer to Figure 3-1).

The status of the LEDs is shown in Table 3-1 and described in the following sections.

Table 3-1. Status of LED Indicators

LED Indicator	Status	Meaning
Standby Indicator	On (solid green)	Computer is in standby mode
	Off	Computer is in operating mode
Backlight Indicator	On (solid green)	Backlight is on
	Off	Backlight is off
Battery Indicator	Flashing (yellow)	Battery is low
	Off	Battery is charged

Standby Indicator

The standby indicator is a green LED. It glows green when the computer is in standby mode. It does not light when the computer is in operating mode.

Backlight Indicator

The backlight indicator is a green LED. It glows green when the backlight is on. It does not light when the backlight is off. The backlight can be turned on and off using the Backlight switch. The backlight can also be controlled by the **config backlite** command (refer to the section Configurator, beginning on page 9-9, for details).

Battery Indicator

The battery indicator is a yellow LED. This indicator alerts you when the battery pack is low.

The LED flashes when the computer is running on battery power and the battery is nearly exhausted. It is off when the battery is charged. When this indicator begins to flash, you may have as little as two minutes of battery power remaining. The exact amount of battery life remaining depends on many factors and is difficult to predict.

The computer also gives three short beeps every 15 seconds when the battery pack is low. These beeps start at the same time that the battery indicator lights. The beeping feature is controlled by the **config lowbeep** command; for more information refer to the description of this command on page 9-22.

When you see the battery indicator flash or hear the beeps, you should immediately save the file you are working on to avoid losing any data. Then take one of the following actions:

- Connect the power supply to the computer to supply external power. This recharges the battery pack while you operate the computer.
- Press the standby button to put the computer into standby mode, then remove the battery pack and replace it with another charged battery pack. While you change battery packs, a small internal rechargeable battery, called the bridge battery, maintains standby power for at least a few minutes.

If you do not take any action to supply more power to the computer when the battery indicator lights, the battery pack will continue to drain. When it is almost exhausted, the computer automatically enters standby mode in an attempt to preserve your work in system RAM. When this happens, the screen goes blank, the standby indicator lights, and the battery indicator continues to flash. This feature is known as low-power standby.

To return to your work, connect the power supply or insert a charged battery pack; then press the standby button to exit standby mode.

Depending on how fully charged the internal bridge battery is, the computer can remain in standby mode for approximately ten minutes. When the internal bridge battery becomes exhausted, the computer turns off. You may lose data if you have not saved your work.

NOTE: Do not leave the computer in low-power standby for an extended period of time. Although standby consumes considerably less power, it continues to drain the main battery and bridge battery if the power switch is left on. This very low discharge will damage the batteries, resulting in reduced cycle life of the battery or battery failure.

The Sides

The side views of the computer are shown in Figure 3-2. Each item shown in the figure is explained in the following sections. The connectors and storage slot have covers over them. Lift the cover from the bottom to access the connector or storage slot; the cover stays attached to the computer at the top of the cover.

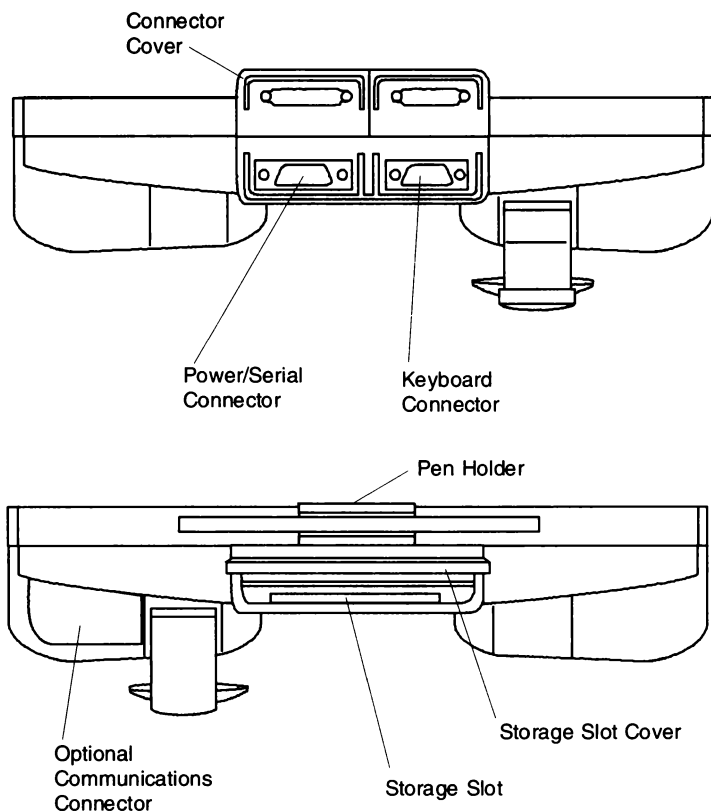


Figure 3-2. Side Views

NOTE: This computer has been FCC-certified under test conditions which include the use of SHIELDED keyboard and serial cables. Cables supplied with the computer are shielded. To reduce the possibility of causing interference to radio, television, and other electronic devices, it is important that you use shielded cables when connecting external devices. Telephone cords do not require shielding.

Power/Serial Connector

The power/serial connector is a 25-pin microminiature connector. The power/serial connector accepts the 25-pin D-shaped connector

on the power/serial cable. The 8-pin round connector on the other end of the cable plugs into the power supply to provide external power to the computer. Refer to Appendix B for the pinouts for the connectors.

The power/serial cable is a Y cable that also provides a 9-pin D-type RS-232C-compatible connector. The 9-pin, RS-232C serial connector allows you to connect the computer to another computer so that you can transfer data between the two computers. It also allows you to connect your computer to external modems, serial printers, and other standard PC-compatible serial devices.

An optional serial cable is also available. The serial cable has a 25-pin microminiature connector at one end and a 9-pin RS-232C connector at the other end. The serial cable may be used to connect peripherals to the serial connector.

You can use the MS-DOS **mode comn** command to change the serial port default settings. For instructions on using this command, refer to the MS-DOS documentation.

The serial port initially is assigned device name COM1. You can use the **config serial** command to change the device name of the serial port. Refer to the section Configurator, beginning on page 9-9, for more information.

Keyboard Connector

The keyboard connector is used to attach an AT-compatible keyboard or a barcode reader to the computer.

The 15-pin keyboard connector accepts the plug from the optional keyboard adapter. The keyboard adapter adapts the 15-pin connector on the computer to a standard size 5-pin DIN jack used by keyboards. If your keyboard has a miniature DIN PS/2 style connector, you need to purchase the PS/2 Adapter Socket from your sales representative or distributor. This adapter converts the standard size DIN to a miniature DIN.

The D-shaped end of the keyboard adapter plugs into the keyboard connector. The trapezoidal or “D” shape makes an improper

connection impossible. If the connector does not fit, turn it upside down. The round end of the keyboard adapter plugs into an AT-compatible keyboard.

Storage Device Slot

Your computer has a storage device slot on the side. This slot accepts PCMCIA 1.0/JEIDA storage cards or SunDisk cards.

Storage PC cards hold programs and data like floppy diskettes, except that storage cards have no internal moving parts. Data is stored in electronic circuits inside the cards.

SunDisk cards are solid-state silicon hard drives that hold programs and data. Refer to Chapter 5 for more information about using storage cards and SunDisk cards.

NOTE: This slot does not accept flash ROM cards.

The Communications Connectors (Optional)

The computer provides several factory-installed communications options.

If one of these options was installed in your computer, the connector will be located on the side.

The Bottom

The bottom view of the computer is shown in Figure 3-3. Each item shown in the figure is explained in the following sections.

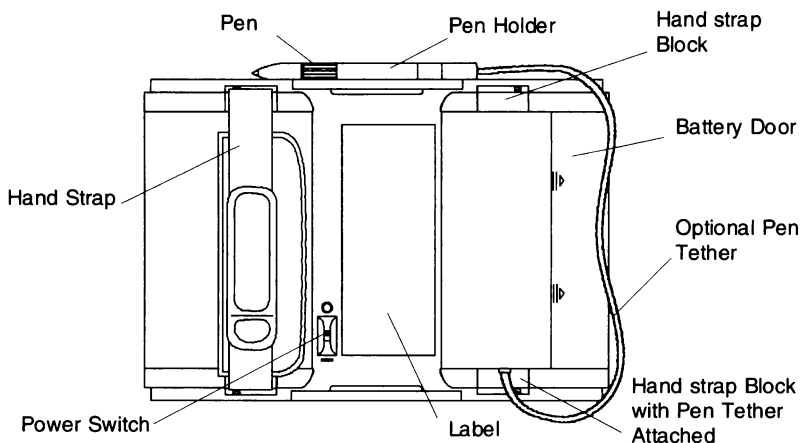


Figure 3-3. Bottom View

Power Switch

The power switch turns the computer on and off. Slide the switch up (toward the center of the computer, marked “O”) to turn off the computer. Slide the switch down (toward the edge of the computer, marked “I”) to turn on the computer.

CAUTION

The computer system (working) memory is erased when you turn off the power. If you want to save your work, be sure to do so before turning off the power. Refer to the documentation for your application program for instructions on how to save your work.

Always turn the computer off if the computer is not connected to the external power supply or a battery is not installed. If the power switch is left on and no power source is available, the computer will go into low-power standby and drain the bridge battery.

The Hand Strap

The hand strap holds the computer securely over the back of your hand. It can be loosened or tightened to fit more comfortably. The hand strap can also be moved to the other side of the computer for left-handed users.

The pen tether fastener inserts into a hand strap block. Refer to the section The Pen on page 3-15 for information on the pen tether.

Adjusting the Hand Strap

The hand strap can be adjusted to fit as loose or tight around your hand as you desire. To adjust the hand strap, follow these steps:

1. Turn the computer over so the bottom is facing you.
2. Slide your hand under the hand strap as shown in Figure 3-4.
3. Pull up on the strap to separate the fastener. The hand strap has hook-and-loop fasteners to hold it in position.
4. Loosen or tighten the hand strap around your hand.
5. Refasten the hook-and-loop fastener.

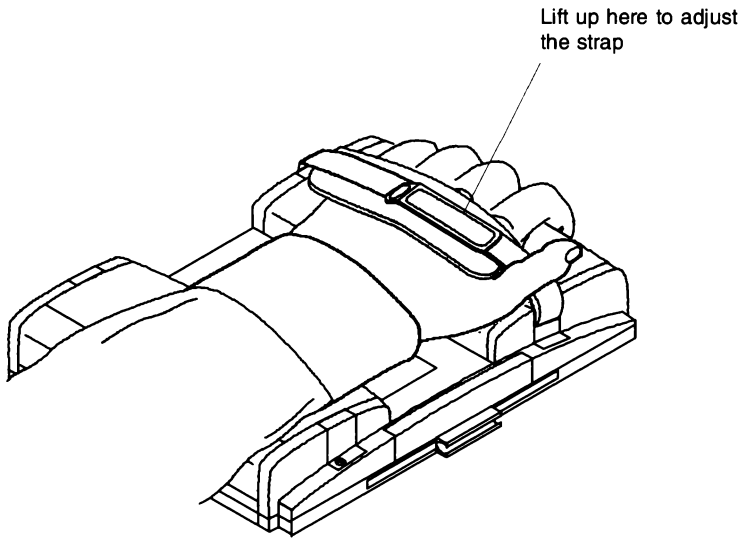


Figure 3-4. Adjusting the Computer Hand Strap

Moving the Hand Strap

The computer is shipped with the hand strap attached to the left side of the computer. This is the way a right-handed person would hold the computer in the left hand while using the right hand to write on the screen. If you are left-handed, you can move the strap to the left side of the computer by performing the following steps (see Figure 3-5):

1. Turn the computer upside down so the bottom is facing you.
2. Remove the screw on the blocks at each end of the hand strap. Use a small Phillips-head screwdriver. Lift out the hand strap and blocks.
3. Remove the screws from the blocks on the other side of the bottom of the computer. Lift out the blocks.
4. Turn the hand strap end-to-end and position the hand strap blocks in the slots on the left from which the blocks were originally removed. Replace and tighten the screws.

5. Place the blocks on the right side where the hand strap blocks were originally located. Change the blocks to the opposite side so the curve on the block matches the curvature of the computer. Replace and tighten the screws.

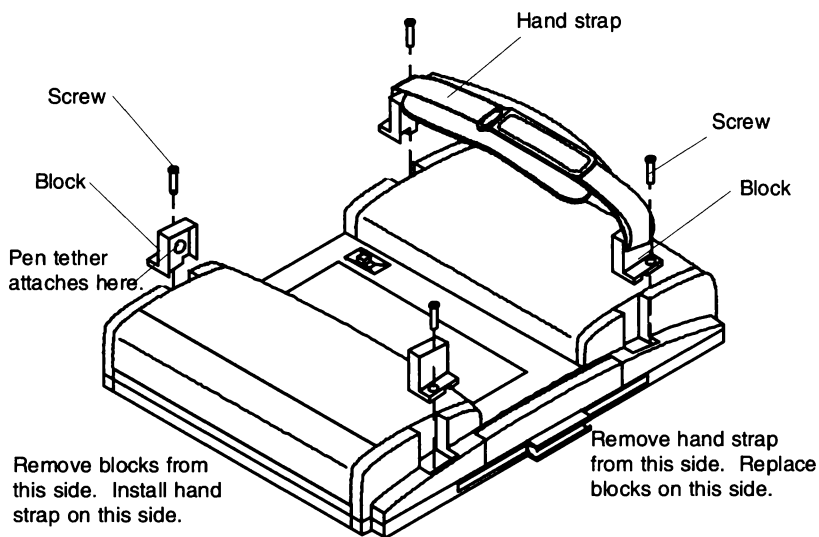


Figure 3-5. Moving the Hand Strap

The Pen

You enter information into the computer by writing on the screen with the pen.

When you are not using the pen, it stores neatly in the holder at the top of the computer, as shown in Figure 3-6. To store the pen, snap the center of the pen into the holder. To remove the pen, slide it out of the holder.

NOTE: The pen was not designed to withstand non-use activities such as repeatedly removing and replacing the cap, bending or twisting the pen, etc.

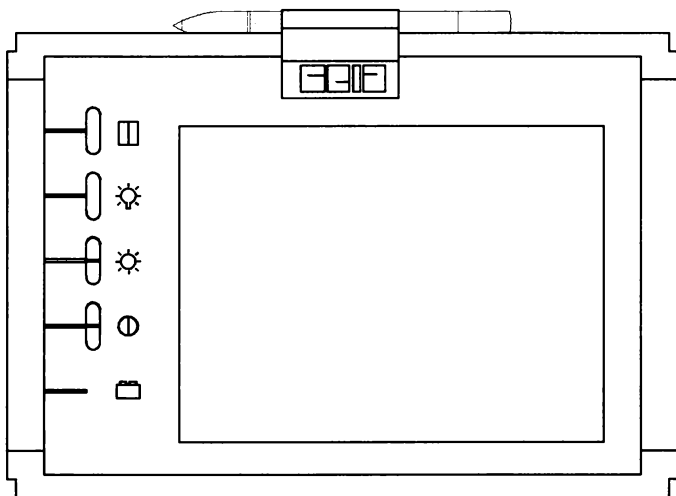


Figure 3-6. Pen Stored in Computer

Since the pen is battery powered, it is designed so that if it is not used (that is, touched to the computer screen) for about two minutes, the pen shuts down to conserve power. To wake up the pen, press the tip of the pen to the screen and release it; the pen is ready to use.

Installing or Changing the Pen Batteries

To install or replace the batteries, unscrew the pen cap. Remove the old batteries (if present). Insert two new lithium battery cells. Be

sure the positive ends of the batteries point toward the top of the pen; refer to Figure 3-7. After the batteries are changed, replace the pen cap; do not tighten the cap excessively. The following replacement batteries may be used in the pen:

Eveready Battery Company Inc., E13E or 393

Rayovac Corp., RN13 or RW48

Duracell Corp., MS13

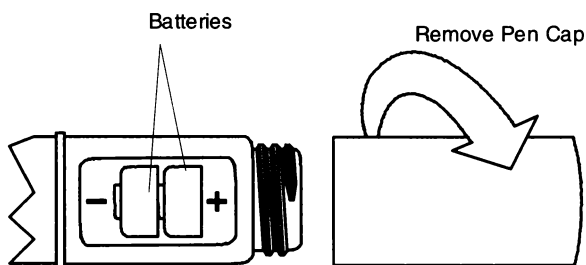


Figure 3-7. Changing the Pen Batteries

WARNING

Batteries may explode if they are mistreated. Do not recharge them, disassemble them, or dispose of them in fire. Dispose of the used batteries according to the manufacturer's instructions. Keep batteries away from children. Replace the batteries with batteries of the same type.

