GRiD®

GRiD Convertible

Computer User's Guide

GRiD Convertible Computer
User's Guide

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DFW Airport, TX 75261

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Federal Communications Commission Compliance Statement

This equipment 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. This equipment generates, uses, 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 this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- This computer has been FCC-certified under test conditions which include the use of SHIELDED cables. GRiD-supplied cables are shielded. To reduce the possibility of causing interference to radio, television, and other electric devices, it is important that shielded cables be used when connecting external devices. Be sure that all cables are properly connected.
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an electrical outlet on a circuit different from that to which the receiver is connected.
- Disconnect peripherals and accessories one at a time to determine which device may be causing interference. For non-GRiD Systems products, contact the dealer or manufacturer for assistance.

Digital devices, including personal computers, are operated under the authority of the Federal Communications Commission. Changes or modifications to the equipment described in this manual, which are not expressly approved by GRiD Systems Corporation, could void your authority to operate the equipment if harmful interference is caused to radio and television reception.

Canadian Compliance Statement

This digital apparatus 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 la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Safety Agencies (TUV, CSA, and UL)

Safety Agency markings for the pen are located on the back side of the battery housing, beneath the battery cover.

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ABOUT THIS BOOK

This manual describes how to operate the GRiD® Convertible™ computer from GRiD Systems Corporation. 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.

GRiD Convertible computers may be used as a "tablet" with the display closed; a pen is used to interact with pen-compatible applications. The computer is also used as a "notebook"; the display is opened to access a keyboard.

Manual Organization

The information in this manual is organized as follows:

- **Chapter 1** shows you how to get started using your GRiD Convertible computer. Read this chapter first if you want to get started quickly.
- **Chapter 2** describes the computer in detail and explains each hardware feature.
- **Chapter 3** describes the internal features that are available for your computer.
- **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 the internal hard disk that are used for storing data and programs in the GRiD Convertible computer. It also describes the external floppy drive.
- **Chapter 6** provides troubleshooting and diagnostic 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 the MS-DOS operating system software on the GRiD Convertible computer.

- **Chapter 9** explains how to use the utility programs supplied for the GRiD Convertible computer.

- **Appendix A** provides the GRiD Convertible computer specifications; **Appendix B** tells how to install additional system RAM, and **Appendix C** provides a system memory map and connector pinout information.

A postage-paid customer response form is included at the end of this manual. Please use the form to comment on the usefulness and readability of this manual.

Related Publications

The following publications contain related information:

- *Internal Modem User's Guide* provides detailed information on using the optional internal modem and the modem command set.

- *PenRight! Application User's Guide* provides information on handwriting and using the pen effectively in PenRight!™ applications.

- The manuals in the *PenRight! Pro Software Development Kit* provide information on developing custom PenRight! programs for the GRiD Convertible computer.

- *Microsoft® Windows™ 3.1 User's Guide* provides information on using the Windows software.

- *Microsoft® Windows™ for Pen Computing 1.0 User's Guide* provides information on using the Windows pen software.

- *GRiD Model 2260 Computer Service Manual* provides information on diagnosing problems and repairing the GRiD Convertible computer.

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.
italics	Used for file names, variables and placeholders that represent the type of text to be entered by the user.
`monospace`	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.

CHAPTER 1:
GETTING STARTED

This chapter shows you how to get started quickly with your GRiD Convertible computer. It covers checking the contents of the shipping box, setting up the computer, and starting up (booting) the operating system.

Checking the Contents of the Box

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

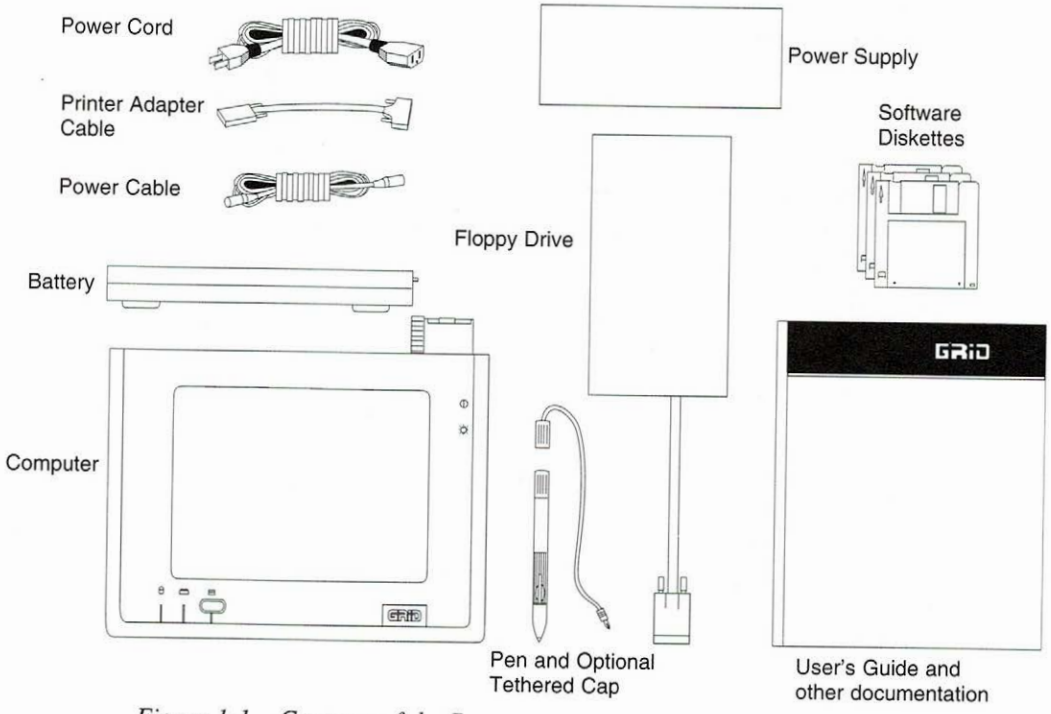


Figure 1-1. Contents of the Box

Check for shipping damage or missing parts. If any equipment is missing or damaged, and you are in the U.S., immediately contact an authorized GRiD Systems representative, call the GRiD Resource Center (GRC) at 1-800-654-GRID (4743), or write to: GRiD Systems Corporation, GRiD Resource Center, P.O. Box 612706, DFW Airport, TX 75261. Outside of the U.S., contact your local GRiD Systems representative or distributor.

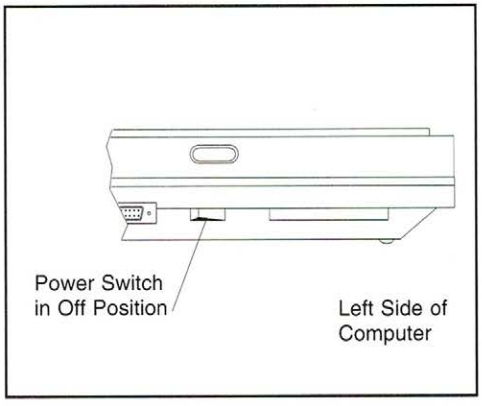
Keep the shipping carton and original packing materials in case you need to return your GRiD Convertible computer to GRiD Systems for upgrading or service. Do not return your computer to GRiD Systems until you have received prior authorization from the GRC or your GRiD Systems representative.

Getting Started

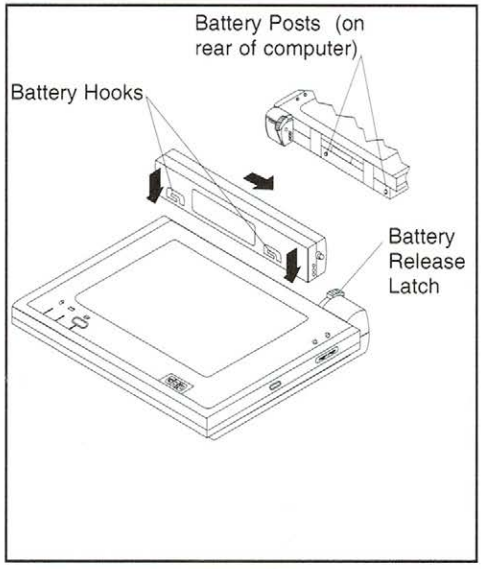
When you first receive your GRiD Convertible computer from GRiD Systems, the battery pack is not charged. You will need to use the power supply included with the computer to operate the computer and charge the battery pack. Refer to Chapter 4 for information on charging the battery pack.

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

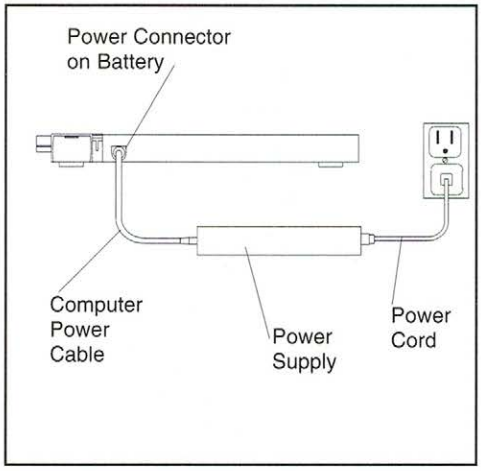
1. **Make sure the power switch on the side of the computer is off.** Press the front of the switch to turn off the computer.



2. **Connect the battery to the rear of the computer.**
   - Open the battery release latch by pushing the latch away from the computer.
   - Put the battery hooks onto the battery posts (located on the rear of the computer), and slide the battery down.
   - Slide the battery toward the battery release latch until it locks into place.
   - Close the battery release latch by sliding it towards the computer. Refer to page 4-8 for more detailed instructions.

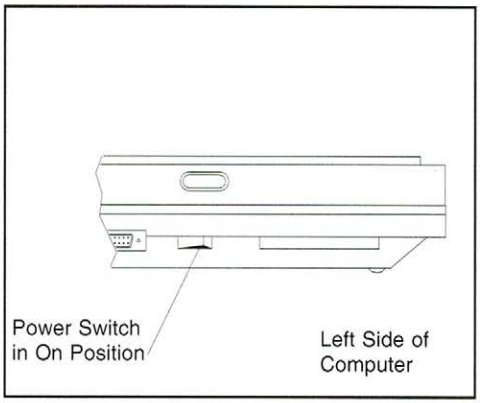


3. **Connect the power supply to the GRiD Convertible computer and plug it into a power outlet.** Plug one end of the computer power cable into the power connector on the computer battery; plug the other end of the cable into the power supply. Plug one end of the power cord into the power cord socket 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.

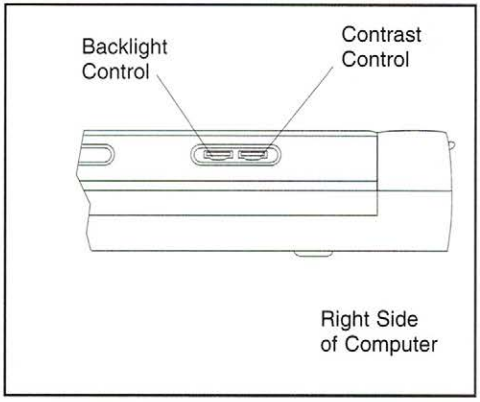


4. **Turn on the computer.** Press the back of the power switch to turn it on.

   When you turn on the power, the computer runs a self-test and loads the MS-DOS operating system into its system memory. It then loads the Microsoft® Windows™ for Pen Computing software.



5. **Adjust the contrast and brightness of the screen if it is blank or you cannot see it clearly**. There are two controls on the right side of the display. The screen backlight intensity is adjusted by turning the control closest to the front of the computer. The screen contrast is adjusted by turning the control closest to the back of the computer. Refer to the section The Sides on page 2-24 for additional information on the controls.



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 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 or leave the battery attached to the computer; the battery pack recharges as long as the power supply is connected to the battery and plugged in to a power outlet. Refer to Chapter 4 for more information about using the battery pack and other power options.

If you want to connect other devices to your computer, such as a printer or floppy diskette drive, refer to Chapters 2 and 5.

CAUTION

Put the computer into standby or turn off the power and turn off the power on the external device before connecting or disconnecting any external device. Failure to turn off the power can cause damage to the equipment.

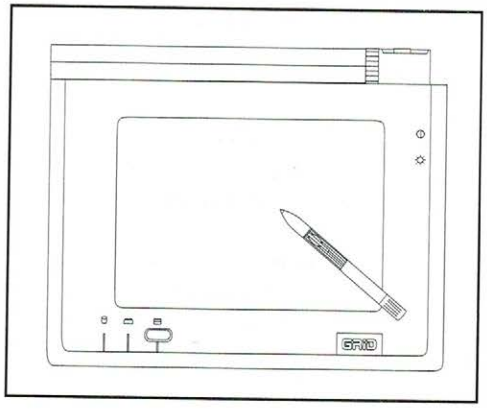
GRiD Convertible computers contain low power circuits that can be damaged by static discharge or transient voltage.

Using the Display

The display accepts pen input. It also displays information entered by the pen or from a keyboard.

Using the Display with a Pen

You may use the pen directly on the display to interact with pen-compatible applications. The pen performs conventional mouse pointing functions under Microsoft Windows for Pen Computing. It also performs drawing and character recognition functions, depending on the application.



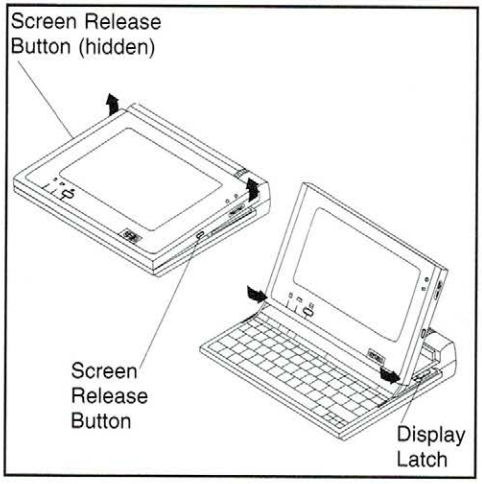
For anything other than simple mouse pointing functions, it is recommended that the display be closed and latched. Refer to page 2-2 for information on the pen.

Use the pen to access programs and enter data according to the instructions provided with your pen-based software application.

Using the Display with the Keyboard

The display also displays information entered via the keyboard. To access the keyboard:

- Simultaneously press the screen release buttons on each side of the computer.
- Lift up the back edge of the display and push the bottom edge toward the back of the computer until it locks into position.



Refer to page 2-12 for information on using the keyboard.

CAUTION

Use the display latch to release the display before attempting to close it. Failure to release the display latch may result in breakage of the arm.

To close the computer, push the display latch toward the back of the computer. Then push the top of the screen away from you. Lower the screen until it locks into position. You should apply some downward pressure to make sure the latches lock.

CAUTION

Be careful to keep your fingers away from the hinge area at the lower edge of the screen when you are opening or closing the display.

Storage Devices

Your GRiD Convertible computer is equipped with the following storage options:

- A PCMCIA card slot that accepts storage PC Cards as well as PCMCIA (version 2.0 compatible) input/output cards.
- An internal hard disk drive.
- A 3.5-inch external floppy diskette drive.

The hard disk is already formatted and contains all of the MS-DOS operating system files and the Windows for Pen Computing files. You can start MS-DOS and Windows from the hard disk simply by turning the computer on. To set up your computer to boot directly to the MS-DOS prompt, modify the *autoexec.bat* file (refer to page 8-3).

Each of the storage devices installed in your computer is assigned a separate drive letter by which it can be accessed. The device letters are shown in Table 1-1 (assuming one partition on each storage device). You can also check your device letters by using the **devices** command (refer to page 9-30).

Table 1-1. Storage Device Drive Letters

Device Letter	Storage Device
A	External Floppy
C	Hard Disk
D	Storage PC Card

Refer to Chapter 5 for information on using the storage devices.

CAUTION

Do not bend PC Cards. PC Cards contain delicate electronic circuits that can be damaged by unusual stresses. Do not store the cards in a wallet.

Starting Up the Operating System (Booting)

When you turn on the GRiD Convertible computer, it performs a RAM test and loads the MS-DOS operating system into main memory (RAM). The RAM test is being performed when numbers representing memory increment on the screen. If you want to terminate the test, press **Esc** or the **spacebar** or touch the pen to the screen. Loading the operating system in this way is called a cold start or boot.

When you boot the computer, it follows a specific order when choosing the storage device from which to load the operating system software. The computer first searches for the operating system software on the hard disk. If it does not find the software there, it looks on the external floppy diskette. You can change the default boot sequence by setting the **config boot** command; refer to the section Configurator beginning on page 9-7. You can override the default boot sequence by pressing the **H** key to boot from the hard disk or the **E** key to boot from the external floppy.

When your computer was shipped from the factory, it was set up to load Windows for Pen Computing software after it loads MS-DOS.

Warm Restart

Once a cold start or boot is complete, you may on occasion find it necessary to restart your computer. For example, if the software you are using locks up the computer, it will not respond to normal input from the keyboard or pen.

CAUTION

Data in main memory is lost when the computer is restarted. Data previously saved on disk is retained. You should save important data to the hard disk every few minutes. Make sure the disk in-use lights are off before performing a warm restart.

When necessary, you should restart the computer by pressing and holding the **Ctrl** and **Alt** keys and then pressing the **Del** key:

This method, called a warm restart or warm boot, restarts the operating system while leaving your power switch on. This saves wear and tear on the power supply and power switch, and the booting time is faster than if you pressed the power switch. A warm restart also uses less battery power than when the power switch is used.

If the warm restart method is unsuccessful, you must turn the power switch off and turn it on again to restart the computer. When you use the power switch to restart the computer, always wait a few seconds before turning the computer on again.

Configuring Your Computer

As 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 for the serial port and optional modem, the speed of the microprocessor, and the status of the standby and auto-standby modes. Refer to the section Configurator, beginning on page 9-7, for information on changing your computer configuration.

Setting a Password

The GRiD Convertible computer provides the ability to protect your file system from unauthorized use by allowing you to set a password. If you set a password on your computer, you will be required to enter the password (using the keyboard) each time you turn on or restart the computer. Refer to the section Password on page 9-30 for information on the **setpass** command.

If you type the wrong password at the password prompt, your computer will restart until you enter the correct password. If you forget your password and you are in the U.S., call the GRiD Resource Center at 1-800-654-GRID (4743) for assistance.

Outside the U.S., contact your local GRiD Systems representative or distributor. While GRiD Systems will try to provide assistance, remembering the password is your responsibility.

NOTE: You are not prompted for the password when the computer comes out of standby.

Closing the Computer

To prepare your GRiD Convertible computer for travel, perform the following steps.

1. Save any files you are working on.

   CAUTION

   Wait until the disk in-use light goes out before you turn off the power. This ensures that you will not lose any data. The disk in-use light indicates that disk access is occurring; turning off power during disk access could cause loss of data.

2. Turn the computer power switch off.

3. Close the screen (if necessary).

4. Disconnect all cords and cables from the computer.

5. Place the computer in the carrying case to transport it. Be sure to protect the screen from contact with sharp objects or from bumping into stationary items.

CHAPTER 2:
GETTING TO KNOW YOUR GRID CONVERTIBLE COMPUTER

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

The Top

The top of the GRiD Convertible computer in its "tablet" form is shown in Figure 2-1. Each item shown in the figure is explained in the following sections.

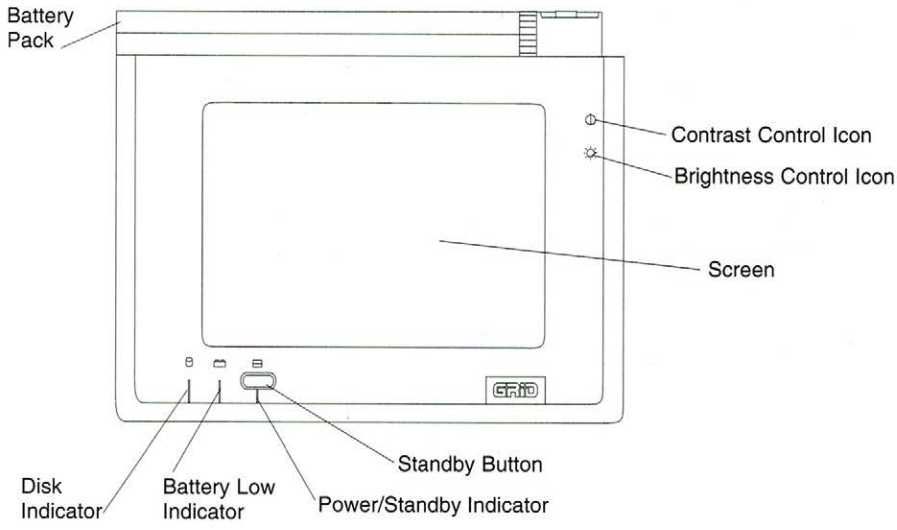


Figure 2-1. Top View of GRiD Convertible Computer

Screen

The screen is a Video Graphics Array (VGA) backlit Liquid Crystal Display (LCD) that fills most of the area on the top of the GRiD Convertible computer.

The screen acts as both a display and a data input device. The computer displays all information on the screen. You can give information to the computer by writing on the screen with the pen, if you are using a pen-based application. Sensors under the screen enable the computer to track your motions as you write.

The screen uses the VGA graphics standard and has a resolution of 640 by 480 pixels. (A pixel is one dot.)

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. For instructions on changing how colors are mapped to shades of gray, refer to the information on the Color function key on page 2-20.

You can also connect an external VGA-compatible monitor to your computer. For more information on connecting an external monitor, refer to the section Monitor Connector on page 2-30.

The screen contrast and backlight intensity are adjusted by controls on the right side of the computer. These controls are described beginning on page 2-28.

Pen

You can interact with pen-based software applications on the GRiD Convertible computer by writing on the screen with the pen.

When you are not using the pen, it stores neatly in the holder on the right side of the GRiD Convertible computer, as shown in Figure 2-2.