Attaching the Pen with the Optional Tether

The pen was shipped with an optional tethered pen cap. If you want to attach the tether, unscrew the pen cap that was shipped on the pen. Replace that cap with the tethered cap. The opposite end of the pen tether connects to the hand strap block, as shown in Figure 3-8. Push the pointed connector into the round hole in the hand strap block. If you are right handed, the tether will be connected at the lower edge of the computer. If you are left handed and have moved the hand strap, the tether will be connected at the top edge of

the computer. The tether is designed to pull out of the fastener if firm pressure is applied. The pen tether will not support the weight of the computer.

NOTE: The fastener on the end of the pen tether is not designed to be repeatedly inserted into and removed from the hand strap block. Once you connect the pen tether to the hand strap block, you should plan to leave it there.

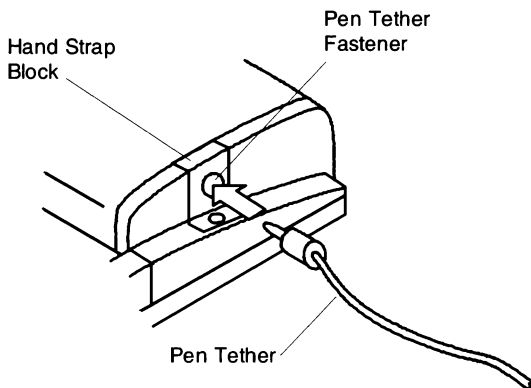


Figure 3-8. Attaching the Pen to the Computer

Testing the Pen Batteries

The pen contains two small batteries that should last about three months.

The batteries in the pen can be tested whenever you turn the computer on. As the computer starts up, it displays the following message:

Touch the pen to the screen and lift to test pen battery.

When you touch the pen to the screen and then remove the pen, the batteries are tested. If the batteries are low, you are alerted by a message on the screen before the computer finishes starting up. You must touch the pen to the screen or press a key on an attached keyboard to acknowledge the message.

You should change the batteries in the pen soon after the low-battery indication, so that your computer will continue to operate. After you receive the low-battery indication, the batteries may continue to last for a while before they become completely exhausted. However, there is no certainty that they will last, so we recommend that you change the batteries as soon as possible.

It is a good practice to change the pen batteries quarterly regardless of their status. This will prevent a pen failure at an unexpected time.

If the pen is not touched to the screen within 60 seconds after the start-up pen-test message appears, the message is removed and your computer finishes the start-up procedure. If you have an attached keyboard, you can press a key to instruct the computer to ignore the pen test and to continue the start-up procedure. Refer to the **config pentest** command on page 9-24 for additional information on testing the pen battery.

CHAPTER 4:

POWERING YOUR COMPUTER

This chapter describes standby mode, the options that are available for powering the computer, and other power considerations. You can use the power supply, the internal battery pack, or the optional auto adapter to power the computer.

Important Safety Instructions

The computer is intended to be electrically grounded when connected through the power supply to an external source of power.

The power supply is equipped with a three-wire grounding-type plug, which has a third (grounding) pin. This plug fits only a grounding-type power outlet. This is a safety feature.

If you are unable to insert the plug into an ac outlet, contact a licensed electrician to replace the outlet with one that is properly grounded.

Do not defeat the purpose of the grounding-type plug.

WARNING

Electrical equipment may be hazardous if misused. Operation of this product, or similar products, must always be supervised by an adult. Do not allow children access to the interior of any electrical product, or permit them to handle any cables.
--

Standby Mode

Standby mode is a valuable power management feature of your computer. It helps you achieve a longer operating time when you are using a battery pack by shutting down almost all computer systems when you are not using the computer, while maintaining your application in memory exactly as you left it.

When the computer is in standby mode, the screen goes blank and the computer appears to be off, but your work is preserved in memory. The standby indicator glows green to remind you that the computer is in standby mode. Computer battery usage is reduced by over 90 percent because the computer uses only enough power to maintain the system RAM, or main memory.

We recommend that you save the file you are working on before putting the computer into standby mode.

When to Enter Standby Mode

Put your computer into standby mode in the following situations:

- You are running on battery power and are not going to be using the computer for a while but do not want to turn it off.
- You need to change the battery and do not want to turn off the computer.

How to Enter Standby Mode

Your computer can enter into standby mode in three ways:

- When you press the standby button.

Press the standby button when you want to put the computer into standby.

- When you use an option of the **config** command.

The **config** command has two options for putting your computer into standby mode. For details refer to the section Configurator, beginning on page 9-9.

- The **config autostandby** command is used to set a specific length of inactivity, after which your computer automatically goes into standby mode.
 - The **config standby** command puts your computer into standby mode immediately. The **config standby** command also enables and disables standby mode. You would not normally want to disable standby mode.
- When power is removed while the power switch is on.

Your computer will enter emergency standby mode if power is removed from the computer. If the battery is removed or power is disconnected while the power switch is on, the computer automatically goes into standby. This feature is a safeguard and should not normally be used to put your computer into standby. The computer will remain in standby until the bridge battery is exhausted. Once you provide power, exit standby and continue using your computer.

CAUTION

If you are writing to a SunDisk card or storage PC Card when power is removed and the computer enters emergency standby mode, data may be lost and the card may be corrupted. Use a disk recovery program to check your card.

While you are in standby, the standby indicator glows green.

Exiting Standby Mode

Press the standby button to return to operating mode.

If you go into standby mode to change the battery or to conserve battery power while you are away from the machine, pressing the standby button returns your work files to the same status as they were when you entered standby mode.

When you leave standby, the standby indicator goes off.

Notes Regarding Standby Mode

- Standby mode has been tested with a variety of widely used MS-DOS and Windows applications. Some applications may not work properly; they may not be able to return from standby mode. Before using standby with a new application, test to see if your application can return from standby mode to protect yourself against data loss. Save the file you are working on before entering standby mode.
- If you find that standby mode does not work properly with an application, disable the automatic standby feature using the **config autostandby** command; refer to the section Configurator, beginning on page 9-9.
- Do not press the standby button during an Interlnk data transfer; you may lose data and your computer may be unable to recover from standby mode. If you do an Interlnk data transfer from the Executive Menu, the computer will not automatically enter standby mode during the data transfer.
- You may need to disable the automatic standby feature if you are using a non-MS-DOS operating system.

Using the Power Supply

The power supply provides external power from a three-wire power outlet. The power outlet must supply power at 100-240 volts at 47-63 or 400 Hertz.

NOTE: The power/serial cable is a Y cable that also provides a 9-pin serial connector. The serial connector is not needed to power the computer. An optional power cable is available; it provides the 25-pin power/serial connector and the 8-pin power connector needed for powering the computer.

The power supply attaches to the computer as described below and as shown in Figure 4-1.

1. Plug the 25-pin D-shaped connector on the power/serial cable into the power/serial connector on the side of the computer; plug the 8-pin round connector into the power supply.
2. Plug the female end of the power cord into the power cord socket on the power supply.
3. Plug the male end of the power cord into an outlet that accepts a three-prong plug. If you use a two-prong plug adapter, make sure that it is properly grounded. Ensure that the power supply is resting on its bottom so that none of the air vents are blocked.

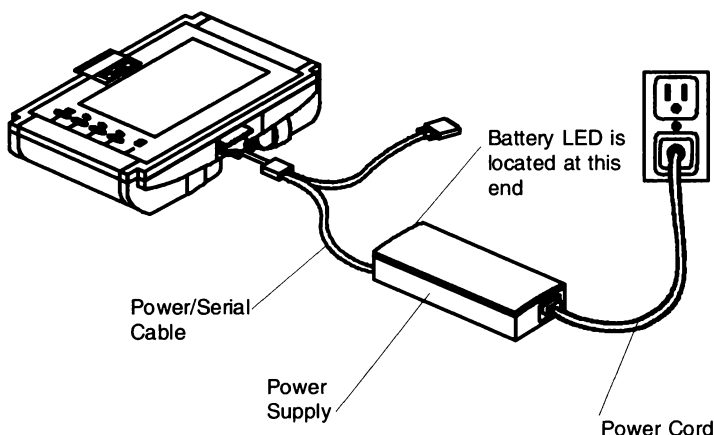


Figure 4-1. Powering Computer from the Power Supply

The power supply also functions as a battery charger.

When the power supply is plugged into the computer and the battery pack is installed, it recharges the computer battery pack in approximately 1.5 hours. The computer does not need to be turned on for the battery pack to recharge.

Alternately, the power supply can be plugged directly into the battery pack to charge the battery in 1.5 hours. For more information, refer to the section Recharging the Battery Pack, on page 4-9.

Table 4-1 shows the status of the green LED on the power supply.

Table 4-1. Power Supply LED Status

Power Supply LED State	Meaning
Solid green	Battery is fully charged.
Flashing green	Battery is rapid charging.
Off	Power supply is not connected to the computer or to a battery.

Using the Battery Pack

The internal battery pack provides power to the computer from rechargeable batteries sealed inside the pack. The battery pack is not charged initially when it is shipped in the computer.

Removing the Battery Pack

To remove the battery pack:

1. Put the computer into standby or turn it off.
2. Press down on the arrows on the battery door on the bottom of the computer (Figure 4-2).

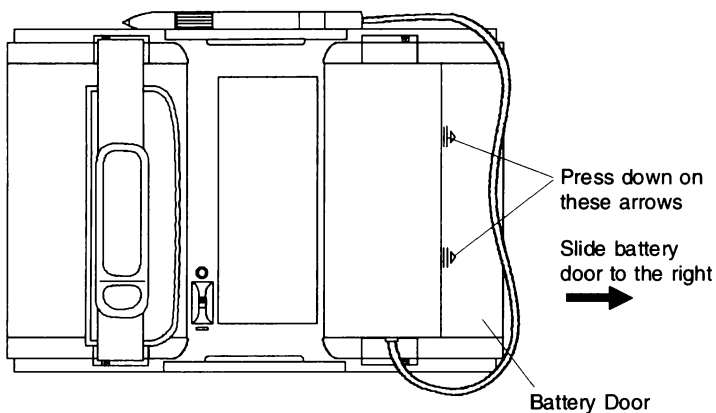


Figure 4-2. Opening the Battery Door

3. Remove the battery door by sliding it out.
4. Press down on the battery latch; then grasp the battery and pull it out, as shown in Figure 4-3.

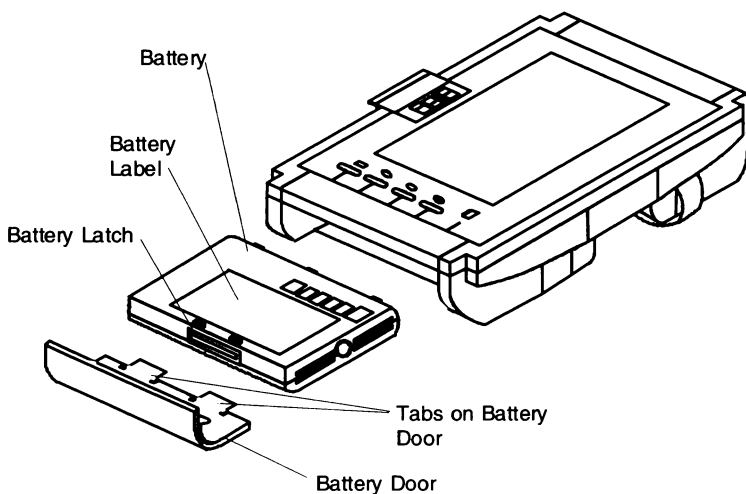


Figure 4-3. Removing the Battery Pack

Inserting the Battery Pack

To insert the battery pack into the computer, remove the battery door and slide the battery into the computer. The battery slides along tracks in the battery opening of the computer. The battery label faces up when the battery is inserted. Be sure the battery latch catches to hold the battery in place; the battery latch will click when the battery is completely inserted. Replace the battery door by inserting the tabs first; then snap the door into place.

Low Battery Warnings

The computer gives three short beeps every 15 seconds when the battery pack is low. These beeps start at the same time that the battery indicator lights. The beeping feature is controlled by the **config lowbeep** command; refer to the section Configurator, beginning on page 9-9, for further information.

When you hear the beeps and see the battery indicator flash, you should **immediately save the file** you are working on to avoid losing any data. Then, take one of the following actions:

- Connect the power supply to the computer to supply external power. This recharges the battery pack while you operate the computer.
- Press the standby button to put the computer into standby mode, then remove the battery pack and replace it with another charged battery pack. While you change battery packs, a small internal rechargeable battery, called the bridge battery, maintains standby power for at least five minutes.

If you do not take any action to supply more power to the computer when the power indicator begins blinking, the battery pack will continue to drain. When it is almost exhausted, the computer automatically enters standby mode in an attempt to preserve your work in system RAM. When this happens, the screen goes blank, and the standby indicator is solid green. This feature is known as low-power standby.

To return to your work, connect the power supply or insert a charged battery pack, then press the standby button to exit standby mode.

Recharging the Battery Pack

The battery pack can be used and recharged many times. It automatically recharges whenever the computer is plugged in; it does not need to be turned on. You also can recharge the battery pack by plugging it directly into the power supply.

When the battery pack becomes exhausted, you must recharge it.

NOTE: Before recharging a battery pack, you should wait for it to become fully discharged. The computer beeps when it is time for you to recharge the battery. If you frequently recharge your battery pack before it is fully discharged, the batteries may lose some of their capacity; they will not last as long after each charge.

You have two options for recharging the battery pack:

- Leave the battery pack in the computer and plug the power supply into the computer, as shown in Figure 4-1. The batteries recharge automatically, whether or not the computer is turned on.
- Remove the battery pack from the computer and connect the power supply directly to the battery pack, using the battery cable. Plug one end into the power supply and plug the other end into the connector on the side of the battery pack, as shown in Figure 4-4. Connect the power supply to the wall outlet using the power cord. You can use this method to recharge one battery pack externally while using another in the computer, if you have more than one battery pack.

It requires about 1.5 hours to recharge a fully discharged battery pack. It doesn't matter whether the computer is turned on.

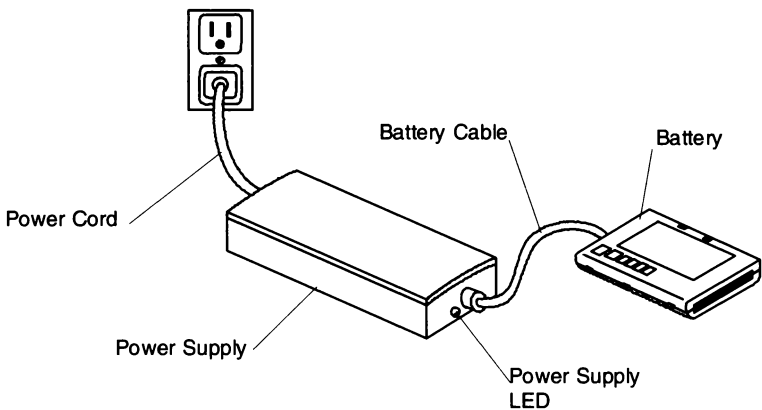


Figure 4-4. Charging Battery Pack Directly from the Power Supply

Optimizing Battery Life

To get the most computer operating time from your battery pack, follow these suggestions:

- Put the computer into standby mode when you are not going to be using it for a while and you do not want to turn it off.

To put the computer into standby mode, press the standby button. The computer also can be configured to automatically enter standby mode if there has been no activity for a few minutes. For more information on standby mode, refer to the section Standby Mode, on page 4-2. For information on enabling standby mode and the automatic standby feature, refer to the section Configurator, beginning on page 9-9.

- Decrease the brightness of or turn off the screen backlight when you don't need it (the contrast of the screen has no effect on battery life).
- If you have an optional internal modem, turn off the modem port when it is not being used. For more information, refer to the section Configurator, beginning on page 9-9.

- Operate the computer at its slower speed if it does not matter how fast it operates. For more information, refer to the section Configurator, beginning on page 9-9.
- Do not connect a keyboard unless you are using it.
- Wait for the battery pack to become fully discharged before you recharge it. If you frequently recharge your battery pack before it is fully discharged, the batteries may lose some of their capacity; they will not last as long after each charge.

Using the Optional Auto Adapter

The optional auto adapter provides power to the computer from the cigarette-lighter socket of a car or from other 12-volt power sources that have cigarette-lighter sockets. You do not need the power supply when you are using the auto adapter. Note that the auto adapter does not provide enough power to charge the computer battery pack.

To connect the auto adapter to the computer, follow these steps:

1. Plug the cigarette-lighter plug end of the auto adapter cable into the cigarette-lighter socket in the car. Plug the other end of the cable into the auto adapter.
2. Plug the D-shaped connector on the computer power cable into the power/serial connector on the side of the computer. Plug the round end of the cable into the auto adapter as shown in Figure 4-5.