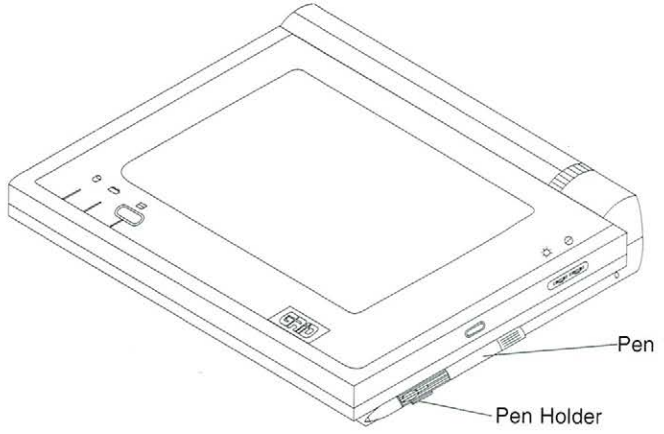


Figure 2-2. Pen Stored in Computer

Since the pen is battery powered, it is designed so that if it is not used (that is, not touched to the computer screen) for five 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. This wakes up the pen and it is ready to use.

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 pen tether fastener on the computer. Push the pointed connector into the round hole on the right side of the computer (refer to Figure 2-3). The tether is designed to pull out of the computer with a firm tug. The pen tether will not support the weight of the computer.

NOTE: The tether is not designed to be continuously inserted and removed. It is built to withstand only a limited number of insertions; therefore, you should plan to leave it connected.

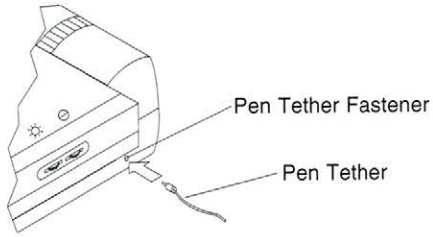


Figure 2-3. Attaching the Pen to the GRiD Convertible Computer

Testing the Pen Batteries

The pen contains two small batteries that should last at least a year.

A utility has been provided to test the pen batteries. You can run this test by selecting "Test pen battery" from the Executive Menu, as described on page 9-6.

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 as long as a month before they become completely exhausted. However, there is no certainty that they will last that long, so we recommend that you change the batteries as soon as possible.

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

Changing the Pen Batteries

To replace the batteries, unscrew the pen cap. Remove the old batteries. Insert two new lithium battery cells. Be sure the positive ends of the batteries point toward the top of the pen. After the batteries are changed, replace the pen cap. 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

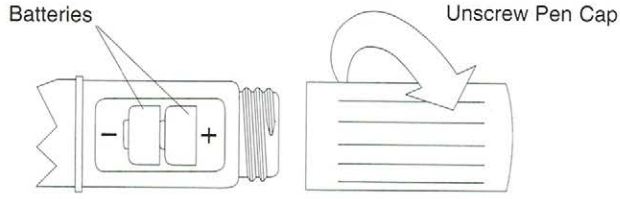


Figure 2-4. Changing the Pen Batteries

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 promptly. Keep batteries away from children as they contain harmful chemicals if swallowed.

Standby Button

The standby button puts the GRiD Convertible 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. 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.

NOTE: A storage PC Card is not affected by standby mode. It receives power from its own internal battery.

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 green power/standby indicator blinks 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 applications and generally is reliable. However, it is possible that it may not work properly with some MS-DOS applications; some applications may not be able to return from standby mode. Before using it with a new MS-DOS 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 before running that application.

Automatic Standby

To conserve power automatically and make your computer battery pack 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 the keyboard for a certain number of minutes. For example, you could set it so that it goes into standby mode if you have not entered anything for five minutes. When you want to start working again, just press the standby button and continue from where you stopped. Automatic standby only functions when you are running from a battery.

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

To set the time interval for automatic standby mode, use the **config autostandby** command. Refer to the description of this command on page 9-14.

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

The GRiD Convertible 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 when the battery is low.

Power/Standby Indicator

The power/standby indicator is a green Light Emitting Diode (LED). This indicator glows green to indicate the power switch is on and the system is not in standby. The indicator flashes when the power switch is on and the computer is in standby.

Battery Low Indicator

The battery low indicator is a flashing red LED. This indicator alerts you when the battery pack is low. This indicator is normally off. It flashes when the GRiD Convertible computer is running on battery power and the battery pack is nearly exhausted; you may have as little as two minutes of battery power remaining. The exact amount of battery life remaining in the battery pack depends on many factors and is difficult to predict.

The computer also beeps when the battery pack is low. These beeps start at the same time that the battery low indicator begins to flash. The beeping feature is controlled by the **config lowbeep** command; for more information, refer to the description of this command on page 9-20.

When you see the battery low indicator light or hear the beeps, you should **immediately save the file** you are working on to avoid losing any data. You should also terminate any active communication session. Then, take one of the following actions:

- Connect the power supply to the GRiD Convertible 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, up to five minutes.

If you do not take any action to supply more power to the GRiD Convertible computer when the battery low indicator flashes, 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 battery low indicator blinks, and the standby indicator blinks. This feature is known as low-power standby.

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

The computer can remain in standby mode for up to one hour after entering low power standby. When the battery pack and the internal bridge battery are exhausted, the computer turns off. You may lose data if you have not saved your work.

Disk Indicator

This indicator glows green to indicate when disk access is occurring. This indicator shows disk access on the internal hard drive or the SunDisk card and the storage PC Card. You should not remove a storage card or turn off the computer when this indicator is lit, since this could cause loss of data.

Contrast Control and Backlight Brightness Control Icons

The icons on the top of the computer identify the controls for the contrast and backlight brightness. These controls are located on the right side of the computer; refer to page 2-28.

The Front View

The front view of the computer shows the computer with the keyboard accessible for use in "notebook" mode. The information on the screen, the indicator lights below the screen, and the standby button work exactly as described in the section The Top, beginning on page 2-1. The other features provided when the computer is in notebook mode are described in this section.

NOTE: You may also use the pen to interact with the application even though the keyboard is accessible.

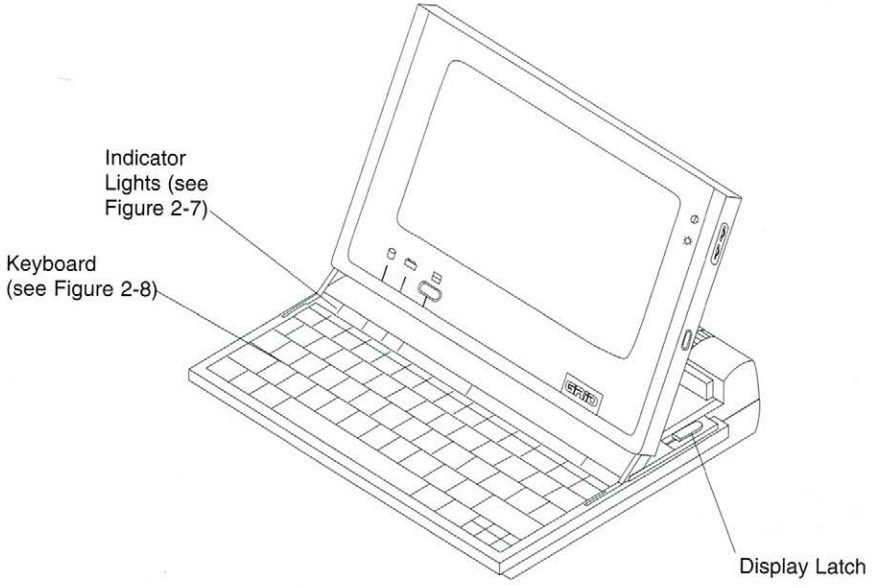


Figure 2-5. The Front View

Opening the Display

To raise the display to use the GRiD Convertible as a "notebook" computer:

1. Simultaneously press in on the screen release buttons on each side of the display (see Figure 2-6).

2. Lift up the back edge of the display.

3. Push the bottom of the display toward the back of the computer until it locks into place. You will hear a click indicating the display has latched. Failure to latch the display open may cause it to fall unexpectedly and may damage the screen.

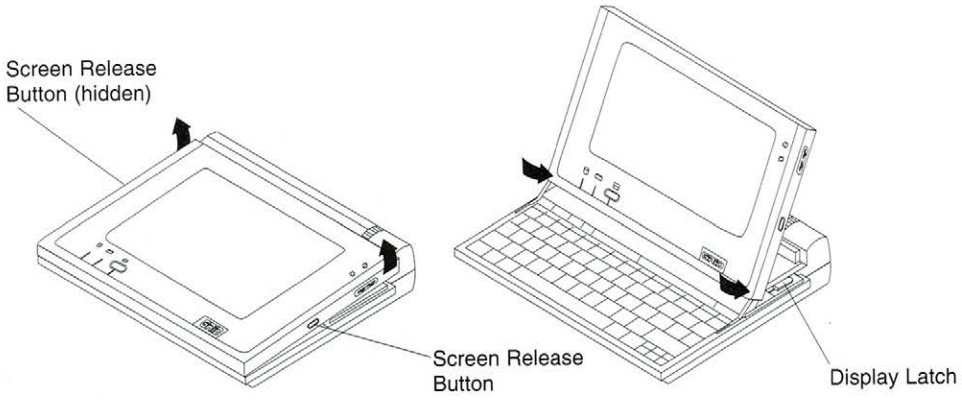


Figure 2-6. Opening the Display

Closing the Display

To close the display on the GRiD Convertible computer:

NOTE: Release the display latch before attempting to close the display.

1. Slide the display latch (located behind the display on the right side of the computer) toward the back of the computer.

2. Push the top of the display away from you and lower the display until it locks into place. Some downward pressure may be required to lock the display.

CAUTION

Be careful to keep your fingers away from the hinge area at the lower edge of the screen when you are closing the screen.

Indicator Lights

Six indicator lights are located above the keyboard. They are shown in Figure 2-7 and defined as follows:

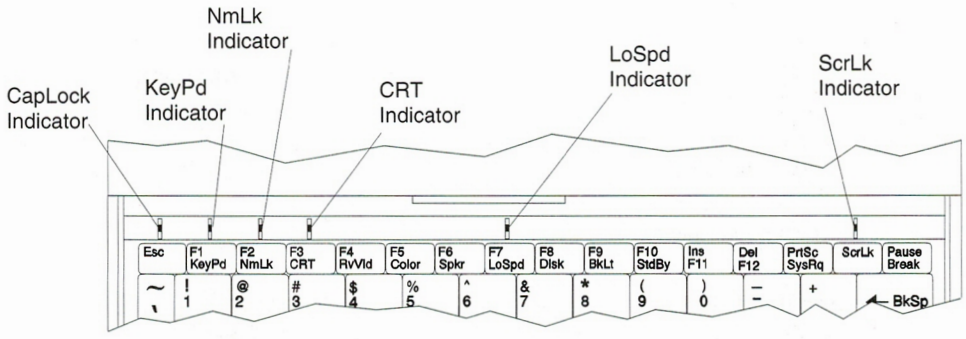


Figure 2-7. Indicator Lights

- **CapLock**: This indicator glows green when the keyboard is in CapsLock mode. To put the keyboard into CapsLock mode, press the **CapLock** key. In CapsLock mode, all alphabetic keys return capital letters. To turn CapsLock off, press the **CapLock** key again.

- **KeyPd**: This indicator glows green when the **FN-KeyPd** keys are pressed to activate the embedded numeric keypad. When KeyPd is activated, the numeric keypad embedded in the keyboard returns numeric values or cursors. To turn off the keypad, press **FN-KeyPd** again.

- **NmLk**: This indicator glows green when the embedded numeric keypad is in NumLock mode; the computer has NumLock activated when it boots. To put the embedded numeric keypad into or out of NumLock mode, press **FN-NmLk**.

- **CRT**: This indicator glows green when the computer video signal is sent to the monitor connector on the rear of the computer. If the internal screen is blank, the video output is displayed only on an external monitor attached to the monitor connector. If the indicator light is on and video output is displayed on the internal screen, your computer is displaying in simultaneous mode; this means video output is displayed on both the internal screen and the external monitor. Simultaneous mode requires more battery power and reduces the contrast on the internal screen. For optimum performance on the internal display, this indicator should be off. Press **FN-CRT** to cycle through the CRT modes.

- **LoSpd:** This indicator glows green when the microprocessor is running at slow speed. The GRiD Convertible is equipped with a multi-speed microprocessor. The 80386SL microprocessor ordinarily runs at 25 MHz; however, it can be slowed to 12.5 MHz. You might want to run the microprocessor at slow speed to save power or if you have a piece of software that cannot run at the faster speed. To switch to the slower speed, press **FN-LoSpd**. To switch back to the faster speed, press **FN-LoSpd** again.

- **ScrLk**: This indicator glows green when the keyboard is in ScrollLock mode. To put the keyboard into ScrollLock mode, press the **ScrLk** key. The effect of ScrollLock mode is dependent on the application you are using. To turn ScrollLock off, press the **ScrLk** key again.

Keyboard

Figure 2-8 shows the GRiD Convertible U.S. keyboard. The keyboard provides you with all of the functionality of the IBM AT 101-key keyboard. The keys marked in blue on the keyboard are used together with the **FN** key to provide some functions.

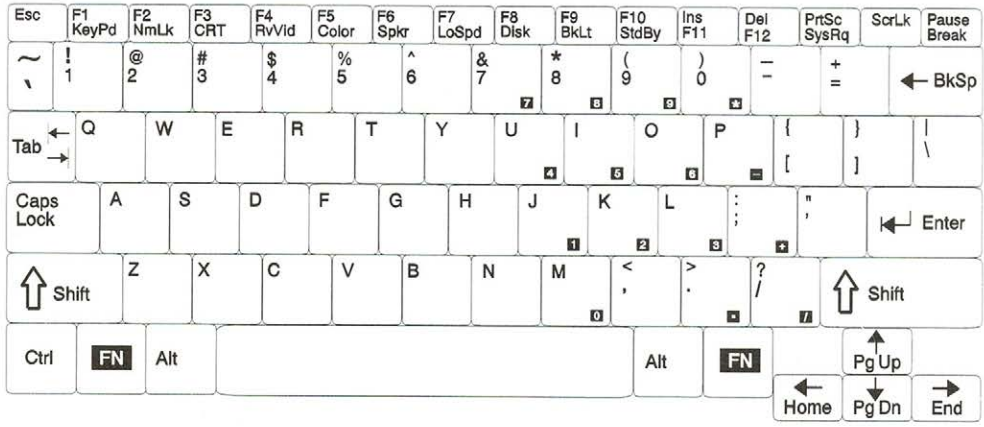


Figure 2-8. GRiD Convertible Keyboard

The ten special functions marked in blue on keys **F1** through **F10** are used to take advantage of some of the special features of your GRiD Convertible computer, such as changing the color mapping or processor speed. These are explained in the section Special Function Keys, beginning on page 2-18.

The other keys marked in blue provide the additional functions found on the IBM keyboard. For example, to use the **F11** IBM PC function key, hold down the **FN** key (you can use either key on the bottom row of the keyboard) and press the **F11** key.

NOTE: This section refers specifically to the GRiD U.S. keyboard. This information is generally applicable to keyboards used in other countries. If you have questions on your keyboard functions, please contact your local GRiD representative.

Using the Numeric Keypad

To conserve space, the GRiD Convertible keyboard overlays the numeric keypad keys on the regular alphanumeric keyboard (see Figure 2-9).

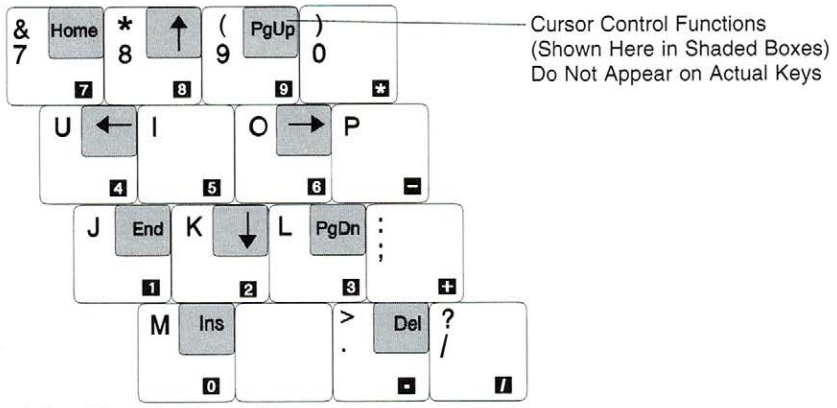


Figure 2-9. Numeric Keypad

To activate the numeric keypad, press **FN-KeyPd**. The KeyPd indicator glows green to indicate the embedded numeric keypad is activated.

The numeric keypad keys will either generate numbers or cursor control functions. When the NmLk indicator is on, the numeric keypad generates a number when a key is pressed. The system has NmLk on when it boots. To turn the NmLk indicator off, press **FN-NmLk**. With the NmLk indicator off, the numeric keypad generates the cursor control functions (which are not labeled on the actual keys).

Table 2-1 shows different ways of accessing numbers, cursor control functions, and alphanumeric characters, depending on whether the keyboard is in NumLock mode.

Table 2-1. Numeric Keypad Functions

	KeyPd Off	KeyPd On	
	NmLk On or Off	**NmLk Off**	**NmLk On**
Keypad Key	alphanumeric	cursor control keys (shaded boxes in Figure 2-9)	numerics printed on keycaps
Shift-Keypad Key	uppercase alphanumeric	numerics printed on keycaps	cursor control keys (shaded boxes in Figure 2-9)

If you need to enter an occasional numeric keypad key, such as the keypad + or - keys, a shortcut method is provided. You can generate any of the numeric keypad keys by pressing the **FN** key followed by the numeric keypad key. The numeric keypad key generated depends on the state of the NmLk indicator. Table 2-2 shows the shortcut keypad functions.

Table 2-2. Shortcut Numeric KeyPad Functions

	KeyPd Off		KeyPd On
	NmLk Off	**NmLk On**	**NmLk On or Off**
FN-Keypad Key	cursor control keys	numerics	alphanumeric
FN-Shift-Keypad Key	numerics	cursor control keys	uppercase alphanumeric

Table 2-3 lists IBM PC special keys and their GRiD Convertible equivalents, for keys that are different between the two computers.

Table 2-3. IBM PC Special Keys and GRiD Convertible Equivalents

Function Keys	
IBM Key	**GRiD Convertible Key**
F11	FN-F11
F12	FN-F12
Cursor Control Keys	
IBM Key	**GRiD Convertible Key**
End	FN-End
Home	FN-Home
PgDn	FN-PgDn
PgUp	FN-PgUp
Typewriter Keyboard Keys	
IBM Key	**GRiD Convertible Key**
Backspace	BkSp
Break	FN-Break
Scroll Lock	ScrLk
Ctrl (right)	FN-Ctrl

Table 2-3. IBM PC Special Keys and GRiD Convertible Equivalents (continued)

Numeric Keypad Keys (NmLk and KeyPd On)

IBM Key	GRiD Convertible Key
Num Lock	FN-NmLk
Gray +	numeric keypad + (;)
Gray -	numeric keypad - (P)
Gray *	numeric keypad * (0)
Gray /	numeric keypad / (/)
Gray .	numeric keypad . (.)
Gray Enter	Enter
1	numeric keypad 1 (J)
2	numeric keypad 2 (K)
3	numeric keypad 3 (L)
4	numeric keypad 4 (U)
5	numeric keypad 5 (I)
6	numeric keypad 6 (O)
7	numeric keypad 7 (7)
8	numeric keypad 8 (8)
9	numeric keypad 9 (9)
0	numeric keypad 0 (M)
Home	Shift-numeric keypad 7 (7) (See note following table)
End	Shift-numeric keypad 1 (J)
PgUp	Shift-numeric keypad 9 (9)
PgDn	Shift-numeric keypad 3 (L)
↑	Shift-numeric keypad 8 (8)
↓	Shift-numeric keypad 2 (K)
←	Shift-numeric keypad 4 (U)
→	Shift-numeric keypad 6 (O)
Ins	Shift-numeric keypad 0 (M)
Del	Shift-numeric keypad . (.)

NOTE: Although the cursor control keys are not labeled on the GRiD Convertible numeric keypad, the keys perform the same functions as on the IBM numeric keypad. Refer to Table 2-1.

Special Function Keys

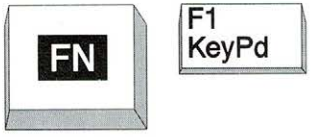
There are ten special function keys color-coded in blue on the keys **F1** through **F10**: **KeyPd**, **NmLk**, **CRT**, **RvVid**, **Color**, **Spkr**, **LoSpd**, **Disk**, **BkLt**, and **StdBy**.

These function keys control special features of your GRiD Convertible computer. To use one of these keys, press **FN** along with the key. The following sections describe these functions.

GRiD Systems also provides **config** commands as an additional method of controlling these functions—refer to the section Configurator, beginning on page 9-7, for details.

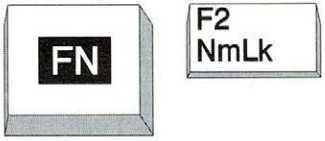
KeyPd

This activates the embedded numeric keypad. The numeric keypad keys have gray numerals on the keycaps. Refer to Table 2-1 for the operation of the numeric keypad. The KeyPd indicator light glows when this key is activated.



NmLk

When the keypad is active, this controls whether the numeric or cursor control keys are active on the embedded keypad. Refer to Table 2-1 for the operation of the numeric keypad. The NmLk indicator light glows when this key is activated.

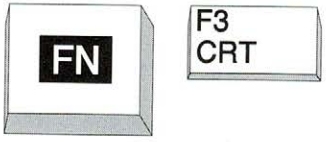


CRT

The **CRT** key controls the video output of the computer. You can select the display used for your computer operation: the internal screen, an external monitor, or simultaneous use of both displays.

The following key combination cycles the video output through these modes:

- internal display (default)
- external monitor
- simultaneous display



By default, the computer video signal is sent to the internal screen and data is displayed there. When you press **FN-CRT**, the computer video signal is sent to the monitor connector on the rear of the computer and data is displayed on an external monitor attached there. When you press it again, you display on both the internal screen and the external monitor (referred to as simultaneous display mode). Each time you press **FN-CRT**, the video output cycles between the three video modes.

When you are using only the external monitor, the 800- by 600-pixel Super VGA mode is supported.

The CRT indicator light comes on when the external monitor is in use. If the indicator is on and your screen is blank, the signal is sent to the external monitor only. If the indicator is on and you have information on your screen, you are using the simultaneous display mode.

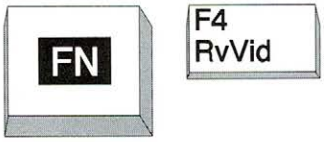
Using simultaneous mode reduces the contrast on the internal screen. The images on the external monitor are reduced in height in simultaneous mode so that the images on the internal screen and the external monitor have the same aspect ratio.

The CRT setting is saved when you turn off the computer.

NOTE: Using the simultaneous display mode increases power requirements, regardless of whether you actually have a CRT monitor connected. Your battery will not last as long.

RvVid

The following key combination toggles the internal screen between normal and reverse video:



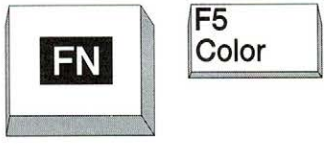
Pressing **FN-RvVid** toggles the internal screen between dark characters on a light background and light characters on a dark background. This commonly is referred to as reverse video. In some cases, you may find reverse video to be more pleasing to look at than normal video. You can also use the **config display** command to change between normal and reverse video; refer to the section Configurator, beginning on page 9-7.

The RvVid setting is saved when you turn off the computer.

Color

The **Color** key controls the color map mode of the computer screen. Because the screen is monochrome, colors are displayed as various shades of gray. A color map mode is a particular set of gray shades that correspond to a palette of colors. You can change the color map mode so that different shades of gray are assigned to the same set of colors. Some software may look better using a different color map than the default. There are six different color maps available.

You can change the color map mode by pressing the following keys:



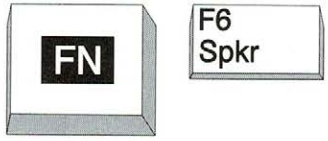
Each time you press **FN-Color**, the screen changes to use the next color map mode. After the sixth color map, the first one is selected again.

NOTE: If you have configured your screen for maximum contrast, you will not see different gray scales for each color map. Use the **config maxcontrast** and **config color** command to control screen contrast and color mapping; refer to the section Configurator, beginning on page 9-7.

The Color setting is saved when you turn off the computer.

Spkr

The **Spkr** key turns the computer speaker on and off. Press the following keys to control the speaker:

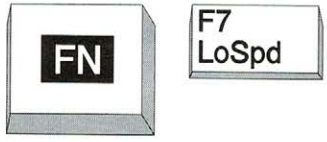


The speaker setting is saved when you turn off or restart the computer. You can also turn the speaker on and off with the **config speaker** command; refer to the section Configurator, beginning on page 9-7.

If you turn off the speaker, you will not hear the battery low warning beeps.

LoSpd

The **LoSpd** key controls the speed of the computer microprocessor. When you press the following keys, the microprocessor toggles between its fast (25 MHz) and slow (12.5 MHz) speeds:

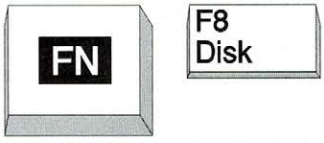


The LoSpd indicator glows green to remind you when the processor is running in slow speed.

You may want to operate the computer at slow speed to save battery power, but you generally won't need to use the slow speed unless your software cannot run at the faster speed. Occasionally, there are games and other programs that run better in the slow speed. You can also use the **config speed** command to change between fast and slow speeds; refer to the section Configurator, beginning on page 9-7.

Disk

The **Disk** key spins down the internal hard disk. The disk indicator glows green when the disk is spun down. This is useful for saving battery power when you are not using the hard disk. The hard disk automatically spins up as soon as a disk access is required. When you press the following keys, the hard disk motor is turned off:

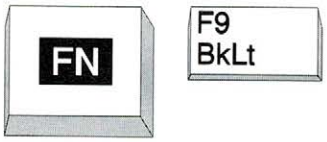


For example, you could use this feature to save battery power by moving the files you need to work with to a storage PC Card. Then shut down the hard disk and work from the storage PC Card.

The hard disk can also be controlled with the **config harddisk** command; refer to the section Configurator, beginning on page 9-7.

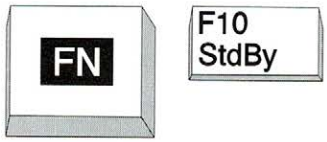
BkLt

The **BkLt** key turns the backlight on and off. The backlight can also be controlled with the **config backlite** command; however, pressing **FN-BkLt** takes precedence over the **config backlite** command setting. Refer to the section Configurator, beginning on page 9-7. Press the following keys to turn the backlight on and off:



StdBy

The **StdBy** key puts the computer into standby mode. When you press the following keys, the computer goes into standby mode as soon as all disk operations are completed:



In standby mode, all computer systems are turned off, except for the system Random Access Memory (RAM). This both preserves your work in memory 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 putting the computer into standby mode.

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 **Fn-StdBy**, the screen goes blank and the computer appears to be off, but your work is still preserved in system RAM. The power/standby indicator flashes green to remind you that the computer is in standby mode. To return to normal operation, press the **spacebar** or press the Standby button; the screen will turn on and show the same thing that was displayed before you entered standby mode.

For more details on standby mode, refer to the section Standby Mode on page 4-2.

The Sides

The side views of the GRiD Convertible computer are shown in Figure 2-10. Each item shown in the figure is explained in the following sections.

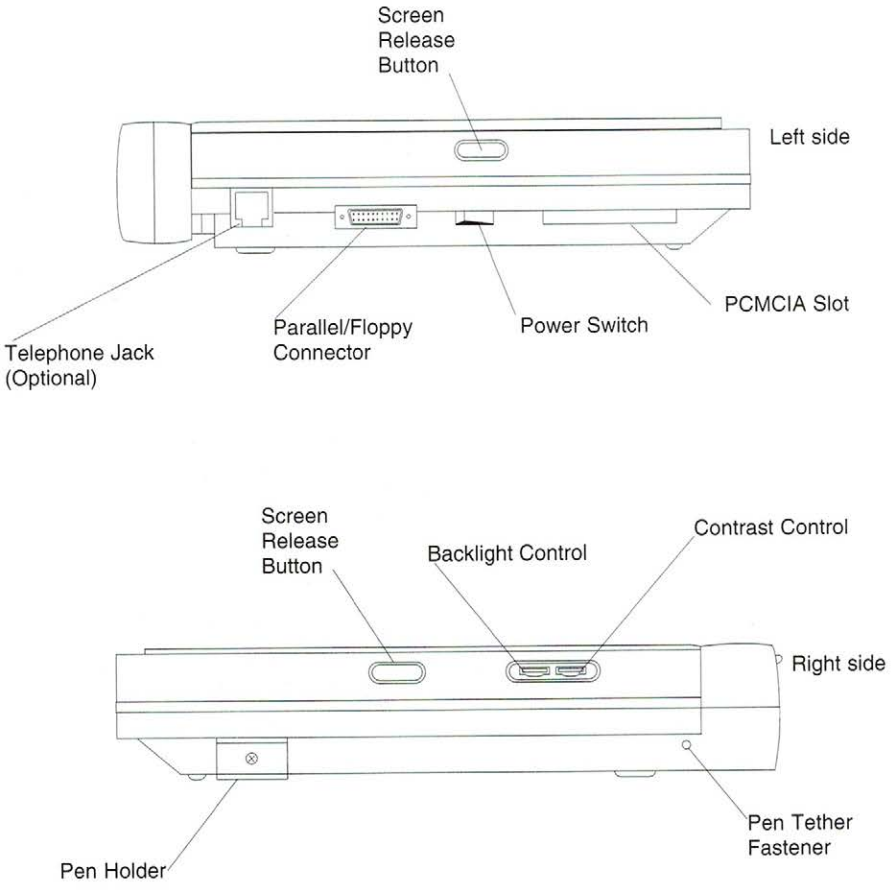


Figure 2-10. Side Views of GRiD Convertible Computer

PCMCIA Slot

The PCMCIA slot allows you to use personal computer cards (PC Cards) that are compatible with the 68-pin Personal Computer Memory Card International Association (PCMCIA) Release 2.0 standard. PC Cards are about the size and shape of a credit card.

Type I PC cards include memory enhancement and storage cards. Use of storage PC Cards is described in Chapter 5. Type II PC Cards may also provide memory enhancement and storage. Some Type II PC Cards provide input/output capabilities such as modems, Token-Ring and Ethernet connectivity, and 3270 emulation.

The PCMCIA slot on the GRiD Convertible supports Type I and Type II cards.

Power Switch

The power switch turns on and off the GRiD Convertible computer. Press the back of the switch to turn on the computer. Press the front of the switch to turn off 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.

Parallel/Floppy Connector

The parallel/floppy connector is a 26-pin microminiature connector. You can use the printer adapter cable (shipped with the computer) to connect a parallel printer. Alternately, you can connect the 3.5-inch floppy drive to this connector; refer to Chapter 5 for information on the floppy drive.

The parallel connector and the printer adapter cable allow you to connect the computer to printers, plotters, and other standard PC-compatible parallel devices. The trapezoidal or "D" shape makes an improper connection impossible. Refer to Appendix C for the pinouts for the parallel/floppy connector.

You can use the MS-DOS **mode lpt*n*** command to change the characteristics for IBM-compatible printers connected to the parallel port. For instructions on using this command, refer to the section MS-DOS Quick Reference, beginning on page 8-17.

Connecting a Printer to the Parallel Connector

Refer to the printer manual to select the cable recommended for an IBM AT or compatible computer being connected to the parallel port.

Before using a printer for the first time with a particular software program, you must make sure that the software is properly configured for your printer. Generally, software configuration consists of installing the appropriate printer driver software for your printer. A printer driver is a program that allows the computer to communicate with a particular make and model of printer. Most application programs include printer drivers for a variety of different printers. (Refer to the documentation for the software program and for the printer for configuration details.)

Before connecting the printer, make sure that the configuration switches on the printer are set properly. These switches determine how the printer operates.

After the switches are set correctly and the appropriate printer driver is installed, you are ready to connect the printer to the computer.

To connect a parallel printer to the computer, perform the following steps.

1. Put the computer into standby or turn it off. Turn off the printer and any other peripherals.

CAUTION

Before connecting or disconnecting a printer or any other external device, put the computer into standby or turn it off. Turn off the power to the external device. Failure to do so may damage your unit.

2. Attach the microminiature connector on the printer adapter cable to the parallel/floppy connector on the side of the computer.

3. Attach the parallel printer cable to the parallel connector on the printer adapter cable.

4. Attach the other end of the parallel printer cable to the parallel connector on the back of the printer.

5. Check your printer manual for instructions on loading the ribbon, paper, and other supplies into the printer.

6. Position your paper so that the print head is at the top of the page.

7. Make sure all power cords are plugged in.

8. Turn on the printer (and any other peripherals), and then turn on the computer or exit standby.

Telephone Jack (Optional)

A telephone jack is provided if the optional internal modem is installed in your GRiD Convertible computer. The modem transmits and receives data through the telephone system. The jack is used to connect the modem to the telephone system.

For more information about the telephone jack and the internal modem, refer to the section Optional Modem on page 3-4.

If you wish to use a standard telephone with the modem (for example, when manual dialing is required), you must purchase a T-connector; it can be found at Radio Shack and other electronic stores.

Contrast Control

The contrast control rotates to adjust the contrast of the computer screen. Rotate the control clockwise to lighten the screen, or counterclockwise to darken the screen.

Backlight Control

The screen backlight intensity is adjusted with the backlight control. Rotate the control clockwise to decrease the intensity, or counterclockwise to increase the intensity. If the backlight is off, it must be turned on before it can be adjusted.

NOTE: Increasing the backlight intensity increases power consumption. It is a good idea to decrease the backlight brightness to conserve power when using a battery pack.

Pen Tether Fastener

The pen tether fastener receives the optional pen tether so your pen can be attached to the GRiD Convertible computer; refer to page 2-3.

Screen Release Buttons

One screen release button is located on each side of the computer. These are pushed to raise the screen so the keyboard can be accessed. Refer to the section Opening the Display on page 2-10.

Pen Holder

The pen holder stores the pen when it is not in use. Refer to the section The Pen on page 2-2.

The Rear

The rear panel contains the battery pack and three connectors. These are shown in Figure 2-11.

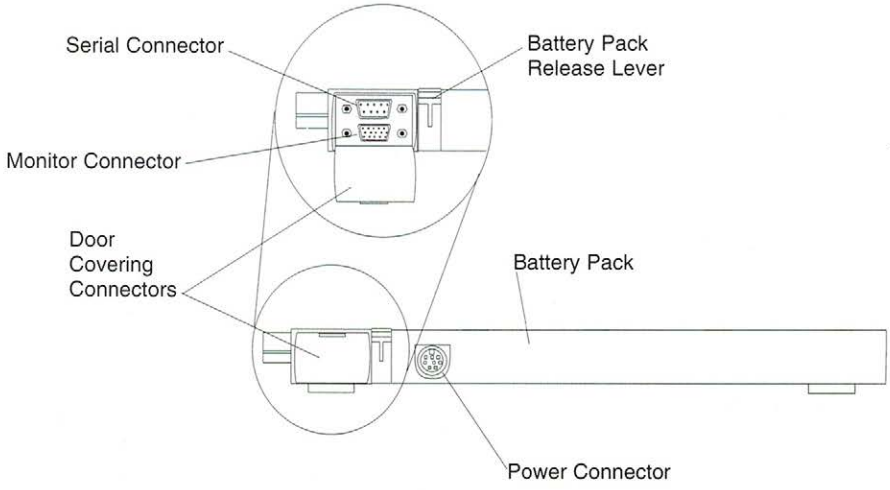


Figure 2-11. The Rear View

Battery Pack

The battery pack is used to provide power to the GRiD Convertible computer. Refer to Chapter 4 for information on using the battery pack.

Power Connector

The power connector for the computer is part of the battery pack. It accepts the plug from the power supply or the optional auto adapter and is used to supply external power to the computer. External power does not need to be connected when you power the GRiD Convertible computer from its battery pack. Refer to the section Using the Power Supply on page 4-4.

Battery Pack Release Lever

This lever is opened to remove and install the battery pack. Refer to the section The Battery Pack on page 4-6 for details on removing or installing the battery pack.

Monitor Connector

The monitor connector allows you to connect an external VGA monitor to the GRiD Convertible computer. The monitor connector is a 15-pin VGA monitor connector. Refer to Appendix C for the pinouts for the monitor connector.

NOTE: The monitor connector supports 800-pixel by 600-pixel Super VGA mode when you use only an external monitor; Super VGA is not supported in simultaneous mode.

Connecting an External Monitor to the Monitor Connector

To connect the monitor to the computer, perform the following steps.

1. Put the computer into standby or turn it off. Turn off the monitor and any attached devices.

   CAUTION

   Before connecting or disconnecting a monitor or any external device, put the computer into standby or turn it off. Turn off the power to the external device. Failure to do so may damage your unit.

2. Attach the cable from the monitor to the monitor connector on the back of the computer.

3. Plug the power cord from the monitor into a properly grounded outlet.

4. Turn on the monitor (and any other peripherals), and then turn on the computer or exit standby.

5. Press **FN-CRT** to send the video output to the external monitor. Refer to the description of the **FN-CRT** key on page 2-19.

Serial Connector

The serial connector is a 9-pin D-type RS-232C-compatible connector. The serial connector allows you to connect the GRiD Convertible computer to another computer so that you can transfer data between the two computers. You also can connect other serial devices such as an external modem, serial printer, or barcode reader. Refer to Appendix C for the pinouts for the serial connector.

NOTE: This computer has been FCC-certified under test conditions which include the use of SHIELDED serial cables. GRiD-supplied cables 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.

You can use the MS-DOS **mode com*n*** command to change the serial port default settings. For instructions on using this command, refer to the the section MS-DOS Quick Reference, beginning on page 8-17.

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 page 9-23.

Connecting a Printer to the Serial Connector

You can connect a serial printer to the serial connector on the rear panel of the computer.

Read the section Connecting a Printer to the Parallel Connector on page 2-26. You must follow the same procedures before connecting a printer to the serial connector.

To connect a serial printer to the computer, perform the following steps.

1. Turn off the computer or put it in standby. Turn off the printer and any other peripherals.

CAUTION

Before connecting or disconnecting a printer or any other external device, put the computer into standby or turn it off. Turn off the power to the external device. Failure to do so may damage your unit.

2. Attach the serial cable to the serial connector on the back of the computer.

3. Attach the other end of the serial cable to the serial connector on the back of the printer.

4. Check your printer manual for instructions on loading the ribbon, paper, and other supplies into the printer.

5. Position your paper so that the print head is at the top of the page.

6. Make sure all power cords are plugged in.

7. Turn on the printer (and any other peripherals), and then turn on the computer or exit standby.

The Bottom

The bottom view of the GRiD Convertible computer is shown in Figure 2-12.

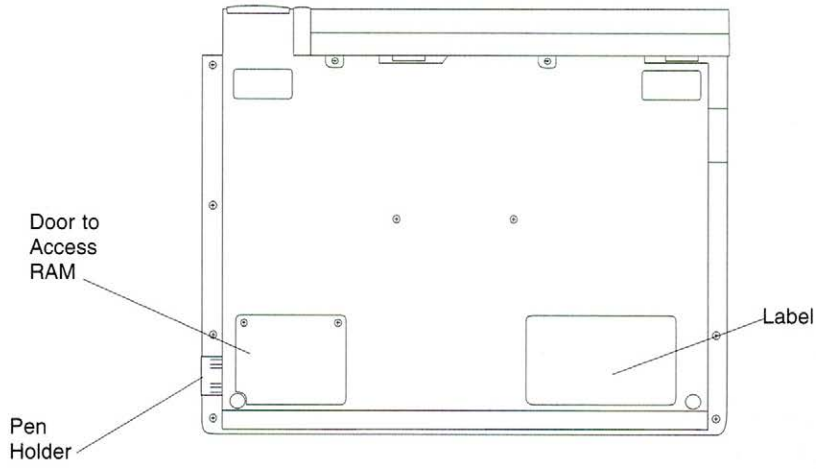


Figure 2-12. Bottom View of GRiD Convertible Computer

Label

The Label provides the tracking (or serial) number of the computer and gives various regulatory agency information.

Door to Access RAM Connector

The door can be removed to access a connector for additional RAM. Refer to Appendix B for instructions on installing additional RAM.

CAUTION

Do not attempt to remove this door for any purpose other than to install additional RAM. Removing this door with the computer on could damage your computer. Follow the instructions in Appendix B.

CHAPTER 3: INTERNAL FEATURES

This chapter describes the internal features available from GRiD Systems Corporation to enhance the performance of your GRiD Convertible computer. Internal features include the system memory, storage devices, the optional modems, and coprocessor.

Table 3-1. Internal Features Available for the GRiD Convertible Computer

Feature	Description
System RAM:	
2 MB System RAM	2 MB of user-installable memory, providing 4 MB of memory rather than the standard 2 MB.
6 MB System RAM	6 MB of user-installable memory, providing 8 MB of memory rather than the standard 2 MB.
Coprocessor:	
CX87SLC Numeric Coprocessor	Provides for faster operation for math-intensive applications (for example, spread sheets, vector graphics, etc.).
Modems:	
V.22bis/V.42bis 2400 bps/FAX	V.22bis, 2400 bits-per-second (bps) Hayes Smartmodem 2400 compatible; auto-dial; auto-answer; V.42 and Microcom Networking Protocol (MNP) Classes 2 through 4 error correction, as well as V.42bis and MNP Class 5 data compression support. Supports 9600 bps send/receive Group III Class I facsimile transmission.

V.32bis/V.42bis 14400 bps/FAX	V.32bis, 14400 bits-per-second (bps) Hayes compatible; auto-dial; auto-answer; V.42 and Microcom Networking Protocol (MNP) Classes 2 through 4 error correction, as well as V.42bis and MNP Class 5 data compression support. Supports 9600 bps send/receive Group III Class I facsimile transmission.
Mass Storage:	Internal hard disk drive, PCMCIA slot, and external floppy drive.

Table 3-2. GRiD Convertible Configurations

Model Number	Features
Model 2260	Internal hard disk drive
Model 2261	Internal hard disk drive; V.22bis/V.42bis 2400 bps/9600 bps FAX modem
Model 2262	Internal hard disk drive; V.32bis/V.42bis 14400 bps/9600 bps FAX modem

System Memory

The system memory inside of the GRiD Convertible computer consists of 2 MB of RAM. This is expandable to 4 or 8 MB of RAM. This system memory is the "working" memory. It is where you run programs and do your work when the computer is turned on. The system memory is erased when the computer is turned off. Data that needs to be saved must be written to a storage card, a hard disk, or some other permanent storage device before the computer is turned off.

The system memory is split into two different kinds of memory: conventional memory and extended memory. Conventional memory is the memory that is available to MS-DOS for running programs. Extended memory is additional memory that some programs can take advantage of.

The 2 MB of memory in your GRiD Convertible computer is split as follows:

- 640 kB of conventional memory
- 1408 kB of extended memory

You may obtain and install either 2 MB or 6 MB of additional RAM which is configured as extended memory. Refer to Appendix B for information on installing additional RAM.

Coprocessor

An CX87SLC numeric coprocessor is included in the GRiD Convertible computer. The numeric coprocessor is designed to speed numeric processing when working with graphs, worksheets, graphics, and other types of files.

Check your application documentation to see if a numeric coprocessor is supported.

Mass Storage

The GRiD Convertible computer is equipped with an internal hard disk. Use the the System Status menu of the **config** command to determine the size of the hard disk in your computer; refer to Figure 9-4.

The computer also includes a PCMCIA slot that holds PCMCIA Release 2.0 storage cards as well as PCMCIA input/output cards.

An external floppy drive is also supplied with each computer. The floppy drive can read from and write to 3.5-inch floppy diskettes.

Refer to Chapter 5 for more information about using these storage devices.

V.32bis/V.42bis 14400 bps/FAX	V.32bis, 14400 bits-per-second (bps) Hayes compatible; auto-dial; auto-answer; V.42 and Microcom Networking Protocol (MNP) Classes 2 through 4 error correction, as well as V.42bis and MNP Class 5 data compression support. Supports 9600 bps send/receive Group III Class I facsimile transmission.
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Refer to Chapter 5 for more information about using these storage devices.