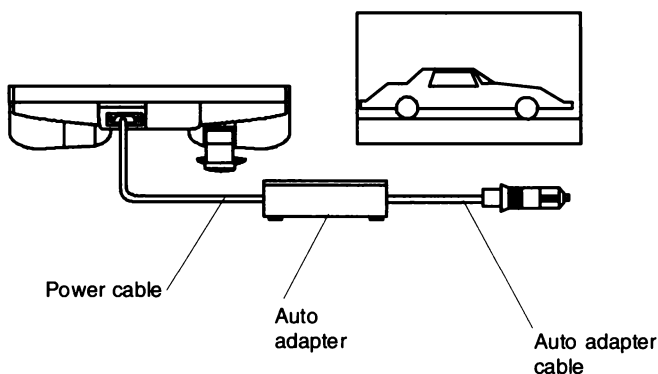


Figure 4-5. Powering Computer from Auto Adapter

NOTE: Many automobiles cause power surges or depressions to the cigarette-lighter socket when the engine is started. If the computer is connected to the cigarette-lighter socket when you start the engine, it may be momentarily turned off. This causes the loss of any data currently in system memory.

We recommend having the battery pack installed in your computer to ensure continuous power while operating from a car cigarette-lighter socket.

CAUTION

In special applications, you may wish to cut off the cigarette-lighter plug and wire the adapter directly into the vehicle electrical system. If you do this, you must include a 5 ampere fuse on the positive line to protect your computer. If you fail to do this, your computer could be damaged.

Internal Bridge Battery

The internal bridge battery is a small rechargeable battery that is contained inside the computer. It is not user-accessible.

The bridge battery supplies enough power for the computer to operate only in standby mode. It is designed so that you do not have to turn the computer off to change battery packs; you just have to press the standby button to put the computer into standby mode. Then you can remove the exhausted battery pack and insert a fresh one, while the bridge battery maintains the computer system RAM. To resume normal operation, press the standby button again.

NOTE: We recommend that you save the file you are working on before pressing the standby button to put the computer into standby mode. Standby does not automatically save your files onto a permanent storage device.

When fully charged, the bridge battery can supply approximately 10 minutes of standby mode power. However, the bridge battery may not be fully charged, so we recommend changing battery packs without delay when in standby mode.

The bridge battery recharges automatically whenever the computer is turned on. The bridge battery recharges no matter how the computer is being powered (power supply, battery pack, or auto adapter); however, it only charges if the power switch is on. It takes approximately 12 hours for the bridge battery to recharge fully if it has been completely discharged. However, it is not likely that the bridge battery would ever become fully discharged, unless you left the computer in standby mode for some time with no other power source connected.

If you do not have a power source connected to the computer (such as an installed battery or external power), do not leave the computer with the power switch in the on position. Doing so will cause the bridge battery to become fully discharged.

CAUTION

Deep discharge of the main battery or bridge battery could damage the batteries, resulting in reduced battery cycle life or battery failure.

CHAPTER 5:

USING STORAGE DEVICES

This chapter describes the storage cards available for the computer and explains how to use them. Changing the storage card battery is also covered. It also describes the SunDisk cards and explains how to use them. Your computer will accept both PCMCIA/JEIDA storage cards and SunDisk cards.

SunDisk Cards

The SunDisk card operates like a hard drive to store programs and data on the computer. The SunDisk card is a credit-card shaped solid-state silicon hard drive card. It contains no moving parts.

Description

The computer uses SunDisk cards that are compatible with the 68-pin PCMCIA 1.0/JEIDA connector. A special controller in the computer provides a proprietary interface to the SunDisk cards that is not PCMCIA compatible and will only interface to SunDisk controller systems. SunDisk cards are available in several sizes. A SunDisk card is shown in Figure 5-1.

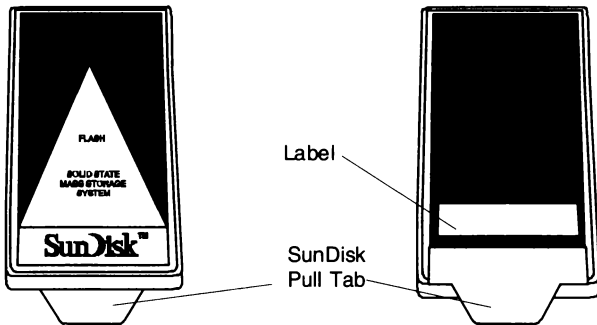


Figure 5-1. SunDisk Card

The SunDisk card stores data and programs and allows you to read from and write to the disk—just like a hard disk.

Using SunDisk Cards

This section describes how to insert and remove SunDisk cards from the computer, and how to use them.

Inserting a SunDisk Card

You do not need to turn off the computer when inserting a SunDisk card.

1. Hold the SunDisk card with the connector towards the computer; the side with the pull-tab and label should be facing towards the top of the computer. Slide the SunDisk card into the storage slot, as shown in Figure 5-2.

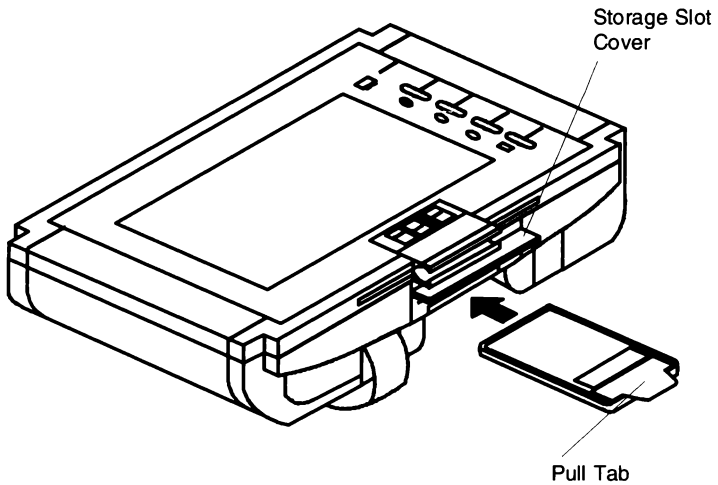


Figure 5-2. Inserting the SunDisk Card

2. Push the SunDisk card in firmly until it will not go in any further. It is OK to use firm pressure, but you should not need a great deal of force to seat the SunDisk card properly in its connector. If it does not go in easily, you probably have the SunDisk card turned upside down.
3. Close the storage slot cover over the card. Be sure the cover is closed tightly so the card will not work loose when the computer is being moved.

Removing a SunDisk Card

You do not need to turn off the computer when removing a SunDisk card.

CAUTION

Removing the SunDisk card while the card is being written to will result in loss of data. It may also damage the file allocation table and make the SunDisk card unreadable.

To remove the SunDisk card, lift the storage slot cover, grasp the pull tab, and pull the SunDisk card straight out, as shown in Figure 5-3.

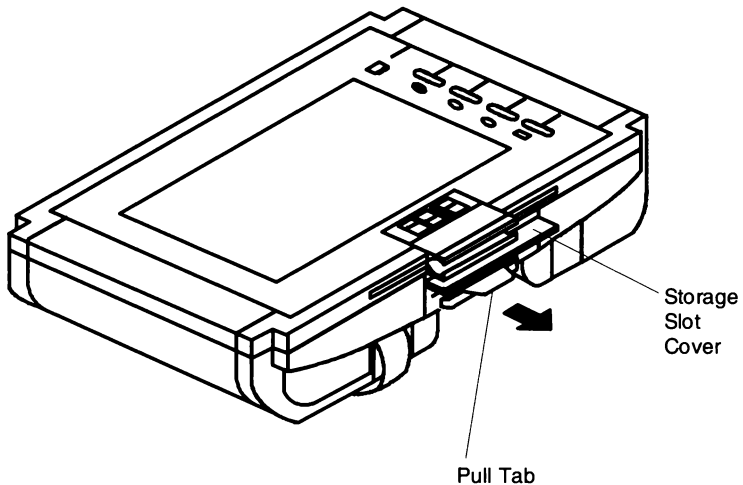


Figure 5-3. Removing the SunDisk Card

Formatting a SunDisk Card

The SunDisk card is similar to a hard drive. It has a drive letter—C—just like a hard drive. A new SunDisk card must be formatted before it can be used. Use the MS-DOS **fdisk** and **format** commands to partition and format your SunDisk card prior to using it; refer to the MS-DOS documentation for information on these commands.

When you use the **fdisk** command, select Option 1 Create DOS Partition. Then select Option 1 Create Primary DOS Partition. The following prompt appears:

```
Do you wish to use the maximum size for a Primary DOS Partition
and make the partition active (Y/N).....? [Y].
```

Type **n** to respond to this prompt. The following prompt appears:

Enter partition size in Mbytes or percent of disk space (%) to create a Primary DOS Partition.....[]

Enter 100 to create one partition. This partition is not active. This means that MS-DOS in ROM is used when the computer boots; the SunDisk is not a system disk.

You may also create a second partition on your SunDisk card if you wish to do so; it is assigned device letter D.

CAUTION

If your computer was purchased for you by your company and has been set up for use, the SunDisk card has already been formatted. Reformatting it will erase all the data on the SunDisk card.

Wear Leveling

Because of the way data is written to the SunDisk, it is sometimes necessary to have the data rearranged to increase the life of the SunDisk. This can be done automatically with the **config wearlevel** command (refer to page 9-28). The **config wearlevel** command specifies a number meaning that after the computer has been turned on that number of times, the SunDisk is automatically checked to determine if wear leveling is needed. If it is needed, it is automatically performed. It may take up to a minute to determine whether the wear leveling is needed and to perform the wear leveling.

Periodic wear leveling can significantly increase the life of your SunDisk. The frequency for checking for the wear leveling should be based on the number of times the disk is written to. In typical use, weekly wear leveling is recommended.

Accessing the SunDisk Card

To your computer's operating system (MS-DOS), the SunDisk card appears identical to a hard drive. You may also access partitions on the SunDisk card by using the appropriate device letter for the

partition. To access the SunDisk card from MS-DOS, use its drive letter. For example, to get a directory of the storage device, enter the following command:

```
dir c:
```

If you insert a SunDisk card with more than one partition while the computer is on, only the first partition is recognized. To have the other partitions recognized, turn the computer off and then back on.

You might not ever use MS-DOS commands on your computer, and, therefore, may never need to issue commands such as the one shown above to access storage cards. Typically, custom-written programs access the storage device automatically so you do not need to be bothered with these details.

If you are using MS-DOS commands on your computer, the SunDisk card will respond to most MS-DOS commands just as if it were a hard drive.

Storage PC Cards

PCMCIA 1.0/JEIDA storage PC Cards store programs and data on the computer. They are similar to floppy diskettes, except that storage cards have no internal moving parts. Data is stored in electronic circuits inside the thin credit-card shaped cards.

Description

The computer uses storage cards that are compatible with the 68-pin PCMCIA 1.0/JEIDA standard. A storage PC Card is shown in Figure 5-4.

NOTE: Flash cards are not supported on the computer.

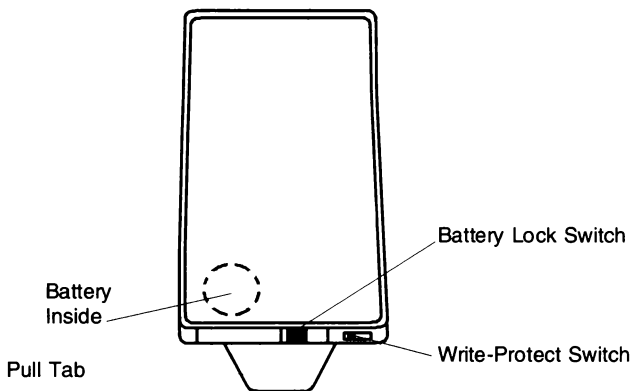


Figure 5-4. Storage PC Card

CAUTION

Do not bend or drop storage cards. Storage cards contain delicate electronic circuits that can be damaged by stress and shock.

The write-protect switch prevents data from being written or erased on the storage card. Figure 5-4 shows the write-protect switch in the unprotected position; the storage card can be read or written to. The switch write-protects the card when it is pushed towards the outside edge of the card (opposite from the position shown in Figure 5-4).

The battery lock switch locks the battery carrier closed so that it cannot be accidentally opened.

The position of the battery inside the storage card is indicated by a dotted circle. The battery carrier is removed by prying it out using the thumbnail slot on the edge of the storage card. Instructions on changing the battery are provided in the section Changing a Storage Card Battery, beginning on page 5-11.

You can write data to a storage PC Card and read data from it—just like a floppy disk. The data in a storage PC Card is preserved by a small amount of electricity flowing from a battery inside the card. The battery lasts for at least six months inside the storage PC Card, after which it must be replaced. (The battery may last much longer, but this cannot be certain.)

A bridge battery in the storage PC Card provides power to the PC Card for a few minutes; this allows you to change the battery in the PC Card without losing data.

CAUTION

Not all storage PC Cards have a bridge battery backup. If you are using cards without a bridge battery, you must back up the data before changing the battery.

Using Storage PC Cards

This section describes how to insert and remove storage PC Cards from the computer, and how to use them.

Before using a storage card, you must apply the label to it, install the battery, and format it. If your computer was purchased for you by your company, this has probably already been done. If not, refer to the section Preparing Storage Cards, on page 5-14, for instructions on preparing your PC Cards for use.

Inserting a Storage PC Card

You do not need to turn off the computer when inserting a storage PC Card.

To insert a storage PC Card in the computer, follow these steps:

1. Set the write-protect switch in the proper position, as shown in Figure 5-5. Push the switch towards the outside edge of the card to write-protect the card; or push the switch towards the middle of the card if you want to write to the card.

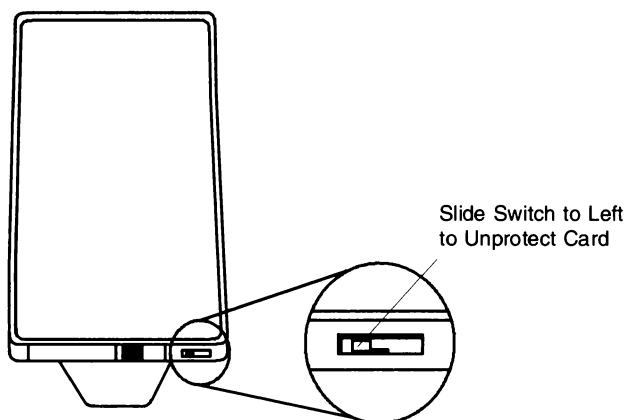


Figure 5-5. Set the Write-Protect Switch

2. Hold the storage card with the connector towards the computer; the side with the pull-tab label should be facing down. Lift the storage slot cover. Slide the storage card into the storage card slot, as shown in Figure 5-6.

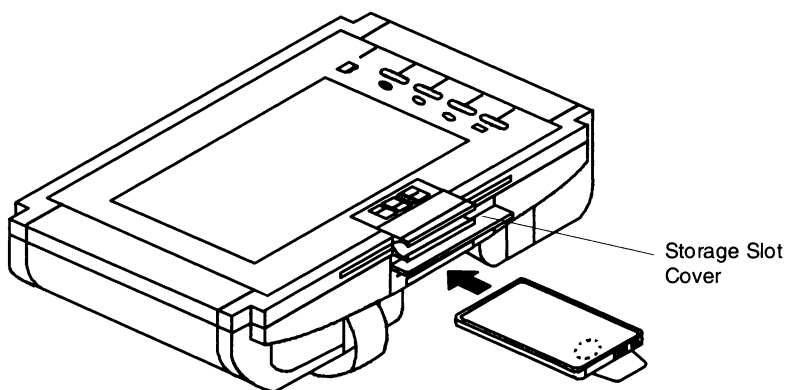


Figure 5-6. Insert the Storage PC Card

3. Push the card in firmly until it will not go in any further. It is OK to use firm pressure, but you should not need a great deal of force to seat the card properly in its connector. If it doesn't go in easily, you probably have the card turned upside down.

4. Close the storage slot cover over the card. Be sure the cover is closed tightly so the card will not work loose when the computer is being moved.

Removing a Storage PC Card

You do not need to turn off the computer when removing a storage card.

To remove a storage PC Card from the computer, lift the storage slot cover, grasp the storage card pull tab, and pull the storage card straight out, as shown in Figure 5-7.

CAUTION

Removing the storage PC Card while the card is being written to will result in loss of data. It may also damage the file allocation table and make the card unreadable.

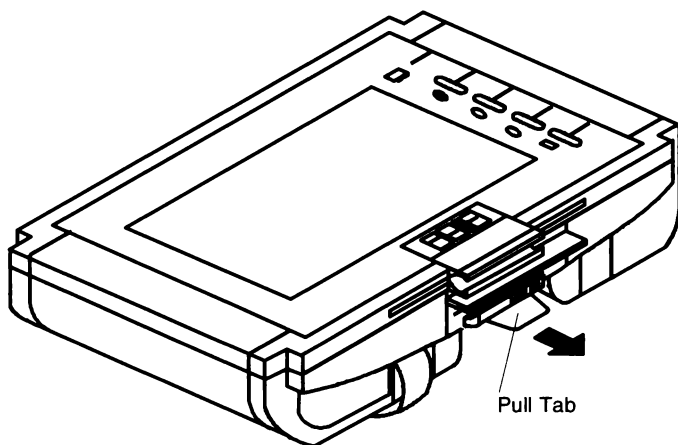


Figure 5-7. Pull Out the Storage PC Card

Changing a Storage Card Battery

The data in a storage PC Card is preserved by a small amount of electricity supplied by a battery inside the card. The battery lasts for at least six months inside the PC Card, after which it must be replaced. (The battery may last much longer, but this cannot be certain.)