Each of the storage devices on your computer is assigned a separate drive letter by which it can be accessed. You can determine your particular computer device configuration by using the **devices** command, described on page 9-30. This command shows you the drive letters assigned to each of the storage devices.

Optional Modem

Your GRiD Convertible computer can contain one of the following internal modems that are available as options. The internal modem transmits and receives data through the telephone system.

- A V.22bis, 2400 bits-per-second (bps)/9600 bps FAX modem that can both transmit and receive data at 300, 1200, or 2400 bps. It also provides V.42 and Microcom Networking Protocol (MNP) Classes 2 through 4 error correction and V.42bis and MNP Class 5 data compression.

- A V.32bis 14400 bits-per-second (bps)/9600 bps FAX modem that can both transmit and receive data at speeds up to 14400 bps. It also provides V.42 and Microcom Networking Protocol (MNP) Classes 2 through 4 error correction and V.42bis and MNP Class 5 data compression.

These types of modems ensure that data is exchanged quickly and error-free. The modems operate with the industry-standard set of AT commands. Refer to the *Internal Modem User's Guide.*

The facsimile capability allows sending and receiving fax documents at 9600, 7200, 4800, or 2400 bps. The modems are EIA-578 Class 1 compatible so they can be used with a variety of fax software packages.

Connecting the Telephone Line

If your GRiD Convertible computer contains an internal modem, there is a telephone jack on the left side of the computer, as shown in Figure 3-1. The modem connects to the telephone system through the telephone jack.

To connect the GRiD Convertible computer to the telephone system, unplug the cord from the back of a telephone, and plug it into the telephone jack on the computer, as shown in Figure 3-1.

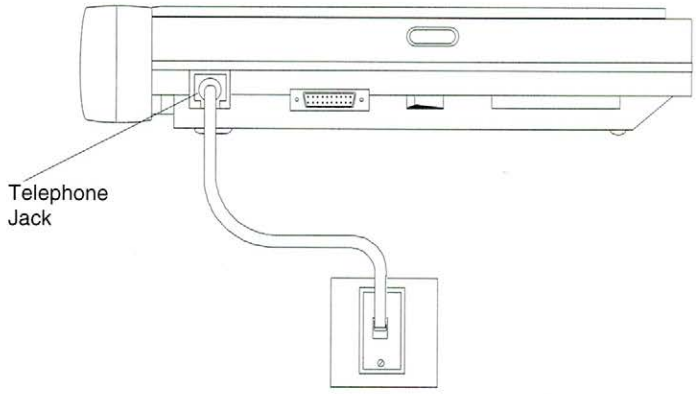


Figure 3-1. GRiD Convertible Computer Connected to Telephone System

NOTE: The GRiD Convertible computer modem will not function with PBX telephone systems that use digital telephone sets. Most of these types of telephone systems use modular connectors that are not compatible with the telephone jack on the computer. If you are unsure whether or not your computer will work with your PBX telephone system, contact your local GRiD representative.

Alternative Telephone Connections

There are some telephone systems that do not use the modular plug-in jack connector. Some use different types of connectors, and others are permanently wired. Read this section if you find that there is no modular connector available to plug into your computer's telephone jack and you are using your computer in the U.S. or Canada.

Some older telephone systems use four-prong connectors. These require an adapter available from electronics stores. (One such adapter is the Radio Shack Model 279-351.)

Some offices use large Amphenol connectors for phones that have several lines coming in. Many adapters are available to tap into these connectors. (Radio Shack Models 43-271 and 43-270 are two commonly available adapters.)

In situations where the telephones are permanently wired, the simplest solution is to use a special coupler that attaches to the handset of the telephone and provides a modular connector for plugging into your computer.

Using the Modem

Most application programs that use the modem automatically configure and control the modem. You do not need to do anything special to make the modem work, other than plugging it into a telephone line.

If your application requires you to change the operating configuration of the modem, refer to the *Internal Modem User's Guide* for more information. You can also use the GRiD Convertible Configurator program to change certain operating parameters. Refer to the **config modem** command on page 9-21.

To take advantage of its MNP, V.42 or V.42bis features, your modem must be communicating with another modem with comparable features. If the modem to which you are connecting does not have comparable features, your modem will still work, but without using its error control or compression features.

CHAPTER 4:
POWERING YOUR COMPUTER

This chapter describes standby mode, the options that are available for powering the GRiD Convertible 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 GRiD Convertible 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 GRiD Convertible 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 power/standby indicator flashes green to remind you that the computer is in standby mode. Computer battery usage is reduced by over 95 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 or key.

  Press the standby button below the screen or the **FN-StdBy** key combination 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 9-7.

  - 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 the battery is low.

  Your computer automatically enters standby mode when the battery is almost exhausted.

Exiting Standby Mode

Press the standby button or the **spacebar** 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 or the **spacebar** returns your work files to the same status as they were when you entered standby mode.

If your computer entered standby because of a low battery, you must supply external power or attach a charged battery pack before you can exit standby.

When you leave standby, the power/standby indicator is steady to indicate power is on.

Notes Regarding Standby Mode

- Standby mode has been tested with a variety of widely used MS-DOS applications. Some MS-DOS applications may not work properly; they may not be able to return from standby mode. Before using standby with a new

MS-DOS 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 9-7.

- If you are communicating through a modem when you enter standby mode, you will lose your carrier because power to the modem is turned off in standby mode. However, the host may not recognize that you are no longer connected.

- Most communication software programs initialize the modem with configuration commands only when the program starts. If power to the modem is turned off (or the computer enters standby) while the communication program is running but after the initialization step has been completed, the modem will lose its configuration information, and the communication program will not operate properly. If the communication program instructs the modem to copy its configuration commands to modem User Profile 0 before the computer enters standby, the necessary configuration will be restored to the modem when the computer comes out of standby. To store the configuration into User Profile 0, add **&W0** to the end of the modem initialization string. Refer to the *Internal Modem User's Guide* for more information. (When the modem is powered on, it gets its initial configuration information from User Profile 0. If desired, User Profile 1 can also be used for the power up configuration.)

- 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.

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

1. Plug one end of the power cable into the power connector on the battery mounted at the back of the computer; plug the other end into the power supply. Hold the locking connector on the power cable with the arrow facing up when you plug it in.

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.

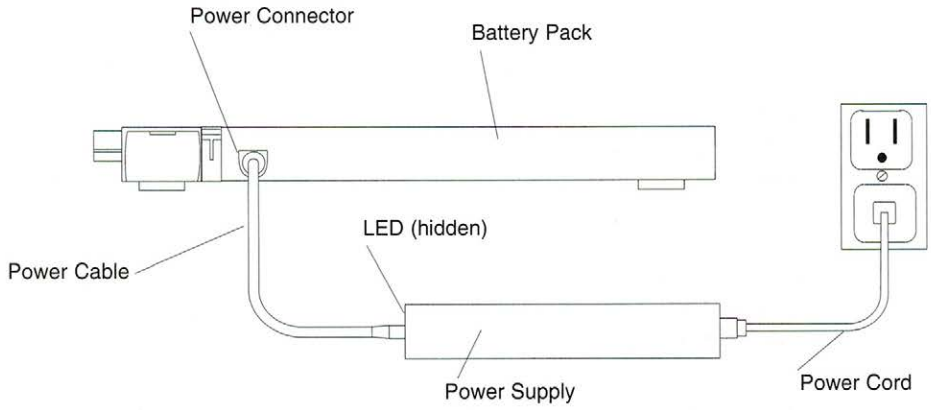


Figure 4-1. Powering Computer from the Power Supply

The power supply also functions as a battery charger.

When the power supply is plugged into the battery, it recharges the computer battery pack in approximately 1.5 hours. The computer may be on or off.

For more information, refer to the section Recharging the Battery Pack on page 4-9.

A green LED is located on one end of the power supply. 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	A battery is rapid charging.
Off	Power supply is not plugged into a wall outlet or not plugged into the battery.

Using the Battery Pack

The battery pack provides power to the GRiD Convertible computer from rechargeable batteries sealed inside the pack. The battery pack is attached to the rear of the computer. The battery pack is not charged initially when it is shipped with the computer.

Two sizes of battery packs are available. An optional battery pack can be ordered; this pack is slightly larger in size and provides approximately 60 percent longer battery life. Both packs attach to the computer in the same way.

Removing the Battery Pack

To remove the battery pack:

1. Turn off the computer or put it into standby.

2. With the rear panel of the GRiD Convertible computer facing you, pull the battery release latch towards you (Figure 4-2).

3. Slide the battery towards your right, as shown in Figure 4-2.

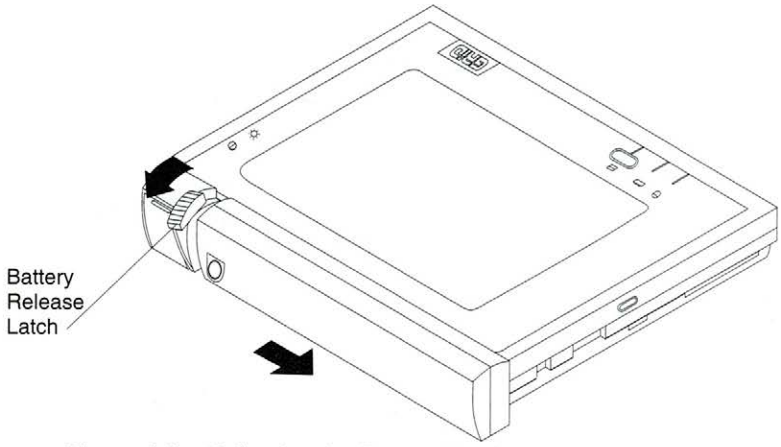


Figure 4-2. Releasing the Battery Latch

4. Lift the battery straight up, as shown in Figure 4-3.

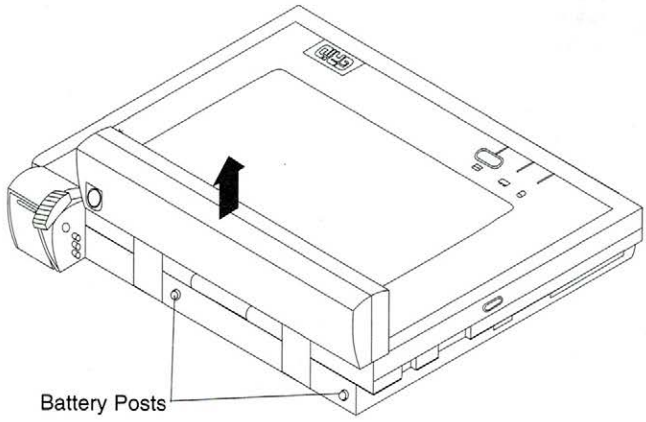


Figure 4-3. Removing the Battery Pack

Attaching the Battery Pack

Perform the following steps to attach the battery pack to the computer.

1. Open the battery release latch by sliding it away from the computer.
2. Put the battery hooks on the battery (Figure 4-4) onto the battery posts on the rear of the computer (Figure 4-3), and slide the battery down.
3. Slide the battery toward the battery release latch.
4. Close the battery release latch by sliding it toward the computer.

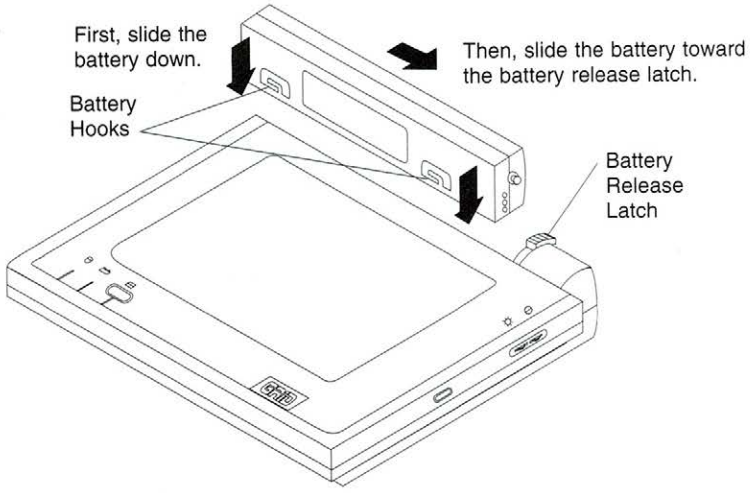


Figure 4-4. Attaching the Battery Pack

Low Battery Warnings

The computer beeps when the battery pack is low. The beeps increase in volume as the battery continues to discharge. These beeps start at the same time that the battery indicator flashes. The beeping feature is controlled by the **config lowbeep** command; refer to the section Configurator, beginning on page 9-7, for further information.

NOTE: The beeps will not sound if the speaker has been turned off.

When you hear the beeps or 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 GRiD Convertible 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 GRiD Convertible computer when the battery 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 flashes green and the battery low indicator flashes red. This feature is known as low-power standby. The system should stay in this mode approximately one hour.

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

Recharging the Battery Pack

The battery pack can be used and recharged many times. It automatically recharges whenever it is connected to the power supply.

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

You have two options for recharging the battery pack:

- Leave the battery pack attached to the computer and connect the power supply, as shown in Figure 4-1; the auto adapter can also charge the battery. The batteries recharge automatically, whether or not the computer is turned on.

- Remove the battery pack from the computer and connect the power supply or auto adapter directly to the battery pack. Plug one end into the power supply and plug the other end into the connector on the battery pack, as shown in Figure 4-5. 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 on the computer, if you have more than one battery pack.

It requires about 1.5 hours to recharge a fully discharged battery pack.

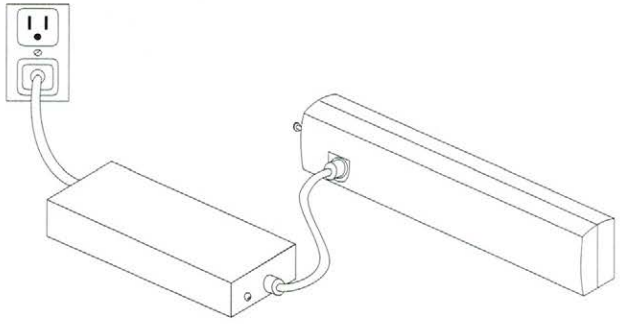


Figure 4-5. Charging Battery Pack Directly from the Power Supply

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. When it is in standby mode, the computer uses less than 5 percent of the power it normally requires.

  To put the computer into standby mode, press the standby button or **FN-StdBy**. 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 9-7.

- 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). Refer to Table A-4 for battery life calculations.

- 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 9-7.

- Spin down the hard disk when it is not in use. To spin down the hard disk, press **FN-Disk**. The disk will spin up automatically when it is accessed.

- Operate the computer at its slower speed if it does not matter how fast it operates. Operating at the slower speed can extend the battery life. For more information, refer to the section Configurator, beginning on page 9-7.

Using the Optional Auto Adapter

The optional auto adapter provides power to the GRiD Convertible 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.

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.

2. Plug the computer power cable into the power connector on the battery pack. Plug the other end of the cable into the auto adapter as shown in Figure 4-6.

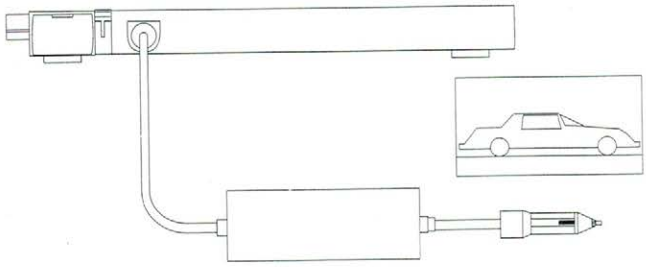


Figure 4-6. Powering Computer from Auto Adapter

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 GRiD Convertible 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 push 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 five minutes of standby mode power. However, the bridge battery may not be fully charged, so you should change 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). It takes approximately 40 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 several hours with no other power source connected.

If you do not have a power source connected to the computer (such as a 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.

CHAPTER 5:
USING STORAGE DEVICES

Several storage options are available for your GRiD Convertible computer. Your computer accepts PCMCIA Release 2.0 storage cards; it has an internal hard drive; and an external floppy drive can be connected. These storage options are described in this chapter.

Storage PC Cards

PCMCIA 2.0 storage cards store programs and data on the GRiD Convertible 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.

In order to use storage PC Cards in your GRiD Convertible computer, you must have the *cmcdd.sys* device driver installed in your *config.sys* file. Refer to the information on page 8-4.

Description

The GRiD Convertible computer uses storage cards that are compatible with the 68-pin PCMCIA 2.0 standard. A storage PC Card is shown in Figure 5-1. The following sections describing Type I PC Cards used for storage apply to those cards available from GRiD Systems Corporation. The cards available from GRiD Systems have been tested and verified to work in the GRiD Convertible computer.

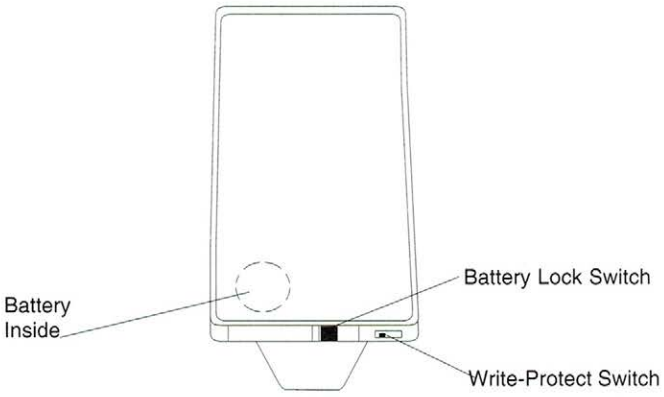


Figure 5-1. Sample Storage PC Card

CAUTION

Do not bend 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 5-2 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 5-2).

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 PC Card Battery, beginning on page 5-6.

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 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 card for a few minutes; this allows you to change the battery in the card without losing data.

CAUTION

Not all storage PC Cards have a bridge battery backup; storage PC Cards supplied by GRiD Systems for the GRiD Convertible computer contain a bridge battery. If you are using storage PC 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 GRiD Convertible computer, and how to use them.

Before using a storage card for the first time, you must apply the label to it, install the battery, and format it. If your GRiD Convertible computer was purchased for you by your company, this may have already been done. If not, refer to the section Preparing Storage Cards, on page 5-9, for instructions on preparing your storage PC Card 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 GRiD Convertible computer, follow these steps:

1. Set the write-protect switch in the proper position, as shown in Figure 5-2. 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 read and write to the card.

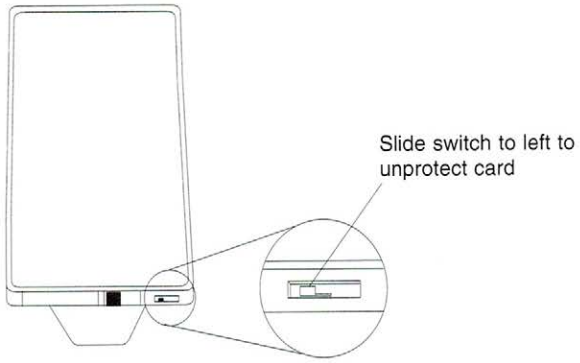


Figure 5-2. Set the Write-Protect Switch

2. Hold the storage PC Card with the connector towards the computer. The corner with the slight cut-out area is toward the back of the computer; the slot in the side of the PC Card is toward the front of the computer. Slide the storage card into the storage card slot, as shown in Figure 5-3. Disregard any instructions on the card label.

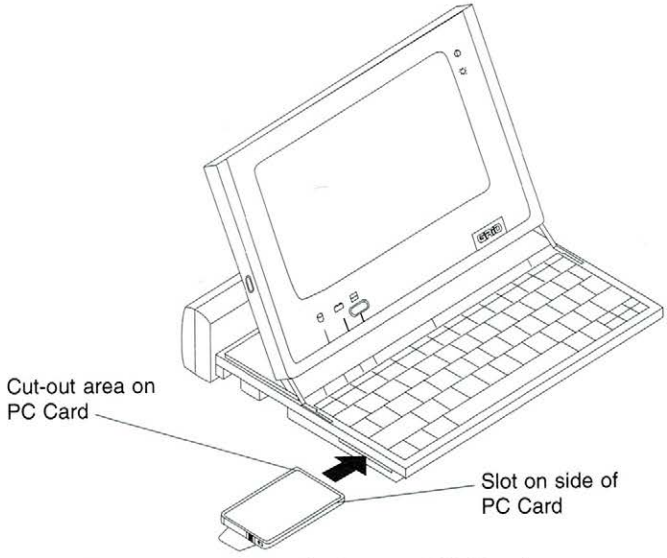


Figure 5-3. Insert the Storage PC Card

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. The card will extend out of the side of the computer approximately three-fourths of an inch when installed properly.

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 GRiD Convertible computer, grasp the pull-tab, and pull the card straight out, as shown in Figure 5-4.

CAUTION

Never remove a storage PC card when the disk in-use light is on. The in-use light indicates that file access may be taking place. Removing the storage PC card at this time could destroy files.

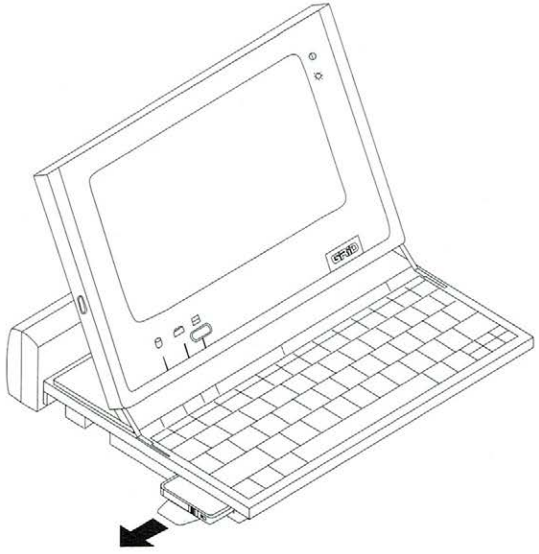


Figure 5-4. Pull Out the Storage PC Card

Changing a Storage PC 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.)

You can check the power level of the battery in a storage PC Card by issuing the **cardbatt** command, as described on page 9-29.

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 it is recommended that you change the battery as soon as possible.