The computer checks the power level of the battery in an installed PC Card each time you turn on the computer. If a low battery is detected, you are alerted by a message on the screen before the computer finishes starting up (you must touch the pen to the screen or press a key on an attached keyboard to acknowledge the message). You can also check the batteries by entering the **cardbatt** command from the MS-DOS prompt, as described on page 9-31.

You should change the battery in a storage PC Card soon after the low-battery indication, so that you do not accidentally lose any data stored on the card. After you receive a low-battery indication, the battery may continue to last as long as a month before it becomes completely exhausted. However, there is no certainty that it will last that long, so we recommend that you change the battery as soon as possible.

CAUTION

If the battery becomes completely exhausted, the PC Card is erased and is not usable.

Some storage PC Cards have a bridge battery that maintains power to the card while the battery is being changed. Storage PC Cards that do not have a bridge battery require that the data be backed up prior to changing the battery.

Before beginning the battery replacement procedure, you should have a replacement battery available.

The following procedure describes how to change the battery in a storage PC Card.

WARNING

The battery may explode if it is mistreated. Do not recharge it, disassemble it, or dispose of it in fire. Dispose of the used battery according to the manufacturer's instructions. Keep batteries away from children. Replace the battery with a battery of the same type.

1. Hold the storage PC Card so that the side showing the battery location is facing up (this is the side opposite the label).
2. Move the battery lock switch to the OPEN position (towards the outside edge of the card), as shown in Figure 5-8. The battery lock switch keeps the battery carrier locked so that it cannot be opened accidentally.

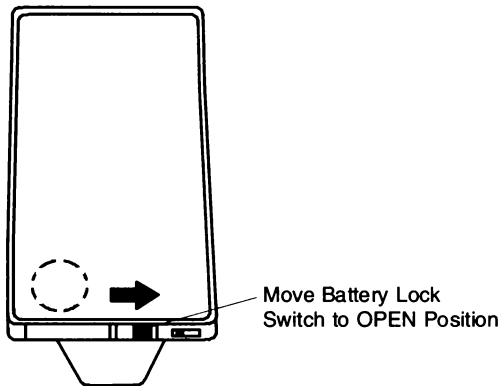


Figure 5-8. Unlocking Battery Carrier

3. Locate the battery carrier thumbnail slot in the edge of the card near the battery lock switch.
4. Place your thumbnail in the slot, grip the plastic border, and gently pull out the battery carrier while firmly holding the storage PC Card (see Figure 5-9). The carrier and battery may flip out of the card suddenly, so you may want to hold the card over a desk while removing the battery carrier.

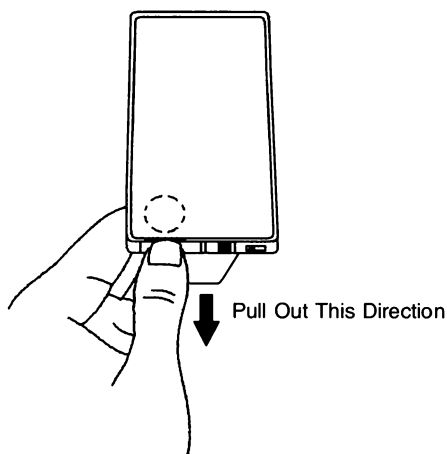


Figure 5-9. Pull Out Battery Carrier

5. Remove the old battery from the carrier and replace it with a new battery of the same type or its equivalent. The battery rests in the carrier with the positive side (marked with a +) facing up, as shown in Figure 5-10.

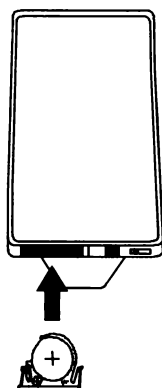


Figure 5-10. Insert Battery Carrier

6. Push the carrier with the new battery into the battery slot in the edge of the card until it snaps into place.
7. Move the battery lock switch to the locked position (towards the battery carrier). The battery lock switch keeps the battery carrier locked so that it cannot be opened accidentally.

8. Write the date you inserted the new battery on the storage PC Card label. If there is already a date written there, erase it before writing the new date.

Writing the date you replaced the battery helps you remember when it is time to replace the battery again. You should replace the battery every six months, or when you are alerted that the battery is low, to prevent loss of data.

NOTE: The six-month life of the battery begins when the battery is installed in the storage PC Card.

Preparing Storage Cards

Before using a storage card in the computer the first time, you need to do three things:

- Apply the label to the storage card.
- Insert the battery.
- Format the card.

Refer to the next three subsections for instructions on how to do these things.

NOTE: If your computer was purchased for you by your company, a storage card may have been prepared already, loaded with software, and installed in your computer for you. In this case, you can skip the following subsections on preparing and formatting a storage card.

Applying the Storage Card Label

Some storage PC Cards are shipped with a label. Apply the label to the side of the storage card that has a notch cut in the upper-left corner, as shown in Figure 5-11. Place the label so that the pull tab extends over the edge of the card and be careful to center the label on the card from side to side.

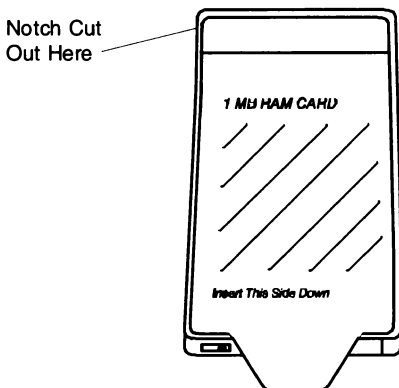


Figure 5-11. Applying Label to Storage Card

You can write on the label to record the contents of the storage card. If you use pencil, the label is erasable.

Installing the RAM Storage Card Battery

A RAM storage card is shipped with a battery, but the battery is not installed because the battery begins to discharge as soon as it is installed.

To install the battery in a storage PC Card, refer to the section **Changing the PC Card Battery** on page 5-11. You will not have an old battery to remove in step 5, but otherwise you can follow those instructions.

Formatting a Storage PC Card

Before you can use a storage PC Card, you must prepare it to accept data. This is done by running the MS-DOS **memcard** command, described in the following paragraphs. To run **memcard**, you either need to invoke the screen keyboard (page 9-3) or use an attached keyboard (page 3-9).

Memcard is a storage PC Card setup program that partitions, formats, erases, deletes partitions from, and displays information about PC Cards. To start the setup program, type **memcard** at the command prompt. When the program starts, the main menu appears, as follows:

```
PC Memory Card Setup Program Version 1.00
Copyright (C) Microsoft Corporation 1991
Current Memory Card Slot: 1 of 1 slots
```

MEMCARD Options

- 1 Create & Format Partition
- 2 Erase Entire Memory Card Slot
- 3 Delete Partition
- 4 Display Partition Information

Enter Choice [4]

Press ESC to exit MEMCARD.

To choose a menu option, type the option number, and then press **Enter**. To return to the previous menu, press a key. To quit **memcard**, return to the main menu, and then press **Esc**.

Each menu displays a "Current Memory Card Slot" message, followed by a number. Since you have only one PC Card slot, the number is always 1.

Viewing Partition Data

You can view information about the status, type, and size of the partitions on your storage PC Card by choosing Display Partition Information (option 4) from the **memcard** main menu. The Display Partition Information screen looks like this:

```
Display Partition Information

Current Memory Card Slot: 1

      Device      Device Size
      Type        (Bytes)

      SRAM        1024K
Total Size of Card:    1024 K

Partition  Start    End      Partition  Partition  Size
Letter     Address  Address  Type       Status     (Bytes)

      D          1024    1048575   DOS       FORMATTED  1023 K

Press any key to return to the main menu.
```

The information varies, depending on the number, size, and type of partitions on your storage PC Card. The information is described in the following table.

Column	Description
Device Type	Indicates the type of device or memory chip in the slot. Possible types are read-only memory (ROM), one-time programmable ROM (OTPROM), ROM that is erasable with ultraviolet radiation (EPROM), ROM that is electrically erasable (EEPROM or FLASH), static random-access memory (SRAM), dynamic RAM (DRAM), and an input/output card (I/O).
Device Size	Shows the size, in bytes, of the entire card.
Drive/Partition Letter	Shows the drive letter associated with each partition.
Start Address	Shows the starting address of each partition.
End Address	Shows the ending address of each partition.
Disk Type	Shows whether the space is an MS-DOS partition (DOS), a partition created by the card manufacturer (Unknown), or unpartitioned (Free) space.
Disk Status	Shows whether the partition is formatted or unformatted. If the partition is unknown, its status is also Unknown.
Size	Shows the size, in bytes, of each partition.

If there are more partitions than **memcard** can display on one screen, press a key to view the next screen of information.

Creating and Formatting an MS-DOS Partition

You can create and format only MS-DOS partitions on storage PC Cards.

You cannot change the size of an existing MS-DOS partition. If you want to change the size of an MS-DOS partition, you must delete the existing partition and create and format a new one. When you delete the existing partition, you lose any information stored there. For information about deleting a partition, see *Deleting a Partition* on page 5-21.

To create and format a partition that occupies the entire storage PC Card, perform the following steps:

1. From the main menu, choose Create & Format Partition (option 1).

The setup program displays the following message:

```
Do you want to use the entire card for DOS? [Y/N] [Y]
```

Press **Enter**.

2. If the card already has an MS-DOS partition, the setup program displays the following message:

```
This card has already been formatted with DOS.  
Creating a partition will destroy the data on the card.
```

```
Continue [Y/N] [N]
```

Type **y** to continue.

3. Specify the total number of files and subdirectories you want in the root directory. Valid numbers range between 16 and 512. The default number that the setup program displays varies, depending on the size of the storage PC Card you have.
4. Specify the volume label for the partition.

Or, press **Enter** to specify no volume label.

Once you press **Enter** (either after specifying a label or to specify no label), the formatting proceeds. It takes approximately one minute. No messages are issued to tell you formatting is in progress.

To create and format a partition that occupies part of the storage PC Card, perform the following steps:

1. From the main menu, choose Create & Format Partition (option 1).

The setup program displays the following message:

```
Do you want to use the entire card for DOS? [Y/N] [Y]
```

Type **n**

2. Specify the size of the partition you want to create. The minimum size is 16 kB. The maximum size depends on the amount of free space available on the storage PC Card. The default number that the setup program specifies is the largest free block of space available.
3. Specify the volume label for the partition.

Or, press **Enter** to specify no volume label.

Once you press **Enter** (either after specifying a label or to specify no label), the formatting proceeds. It takes approximately one minute. No messages are issued to tell you formatting is in progress.

Deleting a Partition

If you want to change the size of a partition, you must delete the partition and recreate it. When you delete a partition, all information about it is lost and cannot be recovered. Therefore, be sure to have backup copies of the information you want to save.

If there are logical drives that have drive letters greater (in alphabetical order) than the drive you delete, these letters will change. For example, if you have logical drives D, E, and F on your storage PC Card and you delete drive D, drive E becomes drive D and drive F becomes drive E.

NOTE: If you only have one partition (drive D) on your storage PC Card, you cannot delete it using this option.

To delete a partition:

1. Choose Delete Partition (option 3) from the **memcard** main menu. The Delete Partition screen appears.
2. Specify the partition you want to delete.

The setup program prompts you to verify that you want to delete the partition.

3. Type **y** to delete the partition.

Or, type **n** to return to the main menu.

Erasing a Storage PC Card

When you buy a storage PC Card, it may contain extraneous information that you will need to erase before you can use the card. Erasing a card destroys all the information stored on it. Because you cannot recover this information, make sure that you have copies of the information you want to save.

To erase a storage PC Card:

1. Choose Erase Entire Memory Card (option 2) from the **memcard** main menu. The Erase Entire Card screen appears, as follows:

```
Erase Entire Card
```

```
Current Memory Card Slot: 1
```

Partition Letter	Start Address	End Address	Partition Type	Partition Status	Size (Bytes)
D	1024	1048575	DOS	FORMATTED	1023

```
Erasing a card destroys all partition and data on the card.  
Use this option only if the card does not contain  
information you want to save.
```

```
Continue? [Y/N] [N]
```

2. Type **y** to erase all information from the storage PC Card.

The setup program displays the following message:

```
This operation may take some time.  
Please do not remove the card from the slot while this  
message is displayed.
```

Accessing Storage PC Cards

To your computer's operating system (MS-DOS), storage PC Cards appear similar to floppy disks. To access a PC Card from MS-DOS, use its device letter—D. For example, to get a directory of the files on the storage PC Card, enter the following command:

```
dir d:
```

You may also access partitions on a PC Card by using the appropriate letter to refer to the partition. If you insert a PC Card with more than one partition while the computer is on, only the first partition is recognized. To have the other partitions recognized, turn the computer off and then back on.

You might not ever use MS-DOS commands on your computer, and, therefore, may never need to issue commands such as the one shown above to access storage PC Cards. If you use custom-written programs on your computer, they access the storage device automatically.

If you are using MS-DOS commands on your computer, the storage PC Cards will respond to MS-DOS commands just as if they were floppy diskettes.

Transferring Application Programs to a Storage Device

A SunDisk card or storage PC Card can hold data and application programs that run on the computer. There are two ways you can transfer files to or from a storage device in a computer:

- Using the Interlnk file transfer utility. Refer to the section Transferring Files Using Interlnk on page 9-7.
- Using the optional modem or radio, if your computer contains this option, and you already have a communication program on another storage device. Run your communication program and refer to its documentation for information on how to use it.

CHAPTER 6:

TROUBLESHOOTING

This chapter describes problems that might arise as you use your computer and provides tips on how to resolve them.

Troubleshooting Table

Table 6-1 lists common problems you might encounter when setting up or using your computer. To use the table, look for your problem under the heading Symptom, identify the Cause, then follow the suggested Remedy.

Table 6-1. Troubleshooting Chart

Symptom	Cause	Remedy
No response when computer is turned on	No external power	Check that the power supply is plugged into a live power outlet and that the power cord is plugged into the computer.
	Battery not installed or charged	Check to be sure the battery is installed properly (page 4-8). If necessary, charge the battery (page 4-9).
Beep and blank screen when computer is turned on (battery low indicator may or may not be lit)	Screen contrast or brightness is set wrong	Reset the contrast control (page 3-5) or the brightness (page 3-4).
	Batteries need recharging	Recharge batteries by plugging the power supply into the computer (page 4-4) or the battery pack directly (page 4-9).

Symptom	Cause	Remedy
Screen is all black	Screen contrast or brightness is set wrong	Reset the contrast control or the brightness (page 3-4).
	Computer is hot	Move the computer to a cool area and let it cool.
Pen does not work	Pen is in sleep mode	Touch the pen to the screen to wake it up.
	Pen batteries are dead	Change the batteries in the pen (page 3-16).
Storage card does not fit into slot	It is upside down	Turn the card over and be sure the connector edge goes in first.
PC Card is unreadable	Battery exhausted	When the PC Card battery becomes exhausted, all data on the card is erased. Insert a new battery (page 5-11), and reformat the PC Card (page 5-15).
	RAM card is not formatted	Format the storage PC card using the memcard command (page 5-15).
Serial device does not function or file transfer does not work	Serial device not found	Make sure your software knows to which port the serial device is assigned. You can use the full-screen configurator to check to which port your serial device is assigned, and the config serial command to change the port (page 9-25).
Characters are lost during high-speed communication	COM port has low priority	Change the setting of the config priority command to comm (page 9-24).
Partitions on SunDisk cards or RAM cards not recognized	The card was inserted while the computer was on	Turn off the computer; insert the SunDisk card or RAM card; and turn the computer on.

Symptom	Cause	Remedy
MS-DOS application could not return from standby mode	Application not compatible with standby mode	Not all MS-DOS applications can successfully return from standby mode. Turn off the automatic standby feature while using such an application (page 9-16).
Incorrect date or time	Clock set wrong	Use MS-DOS date and time commands to reset the clock (refer to your MS-DOS documentation).
External keyboard does not function	Not connected to computer	Check that the keyboard cable is firmly connected to the keyboard adapter cable, and the adapter cable is firmly connected to the keyboard connector.

If you encounter problems with specific software, try erasing your working copy of the problem software and replacing it with a different copy of the same version. Do not erase your master copy of any software.

If you decide your problem is not a set-up or software problem, then it may be a hardware problem. Contact your sales representative or distributor.

Start-up Error Messages

When you start up the computer, you might see certain error messages. These error messages are explained in this section in alphabetical order. If you get any of these messages, you should contact your sales representative or distributor.

Bad application ROM

The ROM containing MS-DOS, utilities, and Executive Menu has failed.

CMOS chip lost power

The computer has lost its configuration information. The configuration items have been reset to their factory defaults. This error message may signal a hardware problem.

Digitizer initialization failed

The screen digitizer information could not be found. It is normally included when the BIOS is programmed at the factory.

Memory test failed

There is a problem with the computer memory.