CAUTION

If the battery becomes completely exhausted, the information stored on PC Card is lost and the card is not usable.

Storage PC Cards sold by GRiD Systems specifically for the GRiD Convertible computer have a bridge battery that maintains power to the PC Card while the battery is being changed. PC Cards supplied by other vendors may not have a bridge battery; they 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 replacement batteries can be used in a GRiD Convertible PC Card:

Crompton Parkinson Ltd., BR2325
Eveready Battery Company Inc., BR2325
Matsushita Electric, BR2325
Panasonic, BR2325
Radio Shack, BR2325
Rayovac Corp., BR2325

The following procedure describes how to change the battery in a storage PC Card supplied by GRiD Systems.

For information on changing the battery in other storage PC Cards, refer to the instructions accompanying the 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 promptly. Keep batteries away from children.

1. Hold the PC card so that the side showing the battery location is facing up.

2. Move the battery lock switch to the OPEN position (towards the outside edge of the card), as shown in Figure 5-5. The battery lock switch keeps the battery carrier locked so that it cannot be opened accidentally.

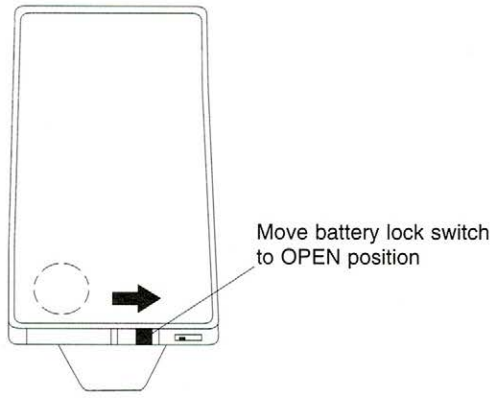


Figure 5-5. Unlocking Battery Carrier

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 PC Card (see Figure 5-6). 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.

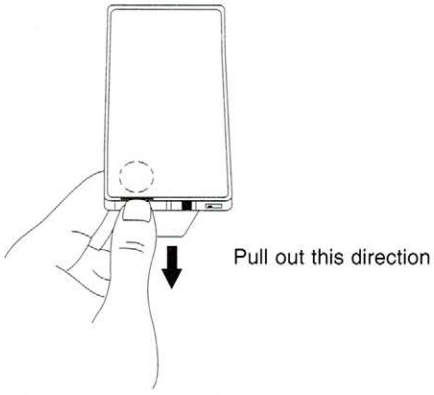


Figure 5-6. Pull Out Battery Carrier

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 5-7.

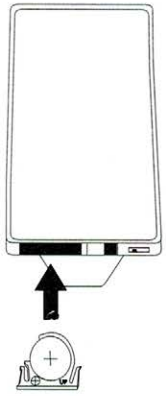


Figure 5-7. Insert Battery Carrier

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 the battery test indicates 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 PC Cards

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

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

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

NOTE: If your GRiD Convertible 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 PC Card Label

The storage PC Card is shipped with a GRiD label. Apply the label to the side of the storage PC Card that has a notch cut in the upper-left corner, as shown in Figure 5-8. 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.

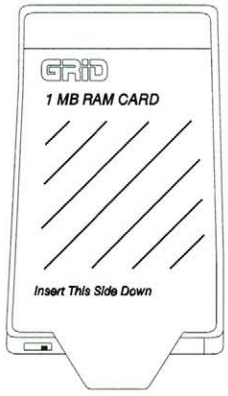


Figure 5-8. Applying Label to Storage PC Card

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

Installing the Storage PC Card Battery

A storage PC 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 Storage PC Card Battery on page 5-6. 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.

NOTE: Do not use the MS-DOS **format** or **fdisk** commands to format a storage PC Card. The card will not function properly unless **memcard** is used.

Memcard is a storage PC Card setup program that partitions, formats, erases, deletes partitions from, and displays information about storage 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 any 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 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 PC Card.

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 RAM 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.
Partition Type	Shows whether the space is an MS-DOS partition (DOS), a partition created by the card manufacturer (Unknown), or unpartitioned (Free) space.
Partition 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 5-15.

To create and format a partition that occupies the entire 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 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 telling you formatting is in progress.

To create and format a partition that occupies part of the 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 telling 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 PC Card and 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 PC Card, you cannot delete it.

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 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  Start     End       Partition    Partition    Size
Letter     Address   Address     Type       Status       (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

In order for a storage PC Card to be recognized by your GRiD Convertible computer, you must have the *cmcdd.sys* device driver in your *config.sys* file. Refer to the information on page 8-4.

To your computer's operating system (MS-DOS), storage PC Cards appear similar to floppy disks. To access a storage PC Card from MS-DOS, use its device letter. PC Card device letters follow those in use for the hard disk; therefore, if the hard disk has one partition, the PC Card will be device D. If the hard disk has two partitions, the PC Card will be device E, etc. You may also access partitions on a PC Card by using the appropriate letter to refer to the partition. For example, to get a directory of the files on the PC Card, enter the following command:

```
dir d:
```

Internal Hard Disk

The internal hard drive is located inside the computer on the right side; it is not user accessible.

Description

The internal hard disk provides data storage. You can determine the capacity of your hard disk by using the **config** command and viewing the System Status screen; refer to Figure 9-4. The MS-DOS **chkdsk** command also provides information on the capacity and available space on the hard disk drive; refer to the MS-DOS Quick Reference, beginning on page 8-17.

Your hard disk is pre-formatted for you at the factory and contains the MS-DOS 5.0 files, Windows for Pen Computing Version 3.1 files, and the utility programs described in Chapter 9. If you ever need to repartition or reformat your hard disk, refer to the commands **fdisk** and **format** in the section MS-DOS Quick Reference, beginning on page 8-17.

Taking Care of your Internal Hard Disk

CAUTION

Because the hard disk incorporates moving parts, the computer is not as rugged as those without a hard disk. Although it is built to withstand some shock, you should treat your computer with extra care. The hard disk could be damaged and you could lose data if you bump the computer sharply or drop it while the hard disk is running.

The hard disk has an "auto parking" mechanism that moves the disk heads to a part of the disk that does not contain data when you turn off the computer or put it into standby mode. This safety feature ensures that neither your data nor the disk is damaged as long as the disk is not spinning.

The GRiD Convertible computer normally starts up from the hard disk. You can change the default start-up device by using the **config boot** command, as described on page 9-15.

The green drive indicator below the screen lights when the hard drive is being accessed. Do not turn off the computer when the hard drive is being accessed, since this could cause loss of data.

The Floppy Drive

The floppy drive was shipped with your GRiD Convertible computer. It supports high-quality double-sided, high-density 135 Track-Per-Inch (TPI) 3.5-inch floppy diskettes or double-sided, double-density 135 TPI 3.5-inch floppy diskettes. High-density diskettes store 1.44 MB of data per diskette. Double-density diskettes store 720 kB of data.

Connecting the External 3.5-inch Pocket Diskette Drive

The external 3.5-inch high-density diskette drive includes its own diskette drive cable. Plug the connector on the cable into the parallel/floppy connector (located on the left side of the computer). The floppy drive receives both its data and its power through the drive cable connected to the computer. Figure 5-9 shows how to properly connect the diskette drive to the computer.

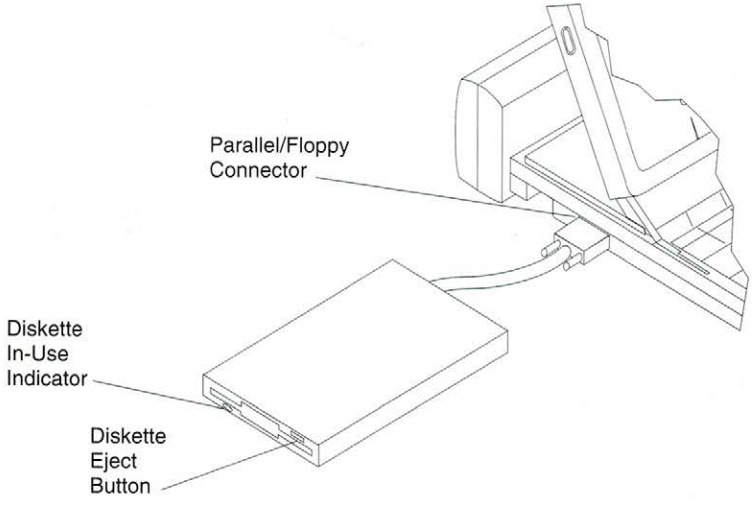


Figure 5-9. Connecting the 3.5-Inch Pocket Diskette Drive

The diskette drive works with any system power option; an ac power source is not necessary to use the diskette drive.

To connect the diskette drive to the computer, perform the following steps.

1. Turn off the computer or put it in standby. Turn off any other external devices.

CAUTION

Before connecting or disconnecting any external device, always turn off the computer and all external devices or put the computer into standby. Failure to do so may damage your equipment.

2. Attach the connector on the diskette drive cable to the parallel floppy connector on the left side of the computer. If it doesn't fit in easily the first time, turn the end of the cable over. (The connector is D-shaped, and so can be connected only one way.) Tighten the thumbscrews on each side of the connector to attach the cable securely to the computer. Do not overtighten the thumbscrews.

3. Turn on any attached external devices, and then turn on the computer or exit standby.

Taking Care of the Diskette Drive

Observe the following rules for taking care of the diskette drive:

- Use only high-quality double-sided, high-density 135 Track-Per-Inch (TPI) 3.5-inch floppy diskettes or double-sided, double-density 135 TPI 3.5-inch floppy diskettes. High-density diskettes store 1.44 MB of data per diskette. Double-density diskettes store 720 kB of data each.

- Never put a damaged or dirty diskette into a drive.

- Never put anything other than a diskette into a drive.

If you follow the rules listed above, you should never need to clean the floppy diskette drive. If you don't follow these rules, however, the diskette drive's read/write heads may become dirty.

The following symptoms may indicate dirty read/write heads:

- You receive error messages when you try to read from or write to a diskette inserted in the internal drive.

- You notice grooves on the surface of your floppy diskettes when you remove them from the drive. You can check for this condition by sliding the metal shutter to one side to expose the plastic diskette inside. Never touch the surface of the diskette.

If you believe the drive heads are dirty, clean them with a wet-process diskette drive cleaner, which can be purchased from most local computer stores. Do not use a dry-method cleaner.

Floppy Diskettes

Floppy diskettes are mylar plastic disks that have been coated with magnetic material (much like the coating on audio recording tape). The diskette spins inside a protective plastic case. The mylar disk is designed to remain within its protective case at all times. Never attempt to remove a diskette from its case.

CAUTION

Two kinds of 3.5-inch floppy diskettes are available: double-density diskettes and high-density diskettes. Double-density diskettes have a storage capacity of 720 kB. High-density diskettes have a storage capacity of 1.44 MB. The diskette drive can read, write, and format both kinds of diskettes. You must be careful, however, not to try to format a 720 kB diskette as a 1.44 MB diskette—use the special **/f:720** switch on the **format** command to format a 720 kB diskette in the diskette drive. Refer to the section MS-DOS Quick Reference, beginning on page 8-17, for information on the **format** command.

Floppy diskettes should be removed from the drive when they are not being used. By changing diskettes in the drive, you can store and retrieve information for many different applications.

All diskettes you use in your GRiD Convertible computer diskette drive must have the following characteristics:

- Double-sided
- High-density or double-density
- Soft-sectored
- 135 TPI (tracks per inch)

Figure 5-10 shows the front and back sides of a 3.5-inch high-density floppy diskette. (A double-density diskette is identical in appearance, except that it lacks the rectangular hole on the lower right corner of the front side.) An arrow on the front side shows the direction in which to insert the diskette into the drive. The write-protect tab is used to protect your floppy diskettes from being overwritten.

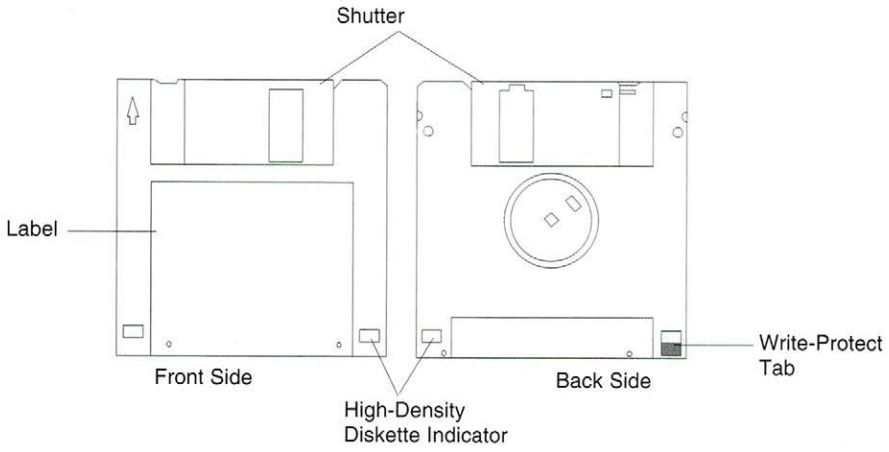


Figure 5-10. High-Density Floppy Diskette

Inserting and Removing Floppy Diskettes

To insert a floppy diskette in a drive, perform the following steps.

1. If you do not want to inadvertently write over the floppy disk, write protect the diskette by sliding the write-protect tab on the back side of the diskette until it uncovers the hole. Refer to the next section, Write Protecting Floppy Diskettes.

2. Hold the diskette so that the side with the larger label is up. An arrow on the diskette points in the direction you should insert the diskette. The shutter goes in first (see Figure 5-11).

3. Push the diskette gently into the drive until it clicks into place. Never jam a diskette into a drive. If you have trouble inserting the diskette, press the eject button on the drive and try again.

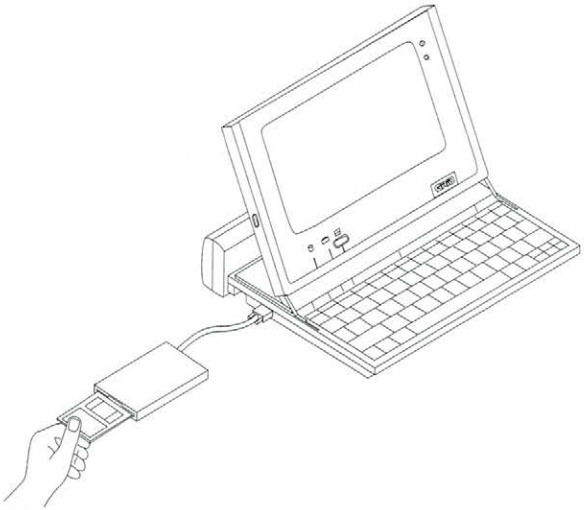


Figure 5-11. Inserting a Floppy Diskette into the Drive

To remove a diskette, push the diskette eject button (shown in Figure 5-9) until the diskette pops out of the drive.

CAUTION

Never eject a floppy diskette when the disk in-use light is on, unless prompted to do so. The in-use light indicates that file access may be taking place. Ejecting the floppy diskette at this time, when you are not prompted to do so, could destroy files.

Write Protecting Floppy Diskettes

Under most circumstances, you want the diskette drive to be able to read data from a diskette and write data to the diskette. Sometimes, however, it is important that the drive not be able to write to a diskette, for instance, when a diskette contains only application software that must not be erased or altered.

Most 3.5-inch floppy diskettes are equipped with a write-protect tab and write-protect hole that allow you to block any attempt to write data to that diskette (see Figure 5-10). To write protect the diskette, slide the write-protect tab toward

the edge of the diskette until the write-protect hole is uncovered. While the write-protect tab is in this position, you cannot create, alter, or erase files on the diskette. An electrical sensor prevents writing to the diskette.

If at some later time you want to remove write protection from the diskette, just slide the write-protect tab away from the edge of the diskette so that the write-protect hole is covered.

Formatting Floppy Diskettes

The diskette drive can read a floppy diskette only when data on that diskette is organized into a specific pattern of tracks and sectors. To create that pattern, you must format each new floppy diskette before you can use it.

CAUTION

Do not format your operating system diskette or any application program diskette. Formatting a diskette erases all data stored on it. Therefore, use extreme caution when formatting diskettes.

To format a diskette, run the MS-DOS **format** command as described in the section MS-DOS Quick Reference, beginning on page 8-17.

CAUTION

High-density and double-density diskettes require different formats. For example, a high-density format will not work on a double-density diskette. By default, the external diskette drive formats diskettes with the high-density format. To format a double-density diskette, you must use the **/f:720** switch on the **format** command; refer to the section MS-DOS Quick Reference, beginning on page 8-17, for details.

Taking Care of Floppy Diskettes

To prevent loss of data on your floppy diskettes, treat them with care. Here are a few tips for handling floppy diskettes:

- Do not touch the surface of the diskette by opening the shutter. This shutter protects the recording surface while the diskette is not being used. An invisible scratch on the surface of the diskette, or even a fingerprint, can cause errors.
- Keep diskettes away from magnetic office items such as paper clip dispensers, magnetic paper holders, telephones, etc.
- Do not set diskettes on top of a television, color monitor, speaker, or CRT.
- Do not carry a diskette and a calculator together in your pocket.
- Do not expose diskettes to microwaves or infrared rays.
- Do not expose diskettes to temperatures below 10° C (50° F) or above 60° C (140° F).
- Keep diskettes away from wall adapters.
- For optimum long-term storage, keep diskettes at a temperature between 15° to 20° C (59° to 68° F).
- Never use a damaged diskette.
- Do not remove a diskette from the drive while the in-use light is on. Removing the diskette during file access may destroy data.
- Do not leave a program or data diskette in the drive while traveling. Doing so may seriously damage the diskette.
- Keep your diskettes away from smoke.
- Label and date all diskettes. This is especially important when making backup copies.

Backing Up Files on Floppy Diskettes

It is very important that you make backup copies of all floppy diskettes that contain important data. Then, if you ever lose or damage a working diskette, you can make another copy from the backup diskette.

You can make backup copies using the **xcopy** or **diskcopy** commands as described in the section MS-DOS Quick Reference, beginning on page 8-17.

CHAPTER 6: TROUBLESHOOTING

This chapter describes problems that might arise as you use your GRiD Convertible computer and provides tips on how to resolve them. It also describes how to use the diagnostic tests provided on the diskette labeled GRiD 2260 Utilities and Diagnostics Diskette.

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 cable 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).
	Power switch was on and battery is discharged	Turn off the power switch for about 15 minutes. Connect the power supply to the battery. Turn on the computer.

Symptom	Cause	Remedy
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 or the backlight brightness (page 2-28).
	Batteries need recharging	Recharge batteries by plugging the power supply into the computer (page 4-4) or the battery pack directly (page 4-9).
Screen is blank	Screen is set to external display	Press **FN-CRT** keys to redirect the screen output (page 2-19).
Screen is all black	Screen contrast or brightness is set wrong	Reset the contrast control or the backlight brightness (page 2-28).
	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 2-4).
Storage PC Card does not fit into slot	It is upside down	Turn the card over and be sure the connector edge goes in first.
Storage PC Card is unreadable	Battery exhausted	When the PC Card battery becomes exhausted, all data on the card is erased. Insert a new PC Card battery (page 5-6), and reformat the PC Card (page 5-11).
	PC Card is not formatted	Format the storage PC Card using the **memcard** command (page 5-11).
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. Use the Configurator to check to which port your serial device is assigned, and the **config serial** command to change the port (page 9-23).

Symptom	Cause	Remedy
Internal modem does not function	Telephone line bad	Check the telephone line by making a call on that line, or use a different phone line.
	Modem not assigned	Use the **config modem** command to assign modem to a COM port (page 9-21).
	Modem not found	Make sure your communication software knows to which port the modem is assigned. Use the Configurator to check to which port your modem is assigned, and the **config modem** command to change the port (page 9-21).
	Modem bad	Contact the GRiD Resource Center (the number follows this table).
	PBX telephone line	The modem will not function through a digital PBX telephone line; switch to an analog telephone line.
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 9-14).
Incorrect date or time	Clock set wrong	Use MS-DOS **date** and **time** commands to reset the clock (refer to the MS-DOS Quick Reference, beginning on page 8-17).
	Power management not installed	Be sure the statement `device=C:\dos\power.exe adv` is in the *config.sys* file. Be sure power management mode is set to advance in Windows.

Symptom	Cause	Remedy
Top row number keys are in shift mode*	**Shift** key was held when going into standby	Press left **Shift** and right **Shift** keys to cancel shift state.
Control keys are echoed to screen even though you are typing single keys*	**Ctrl** key was held when going into standby	Press the **Ctrl** key to cancel control state.
No keys are echoed or application acts as if **Alt** keys are entered*	**Alt** key was held when going into standby	Press left **Alt** and right **Alt** keys to cancel the Alt state.

*These symptoms are possible only if *power.exe* is in the *config.sys* file or Windows is running in power management mode.

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 the software still does not function properly, and if you have ordered a GRiD Customer Support Service (CSS) contract with your computer, call the GRiD Resource Center at 1-800-654-GRID (4743) for help with diagnosing the problem. Make sure you know the tracking number of your computer; it is located on the bottom of the computer. If you are outside the U.S., contact your local GRiD Systems representative or distributor for assistance.

If you decide your problem is not a set-up or software problem, then it may be a hardware problem. Refer to the section Diagnostics on page 6-6, or call the GRiD Resource Center for help in problem diagnosis.

Diagnostics

A diskette labeled GRiD Model 2260 Utilities and Diagnostics Diskette was shipped with your computer. This diskette contains diagnostics you can run if you suspect a problem with your computer.

NOTE: Make a backup of the Utilities and Diagnostics Diskette before running the diagnostic program.

To run the diagnostic tests, perform the following steps:

1. Connect the external floppy diskette drive to the computer as described on page 5-19.

2. Insert the GRiD Model 2260 Utilities and Diagnostics Diskette into the floppy diskette drive. Be sure the write-protect switch is off.

NOTE: Be sure to boot from the floppy prior to running the diagnostic tests. Booting from the floppy sets up certain conditions that need to exist for the tests to run properly.

3. Boot the computer from the floppy drive by pressing the **E** key after the beep during the boot procedure. Then press **Enter** twice to accept the date and time.