PCMCIA card battery low. Press any key or touch the pen to the screen to continue

The battery in a storage PC Card is low and needs to be replaced. For more information, refer to the section Changing a Storage PC Card Battery on page 5-11.

Pen battery is low

The batteries in the pen are low and need to be changed. Touch the pen to the screen to continue. Refer to the section Installing or Changing the Pen Batteries on page 3-16.

System battery low—wear leveling is not performed. Press any key or touch the pen to the screen to continue

The **config wearlevel** command specifies how often your computer will check to see if the SunDisk card needs wear leveling performed. Even if it should be done according to the command parameters, wear leveling will not be performed if the battery pack in the computer is low.

Time-of-day clock stopped

The internal computer clock battery is exhausted or the clock chip is damaged.

CHAPTER 7:

SAFETY AND MAINTENANCE

This chapter contains important safety information and describes how to care for your computer.

Be sure to save these instructions for reference by you and other users.

Follow all instructions and warnings dealing with the computer or the power supply.

Important Safety Instructions

The computer is intended to be electrically grounded when connected through the power supply to an external source of ac power.

The power supply is equipped with a three-wire grounding-type plug, which has a third (grounding) pin. This plug fits only a grounding-type power outlet. This is a safety feature.

If you are unable to insert the plug into a power outlet, contact a licensed electrician to replace the outlet with one that is properly grounded.

Do not defeat the purpose of the grounding-type plug.

WARNING

Electrical equipment may be hazardous if misused. Operation of this product, or similar products, must always be supervised by an adult. Do not allow children access to the interior of any electrical product, or permit them to handle any cables.
--

Warnings

This product was designed and tested to comply with various national and international safety agency standards that reflected the current state of the art at the time it was manufactured. Use and application of this product requires exercising common sense. It is an electrical device.

Observe the following warnings. Ignoring these warnings could lead to physical injury.

- Be sure to read all installation instructions carefully before you plug the power supply into a power outlet.
- Do not get the computer wet; electrical equipment may be hazardous in a moist environment. Keep the computer away from sources of liquids such as washbasins, bath tubs, shower stalls, etc. If the computer gets wet, wipe it off as quickly as possible.
- Never expose the computer to bad weather, such as rain or snow, for extended periods of time. The top surface of the computer is water-resistant, but the computer should not be operated if water has gotten inside the computer.
- Do not operate your computer in any potentially flammable atmosphere, unless it is specially certified for such usage.
- Do not attempt to open the computer case; it contains no user-serviceable parts. Such action voids your warranty and service contract and can damage the computer.
- Arrange any power cords or other cords so they cannot be pulled out or tripped over when the computer is in use.
- Make sure you properly ground any power-plug adapter.
- Always turn off the computer before unplugging it or plugging it in.

- Disconnect the power plug:
 - if the power cord or plug is frayed or otherwise damaged;
 - if the computer performs such that you suspect it needs servicing;
 - if anything has been spilled into the case; if the computer has been exposed to rain or other excess moisture; or,
 - if the computer has been dropped or the case is otherwise damaged.
- Do not operate a computer with an antenna for prolonged periods with the radio modem antenna closer than 2 inches (5 cm.) to your eyes or reproductive organs. Transmitting antennas, like those on the computer, emit electromagnetic signals that may be harmful to these areas of your body if you are exposed to these signals for a long time at very close distances. Also, avoid touching the radio modem antenna for prolonged periods when the computer is turned on and transmitting.

Cautions

Observe the following cautions. Ignoring these cautions could damage your computer.

- Operate and store the computer only when the surrounding temperature and humidity are within the ranges specified in Appendix A.
- Do not operate the computer in an excessively dirty or dusty environment.
- Do not subject the computer to unnecessary shock or vibration.
- When cleaning the computer, never use any cleaning agent such as dust wax, spray cleaner, or any abrasive substance.

Computer Ruggedness

Your computer is a rugged, durable computer. It has been designed to stand up to a certain amount of shock and rough handling, but you should always treat it as you would any other precision instrument—with care.

The most fragile part of the computer is its screen. The screen is made of glass and could break if the computer is dropped or if the screen is bumped against a hard object. Keep this in mind as you handle or carry the computer.

When you carry the computer, carry it with the screen towards you, to prevent it from accidentally hitting something. You should use a protective carrying case whenever possible.

The computer is not designed to withstand extreme temperatures. Be careful not to leave the computer inside a closed vehicle in the sun for an extended time. Enclosed vehicles can heat up to extreme temperatures when in the sun, and the computer could be damaged if the temperature exceeds 60° C (140° F).

If the computer is heated to a high temperature, the screen may darken and become unreadable. If this happens, let the computer cool before using it. Very cold temperatures may also affect the screen contrast, requiring you to adjust it.

The computer has an emergency standby feature that puts it into standby mode if power is removed. If you are writing to a storage card when the computer goes into emergency standby, it is possible that data may be lost and the card may be corrupted. Use a disk recovery program to check your storage card if this should happen.

Cleaning the Computer

Before cleaning your computer, turn it off and disconnect the power cord from the outlet.

To clean the case, use a slightly damp, soft cloth and plain water. If necessary, you can use a mild, nonabrasive detergent.

CAUTION

Never use any cleaning agent such as dust wax, spray cleaner, or any abrasive substance.

Wipe the case clean and then dry it.

To clean the screen, slightly dampen a soft cloth with water or an ammonia-based glass cleaner and gently wipe the screen. Use the cleaner sparingly so that no fluid runs down the screen and into the frame. Do not use a cleaner that leaves any residue.

WARNING

To prevent shock hazard, never apply any liquid to the openings or connectors on your computer.

Storing the Computer

Always store your computer between the temperatures -20° to 60° C (-4° to 140° F). To keep it free from dust and dirt, store it in a protected location. Keep it in a carrying case or its original shipping carton.

If you are storing the computer for an extended period of time, you should back up the data on storage cards to some other storage medium, since the battery that maintains the data in these cards may become exhausted. The data on these cards is maintained by a battery that lasts at least six months.

Traveling with the Computer

When traveling with your computer, keep it in a protective carrying case and carry it instead of checking it as luggage. Many transportation carriers do not cover the replacement cost of your computer should they lose or damage it. If you do check it as luggage, pack it in the original shipping carton and packing materials that came with your computer. Any damage incurred due to improper shipping is considered abuse and will not be covered under the warranty.

CAUTION

If you are carrying the battery pack inside the computer, make sure that the power switch is off. If it is left on, the battery pack will discharge during transportation. As an extra precaution, you may want to remove the battery pack from the computer and carry it separately.

It should be safe to x-ray the computer or any peripherals in airport security checks, but you can have it hand-checked, if you wish.

Updating the Clock

The time-of-day clock, which keeps the time inside the computer, is not a high-precision time keeper. The precision of its time-measuring electronics may vary because of temperature changes. Check the time and date of your clock periodically.

To change the time or date, use the MS-DOS commands **time** or **date**. Refer to the MS-DOS documentation for more information about these commands.

CHAPTER 8:

USING MS-DOS ON THE COMPUTER

Each time you turn on the computer, it loads the MS-DOS operating system from its MS-DOS ROM or another storage device. This is the same operating system used by other IBM PC-compatible computers.

Depending on how your computer is set up, you may never need to interact directly with the MS-DOS operating system. Your computer may start up and go directly into an application program or a menu from which you can pick a program to run.

If you want to use MS-DOS commands on the computer, or run MS-DOS programs, you should read this chapter.

This chapter is not intended to teach you MS-DOS. You should be familiar with the operating system before reading this chapter. Refer to the MS-DOS documentation or other widely available MS-DOS tutorial guides for basic operating system information.

MS-DOS Start-up

After MS-DOS starts up, the first thing it does is look for the file *config.sys*. If it finds this file, MS-DOS reads it and loads device drivers or sets system configuration information based on commands in this file.

When starting up from the MS-DOS ROM with no storage device in the storage slot, MS-DOS loads the *config.sys* file on the MS-DOS ROM. If a storage card is in the storage slot, the *config.sys* file on the MS-DOS ROM is loaded. If a SunDisk card is in the storage slot, the *config.sys* file on the SunDisk card is loaded.

After executing the *config.sys* file, the next thing MS-DOS does is look for the file *autoexec.bat*. This is a batch file that is executed whenever MS-DOS starts up. If no storage device is in the slot, the *autoexec.bat* file on the MS-DOS ROM is loaded. This brings up the Executive Menu. Executive Menu allows you to run other utility programs. Refer to the section Executive Menu, beginning on page 9-1, for more information.

If a SunDisk card is in the storage slot, the *autoexec.bat* file on the SunDisk card is loaded. If a storage PC Card is in the storage slot, the *autoexec.bat* file on the storage PC Card is loaded. If the *autoexec.bat* files does not exist on the storage device, one is not loaded.

Table 8-1 summarizes the location of the files that are loaded when the computer is turned on.

Table 8-1. Location of Start-up Files on the Computer

Contents of Storage Slot	Loads MS-DOS from:	Loads <i>config.sys</i> file from:	Loads <i>autoexec.bat</i> file from:
Empty	ROM	ROM	ROM
SunDisk Card	ROM	SunDisk Card	SunDisk Card
PC Card	ROM	ROM	PC Card

Using Standard MS-DOS Application Programs

The computer can also run “off-the-shelf” MS-DOS and Windows programs. The computer is an IBM AT-compatible computer.

NOTE: Programs that require a numeric coprocessor chip cannot run on the computer. It does not support this chip.

Unlike the IBM AT computer, the computer does not include a keyboard, which some MS-DOS programs may require. To make the computer fully equivalent to a standard IBM AT computer, you must attach a keyboard.

Each of the storage devices appears like a disk drive to MS-DOS and is assigned a drive letter. The storage devices are assigned drive letters as shown in Table 8-2. This table assumes that none of the storage devices are partitioned. If the hard disk is partitioned, the device letter for the storage PC Card is the next available letter.

Table 8-2. Storage Device Drive Letters

Drive Letter	Storage Devices
A	MS-DOS ROM
C	SunDisk card
D	Storage PC Card

SunDisk cards and storage PC Cards can be partitioned. When a SunDisk card is partitioned, the additional partitions start with D. The SunDisk allows two partitions. When a PC card is partitioned, the additional partitions start with E.

Most MS-DOS programs can be run on the computer without attaching a keyboard. These programs can be run by using the Screen Keyboard, a utility program built into the computer that emulates a physical keyboard on the screen.

Screen Keyboard displays a keyboard in the lower half of the screen while a program runs in the upper half of the screen. You “type” on the keyboard by touching keys with the pen. Refer to the section Screen Keyboard, on page 9-3, for more information on how to use this program.

MS-DOS programs that run in graphics mode can be run on the computer if you attach an external keyboard. You can attach any AT-compatible keyboard to the computer by using the optional keyboard adapter. You need an optional PS/2 Keyboard Socket to attach PS/2 style keyboards. Refer to the section Keyboard Connector on page 3-9 for information on connecting a keyboard.

Using Microsoft Windows Software

Your computer will run Microsoft Windows for Pen Computing software. To do this, you must first install the Windows for Pen Computing software on another computer, but configuring it for your pen computer. Then use the file transfer utility described on page 9-7 to copy the Windows directory to a SunDisk card.

CHAPTER 9:

UTILITY PROGRAMS

This chapter describes and explains how to use the utility programs that are stored inside the computer in the MS-DOS ROM. These programs are built into every computer.

Executive Menu

Executive Menu is a simple program that displays a menu of the other utility programs, as shown in Figure 9-1. You can start any of the other utility programs by selecting it from the menu.

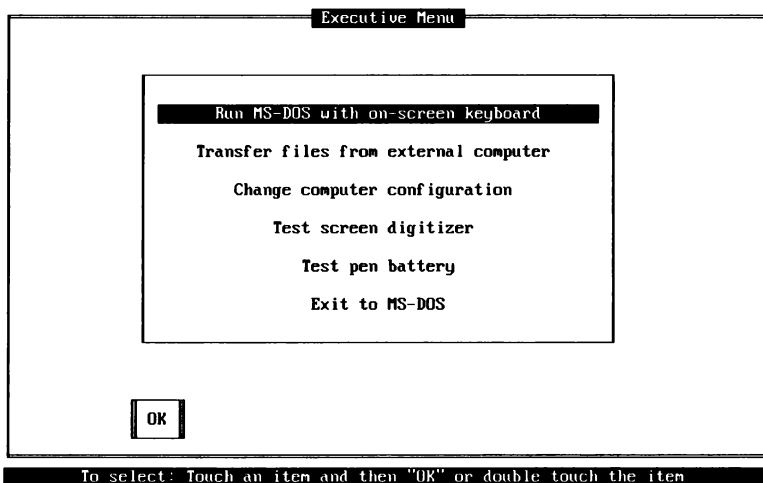


Figure 9-1. Executive Menu

Starting Executive Menu

There are two methods for starting Executive Menu:

- Executive Menu is started automatically if you do not have a SunDisk card or RAM card installed in the storage slot.
- Run the program **padmenu**, which is on the MS-DOS ROM inside your computer (drive A). Enter the command **a:padmenu** from the MS-DOS prompt. To do this automatically each time you start your computer, include the command **a:padmenu** in your *autoexec.bat* file

Using Executive Menu

To start one of the functions listed in Executive Menu, touch the pen to the function you want to pick. This moves the highlight bar to that function. Then touch the pen to the OK button. This starts the function you have chosen. As a shortcut, you can double tap on the function you want; in this case you do not need to touch the OK button. (To double tap, you tap twice quickly.)

NOTE: The term button, above, refers to a small box on the screen labeled with text. Such screen buttons cause specific actions when they are touched with the pen. The term button is also used in this manual to refer to the buttons or switches beside the computer screen.

To “touch” with the pen means to tap quickly on a spot on the screen. Tap quickly enough so that the pen contacts the screen only momentarily, like striking a key on a keyboard. Be sure to make good contact with the screen, but do not leave the pen down on the screen.

If you are using an attached keyboard, the up and down arrow keys move the highlight up and down. The **Tab** and **Shift-Tab** keys can also be used. Pressing the **Enter** key is the same as touching the OK button.

When the function you have chosen from Executive Menu is finished, Executive Menu is displayed again.

Each of the items listed in Executive Menu is described in Table 9-1.

Table 9-1. Executive Menu Items

Menu Item	Description
Run MS-DOS with on-screen keyboard	Starts Screen Keyboard, allowing you to run programs that require a keyboard without attaching a physical one. Refer to the section Screen Keyboard, beginning on page 9-3, for more information.
Transfer files from external computer	Starts the MS-DOS Intersvr utility, making the pen computer the server computer. This allows you to transfer files between the pen computer and another computer through a serial cable. Refer to the section Transferring Files with Interlnk, beginning on page 9-7, for more information.
Change computer configuration	Starts the full-screen configurator. Refer to the section Configurator, beginning on page 9-9, for more information.
Test screen digitizer	Starts the PenDraw program. This program allows you to test the screen digitizer. Refer to the section Testing the Screen Digitizer, beginning on page 9-29, for more information.
Test pen battery	Determines whether the batteries in the pen are OK or low.
Exit to MS-DOS	Exits from Executive Menu to MS-DOS. If you do not have a physical keyboard attached to your computer when you make this choice, you will not be able to continue operating the computer when Executive Menu stops. MS-DOS requires you to type commands in order to do anything.

Screen Keyboard

Screen Keyboard is a versatile program that emulates a physical IBM AT-compatible keyboard on the computer screen. It allows you to enter keyboard data even though you do not have an external keyboard attached to the computer.

For example, you can use the screen keyboard program to operate most “off-the-shelf” MS-DOS programs that use text mode and expect keyboard input, since such programs do not take handwriting input from the pen. Or, you can use it to type MS-DOS commands.

You need to use Screen Keyboard only if you want to give MS-DOS commands or run MS-DOS application programs without attaching an external keyboard. You do not need Screen Keyboard if you have an external keyboard or if you use Windows, PenRight!, or other application programs designed to take input from the pen.

Screen Keyboard works by displaying a picture of a keyboard in the lower half of the screen; the screen keyboard is shown in Figure 9-2. MS-DOS runs in the top half of the screen, which contains the standard 25 lines by 80 characters per line. You “type” on the keyboard by touching the keys with the pen. The keys you type are passed directly to MS-DOS, as if you had typed them on a physical keyboard.

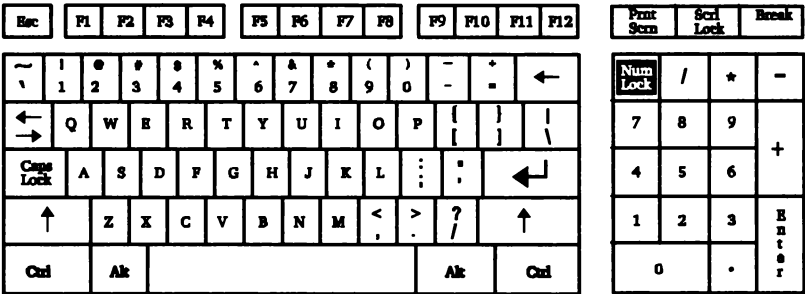


Figure 9-2. Screen Keyboard (U.S.)