4. Enter the following command and press **Enter**:

   ```
   2260diag
   ```

   The test starts by checking several options and lists information on the screen.

NOTE: The diagnostic tests are set up to run from the floppy diskette. Do not copy them to the hard disk or a storage card.

5. The menu shown in Figure 6-1 is displayed.

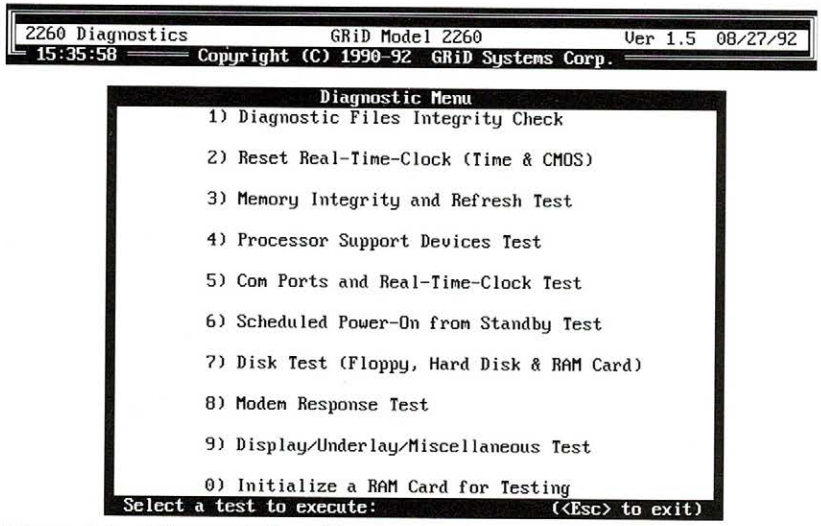


Figure 6-1. Diagnostic Test Menu

The purpose of each of these tests is:

Diagnostic Files Integrity Check	This test automatically verifies that the diagnostic files on the floppy diskette have not been corrupted.
Reset Real-Time-Clock (Time & CMOS)	This test asks you to set the date and time. It also reinitializes the factory default settings and reboots the computer.
Memory Test	This test automatically performs data and address integrity checks on the RAM. It also checks the BIOS ROM.
Processor Support Devices Test	This test automatically checks registers, processor speeds, interrupts, and the soft keyboard.
Com Ports and Real-Time Clock Test	This test automatically checks the function of the serial ports and the printer port. It also tests the real-time clock and associated interrupts.
Scheduled Power-On from Standby Test	This test automatically checks the entering into and exiting from standby.

Disk Test (Floppy, Hard Disk, & RAM Card)	This test automatically checks the reliability of the floppy diskette drive and the internal hard drive. This test does not modify the hard disk contents. It also tests the RAM card if it has been initialized for testing.
Modem Response Test	This test automatically checks the function of the optional internal modem. It performs a serial controller response check and a modem response check.
Display/Overlay/ Miscellaneous Test	This test checks the display, LEDs, standby function, speaker, pen, and real-time clock. This test requires operator interaction to verify whether the various items being tested function properly; respond to the prompts on the screen.
Initialize a RAM Card for Testing	This function initializes a RAM card so it can be tested during the Disk Test. **This function destroys all existing data on the RAM card.**

6. Enter the number corresponding to the test you wish to run. A message is displayed that describes the test and asks if you wish to continue. Press **Y** to run the test.

   You should generally perform the tests in the order listed. In Test 2, Reset Real-Time-Clock, your system reboots as part of this test. When you are prompted, press **F1** to continue. Immediately after pressing **F1**, press **E** to boot from the floppy. After your system reboots, enter the command **2260diag** at the prompt to display the Diagnostic Menu.

7. Perform the remainder of the tests. You may perform one or any number of the tests, depending on what areas of the computer you wish to test.

   While the tests are being performed, various messages display on the screen. These tell you what is being checked. Files are also written to the floppy diskette.

   The only test that does not run automatically is Test 9, Display/Overlay/ Miscellaneous Test. This test requires that you respond to a series of prompts in which you test the LEDs, standby button, etc.

After a test has been performed, a message is displayed telling you whether errors were found.

8. If no errors are found, you return to the Diagnostic Menu. If errors are found, a screen similar to that shown in Figure 6-2 is displayed. The test area in which errors occurred will blink. This screen lets you access additional error information. Enter a number from **1** to **7** to see further information on errors.

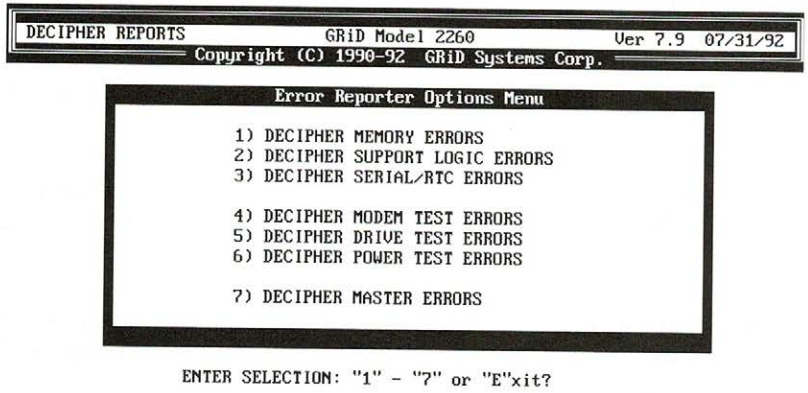


Figure 6-2. Error Reporter Options Menu

9. If errors are detected from these tests, or if your computer fails to operate properly, contact the GRiD Resource Center for additional assistance in diagnosing your problem or in getting your computer repaired.

CHAPTER 7:
SAFETY AND MAINTENANCE

This chapter contains important safety information and describes how to care for your GRiD Convertible 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 GRiD Convertible 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 require 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 GRiD Convertible 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.

- Make sure you properly ground any power-plug adapter.

- 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.

Attention!
Explosion hazard if battery is replaced incorrectly. Exchange only with manufacturer authorized type. Disposal in accordance with manufacturer's instructions.

Vorsicht!
Explosionsgefahr bei unsachgenäßem Austausch der Batterie. Ersatz nur durch denselben oder einen von Hersteller empfohlenen ähnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstallers.

Cautions

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

- Operate the computer only when the surrounding temperature is from 5° to 40° C (41° to 104° F).
- Operate the computer only when the relative humidity level is from 10 percent to 80 percent noncondensing.
- Store the computer where the surrounding temperature is from -20° to 60° C (-4° to 140° F).
- 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 GRiD Convertible 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 GRiD Convertible 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 GRiD Convertible 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.

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 PC 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 attached to 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 MS-DOS Quick Reference in Chapter 8 for more information about these commands.

CHAPTER 8:
USING MS-DOS ON THE GRID CONVERTIBLE COMPUTER

Each time you turn on the GRiD Convertible computer, it loads the MS-DOS operating system from the internal hard drive or another storage device. This is the same operating system used by other IBM PC-compatible computers. It then loads Microsoft Windows for Pen Computing software.

Depending on how your GRiD Convertible 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 GRiD Convertible computer or run MS-DOS programs, you should read this chapter. It contains important information about how to use MS-DOS.

MS-DOS Start-up

The computer searches for the MS-DOS files on drive C—the hard disk. You can change the search order with the **config boot** command (refer to page 9-15).

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. Then the *autoexec.bat* file is read and those commands are executed. The default *config.sys* and *autoexec.bat* files are described next.

Config.Sys File

The default *config.sys* file contains the following lines:

```
Device=C:\Windows\HiMem.Sys
DOS=High,UMB

REM The only upper memory available is from C000-CFFF.  This can be used
REM as the EMS page frame or as upper memory used to load programs into
REM upper memory but not both.
REM The rest of the upper memory area is allocated as:

REM    PCMCIA RAM card driver         D000-DFFF
REM    VGA BIOS                         E000-EBFF
REM    System BIOS                      F000-FFFF

REM The following EMM386 provides 256KB of expanded memory to the system
REM Device = C:\DOS\EMM386.Exe 256 Frame=C000 I=C000-CFFF I=EC00-EFFF

REM The following EMM386 provides 80KB of high memory to load
REM device drivers
Device = C:\DOS\EMM386.Exe NoEms I=C000-CFFF I=EC00-EFFF

REM The following EMM386 provides 144KB of high memory to load device
REM drivers.  This can only be used if no PCMCIA card drivers that use
REM memory from D000-DFFF are used.  For example, CMCDD.Sys must be
REM commented out.
REM Device = C:\DOS\EMM386.Exe NoEms I=C000-CFFF I=D000-DFFF I=EC00-EFFF

DeviceHigh = C:\DOS\SetVer.Exe

REM Power.Exe provides power managment for MS-DOS applications
DeviceHigh = C:\DOS\Power.Exe Adv

REM CMCDD.Sys is the device driver to support PCMCIA RAM cards
DeviceHigh = C:\GRiDUtil\CMCDD.Sys

Stacks = 9,256
Files = 30
Buffers = 15
Shell = C:\Command.Com C:\ /P /E:800
```

To install a device driver that has been commented out, delete the letters "REM", save the file, and reboot your computer. You may also comment out device drivers you do not wish to have active.

Autoexec.Bat File

The default *autoexec.bat* file that is loaded on the hard disk contains the following commands:

```
@echo off
c:\windows\smartdrv.exe
prompt $p$g
path c:\windows;c:\gridutil;c:\dos
loadhigh Doskey
win /3
padmenu
```

This *autoexec.bat* file sets the path and shows the path in the prompt. The Doskey program is loaded. Windows for Pen Computing is also loaded when the computer boots. If you exit Windows, the Padmenu (described on page 9-1) is displayed.

Smartdrv.exe is the disk-caching program provided with Windows. It requires extended memory. The default extended memory allocated depends on the amount of extended memory available.

Using System Memory

MS-DOS 5.0 comes with the *himem.sys* driver to manage extended memory (the memory over 1 MB) and upper memory (the memory between 640 kB and 1 MB). It incorporates the rules and guidelines set forth in Version 2.0 of the Extended Memory Specification (XMS).

Your GRiD Convertible computer has 1408 kB of extended memory (in the default configuration). You may add either 2 MB or 6 MB of additional memory.

In order to use this memory as expanded memory (ems), you must install on your system the device driver, *emm386.exe*. This driver uses extended memory to simulate expanded memory for programs that can use expanded memory. It also makes it possible to load programs and device drivers into the upper memory area.

The following statement is in the default *config.sys* file on your computer.

```
device=c:\dos\emm386.exe 256 frame=C000 I=C000-CFFF I=EC00-EFFF
```

The letters "rem" at the beginning indicate it was commented out. Remove the letters "rem" to install the *emm386.exe* driver on your system.

You may change the value 256, which is kilobytes of EMS memory, to another value, depending on how much memory your computer has available. Do not change the **FRAME** and **I** parameters. The **RAM** parameter should not be used on the GRiD Convertible computer.

After adding this line to the *config.sys* file, you must restart your computer (press **Ctrl-Alt-Del**) for the device driver to take effect.

Programs that use EMS will automatically do so when you install the *emm386.exe* driver. For more information on how MS-DOS applications use EMS, refer to the documentation provided with those programs.

Using Storage PC Cards

Your GRiD Convertible computer has a slot that provides the capability to use storage cards that conform to the PCMCIA specification. In order to use the storage PC Cards, you must include the *cmcdd.sys* driver in your *config.sys* file.

Tthe following statement is in the default *config.sys* file on your computer.

```
device=c:\gridutil\cmcdd.sys
```

You may add two optional switches to the command. The **/part=***n* switch specifies the maximum number of partitions per card; *n* is a number between 1 and 8. The **/port=***address* switch specifies the I/O address of the PC memory card drive; *address* is a hex value between 100 and 3F0.

After adding this line to the *config.sys* file and saving your file, you must restart your computer (press **Ctrl-Alt-Del**) for the device driver to take effect.

Using Standard MS-DOS Application Programs

The GRiD Convertible computer can run "off-the-shelf" MS-DOS programs. The computer is an IBM AT-compatible computer, so most programs that can run on the IBM AT computer can run on the GRiD Convertible computer.

Each of the GRiD Convertible 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 8-1. 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. You can determine your device configuration by running the **devices** command, described on page 9-30. This program shows you the drive letters assigned to each of the storage devices.

Table 8-1. Storage Device Drive Letters

Drive Letter	Storage Devices
A	External floppy
B	Logical drive for external floppy
C	Hard disk
D	Storage PC Card

The hard disk and storage PC Cards can be partitioned. When a storage PC Card is partitioned, the additional partitions start with E.

Using MS-DOS

MS-DOS is an operating system that manages your computer's operations and conveys your instructions to the computer. How much you need to know about the MS-DOS operating system depends on how you plan to use your computer. If you plan to use advanced operating system features or create your own applications, you need to become quite familiar with MS-DOS.

How MS-DOS Stores Information

If you want to learn more about how your operating system works, you need to know how MS-DOS organizes and stores information.

About Files

Your computer stores all information on the diskette in *files*. A file is a collection of information. These are the main types of files:

- *System files* contain operating system information that manages the computer's operations.
- *Application files* contain information that causes the computer to perform a task or set of tasks.
- *Data files* contain information you enter, such as the documents and spreadsheets you create with software.

Creating Filenames

Following is a complete list of acceptable characters for filenames:

- Uppercase letters A through Z
- Lowercase letters a through z
- Decimal digits 0-9
- Symbols $ & # % ' ( ) @ – { } ! _~'

When you create filenames and subdirectory names, you can use up to eight characters. MS-DOS ignores any characters after the eighth. For example, MS-DOS regards both *Accounts1* and *Accounts2* as *Accounts*. If you save both files, MS-DOS writes over the first file with the second, destroying the first file. Also, MS-DOS does not distinguish between upper and lowercase letters.

You cannot use the following special MS-DOS device names for filenames:

aux	com1	com2	com3
con	lpt1	lpt2	com4
lpt3	nul	prn	clock$

The following examples are **valid** filenames:

mydata1	SAMPLE
1.TST	$100GIFT
records.art	'HELP'.fil
XXX.XX	File#1.txt
10%SALES	par@64.gam

The following examples are **invalid** filenames:

his*hers — The asterisk is not a valid character for filenames.

.DATA — The period is valid in a filename only when it separates the filename from its extension.

regionsales — Filenames have a maximum of eight characters. MS-DOS uses only the first eight characters you enter.

COST+INT — The plus symbol is not a valid character.

CON.dat — CON is a word reserved by MS-DOS.

Filename Extensions

Any filename or directory can contain an *extension*, which further identifies the file. An extension appears at the end of a filename, preceded by a period.

Extensions can have up to three characters and can include the same characters allowed in filenames. If you try to give extensions more than three characters, MS-DOS uses only the first three.

If you include an extension in a filename, you must use that extension whenever you specify the file.

NOTE: Some applications automatically assign an extension to a filename.

Looking Inside Files

Type is a command that lets you examine files that consist of text characters. For instance, to view the *joe.sls* file, type:

```
type joe.sls Enter
```

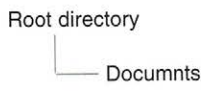
The file contents appear on the screen. If there are too many lines in the file to fit on the screen, use **Ctrl-S** or **Pause** to stop the screen from scrolling. Press any key to resume scrolling.

If you use **type** to display a file that is not a text file, the computer displays meaningless data.

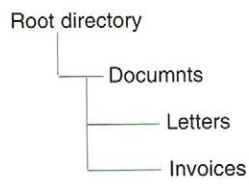
About Directories

All files reside in *directories*. A directory is a storage space for your files. When you format a diskette, you create one directory called the *root* directory. On your MS-DOS system diskette, the root directory contains all command and system files. When you start up your computer using MS-DOS, you are automatically in (operating from) the root directory.

You can create other directories using the **md** command. The new directory is a *subdirectory* of the directory you are in when you create the directory. For example, if you create a subdirectory named *documnts*, it resides in the root directory and your disk organization looks like this:



You can now store files in the *documnts* subdirectory. If you change your current directory to the *documnts* directory using the **cd** command, then make two more subdirectories called *letters* and *invoices*, your directory looks like this:



In each subdirectory you can save files with related information. For example, save your letters in the *letters* subdirectory of *documnts* and save your invoices in the *invoices* subdirectory of *documnts*.

Your computer uses a shorter way of referring to subdirectories and files. The computer always refers to the root directory as \. The computer refers to files and subdirectories of the root directory as the names of those files or subdirectories, preceded by \. In the above example, we refer to the *documnts* directory as *\documnts*. To refer to the next level of subdirectory or a file in *\documnts*, add a \, then the name of the file or subdirectory—for example, *\documnts\letters*.

Viewing a Directory

To view the contents of the current directory, type the following:

```
dir Enter
```

If a diskette contains more filenames than can appear on the screen at one time, all but the last 22 filenames scroll off the top of the screen. You can control the scrolling by using any of these three methods:

- Press **Ctrl-S** to stop the screen from scrolling. (Press any key to restart the scrolling.)

- Use the **/P** switch with the **dir** command. The **/P** switch tells MS-DOS to display only 23 lines of the directory at one time. Press the spacebar to display another screen. To use the **/P** switch, type the following:

  ```
  dir /p Enter
  ```

- Use the **/W** switch to display the files in five columns. To use the **/W** switch, type the following:

  ```
  dir /w Enter
  ```

Installing MS-DOS

MS-DOS was installed on your internal hard drive at the factory. However, if you need to install MS-DOS, perform the following steps:

1. Turn off your computer.

2. Connect the external floppy drive to the parallel/floppy connector, as described on page 5-19.

3. Insert MS-DOS Disk 1 in the floppy drive.

4. Turn on your computer.

5. Press the **E** key after the beep sounds to boot from the floppy disk.

6. Follow the instructions on your screen.

If you have any questions about any of the procedures or options, you can request help by pressing the **F1** key.

After you install MS-DOS, create a system disk so you can start MS-DOS if your hard disk should fail. A system disk contains only the files required to start your system with MS-DOS version 5.0. To create a system disk:

1. Insert a blank, formatted floppy disk in the floppy diskette drive. Be sure the floppy diskette drive is connected to the parallel/floppy connector on the computer.

2. At the C:> prompt, type **sys a: Enter**

   MS-DOS copies system files to the floppy disk.

If your hard disk fails, start MS-DOS by inserting the system disk in the floppy drive and restarting your computer. Then press **E** to boot from the floppy.

Entering MS-DOS Commands

You type MS-DOS instructions, or *commands*, at the system prompt (such as `C:\>` or `A:\>`), which tells you that MS-DOS is ready to accept commands. A command consists of one word. A *command line* consists of one or more commands and their associated parameters and switches. A command line can have a maximum of 127 characters, including any combination of uppercase or lowercase letters. *Parameters* and *switches* are special information you include with a command. They provide information to the command, or they determine how the command operates.

You must enter MS-DOS commands exactly as given. Your computer carries out MS-DOS commands exactly as you enter them. If you mistype a command, MS-DOS gives you an error message.

Press **Enter** after you enter the MS-DOS command. For example, to clear the screen, type:

`cls` **Enter**

If you notice a typing mistake before you press **Enter**, do one of the following:

- Backspace to the mistake, and retype to the end of the line.
- Press **Esc** and retype the command. The system prompt does not reappear. After you retype the command, press **Enter** to execute it.

Using Online Help

Your GRiD Convertible computer has an online MS-DOS Help program that provides information about MS-DOS commands. The Help program provides information in two different forms—a summary of what each command does, and a more detailed listing of the syntax and options for each command.

To use the Help program, type the following:

`help` **Enter**

The first screen of general information appears. Press a key to display additional screens of information.

To display more detailed information about a particular command, type **help** plus the name of the command. For example, to see information about the **append** command, type the following:

```
help append Enter
```

Information describing the **append** command is displayed.

Using the MS-DOS Shell

The MS-DOS Shell helps you run programs and use MS-DOS commands. To run the MS-DOS Shell, type the following:

```
dosshell Enter
```

The MS-DOS shell's main screen appears.

NOTE: Add the **dosshell** command to the *autoexec.bat* file if you want to load the shell each time you turn on the computer.

- Use a mouse or press **Alt** and the arrow keys to select a menu. To choose a program or command, highlight the program or command name and press **Enter**.
- Press the **Tab** to move from one window to another.
- Use the arrow keys to select items within a window.

For online help for the MS-DOS shell, press **F10**. Then, select **help** and press **Enter**. Or, you can press **F1** for help information about the currently highlighted topic.

Special Keys

The following keys and key combinations have special significance to MS-DOS.

Spacebar — Moves the cursor (the flashing underline or block character displayed on the screen) one space to the right and adds a space to a line.

Ctrl — Lets you give commands to your computer by pressing only two or three keys. Press and hold down **Ctrl**. Then, while you hold down **Ctrl**, press the other keys.

Backspace — Moves the cursor left one character and erases the character in that position.

Ctrl-C or **Ctrl-Break** — Stops the execution of an MS-DOS command or an application that uses MS-DOS functions. If the application does not access MS-DOS, the application does not recognize this key combination. (The computer might take a few seconds to recognize the key combination.)

Ctrl-PrtSc or **Ctrl-P** — Sends each character of output to the printer. Press the combination again to stop print echo.

PrtSc — Sends the current display to the printer.

Esc — Terminates the current line without processing the command. The cursor moves down one line and returns to the left margin. Although the system prompt does not appear, the system is ready for a command.

Enter — Executes a command and begins processing the command line you type. Pressing **Enter** also causes a carriage return and line feed. (The cursor moves down one line and returns to the left margin.)

Ctrl-J — Ends the current line, and moves the cursor to the next line without processing the line. Press **Enter** to execute the command line when it is complete.

Ctrl-Alt-Del — Resets your computer the same as if you had turned it off and then on again.

Ctrl-S or **Pause** — Stops scrolling information on the screen to let you view it. Press a key to resume scrolling.

MS-DOS Editing Keys

MS-DOS provides several keys and key combinations to help you edit an MS-DOS command line. These keys act on the command line in the last-command memory, or *template*. Press **F3** to display the template. You can execute the command line again by pressing **Enter**, or you can use the following keys to edit the command line in the template.

Enter — Enter line. Makes the new line the new template and executes the command line.

Esc — Voids the new line without affecting the template.