Starting Screen Keyboard

There are two methods for starting Screen Keyboard:

- Choose “Run MS-DOS with on-screen keyboard” from the Executive Menu. This method works best if you occasionally need to use Screen Keyboard.

- Run the program **padkbd**, which is on the MS-DOS ROM inside your computer (drive A). To do this automatically each time you start your computer, include the command **a:padkbd** in your *autoexec.bat* file.

When Screen Keyboard starts, it splits the screen in half and displays a keyboard in the lower half.

Screen Keyboard is a Terminate-and-Stay-Resident program (TSR). It stays in memory at the same time that you are using MS-DOS or running an application program.

Features and Limitations

Screen Keyboard has the following features:

- The upper half of the screen is a standard 640- by 200-pixel CGA screen. Almost any MS-DOS application that can use a CGA screen in text mode can run there.
- In the lower half of the screen, the Screen Keyboard includes all of the keys found on a standard IBM AT-compatible keyboard. When a key is touched, it is briefly highlighted, unless it is a locking or modifying key.
- The locking keys, **CapsLock**, **NumLock**, and **ScrlLock**, stay highlighted and modify other keys until they are touched a second time to turn them off.
- The modifying keys, **Shift**, **Ctrl**, and **Alt**, work differently. First touch the modifying key (it stays highlighted), then touch a second key, and the modifying key returns to normal. For example, to type a capital B, touch **Shift**, then touch **B**. If you accidentally touch one of the modifying keys, touch it again to turn the highlight off.
- When the **NumLock** key is touched, the numeric keypad keys are shown on the keys below it (at the right side of the screen). When **NumLock** is off, the direction keys are displayed in that area.

- The **Alt** key works specially in combination with the numeric keypad. If you touch **Alt**, it normally modifies only the key that immediately follows it. But if you use the numeric keypad, you can enter a two- or three-number decimal ASCII code following **Alt**. For example, **Alt-156** causes the British pound sign (£) to be displayed.

In this way, you can enter extended character ASCII codes the same as on a physical keyboard. (Extended character ASCII codes include foreign characters and line draw characters, which some application programs use.)

- If you touch the pen to a key and hold it there, the key repeats.
- Screen Keyboard does not interfere with a physical keyboard, if one is attached to the computer. Both keyboards can be used interchangeably. However, if you use the locking keys, **CapsLock**, **NumLock**, and **ScrLk**, interchangeably on both Screen Keyboard and a physical keyboard, the indicators for these keys may not reflect their actual settings.

Screen Keyboard has the following two limitations:

- Only character-mode MS-DOS applications are supported; if an application changes the screen to graphics mode, Screen Keyboard will not be visible.
- MS-DOS applications that use the second page (page 1) of video memory will interfere with Screen Keyboard and are not supported. Most character-mode applications do not do this and will run properly.

NOTE: Screen Keyboard can be used to *start* any application, even if the application then interferes with Screen Keyboard operation. For example, you could use Screen Keyboard to start a graphics application program that requires no further input from you, so it does not matter that the Screen Keyboard disappears when the application is started.

Removing Screen Keyboard

If you started Screen Keyboard from Executive Menu, you can remove it and return to Executive Menu by giving the **exit** command. To do this, type the command **exit** and press **Enter**.

If you started Screen Keyboard by running the program **padkbd**, you can remove it by giving the command **padkbd /r** and pressing **Enter**.

Remember that if you do not have an external keyboard attached to your computer and you remove Screen Keyboard this way, you will not be able to type any more.

Transferring Files From External Computer

The Intersvr file for the Interlnk program is built into the MS-DOS ROM. To use it, you will also need a 3-wire or 7-wire null modem serial cable to connect the computers together. The computer to which you want to connect the pen computer must be running MS-DOS version 3.0 or later.

When using the Interlnk program, the storage devices on your computer are accessible from another computer. For example, if on the other computer you have drives A, B, and C, you would be able to access your devices using subsequent drive letters such as D and E.

To use Interlnk, you need to have the Interlnk program files on both the pen computer and the other computer. See your sales representative or distributor for information on obtaining these files and a null modem cable.

Here are brief instructions on how to use Interlnk to transfer files.

Throughout the following steps, *client* computer refers to the computer to which you are connecting the pen computer. *Client* is the Interlnk term for the computer that takes control and from which MS-DOS commands are issued to access another computer's storage devices. *Server* is the Interlnk term for the computer that shares its

storage devices with another computer. The server computer remains occupied and unavailable as long as the client computer is in control.

1. Connect the power/serial port on the pen computer to the serial port of the other computer using the null modem cable, as is shown in Figure 9-3.

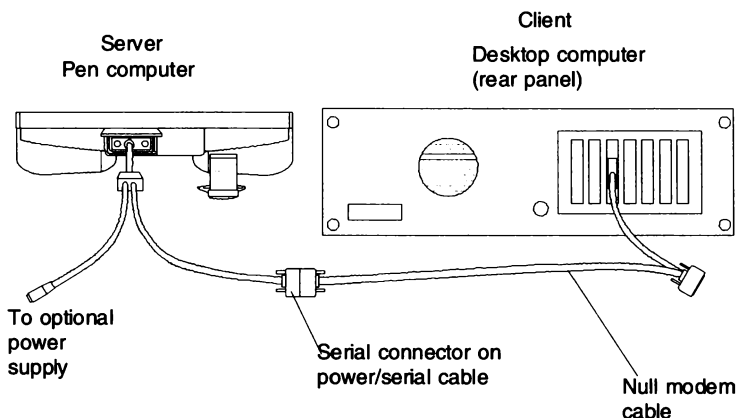


Figure 9-3. Computers Connected for Intersvr/Interlnk File Transfer

2. Install the Interlnk device driver on the client computer by including the following statement in the *config.sys* file on that computer:

device=interlnk.exe

Restart the client computer by pressing **Ctl-Alt-Del**.

3. Start the Executive Menu program on the pen computer, select the function "Transfer files from external computer," and touch the OK button. The Intersvr status screen and the Screen Keyboard are displayed on the screen. The status screen is displayed as long as Intersvr is running. You do not need to change anything on it.

Note that the screen backlight may turn off during the Intersvr session; for more information, refer to the **config backlight** command on page 9-16.

Standby is disabled during a data transfer. Once you end the Interlnk session, the original standby state is restored.

4. At the client computer, give the **interlnk** command. This displays a message giving the drive letters that you can use to access the computer storage devices. Make a note of these drive letters.

Now you can enter MS-DOS commands on the client computer to access the storage devices on the pen computer. You can transfer files by copying them from a drive letter on one computer to a drive letter on the other.

NOTE: Installing applications directly onto the pen computer by using an installation program via Interlnk is not recommended. This technique may install an application successfully, but does not always work. If the installation program automatically changes the *config.sys* or *autoexec.bat* files, usually the files on the wrong computer will be changed.

To end the Interlnk session, touch the **Alt** key, then the **F4** key, on the pen computer Screen Keyboard. To return to the Executive Menu, type **exit**, then press **Enter** on the Screen Keyboard.

Configurator

The Configurator program allows you to change your computer configuration. The computer configuration includes such items as the device from which the system should start up, system power control, the screen brightness and other attributes, the device names for the serial port and optional modem, the speed of the microprocessor, and the status of the standby and auto-standby modes.

The Configurator program can be used in either full-screen or command line mode. To use the full-screen configurator, select “Change configuration” from the Executive Menu or enter the command **config** at the command line. The full-screen configurator main menu is displayed. The main menu has the following buttons:

- System Status—Lists information about the computer BIOS, memory, and storage card.
- Power Settings—Displays the Power settings Menu and lets you set various power control options.
- Peripheral Settings—Displays the Peripheral Settings Menu and lets you set the ports and interrupt priority.
- System Settings—Displays the System Settings menu and lets you change the SunDisk wear leveling, processor speed, speaker, pen battery test, and wakeup from standby features.
- Video Settings—Displays the Video Settings Menu and lets you change various display features.

Figures 9-4 through 9-9 show the screens in the full-screen configurator. Table 9-2 lists the items that can be configured on each screen.

To use the full-screen configurator, touch the pen to the appropriate button. The menu for that section is displayed. The current values are highlighted. To change an option on the screen, touch the name of the item with the pen. Tap the setting button with the pen to select the new value. Holding the pen down on an arrow causes the values to cycle.

If you are using an attached keyboard, you can press the **Tab** or **Shift-Tab** keys to move through the options. The **↑** and **↓** keys cycle through the values.

You can also use the Configurator program from the MS-DOS command line. To get an MS-DOS command line along with the Screen Keyboard, choose “Run MS-DOS with on-screen keyboard”

from Executive Menu. To give Configurator commands, type **config** followed by the appropriate parameters. For convenience, you can include Configurator commands in batch files.

The settings of most configuration items are saved after the computer is turned off, but a few configuration items are reset each time the computer is started. Table 9-2 lists each of the Configurator items, notes whether it is saved or not, and gives the factory default setting for the command. If the command is saved after the computer is turned off, a plus sign (+) appears in the last column.

Each of the Configurator items is described in alphabetical order in the sections following Table 9-2. In the command line syntax statements, the vertical bar (|) is used to indicate a choice between two or more parameters. You should enter one of the parameters that are separated by vertical bars. Brackets [] are used to indicate optional parameters.

Main Menu

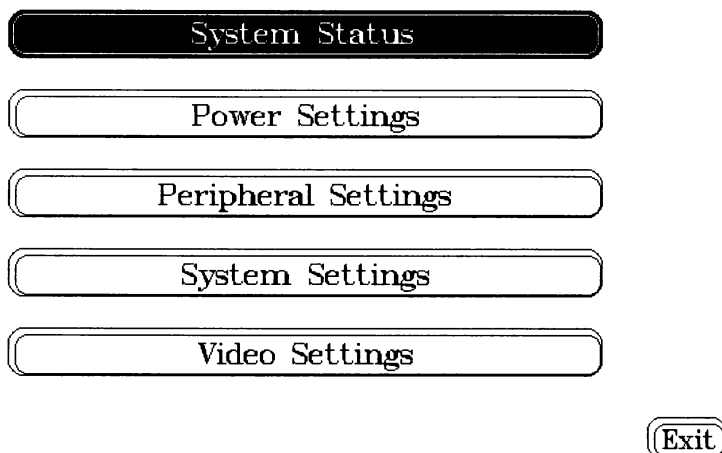


Figure 9-4. Configurator Main Menu

System Status

BIOS Date: 06/11/93

VGA BIOS Rev: 1.03

Total DOS memory: 639k

Free DOS memory: 435k

Total memory: 4mb

SunDisk Installed: 10mb

Modem Type: 14400bps, V.42bis with Fax

Modem Checksum: 105

Keyboard Date: 6/14/93

Return

Figure 9-5. Configurator System Status

Power Settings

Standby Button	☐ Off ☒ On
Auto Standby	☐ Off ☒ 01 ☐ minutes
Backlight	☐ Off ☒ On ☒ 02 ☐ minutes
Backlight Brightness	☒ Low ☐ Medium ☐ High
Brightness Limit	☒ 4 ☐
Backlight Control: Serial	☒ Off ☐ On
Low Battery Alarm	☐ Off ☒ On

Return

Figure 9-6. Configurator Power Settings

Peripheral Settings

Modem Port	☐ Off	☐ Com1	☒ Com2
Serial Port	☐ Off	☒ Com1	☐ Com2
Serial pin setting	☒ Ring	☐ Barcode	
Interrupt Priority	☒ Pen	☐ Comm	
Parallel Port	☐ Off	☒ On	

☒ Return

Figure 9-7. Configurator Peripheral Settings

System Settings

Sundisk Wear Level	☐ Off	☐ ↓ 020 ↑	Boots
Processor Speed	☐ Slow	☒ Fast	
Pen Battery Test	☐ Off	☒ On	
Speaker	☐ Off	☒ On	
Key Click	☒ Off	☐ Low	☐ High
Standby Wakeup Action	☒ Off	☐ Boot	☐ Resume
Standby Wakeup Time	☐ ↓ 00 ↑	:	☐ ↓ 00 ↑

☒ Return

Figure 9-8. Configurator System Settings

Video Settings

Display Contrast	255
Gray Scaling	
Display	
Boldfont	
Colormap	1
Frame Color	14

Figure 9-9. Configurator Video Settings

Table 9-2. Configurator Command Summary

Command	Description	Default Setting	Saved
Power			
autostandby	Enables/disables the automatic standby feature.	2 minutes	+
backlite	Controls screen backlight timing.	On	+
blcontrol	Enables and disables the serial port control of the backlight	Off	
brightlimit	Controls the backlight maximum intensity.	4	+
brightness	Controls screen backlight brightness.	low	+
lowbeep	Controls low battery warning beep.	On	+
standby	Controls entering standby mode.	On	+

Command	Description	Default Setting	Saved
Peripheral			
modem	Controls the internal modem.	On & COM2	+
parallel	Controls the optional parallel port.	Off	+
priority	Controls the priority of interrupts.	Pen	+
serial	Controls the serial port.	COM1 & RING	+
System			
keyclick	Controls whether the keyclick is on or off.	Off	
pentest	Controls the pen battery test.	On	+
speaker	Controls the internal speaker.	On	+
speed	Sets the processor speed.	Fast	
wakeup	Schedules system wakeup from standby.	Off	+
wearlevel	Specifies the SunDisk wear level frequency.	20	+
Video			
boldfont	Specifies how bold characters are displayed.	On	+
colormap	Sets colormapping.	1	+
contrast	Controls the contrast intensity.	64	+
display	Sets normal or reverse video.	Normal	+
framecolor	Sets the color for the frame.	0	+
grayscale	Selects the character display contrast.	On	+

Config Autostandby

The **config autostandby** command enables or disables automatic standby mode. This command has the following format:

```
config autostandby = 1 | ... | 60 | off
```

To conserve the most power and make your batteries last longer, you can set up your computer so that it automatically goes into standby mode if the display has not changed or you have not touched the pen to the screen (or typed on a keyboard) for a certain number of minutes. The default is 2 minutes.

You can specify from 1 to 60 minutes. For example, you could set it up so that it goes into standby mode if there has been no activity for five minutes. When you want to start working again, just press the standby button and continue where you stopped.

To turn off the automatic standby feature if you have previously enabled it, specify **off**.

The automatic standby feature operates only when the computer is running on battery power.

NOTE: Automatic standby may not work with some MS-DOS application programs.

Refer to the command **config standby** (page 9-26) for more information about entering standby mode.

Config Backlite

The **config backlite** command controls the timing of the backlight for the LCD display. This command has the following format:

```
config backlite = 1 | ... | 17 | on | off
```

To conserve power and make your batteries last longer, you can set up your computer so that it automatically turns off the screen backlight if the display has not changed or you have not touched the pen to the screen (or typed on a keyboard) for a certain number of

minutes. You can specify from 1 to 17 minutes. The default is **on**. The screen backlight is automatically turned back on as soon as the pen or a keyboard is used or the display changes.

To permanently turn off the screen backlight, specify **off**. In this case, using the pen or keyboard will not cause the backlight to turn on again.

To permanently turn on the screen backlight, specify **on**. The screen backlight stays on until you change this setting. The initial setting is **on**.

The backlight on/off switch on the computer overrides the **config backlite** setting.

Config Blcontrol

The **config blcontrol** command enables and disables the serial port control of the backlight. This command has the following format:

```
config blcontrol = off | comm
```

where

off	The backlight is not turned as a result of serial port activity.
comm	The backlight turns on as a result of serial port activity, such as when a communication option receives a transmission.

Config Boldfont

The **config boldfont** command specifies how characters appear on the display. This command has the following format:

```
config boldfont = on | off
```

where

- | | |
|------------|--|
| on | Regular characters are displayed as bold and bold characters are displayed in a heavier font (default). This is an extension to VGA to improve the image on the display. |
| off | Characters are generated normally on the display. This is standard VGA. |

Config Brightlimit

The **config brightlimit** command controls the range of brightness when the backlight switch is pressed or **config brightness** command is issued. This command has the following format:

```
config brightlimit = 0 | 1 | ... | 8
```

This setting controls the intensity of the backlight when the **config brightness** command is set at low, medium, or high.

When this command is set at 0, there is no variation in the brightness of the backlight. However, if it is set at 8, the brightness on high is very intense. Table 9-3 shows the impact in the output of the backlight for several combinations of the **config brightlimit** command.

Table 9-3. Backlight Output

config brightlimit setting	config brightness setting	Backlight output
8	high	100%
	medium	50%
	low	1%
4	high	50%
	medium	25%
	low	1%
0	high	1%
	medium	1%
	low	1%

Because having the backlight at full brightness uses 60 percent more power than having the backlight off, you should set this command as low as possible for your work conditions.

Config Brightness

The **config brightness** command sets the brightness of the screen backlight. This command has the following format:

```
config brightness = low | medium | high
```

This command allows you to set the brightness of the LCD screen backlight. Initially, the brightness is set to low. To conserve battery power, it is very helpful to set the screen backlight brightness to a low level.