Ins — Insert character. Goes into the insert mode so that you can insert characters into the template. Press **F3** to end the insert function.

Del — Delete character. Erases the next character from the template. The character is skipped and is not copied to the command line.

F1 — Copy character. Copies the next character from the template and displays it on the command line.

F2 (*character*) — Copy to character. Copies all characters in the template up to the specified character and displays the characters on the command line.

F3 — Display template. Redisplays the entire template.

F4 (*character*) — Delete to character. Deletes all characters up to the character indicated. These characters are skipped and not copied to the command line.

F5 — Replace template. Makes the line you type the new template but does not execute the command.

F6 or **Ctrl-Z** — End-of-file. Puts an end-of-file marker in the template.

Backing Up the Hard Disk

Making backups of hard disk files is very important. Because the storage capacity of a hard disk is so great, loss of data can result in the loss of thousands of hours of work.

You can use the **backup** command to make copies of one or more directories or of the entire hard disk. For example, if you have a subdirectory named *mystuff* in the root directory of the hard disk, you can use the **backup** command to copy the subdirectory to a diskette. With a formatted diskette in Drive A, type the following:

```
backup c:\mystuff a: /s Enter
```

NOTE: Unless you specify otherwise, using this method causes MS-DOS to erase any files currently on the diskette used for the hard disk backup. Be sure you use a newly formatted diskette or a diskette that contains files you do not want to keep.

To accomplish the same backup without erasing files currently on the diskette, add the **/a** switch to the command. The **/a** switch causes the **backup** command to add the new files to any existing files on the diskette. In MS-DOS, a switch is always preceded by a slash (/) symbol. The same command with the **/a** switch is:

```
backup c:\mystuff a: /s/a Enter
```

The **/s** switch, used in the previous command, instructs MS-DOS to back up all the files in a directory and all the directories and files that branch from that specified directory.

You can use the **backup** command with the **/s** switch to back up the entire hard disk to diskettes. Before you use this command, use the **format** command to prepare enough diskettes to hold all the files you want to back up. To back up everything on Drive C, type:

```
backup c:\ a: /s Enter
```

The backward slash (\) is an abbreviation for the root directory of any disk. This command line instructs MS-DOS to copy all files from the root directory of Drive C (the hard disk) to the diskette in drive A. Because all directories branch from the

root directory, **backup** copies all the files in all the disk directories. For more information on **backup** and its switches, refer to the section MS-DOS Quick Reference.

Restoring Backups to the Hard Disk

Use the **restore** command to copy one or more backed up directories from a diskette to the hard disk. Use **restore** only for those directories that were copied to the diskette with the **backup** command.

To restore the directory *mystuff* from the diskette in Drive A back to the hard disk (Drive C), type:

```
restore a: c:\mystuff\*.* /s Enter
```

To restore all the files that were backed up from all directories of Drive C, insert the first backup diskette into Drive A and type:

```
restore a: c: /s Enter
```

The **/s** switch instructs MS-DOS to copy all files and directories that were saved on diskettes with the **backup** command. If the backup required more than one diskette, MS-DOS prompts you to change diskettes during the restore procedure.

For more information about **restore** and its options, refer to the section MS-DOS Quick Reference.

CAUTION

The Disk indicator lights whenever the computer accesses the hard disk. Do not turn off the computer when the Disk indicator is on. The data on the hard disk could be lost or distorted.

MS-DOS Quick Reference

APPEND

Enables programs to open data files in specified directories as if these files were in the current directory.

Append [[*drive*:]*path*[;...]] [/**X**[:**ON**|:**OFF**]] [/**PATH**:**ON**|/**PATH**:**OFF**] [/**E**]

drive:*path* Specifies the drive and directory to be appended to the current directory. You can specify multiple entries of *drive*:*path*, separating the entries with semicolons.

; Cancels the existing list of appended directories.

/X[:**ON**|:**OFF**] Specifies whether MS-DOS is to search appended directories when executing programs.

/PATH:**ON**|**PATH**:**OFF** Specifies whether a program is to search appended directories for a data file when a path is already included with the name of the file the program is looking for.

/E Assigns the list of appended directories to an environment variable named APPEND.

ASSIGN

Redirects requests for disk operations on one drive to another.

Assign [*x*[:]=*y*[:][...]]

Assign /status

x Specifies the drive letter to reassign.

y Specifies the drive that *x*: will be assigned to.

/STATUS Displays current drive assignments.

Type **assign** without parameters to reset all drive letters to original assignments.

ATTRIB

Displays or changes file attributes.

```
Attrib [+R | -R] [+A | -A] [+S | -S] [+H | -H]
[[drive:][path]filename] [/S]
```

+	Sets an attribute.
-	Clears an attribute.
R	Read-only file attribute.
A	Archive file attribute.
S	System file attribute.
H	Hidden file attribute.
/S	Processes files in all directories in the specified path.

BACKUP

Backs up one or more files from one disk to another.

```
Backup source destination-drive: [/S] [/M] [/A]
[/F[:size]] [/D:date[/T:time]]
[/L[:[drive:][path]logfile]]
```

source Specifies the file(s), drive, or directory to back up.

destination-drive: Specifies the drive to save backup copies onto.

/S Backs up contents of subdirectories.

/M Backs up only files that have changed since the last backup.

/A Adds backup files to an existing backup disk.

/F:[*size*] Specifies the size of the disk to be formatted.

/D:*date* Backs up only files changed on or after the specified date.

/T:*time* Backs up only files changed at or after the specified time.

/L[:[*drive*:][*path*]*logfile*] Creates a log file and entry to record the backup operation.

BREAK

```
Break [ON | OFF]
```

Type **break** without a parameter to display the current break setting.

CALL

Calls one batch program from another.

```
Call [drive:][path]filename [batch-parameters]
```

batch-parameters Specifies any command-line information required by the batch program.

CD

Displays the name of or changes the current directory.

```
Cd [drive:][path]
```

Cd[..].. Specifies that you want to change to the parent directory.

Type **cd** *drive*: to display the current directory in the specified drive.

Type **cd** without parameters to display the current drive and directory.

CHCP

Displays or sets the active code page number.

Chcp [*nnn*]

nnn Specifies a code page number.

Type **chcp** without a parameter to display the active code page number.

CHDIR

Displays the name of or changes the current directory.

Chdir [*drive*:][*path*]

Chdir[..]

CHKDSK

Checks a disk and displays a status report.

Chkdsk [*drive*:][[*path*]*filename*] [/**F**] [/**V**]

[*drive*:][*path*] Specifies the drive and directory to check.

filename Specifies the file(s) to check for fragmentation.

/F Fixes errors on the disk.

/V Displays the full path and name of every file on the disk.

Type **chkdsk** without parameters to check the current disk.

CLS

Clears the screen.

```
Cls
```

COMMAND

Starts a new instance of the MS-DOS command interpreter.

```
Command [[drive:]path] [device] [/E:nnnnn] [/P]
[/C string] [/MSG]
```

[*drive:*]*path* Specifies the directory containing *command.com* file.

device Specifies the device to use for command input and output.

/E:*nnnnn* Sets the initial environment size to *nnnnn* bytes.

/P Makes the new command interpreter permanent (can't exit).

/C *string* Carries out the command specified by string, and then stops.

/MSG Specifies that all error messages be stored in memory. You need to specify **/P** with this switch.

COMP

Compares the contents of two files or sets of files.

```
Comp [data1] [data2] [/D] [/A] [/L] [/N=number] [/C]
```

data1 Specifies location and name(s) of first file(s) to compare.

data2 Specifies location and name(s) of second files to compare.

/D Displays differences in decimal format. This is the default setting.

/A Displays differences in ASCII characters.

/L Displays line numbers for differences.

/N=*number* Compares only the first specified number of lines in each file.

/C Disregards case of ASCII letters when comparing files.

To compare sets of files, use wildcards in *data1* and *data2* parameters.

COPY

Copies one or more files to another location.

```
Copy [/A |/B] source [/A |/B] [+ source [/A |/B]
[+ ...]] [destination [/A |/B]] [/V]
```

source Specifies the file or files to be copied.

/A Indicates an ASCII text file.

/B Indicates a binary file.

destination Specifies the directory and/or filename for the new file(s).

/V Verifies that new files are written correctly.

To append files, specify a single file for *destination*, but multiple files for *source* (using wildcards or file1+file2+file3 format).

CTTY

Changes the terminal device used to control your system.

```
Ctty device
```

device The terminal device you want to use, such as COM1.

DATE

Displays or sets the date.

Date [*date*]

Type **date** without parameters to display the current date setting and a prompt for a new one.

Press **Enter** to keep the same date.

DEBUG

Runs Debug, a program testing and editing tool.

Debug [[*drive:*][*path*]*filename* [*testfile-parameters*]]

[*drive:*][*path*]*filename* Specifies the file you want to test.

testfile-parameters Specifies command-line information required by the file you want to test.

After Debug starts, type **?** to display a list of debugging commands.

DEL

Deletes one or more files.

Del [*drive:*][*path*]*filename* [**/P**]

Erase [*drive:*][*path*]*filename* [**/P**]

[*drive:*][*path*]*filename* Specifies the file(s) to delete. Specify multiple files by using wildcards.

/P Prompts for confirmation before deleting each file.

DISKCOMP

Compares the contents of two floppy disks.

```
Diskcomp [drive1: [drive2:]] [/1] [/8]
```

/1 Compares the first side of the disks.

/8 Compares only the first eight sectors of each track.

DISKCOPY

Copies the contents of one floppy disk to another.

```
Diskcopy [drive1: [drive2:]] [/1] [/V]
```

/1 Copies only the first side of the disk.

/V Verifies that the information is copied correctly.

The two floppy disks must be the same type.

You may specify the same drive for *drive1* and *drive2*.

DIR

Displays a list of files and subdirectories in a directory.

```
Dir [drive:][path][filename] [/P] [/W]
[/A[[:]attributes]] [/O[[:]sortorder]] [/S] [/B] [/L]
```

[*drive:*][*path*][*filename*] Specifies drive, directory, and/or files to list.

/P Pauses after each screenful of information.

/W Uses wide list format.

/A Displays files with specified attributes.

attributes				
	D	Directories	**R**	Read-only files
	H	Hidden files	**A**	Files ready for archiving
	S	System files	**-**	Prefix meaning "not"

/O List by files in sorted order.

sortorder				
	N	By name (alphabetic)	**S**	By size (smallest first)
	E	By extension (alphabetic)	**D**	By date & time (earliest first)
	G	Group directories first	**-**	Prefix to reverse order

/S Displays files in specified directory and all subdirectories.

/B Uses bare format (no heading information or summary).

/L Uses lowercase.

Switches may be preset in the DIRCMD environment variable. Override preset switches by prefixing any switch with - (hyphen)—for example, /-W.

ECHO

Displays messages, or turns command-echoing on or off.

Echo [**ON** | **OFF**]

Echo [*message*]

Type **echo** without parameters to display the current echo setting.

EDIT

Starts the MS-DOS Editor, which creates and changes ASCII files.

Edit [[*drive*:][*path*]*filename*] [**/B**] [**/G**] [**/H**] [**/NOHI**]

[drive:][path]filename Specifies the ASCII file to edit.

/B Allows use of a monochrome monitor with a color graphics card.

/G Provides the fastest update of a CGA screen.

/H Displays the maximum number of lines possible for your hardware.

/NOHI Allows the use of a monitor without high-intensity support.

EDLIN

Starts Edlin, a line-oriented text editor.

```
EDLIN [drive:][path]filename [/B]
```

/B Ignores end-of-file (**Ctrl-Z**) characters.

EMM386

Turns on or off EMM386 expanded memory support.

```
Emm386 [ON | OFF | AUTO] [W=ON | W=OFF]
```

ON | OFF | AUTO Activates or suspends *emm386.exe* device driver, or places it in auto mode.

W=ON | OFF Turns on or off Weitek coprocessor support.

ERASE

Deletes one or more files.

```
Del [drive:][path]filename [/P]
```

```
Erase [drive:][path]filename [/P]
```

[*drive*:][*path*]*filename* Specifies the file(s) to delete. Specify multiple files by using wildcards.

/P Prompts for confirmation before deleting each file.

EXE2BIN

Converts *.exe* (executable) files to binary format.

```
Exe2bin [drive1:][path1]input-file
[[drive2:][path2]output-file]
```

input-file Specifies the *.exe* file to be converted.

output-file Specifies the binary file to be created.

EXIT

Quits the *command.com* program (command interpreter).

```
Exit
```

EXPAND

Expands one or more compressed files.

```
Expand [drive:][path]filename
[[drive1:][path1]filename[ ...]] destination
```

[*drive*:][*path*]*filename* Specifies the location and/or name of a file or set of files to be expanded. You cannot use wildcards.

destination Specifies the new location and/or name of an expanded file or set of files.

Destination can be a drive letter and colon, directory name, filename, or combination. The destination can only be a filename if you have specified a single filename for the source filename parameter. To expand multiple files to a different directory and keep the original filenames, specify only a directory as the destination.

FASTOPEN

Decreases the amount of time needed to open frequently used files and directories.

Fastopen *drive*:[[=]**n**] [*drive*:[[=]**n**][...]] [/**X**]

drive: Specifies the hard disk drive you want **fastopen** to work with.

n Specifies the maximum number of file locations **fastopen** retains in its filename cache.

/X Creates the filename cache in expanded memory.

FC

Compares two files or sets of files and displays the differences between them.

Fc [/**A**] [/**C**] [/**L**] [/**LB***n*] [/**N**] [/**T**] [/**W**] [/*nnnn*]
[*drive1*:][*path1*]*filename1* [*drive2*:][*path2*]*filename2*

Fc /**B** [*drive1*:][*path1*]*filename1*
[*drive2*:][*path2*]*filename2*

/A Displays only first and last lines for each set of differences.

/B Performs a binary comparison.

/C Disregards the case of letters.

/L Compares files as ASCII text.

/LB*n* Sets the maximum consecutive mismatches to the specified number of lines.

/N Displays the line numbers on an ASCII comparison.

/T Does not expand tabs to spaces.

/W Compresses white space (tabs and spaces) for comparison.

/nnnn Specifies the number of consecutive lines that must match after a mismatch.

FDISK

Configures a hard disk for use with MS-DOS.

```
Fdisk
```

FIND

Searches for a text string in a file or files.

```
Find [/V] [/C] [/N] [/I] "string"
[[drive:][path]filename[ ...]]
```

/V Displays all lines NOT containing the specified string.

/C Displays only the count of lines containing the string.

/N Displays line numbers with the displayed lines.

/I Ignores the case of characters when searching for the string.

"*string*" Specifies the text string to find.

[*drive*:][*path*]*filename* Specifies a file or files to search.

If a pathname is not specified, **find** searches the text typed at the prompt or piped from another command.

FOR

Runs a specified command for each file in a set of files.

For *%variable* **IN** (*set*) **DO** *command* [*command-parameters*]

%variable Specifies a replaceable parameter.

(*set*) Specifies a set of one or more files. Wildcards may be used.

command Specifies the command to carry out for each file.

command-parameters Specifies parameters or switches for the specified command.

To use the **for** command in a batch program, specify *%%variable* instead of *%variable*.

FORMAT

Formats a disk for use with MS-DOS.

Format *drive:* [**/V**[:*label*]] [**/Q**] [**/U**] [**/F:***size*] [**/B** | **/S**]

Format *drive:* [**/V**[:*label*]] [**/Q**] [**/U**] [**/T:***tracks* **/N:***sectors*] [**/B** | **/S**]

Format *drive:* [**/V**[:*label*]] [**/Q**] [**/U**] [**/1**] [**/4**] [**/B** | **/S**]

Format *drive:* [**/Q**] [**/U**] [**/1**] [**/4**] [**/8**] [**/B** | **/S**]

/V[:*label*] Specifies the volume label.

/Q Performs a quick format.

/U Performs an unconditional format.

/F:*size* Specifies the size of the floppy disk to format (such as 160, 180, 320, 360, 720, 1.2, 1.44, 2.88).

/B Allocates space on the formatted disk for system files.

/S Copies system files to the formatted disk.

/T:*tracks* Specifies the number of tracks per disk side.

/N:*sectors* Specifies the number of sectors per track.

/1 Formats a single side of a floppy disk.

/4 Formats a 5.25-inch 360K floppy disk in a high-density drive.

/8 Formats eight sectors per track.

GOTO

Directs MS-DOS to a labeled line in a batch program.

```
Goto label
```

label Specifies a text string used in the batch program as a label.

You type a label on a line by itself, beginning with a colon.

GRAFTABL

Enables MS-DOS to display an extended character set in graphics mode.

```
Graftabl [xxx]

Graftabl /STATUS
```

xxx Specifies a code page number.

/STATUS Displays the current code page selected for use with **graftabl**.

GRAPHICS

Loads a program that can print graphics.

Graphics [*type*] [[*drive:*][*path*]*filename*] [**/R**] [**/B**] [**/LCD**] [**/PRINTBOX:STD** | **/PRINTBOX:LCD**]

type Specifies a printer type.

[*drive:*][*path*]*filename* Specifies the file containing information on supported printers.

/R Prints white on black as seen on the screen.

/B Prints the background in color for COLOR4 and COLOR8 printers.

/LCD Prints using LCD aspect ratio.

/PRINTBOX:STD | /PRINTBOX:LCD Specifies the print-box size, either STD or LCD.

HELP

Provides help information for MS-DOS commands.

Help [*command*]

command Displays help information on that command.

IF

Performs conditional processing in batch programs.

If [**NOT**] **ERRORLEVEL** *number command*

If [**NOT**] *string1==string2 command*

If [**NOT**] **EXIST** *filename command*

NOT Specifies that MS-DOS should carry out the command only if the condition is false.

ERRORLEVEL *number* Specifies a true condition if the last program run returned an exit code equal to or greater than the number specified.

command Specifies the command to carry out if the condition is met.

string1==*string2* Specifies a true condition if the specified text strings match.

EXIST *filename* Specifies a true condition if the specified filename exists.

INTERLNK

Add the *interlnk.exe* device driver to the *config.sys* file to redirect requests for operations on one or more Interlnk client drives or printer ports to one or more drives or printer ports on the Interlnk server.

```
device=[drive:][path]interlink.exe [/drives:n]
[/noprinter] [/com[:][n|address]]
[/lpt[:][n|address]][/auto] [/noscan] [/low]
[/baud:rate][/v]
```

[*drive*:][*path*] Specifies the location of the *interlnk.exe* file.

/drives:*n* Specifies the number of redirected drives. The default is 3. If you specify 0, Interlnk redirects only printers.

/noprinter Specifies that printers not be redirected when you install *interlnk.exe*.

/com[:][*n*|*address*] Specifies a serial port. The *n* parameter specifies the number of the serial port. The *address* parameter specifies the address of the serial port.

/lpt[:][*n*|*address*] Specifies a parallel port. The *n* parameter specifies the number of the LPT port. The *address* parameter specifies the address of the LPT port.

/auto Installs the *interlnk.exe* device driver in memory only if the client can establish a connection with the server when the client starts up.

/noscan Installs the *interlnk*.exe device driver in memory, but prevents establishing a connection between client and server.

/low Loads the *interlnk.exe* device driver into conventional memory, even if the upper memory is available.

/baud:*rate* Sets a maximum baud rate for serial communication. Valid values for *rate* are 9600, 19200, 38400, 57600, and 115200. The default is 115200.

/v Prevents conflicts with a computer's timer. Specify this switch if you have a serial connection between computers and one of them stops running when you use Interlnk to access a drive or printer port.

INTERSVR

Provides serial or parallel file transfer capabilities via redirected drives.

```
Intersvr [drive:[...]] [/X=drive:[...]] [/LPT[:][n | address]] [/COM[:][n | address]] [/BAUD:rate] [/B]
```

drive: Specifies the drive(s) to redirect. (By default, all drivers are redirected.)

/X=*drive*: Specifies the drive(s) to exclude.

/LPT[*n*] Specifies a port to scan. (/LPT scans all LPT ports.)

/LPT[*address*] Specifies a port address to scan.

/COM[*n*] Specifies a port to scan.

/COM[*address*] Specifies a port address to scan.

/BAUD:*rate* Sets a maximum serial baud rate.

/B Displays the Interlnk server screen in black and white.

/V Prevents conflicts with a computer's timer. Specify this switch if you have a serial connection between computers and one of them stops running when you use Interlnk.

Intersvr /RCOPY Copies Interlnk files from one computer to another, provided that the computer's serial ports are connected with a 7-wire null-modem cable.

JOIN

Joins a disk drive to a directory on another drive.

Join [*drive1*: [*drive2*:]*path*]

Join *drive1*: /**D**

drive1: Specifies a disk drive that will appear as a directory on *drive2*.

drive2: Specifies a drive to which you want to join *drive1*.

path Specifies the directory to which you want to join *drive1*. It must be empty and cannot be the root directory.

/D Cancels any previous **join** commands for the specified drive.

Type **join** without parameters to list currently joined drives.

KEYB

Configures a keyboard for a specific language.

Keyb [*xx*[,[*yyy*][,[*drive*:][*path*]*filename*]]] [/**E**] [/**ID:***nnn*]

xx Specifies a two-letter keyboard code.

yyy Specifies the code page for the character set.

[*drive*:][*path*]*filename* Specifies the keyboard definition file.

/E Specifies that an enhanced keyboard is installed.

/ID:*nnn* Specifies the keyboard in use.

LABEL

Creates, changes, or deletes the volume label of a disk.

Label [*drive*:][*label*]

LOADFIX

Loads a program above the first 64 kB of memory, and runs the program.

Loadfix [*drive*:][*path*]*filename*

Use **loadfix** to load a program if you have received the message "Packed file corrupt" when trying to load the program in low memory.

LOADHIGH

Loads a program into the upper memory area.

Loadhigh [*drive*:][*path*]*filename* [*parameters*]

Lh [*drive*:][*path*]*filename* [*parameters*]

parameters Specifies any command-line information required by the program you want to load.

MD

Creates a directory.

Mkdir [*drive:*]*path*

Md [*drive:*]*path*

MEM

Displays the amount of used and free memory in your system.

Mem [**/PROGRAM** | **/DEBUG** | **/CLASSIFY**]

/PROGRAM or **/P** Displays status of programs currently loaded in memory.