The intensity of the backlight at each setting is dependent on the setting of the **config brightlimit** command (as shown in Table 9-3).

The backlight brightness switch on the computer changes the **config brightness** setting.

Config Colormap

The **config colormap** command sets color mapping on the display. This command has the following format:

```
config colormap = n
```

where *n* is a value from 1 through 6 and specifies a color mapping mode (the default setting is 1).

Color mapping determines how colors are mapped to the display. Colors displayed by software are changed to various shades of gray on the screen. A color map is a particular set of gray shades that correspond to a set of colors. You can change the color mapping mode so that different shades of gray are assigned to the same set of colors.

If you cannot change the color mapping, check the **config grayscale** setting. If it is **on**, the **config colormap** command has no effect.

Config Contrast

The **config contrast** command adjusts the contrast of the screen. This command has the following format:

```
config contrast = 0 | 1 | ... | 255
```

This commands allows you to set the screen contrast. Initially the contrast is set to 64, a medium contrast.

The contrast switch on the computer changes the **config contrast** setting.

If you have a keyboard attached or are using Screen Keyboard, you can increase the contrast by pressing **Ctrl-Alt-↑**, or decrease the contrast by pressing **Ctrl-Alt-↓**. These keystrokes simply cycle through each of the contrast settings forwards or backwards, respectively.

When you are using the full-screen configurator, the value changes in increments of 5.

Config Display

The **config display** command changes the video mode of the screen from normal to reverse video. This command has the following format:

```
config display = normal | reverse
```

If you specify **normal** (the default setting), the screen shows dark characters on a light background. If you specify **reverse**, the screen shows light characters on a dark background.

If you have a keyboard attached or are using Screen Keyboard, you can switch instantly between the two display modes by using the keystroke **Ctrl-Alt-Backspace**.

Config Framecolor

The **config framecolor** command specifies the gray tone to be used for the frame or border on the display. This command has the following format:

```
config framecolor = n
```

where

<i>n</i>	Shades of gray for the frame color. The range is 0 (lightest) to 15 (darkest); the default is 0 .
----------	--

The frame (or border) is visible when displaying in a mode that does not use all of the display.

Config Grayscale

The **config grayscale** command specifies how the color mapping for characters is to be done on the VGA display. This command has the following format:

```
config grayscale = on | off
```

where

- on** Selects the highest level of contrast possible between a character's foreground color and background color; **on** maximizes the contrast.
- off** Maps the color selected by the program to a gray scale on the internal display; **off** is standard VGA compatible (default).

Config Keyclick

The **config keyclick** command controls whether the keys on the screen keyboard click when they are touched. This command has the following format:

```
config keyclick = off | low | high
```

The computer can make a clicking noise each time you touch a key on the screen keyboard. This feature is initially set to **off**. The setting of the **config keyclick** command is not saved when the computer is turned off. Each time you start the computer, it is reset to **off**.

Config Lowbeep

The **config lowbeep** command controls the low-power beep feature. This command has the following format:

```
config lowbeep = on | off
```

The initial setting is **on**. When turned on, the low power beep feature causes the computer to give three short beeps about every 15 seconds if it is running from the battery pack and the battery pack becomes nearly exhausted. The beeps begin at the same time that the battery indicator lights steadily and continue until the battery is exhausted.

You may have as little as two minutes of battery power remaining when the beeps start. When you hear the beeps, you should immediately save the file you are working on to avoid losing any

data. Then you should connect power to the computer, or put the computer into standby mode and replace the exhausted battery pack with a charged battery pack.

If you do not take any action to supply more power to the computer when the low power beeps start, the battery pack will continue to drain. When it is almost exhausted, the computer will automatically enter standby mode in an attempt to preserve your work in system RAM. You will see the screen go blank when this happens.

You can turn off the low power beep feature by specifying **off**.

Config Modem

The **config modem** command turns the optional internal modem driver on or off. This command also assigns the modem a device name. This command has the following format:

```
config modem = on | off | com1 | com2
```

The **config modem** command assigns the modem a device name. The modem initially is assigned device name COM2. If you want, you can specify COM1 to assign it that device name. The **off** option means that the modem is not set to a COM port. The modem cannot be used until it is assigned. The **on** option turns on the modem.

NOTE: If you assign the modem to a different COM device name, the serial port is reassigned automatically to the other COM device name.

Config Parallel

The **config parallel** command enables and disables the optional parallel port. It is possible to install a parallel port inside the computer in place of a communications option. This command has the following format:

```
config parallel = on | off
```

Config Pentest

The **config pentest** command determines whether the pen batteries are checked when the computer is turned on. This command has the following format:

```
config pentest = on | off
```

If this command is set to **on**, every time you turn on your computer a message is issued telling you to touch the pen to the screen. After you touch the pen to the screen, a low battery warning is issued if the pen batteries are low. Refer to the section Pen on page 3-15 for information on testing and changing the pen batteries.

If this command is set to **off**, your pen batteries are not checked. You should periodically turn on this setting or select Test pen battery from the Executive Menu to check your pen batteries.

Config Priority

The **config priority** command sets the priority of hardware interrupts. You would need to use this command only under special circumstances. This command has the following format:

```
config priority = comm | pen
```

The **pen** setting is the default setting, in which the hardware interrupts follow the normal IBM AT sequence (IRQ0 through IRQ7, in order, and with IRQ8 through IRQ15 coming through

IRQ2). You should normally leave the priority set this way. With the **pen** setting, the highest processing priority in the system is given to tracking the pen on the display.

You might need to change the priority to the **comm** setting if you are performing communication through the serial port or modem at the same time that you are using the pen on the display. This situation could cause slow communication performance or, if you are using no error-checking protocol, loss of incoming data.

If you are experiencing such problems, using the **comm** setting may remedy the situation by giving the highest processing priority in the system to the communication ports. The pen is still tracked accurately on the display.

NOTE: When the **comm** setting is chosen, the hardware interrupt priority is changed to the following (highest to lowest priority): IRQ3, IRQ4, IRQ5, IRQ6, IRQ7, IRQ0, IRQ1, IRQ2. IRQ8 through IRQ15 are cascaded through IRQ2 so their priority is also lowered below the comm ports.

Config Serial

The **config serial** command assigns the serial port a device name. This command also changes how the serial port works to accommodate a barcode reader. This command has the following two formats:

```
config serial = on | off | com1 | com2
config serial = ring | barcode
```

The first form of the **config serial** command turns on and off the serial port and assigns it a device name. The serial port initially is assigned device name COM1. If you want, you can specify COM2 to assign it that device name.

NOTE: If you assign the serial port to a different COM device name, the modem is reassigned automatically to the other COM device name.

The second form of the **config serial** command changes how the serial port works in order to accommodate a barcode reader. Normally, pin 9 in the serial port connector is used for the Ring Indicator signal. This is set by specifying **ring** (the default setting). Many barcode readers require this pin to supply +5V dc power. You can change the pin so that it supplies power by specifying **barcode**. Note that the maximum current available is 50 milliAmps.

Config Speaker

The **config speaker** command turns on and off the internal speaker. This command has the following format:

```
config speaker = on | off
```

Config Speed

The **config speed** command sets the speed at which the computer microprocessor operates. This command has the following format:

```
config speed = fast | slow
```

If you specify **fast** (the default setting), the microprocessor immediately begins operating at its fast speed. If you specify **slow**, the microprocessor immediately begins operating at its slow speed.

The setting of the **config speed** command is not saved when the computer is turned off. Each time you start the computer, it is reset to **fast**.

Config Standby

The **config standby** command enables or disables standby mode or immediately puts the computer into standby mode. This command has the following format:

```
config standby [=on | =off]
```

Standby mode is enabled by default. When you press the standby button on top of the computer, it puts the computer into standby mode. Specify **off** to disable standby mode. When standby mode is disabled, nothing happens when you press the standby button.

To immediately put the computer into standby mode, you can also issue the command **config standby** with no parameters.

Refer to the command **config autostandby** (page 9-16) for more information about entering standby mode.

Config Wakeup

The **config wakeup** command schedules when the system will wake up from standby. This command has the following format:

```
config wakeup = hour: minute [,hourly |  
,daily | once] [,boot |,resume] | off
```

where

<i>hour</i>	Specifies the hour of the day when the system will wake up from standby. Values are 0 through 23, representing the hour on a 24-hour clock.
<i>minute</i>	Specifies the minute when the system will wake up from standby. Values are 0 through 59.
hourly	Directs the system to wake up from standby every hour at <i>minute</i> past the hour.
daily	Directs the system to wake up from standby every day at <i>hour:minute</i> .
once	Indicates the wakeup is only to occur the next time the <i>hour:minute</i> is reached; wakeup is not to continue on an hourly or daily basis (default).
boot	Indicates the wake up is to be in the form of a warm boot; the application in process when standby was entered will no longer be running.

resume	Indicates the wake up is to be in the form of a resume, or exit from standby; the application in process when standby was entered is available.
off	Cancels the scheduled wake up.

CAUTION

If you set **config wakeup = boot**, your computer reboots every time you leave standby mode. The reboot occurs regardless of how you entered standby mode. If you have **config wakeup = boot** set, use the command **config wakeup = off** to clear it.

For example, you can issue the following command so the computer wakes up from standby at 7:30 a.m.

```
config wakeup = 7:30,daily
```

The wakeup is repeated every day (**daily**) at 7:30 until the command is cancelled (**config wakeup=off**).

Config Wearlevel

The **config wearlevel** command is used to activate automatic wear leveling of the SunDisk card. This command has the following format:

```
config wearlevel = 0 | 1 | ... | 255
```

Wear leveling is a procedure in which the location of data on the SunDisk is automatically rearranged to ensure that data in one area is not lost due to a large number of write statements.

The purpose of this command is to indicate how often the SunDisk should be checked to determine whether wear leveling is needed. The SunDisk is checked when the computer is turned on. If the setting is 0, the SunDisk will never be checked to determine whether wear leveling is necessary. A setting between 1 and 255 specifies that after the computer is turned on that number of times, the

SunDisk is automatically checked to determine if wear leveling is needed. If it is needed, it will be performed. The wear leveling check could take up to a minute during the computer start-up.

Testing the Screen Digitizer

The PenDraw program allows you to check the calibration of the screen digitizer, to make sure that the pen is being located with the best accuracy when it is touched to the screen.

There are two methods for starting the digitizer test program:

- Choose “Test screen digitizer” from the Executive Menu.
- Run the program **pendraw**, which is on the MS-DOS ROM inside your computer (usually drive A).

When you start the program, the test screen shown in Figure 9-10 is displayed. This is a test screen on which you can draw with the pen. The pen leaves “electronic ink” as you draw with it. You can test the screen digitizer calibration by drawing exactly on top of the lines shown on the screen. If the electronic ink closely matches the lines, then the screen is calibrated properly. The screen overlay is calibrated at the factory and should never need to be recalibrated. If your computer is not calibrated properly, contact your sales representative or distributor.

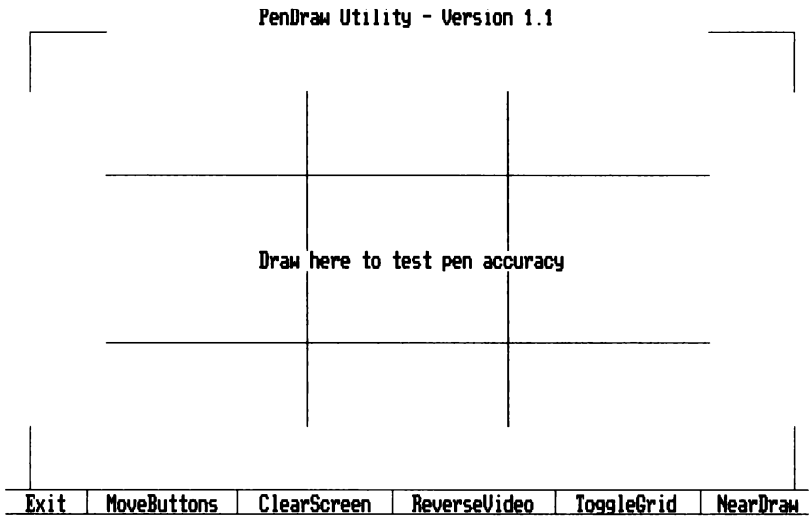


Figure 9-10. Digitizer Test Screen

The buttons at the bottom of the test screen allow you to:

- Exit—Return to the Executive Menu.
- Move buttons—Move the row of buttons to the top of the screen (or back to the bottom of the screen).
- Clear screen—Remove the electronic ink and refresh the test screen.
- Reverse video—Toggle between the light and dark background.
- Toggle grid—Turn on and off the lines on the test screen.
- Near draw/Down draw—Change to Near draw (if the NearDraw button is displayed) or change to Down draw (if the DownDraw button is displayed). Near draw means the electronic ink is deposited if the pen is near the screen. Down draw means electronic ink is deposited only if the pen is in contact with the screen.

Test Pen Battery

Select this option to test the batteries in your pen. The instructions on the screen tell you to touch the pen to the display and then lift the pen. When you lift the pen, a message is issued telling you that the pen battery is OK or is low. If the pen batteries are low, you should change them as soon as possible. Refer to the section Changing the Pen Batteries on page 3-16.

Exit to MS-DOS

Select this option from the Executive Menu to return to the MS-DOS prompt. You must use an attached keyboard to continue to enter commands. If you do not have a physical keyboard attached to your computer when you make this choice, you will not be able to continue operating the computer; MS-DOS requires you to type commands in order to do anything. The following commands can be issued using either an attached keyboard or the screen keyboard.

Cardbatt

The batteries in a storage PC Card have a life of approximately six months after they are installed. You can check the status of the battery in a card installed as drive D: in your computer with the following **cardbatt** command:

```
cardbatt d:
```

A message is issued telling you the battery status. If the battery is low, you should change it immediately. If the battery is dead, the storage PC Card is no longer usable. It must be reformatted.

Penmouse

The *penmouse.com* driver is a software-based mouse emulation driver. It lets your pen emulate the industry-standard Microsoft mouse. Penmouse is loaded at the MS-DOS prompt (using either the screen keyboard or an attached keyboard) and has the following syntax:

```
penmouse [ON | OFF] [/Lx] [/Rx]
```

where

OFF	Removes <i>penmouse.com</i> from memory if it is installed and safe to remove it.
ON	Reinitializes the driver and reloads it if it is not loaded.
/Lx	Maps the left mouse button.
/Rx	Maps the right mouse button.

x describes the state of the pen to map to the mouse. It is “d” if pen down is used, and “1” if a barrel button is used.

Example: The default on the computer is /Ld, meaning the pen emulates the left mouse button when the pen is down, and /R1, meaning the barrel button emulates the right mouse button.

NOTE: Penmouse may not work properly with other applications that use the pen.

APPENDIX A:

COMPUTER SPECIFICATIONS

Microprocessor	
Main microprocessor	80386SL CPU
Display	
Transflective LCD	6.5-inch diagonal, backlit transflective LCD; 640 x 400-pixel, PC-compatible VGA display, with an aspect ratio of 1:1, 64 gray scales
Memory	
RAM	4 MB RAM standard
Storage	
MS-DOS ROM (standard)	512 kB of internal Flash EPROM storage for MS-DOS operating system and utility programs.
Storage PC card	Storage PC Cards (68-pin PCMCIA 1.0/ JEIDA standard) fit into the storage card slot. Available in several sizes.
SunDisk card	SunDisk cards for use in the storage slot. Available in several sizes.

Interfaces

Power/Serial port	RS-232C 25-pin, with support for bar code readers.
Keyboard port	15-pin connector for IBM AT-compatible keyboard, using keyboard adapter cable (and PS/2 Keyboard Socket for PS/2 style keyboards).
Phone jack (optional)	One modular telephone jack for internal modem and telephone (RJ-12 jack).

Other Features

System Indicators	Three LEDs show standby, backlight, and battery status.
Audio	Built-in speaker.
Clock/calendar	Internal, lithium battery-powered.
Bridge battery	Internal battery provides standby mode power while changing the battery pack.

Power

Computer requirements 8 to 15 Vdc, 17 W, 100 mV p-p max. noise.

Sources:

Standard battery	Removable, rechargeable battery pack provides 2-4 hours of life in typical use.
Power supply	Requires 100-240 Vac, at 47-63 or 400 Hz, autosensing; supplies 12 Vdc, 30 W (without battery charging).
Auto adapter	Connects power from a 12 Vdc cigarette-lighter socket.

Physical Characteristics

Case	High-impact plastic
Weight	2.9 lbs (1.3 Kg), with battery pack 2.3 lbs (1.1 Kg) without battery pack
Height	6.2 inches (15.7 cm)
Width	9.0 inches (22.8 cm)
Depth	1.9 inches (4.8 cm)
Temperature	
Operating	0° to 50° C (32° to 122° F)
Storage	-20° to 60° C (-4° to 140° F)
Relative humidity	
Operating	5% to 95% noncondensing
Storage	5% to 95% noncondensing
Drop	2 feet
Vibration	
Operating	5-500-5 Hz at 1.5g, 0.5 in. maximum displacement, 1 octave/minute
Storage	5-500-5 Hz at 5g, 0.5 in. maximum displacement, 1 octave/minute
Altitude	
Operating	10,000 feet (3,048 meters)
Nonoperating	40,000 feet (12,191 meters)
Electrostatic discharge	15 kV

Cables

Power Cord	Connects the power supply to an ac power outlet.
Power/Serial Cable	Y cable with a 25-pin D-shaped power/serial connector, a 9-pin D-shaped RS-232C serial connector, and an 8-pin round power connector.
Keyboard Adapter	Provides a 15-pin D-shaped keyboard connector and a 5-pin DIN keyboard connector.
Battery Cable	Provides two 8-pin power connectors.
Serial Cable	Provides a 25-pin D-shaped power/serial connector and a 9-pin D-shaped RS-232C serial connector.
Power Cable	Provides a 25-pin D-shaped power/serial connector and an 8-pin round power connector.

APPENDIX B:

TECHNICAL INFORMATION

This appendix contains information about the memory usage in the computer and information about the pinouts of the interface connectors.

System Memory

Main memory for the computer is four megabytes of dynamic RAM.

Main memory is allocated starting at the low end of the available address space (address 0h). The memory from 0h to 9FFFFh (640 kB) is conventional MS-DOS memory. The memory from A0000h to FFFFFh (384 kB) is reserved for video, the BIOS, and other system functions. The system memory is allocated as shown in Figure B-1.

Any EMM driver must be configured to avoid the D0000-DFFFF range to prevent a conflict with the DOS ROM page locations.

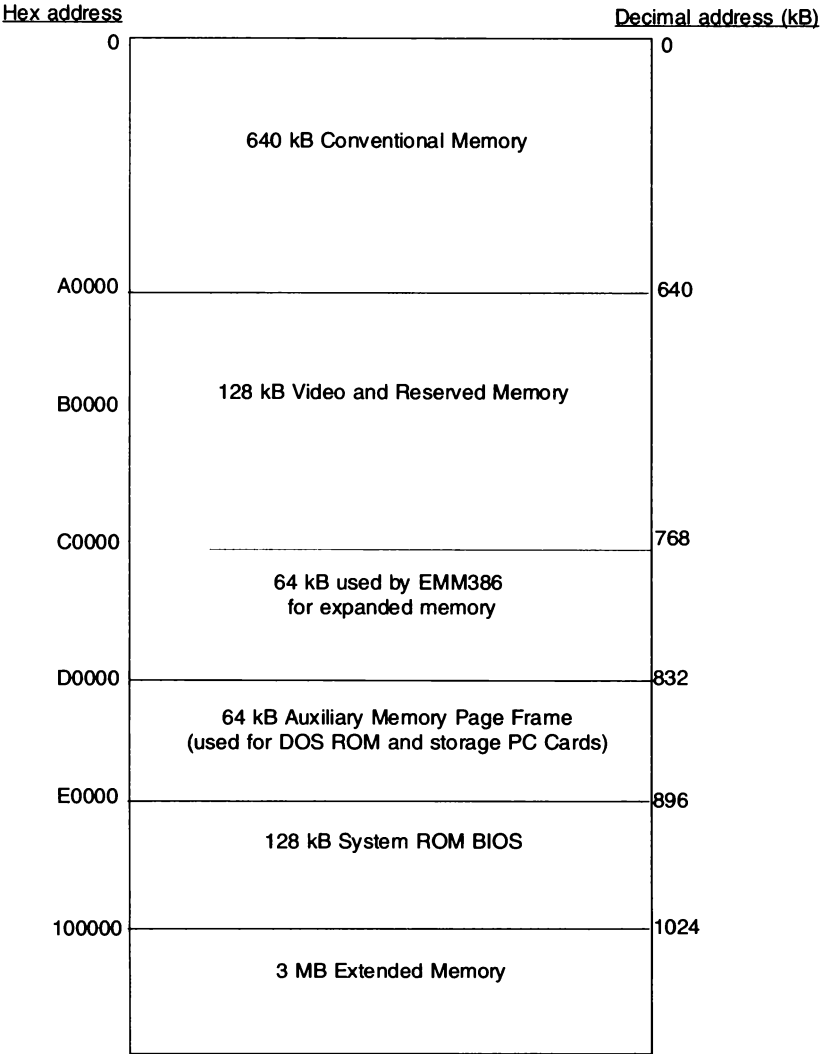


Figure B-1. Memory Map

Connectors

This section gives the pinout information for each of the interface connectors on the computer.

NOTE: The tilde (~) symbol after a signal name means that signal is “true” or “active” in its low state.

Keyboard Connector

The keyboard connector is a 15-pin D-shaped microminiature connector. It can be used to connect a keyboard or barcode reader to the computer using the optional keyboard cable. Figure B-2 shows the Keyboard connector and Table B-1 gives the pinouts for the Keyboard Connector.

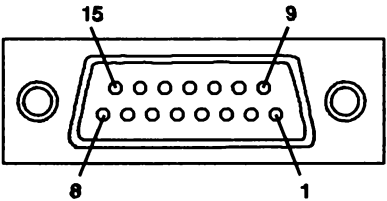


Figure B-2. Keyboard Connector Layout

Table B-1. Keyboard Connector Pinouts

Pin	Signal
1	Keyboard Clock
2	Keyboard Data
3	Not connected
4	Ground
5	+5 volts Keyboard Power (Switched)
6-15	None

Power/Serial Connector

The power/serial port is a 25-pin D-shaped microminiature connector. It is used to connect the power supply to the computer using either the power/serial cable or the optional power cable. This connector can also be used to connect serial peripherals using either the power/serial cable or the optional serial cable.

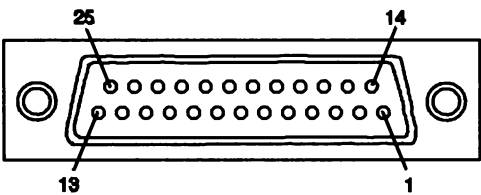


Figure B-3. Power/Serial Connector Layout

Table B-2. Power/Serial Connector Pinouts

Pin	Signal	Pin	Signal
1	Ground	14	External Power
2	Transmit Data	15	External Power
3	Receive Data	16	External Power
4	Request To Send~	17	Standby Switch~
5	Clear To Send~	18	Not connected
6	Data Set Ready~	19	Ground
7	Ground	20	Data Terminal Ready~
8	Data Carrier Detect~	21	Ground
9	Ground	22	Ring Indicator/+5V
10	Not connected	23	Positive Current Sense
11	Not connected	24	Negative Current Sense
12	Rapid Charge Status~	25	Ground
13	Charge Enable~		

Telephone Connector

Computers equipped with an optional internal modem in the U.S. contain one telephone connector. The telephone connector is a 6-pin RJ-12C connector that allows you to connect the telephone line to the computer. Figure B-4 shows the telephone connector and Table B-3 gives the pinouts for the telephone connector. Modem connectors in other countries will conform to the telephone system requirements for that country.

The telephone connector accepts and is compatible with the 6-pin RJ-11C telephone plugs that are standard in the U.S.

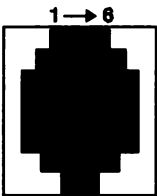


Figure B-4. Telephone Connectors

Table B-3. Telephone Connector Pinouts

Pin	Signal (U.S.)	Signal (International)
1	Not connected	EQL3
2	Not connected	EQL2
3	Ring	Ring
4	Tip	Tip
5	Not connected	EQL1
6	Not connected	IA

Serial Port on Serial or Power/Serial Cable

The power/serial cable and the optional serial cable have 9-pin D-shaped RS-232C serial connectors. The serial port is a Data Terminal Equipment (DTE) input/output port for use with a serial printer, external modem, mouse, bar code reader, or other serial peripheral. You can configure the serial port using the MS-DOS

commands **mode comn** and **config serial**. Refer to the MS-DOS documentation and the description of the **config serial** command on page 9-25, for further information.

Figure B-5 shows the Serial connector and Table B-4 gives the pinouts for the Serial connector.

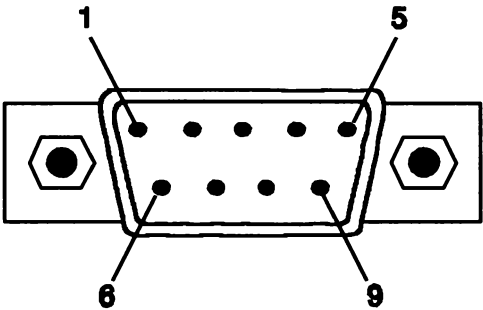


Figure B-5. Serial Connector

Table B-4. Serial Connector Pinouts

Pin	Signal
1	Carrier Detect
2	Received Data
3	Transmitted Data
4	Data Terminal Ready
5	Signal Ground
6	Data Set Ready
7	Request To Send
8	Clear To Send
9	Ring Detect or +5V dc (changeable with config serial command)

Keyboard Connector on Keyboard Adapter

The optional keyboard adapter provides a standard size 5-pin DIN jack that accepts the plug from an external IBM AT-compatible keyboard or a numeric keypad.

Figure B-6 shows the Keyboard connector and Table B-5 gives the pinouts for the Keyboard connector.

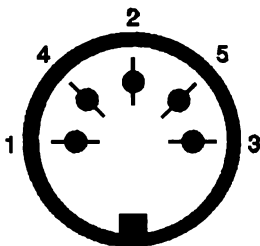


Figure B-6. Keyboard Connector

Table B-5. Keyboard Connector Pinouts

Pin	Signal
1	Keyboard Clock
2	Keyboard Data
3	Keyboard Reset
4	Ground
5	+5V Keyboard Power

Power Connector on Power/Serial Cable, Power Cable, and Battery Cable

The power/serial cable and the optional power cable provide an 8-pin connector that plugs into the power supply. The battery cable provides a power connector at each end to plug into the power supply to recharge the battery when the battery is outside the computer.

Figure B-7 shows the Power connector and Table B-6 gives the pinouts for the Power connector.

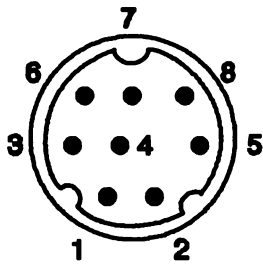


Figure B-7. Power Connector

Table B-6. Power Connector Pinouts

Pin	Signal
1	Ground
2	External Power
3	Ground
4	Battery Charge Enable~
5	External Power
6	Battery Positive Current Sense Voltage
7	Battery Negative Current Sense Voltage
8	Battery Rapid Charge Status~

GLOSSARY

Application program	A program that you use to do a specific task. Examples of application programs include word processors, spreadsheets, databases, communication programs, and custom applications designed to gather information or perform other specific tasks.
ASCII	American Standard Code for Information Interchange. A code in which each character (A, B, C, etc.) is assigned a number to facilitate the interchange of data between computer systems. Most computer data is stored as ASCII codes.
Backlight	The lighted panel behind or to the side of the LCD screen. The backlight makes it easier to read the screen in low light conditions. The brightness of the backlight is adjustable using the switch to the left of the screen or with the config brightness command. The backlight can be turned on and off using the switch to the left of the screen or with the config backlight command.
Bps	Bits-per-second. A measure of data transmission speed commonly used for modems.
Button	The standby button next to the computer screen, or an object displayed on the computer screen that acts like a physical button. A button displayed on the computer screen usually is a small box containing text, such as OK or CANCEL. When you touch the button with the pen, the computer performs some action.
Byte	A unit of computer data that stores a single character. A byte is made up of 8 bits, each of which can be set to one or zero.

Conventional memory	Main memory in your computer that MS-DOS uses for itself and for program execution. The computer has 640 kB of conventional memory, the maximum that can be used by MS-DOS.
Default	The initial factory setting of an item. For example, the default setting for standby mode is ON in the computer.
Directory	An area on a storage device that holds a group of related files. This is analogous to a drawer in a filing cabinet, in which related files are stored. Directories have names that can be up to eight characters long. For example, you might have a directory on a SunDisk card called <i>memos</i> which contains several memo files.
EPROM	Erasable Programmable Read Only Memory. A type of computer memory that can be read from but not written to, except through the use of a special utility. The data in an EPROM is semi-permanently programmed into the device. It does not require any power to maintain data in EPROM. See also ROM.
Field	An area on the computer screen where you enter information. Fields are usually indicated by boxed areas and labeled with labels such as Name, Address, etc. You enter information into a field by writing in it with the pen.
File	A group of data treated and stored as a single unit by the computer. Each file has a name and is stored on one of the computer storage devices. Computer files are analogous to files in a file drawer. For example, a memo that you write with a word processor is stored as a file. The word processor program itself is another file.
File name	The name of a file. A file name can be up to eight characters long with a three-character file extension separated by a period. For example,

here are some file names: *padkbd.exe*, *autoexec.bat*, *config.sys*, *intersvr.exe*, and *memo.doc*.

Flash storage A type of storage device that uses Flash EPROMs to store data. A flash EPROM is a special type of EPROM chip that can be erased and reprogrammed electrically, while it is installed in the computer.

Font A complete set of characters that have the same style and size. For example, the chapter titles in this book are printed in one font and the body text is printed in another font. There are bold fonts, italic fonts, regular fonts, large fonts, and small fonts.

Kilobyte (kB) 1024 bytes.

Landscape mode Orientation of the screen with the long edge horizontal.

LCD Liquid Crystal Display. The type of display screen used on the computer. A thin layer of liquid crystal material reacts to electrical signals which turn individual pixels on and off.

LED Light Emitting Diode. An indicator light. The computer has three LEDs: a green standby indicator, a green backlight indicator, and a yellow battery low indicator.

List A list of choices shown on the computer screen. A list can contain more items than are shown at one time. To scroll a list, touch inside the list with the pen and then drag the pen downwards or upwards, beyond the edge of the list. The list scrolls in the direction you drag.

Megabyte (MB) 1024 kilobytes or 1,048,576 bytes.

Modem	An acronym for <i>modulator-demodulator</i> . The optional internal modem translates computer data into audible tones for communication over telephone lines.
MS-DOS	Microsoft Disk Operating System. The basic control program that operates the computer. This is the standard operating system used by all IBM personal computers and compatibles.
Operating system	The basic control program that operates the computer. It is the program that begins running when you turn on the computer. It manages your files, the storage devices, and interprets commands that you issue.
Path	A sequence of directory names describing in which directory a file is stored. Each directory name in a path is separated from the previous one by a backslash (\). Each directory is a subdirectory of the one to its left and is contained within it. For example, here are some paths: <i>\memos\january, \programs, \finance\audits\qtr1.</i>
Pixel	A single dot on the screen. The computer screen contains 400 rows of 640 pixels each.
Portrait mode	Orientation of the screen so the long edge is vertical.
RAM	Random Access Memory. A type of computer memory that can be read from and written to. It is extremely fast, but requires a constant source of power to maintain its data. In the computer, RAM is used for the 4 megabytes of main memory and for the storage in the RAM storage cards.
ROM	Read Only Memory. A type of computer memory that can be read from but not written to. A ROM chip cannot be erased or overwritten because the data is permanently burned into its circuits. It

does not require any power to maintain data in ROM. See also EPROM, which is a special type of ROM chip.

- Software** A general term describing any programs that run on the computer. A program is a set of instructions written in a computer language that tells the computer how to perform some task.
- Standby mode** A power-saving mode of operation on the computer. In standby mode, all computer systems are turned off, except for the main memory, where the program and data you are working with are maintained. This mode uses less than 5 percent of the power that the computer normally needs to operate and can greatly extend battery life if you use it frequently. Put the computer into standby mode if you are going to stop using it for a while but do not want to turn it off. To put the computer into standby mode, press the Standby button or use the autostandby feature. For more information, see the section Standby Mode, in Chapter 4.
- Storage PC Card** A credit card-size storage device used with the computer. A storage PC Card is similar to a floppy disk, because it is a permanent storage device for your files. Data is stored in RAM circuits inside the card. In a storage PC Card, the data is preserved by a small amount of electricity flowing from a battery inside the card. The battery must be replaced periodically. For more information, see Chapter 5.
- Stroke** A single mark made with the pen when you are writing on the screen. A stroke begins when you touch the pen to the screen and ends when you lift up the pen. For example, the letter C usually is made with a single stroke, but the letter E often is made with four strokes.

- SunDisk card** A credit card-size solid-state silicon hard drive card used for data storage. SunDisks are compatible with the 68-pin PCMCIA 1.0/JEIDA connector. For more information, see Chapter 5.
- VGA** Video Graphics Array. An IBM graphics display standard that uses 640 by 400 pixels.
- Write-protect** To prevent the writing of data to a storage device. Write-protecting a storage device prevents the accidental erasure or overwriting of important files. On the computer, you can write-protect the storage PC Cards. To do so, move the tiny write-protect switch on the end of the card towards the middle of the card (the left).

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