/DEBUG or **/D** Displays status of programs, internal drivers, and other information.

/CLASSIFY or **/C** Classifies programs by memory usage. Lists the size of programs, provides a summary of memory in use, and lists largest memory block available.

MIRROR

Records information about one or more disks.

Mirror [*drive:*[...]] [**/1**] [**/T***drive*[*-entries*][...]]

Mirror [**/U**]

Mirror [/PARTN]

drive: Specifies the drive for which you want to save information.

/1 Saves only the latest disk information (does not back up previous information).

/T*drive* Loads the deletion-tracking program for the specified drive.

-entries Specifies maximum number of entries in the deletion-tracking file.

/U Unloads the deletion-tracking program.

/PARTN Saves hard disk partition information to a floppy disk.

MKDIR

Creates a directory.

Mkdir [*drive:*]*path*

Md [*drive:*]*path*

MODE

Configures system devices.

Printer Port

MODE LPT*n*[:] [**COLS**=*c*] [**LINES**=*l*] [**RETRY**=*r*]

Serial Port

MODE COM*m*[:] [**BAUD**=*b*] [**PARITY**=*p*] [**DATA**=*d*] [**STOP**=*s*] [**RETRY**=*r*]

Device Status

MODE [*device*] [/**STATUS**]

Redirect Printing

MODE LPT*n*[:]=**COM***m*[:]

Prepare Code Page

MODE *device* **CP PREPARE**=((*yyy*[...])
[*drive:*][*path*]*filename*)

MOUSE

Displays information about the mouse driver and tells you the installation status of the driver. The following switches let you change the status:

/1 Instructs the computer to check the COM1 port for a mouse.

/2 Instructs the computer to check the COM2 port for a mouse.

out Removes the mouse driver from memory if possible.

MOUSECON

Lets you adjust the mouse sensitivity while you run an application program. After you install the mouse driver, type **mousecon**. Then, press **Ctrl-Alt-**left mouse button to display the mouse control panel.

NLSFUNC

Loads country-specific information.

Nlsfunc [[*drive*:][*path*]*filename*]

[*drive*:][*path*]*filename* Specifies the file containing country-specific information.

PATH

Displays or sets a search path for executable files.

Path [[*drive*:]*path*[;...]]

Path ;

Type **path ;** to clear all search-path settings and direct MS-DOS to search only in the current directory.

Type **path** without parameters to display the current path.

PAUSE

Suspends processing of a batch program and displays the message "Press any key to continue...."

```
Pause
```

PRINT

Prints a text file while you are using other MS-DOS commands.

```
Print [/D:device] [/B:size] [/U:ticks1] [/M:ticks2]
[/S:ticks3] [/Q:qsize] [/T]
[[drive:][path]filename[ ...]] [/C] [/P]
```

/D:*device* Specifies a print device.

/B:*size* Sets the internal buffer size, in bytes.

/U:*ticks1* Waits the specified maximum number of clock ticks for the printer to be available.

/M:*ticks2* Specifies the maximum number of clock ticks it takes to print a character.

/S:*ticks3* Allocates the scheduler the specified number of clock ticks for background printing.

/Q:*qsize* Specifies the maximum number of files allowed in the print queue.

/T Removes all files from the print queue.

/C Cancels printing of the preceding filename and subsequent filenames.

/P Adds the preceding filename and subsequent filenames to the print queue.

Type **print** without parameters to display the contents of the print queue.

PROMPT

Changes the MS-DOS command prompt.

Prompt [*text*]

text Specifies a new command prompt. Prompt can be made up of normal characters and the following special codes:

$Q	= (equal sign)
$$	$ (dollar sign)
$T	Current time
$D	Current date
$P	Current drive and path
$V	MS-DOS version number
$N	Current drive
$G	> (greater-than sign)
$L	< (less-than sign)
$B	| (pipe)
$H	Backspace (erases previous character)
$E	Escape code (ASCII code 27)
$_	Carriage return and linefeed

Type **prompt** without parameters to reset the prompt to the default setting.

QBASIC

Starts the MS-DOS QBasic programming environment.

Qbasic [**/B**] [**/EDITOR**] [**/G**] [**/H**] [**/MBF**] [**/NOHI**] [[**/RUN**] [*drive:*][*path*]*filename*]

/B Allows use of a monochrome monitor with a color graphics card.

/EDITOR Starts the MS-DOS Editor.

/G Provides the fastest update of a CGA screen.

/H Displays the maximum number of lines possible for your hardware.

/MBF Converts the built-in functions MKS$, MKD$, CVS, and CVD to MKSMBF$, MKDMBF$, CVSMBF, and CVDMBF, respectively.

/NOHI Allows the use of a monitor without high-intensity support.

/RUN Runs the specified Basic program before displaying it.

[[*drive*:][*path*]*filename*] Specifies the program file to load or run.

RD

Removes (deletes) a directory.

Rmdir [*drive*:]*path*

Rd [*drive*:]*path*

RECOVER

Recovers readable information from a bad or defective disk.

Recover [*drive*:][*path*]*filename*

Recover *drive*:

REM

Records comments (remarks) in a batch file or *config.sys*.

Rem [*comment*]

RENAME

Renames a file or files.

Rename [*drive:*][*path*]*filename1 filename2*

Ren [*drive:*][*path*]*filename1 filename2*

Note that you cannot specify a new drive or path for your destination file.

REPLACE

Replaces files.

Replace [*drive1:*][*path1*]*filename* [*drive2:*][*path2*]
[**/A**] [**/P**] [**/R**] [**/W**]

Replace [*drive1:*][*path1*]*filename* [*drive2:*][*path2*]
[**/P**] [**/R**] [**/S**] [**/W**] [**/U**]

[*drive1*:][*path1*]*filename* Specifies the source file or files.

[*drive2*:][*path2*] Specifies the directory where files are to be replaced.

/A Adds new files to destination directory. Cannot use with **/S** or **/U** switches.

/P Prompts for confirmation before replacing a file or adding a source file.

/R Replaces read-only files as well as unprotected files.

/S Replaces files in all subdirectories of the destination directory. Cannot use with the **/A** switch.

/W Waits for you to insert a disk before beginning.

/U Replaces (updates) only files that are older than source files. Cannot use with the **/A** switch.

RESTORE

Restores files that were backed up using the **backup** command.

Restore *drive1*: *drive2*:[*path*[*filename*]] [**/S**] [**/P**] [**/B:***date*] [**/A:***date*] [**/E:***time*] [**/L:***time*] [**/M**] [**/N**] [**/D**]

drive1: Specifies the drive where the backup files are stored.

drive2:[*path*[*filename*]] Specifies the file(s) to restore.

/S Restores files in all subdirectories in the path.

/P Prompts before restoring read-only files or files changed since the last backup (if appropriate attributes are set).

/B Restores only files last changed on or before the specified date.

/A Restores only files changed on or after the specified date.

/E Restores only files last changed at or earlier than the specified time.

/L Restores only files changed at or later than the specified time.

/M Restores only files changed since the last backup.

/N Restores only files that no longer exist on the destination disk.

/D Displays files on the backup disk that match specifications.

RMDIR

Removes (deletes) a directory.

Rmdir [*drive:*]*path*

Rd [*drive:*]*path*

SET

Displays, sets, or removes MS-DOS environment variables.

Set [*variable*=[*string*]]

variable Specifies the environment-variable name.

string Specifies a series of characters to assign to the variable.

Type **set** without parameters to display the current environment variables.

SETVER

Sets the version number that MS-DOS reports to a program.

Display Current Version Table

Setver [*drive*:*path*]

Add Entry

Setver [*drive*:*path*] *filename n.nn*

Delete Entry

Setver [*drive*:*path*] *filename* /**DELETE** [/**QUIET**]

[*drive*:*path*] Specifies location of the *setver.exe* file.

filename Specifies the filename of the program.

n.nn Specifies the MS-DOS version to be reported to the program.

/DELETE or **/D** Deletes the version-table entry for the specified program.

/QUIET Hides the message typically displayed during deletion of version-table entry.

SHARE

Installs file-sharing and locking capabilities on your hard disk.

Share [/**F:***space*] [/**L:***locks*]

/F:*space* Allocates file space (in bytes) for file-sharing information.

/L:*locks* Sets the number of files that can be locked at one time.

SHIFT

Changes the position of replaceable parameters in a batch file.

Shift

SORT

Sorts input and writes results to the screen, a file, or another device.

Sort [/**R**] [/*+n*] [*drive1*:][*path1*]*filename1*
[[*drive2*:][*path2*]*filename2*]

[*command* |] **Sort** [/**R**] [/*+n*]
[>[*drive2*:][*path2*]*filename2*]

/R Reverses the sort order; that is, sorts Z to A, then 9 to 0.

/+n Sorts the file according to characters in column *n*.

[*drive1*:][*path1*]*filename1* Specifies a file to be sorted.

[*drive2*:][*path2*]*filename2* Specifies a file where the sorted input is to be stored.

command Specifies a command whose output is to be sorted.

SUBST

Associates a path with a drive letter.

Subst [*drive1*: [*drive2*:]*path*]

Subst *drive1*: /**D**

drive1: Specifies a virtual drive to which you want to assign a path.

[*drive2*:]*path* Specifies a physical drive and path you want to assign to a virtual drive.

/D Deletes a substituted (virtual) drive.

Type **subst** with no parameters to display a list of current virtual drives.

SYS

Copies MS-DOS system files and command interpreter to a disk you specify.

Sys [*drive1*:][*path*] *drive2*:

[*drive1*:][*path*] Specifies the location of the system files.

drive2: Specifies the drive the files are to be copied to.

TIME

Displays or sets the system time.

Time [*time*]

Type **time** with no parameters to display the current time setting and a prompt for a new one.

Press **Enter** to keep the same time.

TREE

Graphically displays the directory structure of a drive or path.

Tree [*drive:*][*path*] [**/F**] [**/A**]

/F Displays the names of the files in each directory.

/A Uses ASCII instead of extended characters.

TYPE

Displays the contents of a text file.

Type [*drive:*][*path*]*filename*

UNDELETE

Restores files which have been deleted.

Undelete [[*drive:*][*path*]][*filename*] [**/LIST** | **/ALL**] [**/DT** | **/DOS**]

/LIST Lists the deleted files available to be recovered.

/ALL Undeletes all specified files without prompting.

/DT Uses only the deletion-tracking file.

/DOS Uses only the MS-DOS directory.

UNFORMAT

Restores a disk erased by the **format** command or restructured by the **recover** command.

```
Unformat drive: [/J]

Unformat drive: [/U] [/L] [/TEST] [/P]

Unformat /PARTN [/L]
```

drive: Specifies the drive to unformat.

/J Verifies that the mirror files agree with the system information on the disk.

/U Unformats without using MIRROR files.

/L Lists all file and directory names found, or, when used with the /PARTN switch, displays current partition tables.

/TEST Displays data but does not write changes to disk.

/P Sends output messages to printer connected to LPT1.

/PARTN Restores disk partition tables.

VER

Displays the MS-DOS version.

VERIFY

Tells MS-DOS whether to verify that your files are written correctly to a disk.

```
Verify [ON | OFF]
```

VOL

Displays the disk volume label and serial number, if they exist.

```
Vol [drive:]
```

XCOPY

Copies files (except hidden and system files) and directory trees.

```
Xcopy source [destination] [/A | /M] [/D:date] [/P]
[/S [/E]] [/V] [/W]
```

source Specifies the file(s) to copy.

destination Specifies the location and/or name of new files.

/A Copies files with the archive attribute set, doesn't change the attribute.

/M Copies files with the archive attribute set, turns off the archive attribute.

/D:*date* Copies files changed on or after the specified date.

/P Prompts you before creating each destination file.

/S Copies directories and subdirectories except empty ones.

/E Copies any subdirectories, even if empty.

/V Verifies each new file.

/W Prompts you to press a key before copying.

CHAPTER 9:
UTILITY PROGRAMS

This chapter describes and explains how to use the utility programs that are available for the GRiD Convertible computer. These programs are available in the *gridutil* directory on the hard disk and on the GRiD Model 2260 Utilities and Diagnostics diskette.

Executive Menu

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

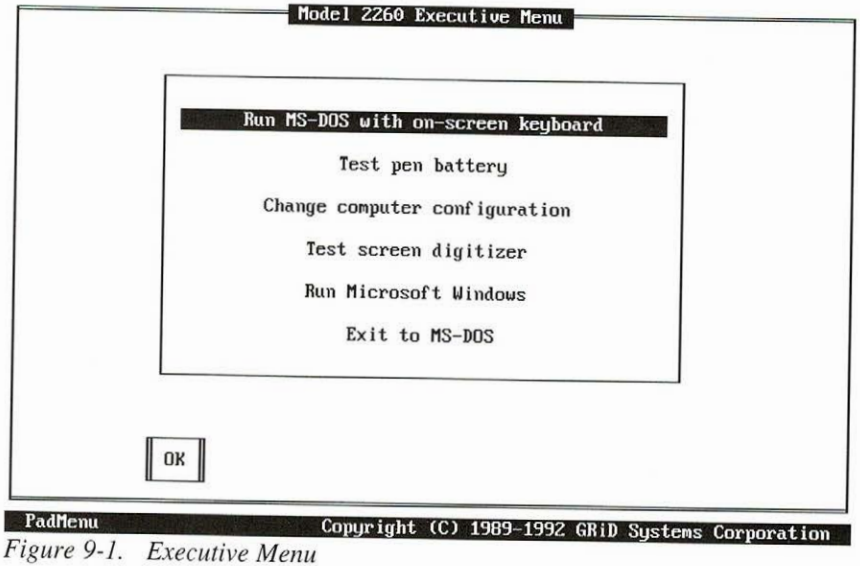


Figure 9-1. Executive Menu

Starting Executive Menu

To start Executive Menu, run the program **padmenu**. To do this automatically each time you start your computer, include the command **c:\gridutil\padmenu** in your *autoexec.bat* file. You also return to Executive Menu whenever you exit Windows for Pen Computing (if you use the default *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 very quickly.)

NOTE: The term button, above, refers to a small box on the screen labelled 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 standby button below 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 the keyboard, the up and down arrow keys move the highlight up and down. 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 using the physical one. Refer to the section Screen Keyboard, beginning on page 9-4, for more information.
Test pen battery	Determines whether the batteries in the pen are ok or low.
Change configuration	Starts the full-screen configurator. Refer to the section Configurator, beginning on page 9-7, for more information.
Test 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 9-26, for more information.
Run Microsoft Windows	Starts Microsoft Windows for Pen Computing.
Exit to MS-DOS	Exits from Executive Menu to MS-DOS.

Screen Keyboard

Screen Keyboard is a versatile program that emulates a physical IBM AT-compatible keyboard on the GRiD Convertible computer screen. It allows you to enter keyboard data without accessing the physical keyboard.

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 opening the computer to access the keyboard. You do not need Screen Keyboard if you use the keyboard or if you use Windows or PenRight! 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 GRiD Convertible screen, as 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 real keyboard.

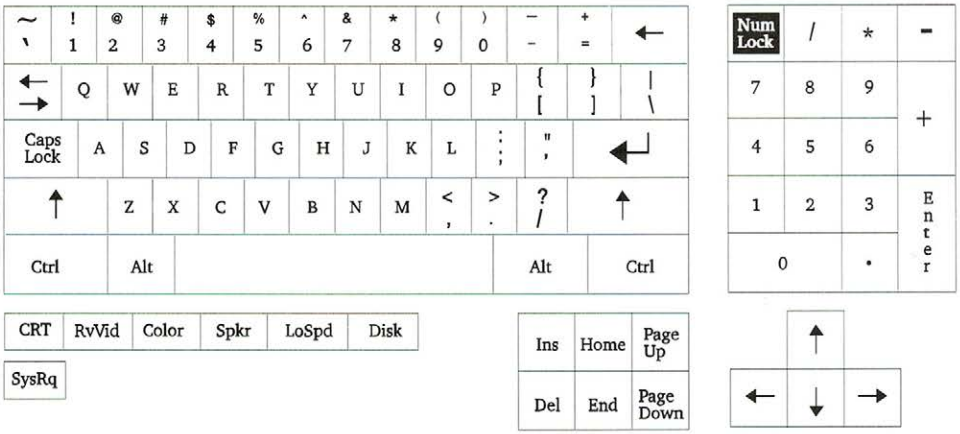


Figure 9-2. Screen Keyboard (U.S.)

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**. To do this automatically each time you start your computer, include the command **c: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 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 real 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 the physical keyboard. Both keyboards can be used interchangeably. However, if you use the locking keys, **CapsLock**, **NumLock**, and **ScrlLock**, interchangeably on both Screen Keyboard and the 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**.

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 2-5.

You can also test your pen batteries by running the program **penbatt**, which is on your hard disk or on the MS-DOS Utilities and Diagnostics diskette.

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 autostandby 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, keyboard, memory, and hard drive.
- 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 modem and the serial and parallel ports.
- System Settings—Displays the System Settings Menu and lets you change the boot sequence, processor speed, keyboard emulation, keyclick, and speaker.
- Video Settings—Displays the Video Settings Menu and lets you change various display features.
- Wakeup from Standby—Displays the Wakeup from Standby Menu and lets you establish how your computer wakes up from standby mode.

Figures 9-3 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.

To use the full-screen configurator with the keyboard, use the **Tab** and **Shift-Tab** keys to move between the buttons. Use the ← and → keys to change the settings and the ↑ and ↓ keys to change the value for a setting.

You can also use the Configurator program from the MS-DOS command line. To issue Configurator commands from the command line, 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.

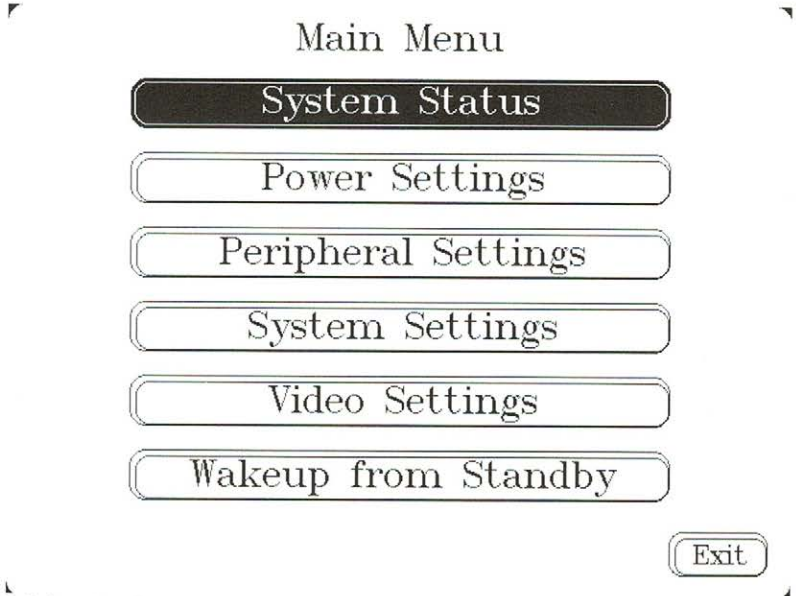


Figure 9-3. Configurator Main Menu

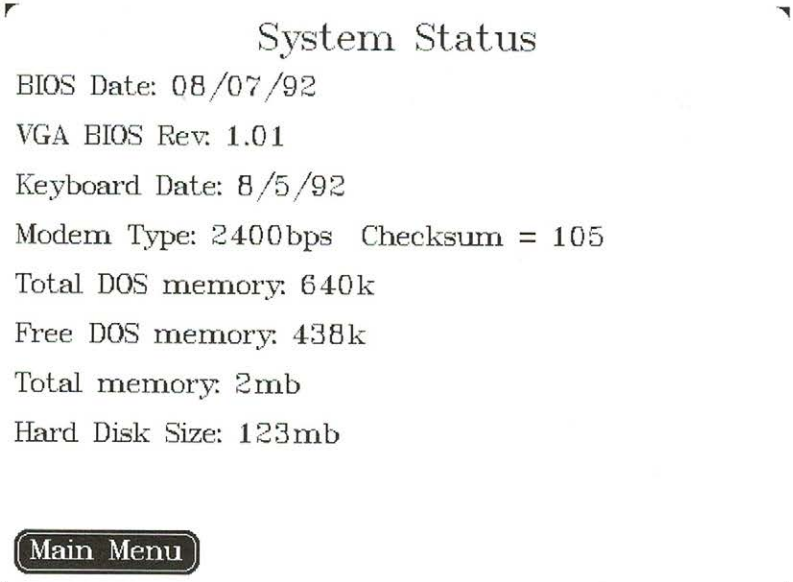


Figure 9-4. System Status Screen

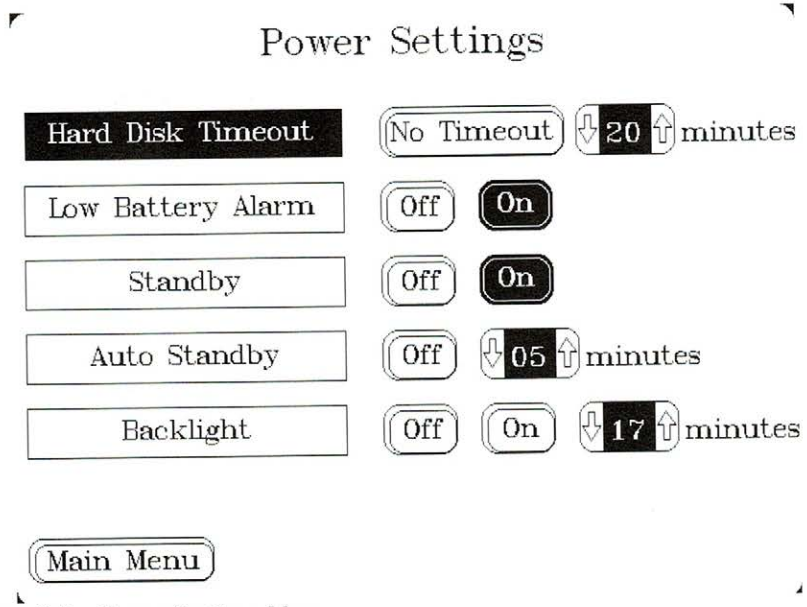


Figure 9-5. Power Settings Menu

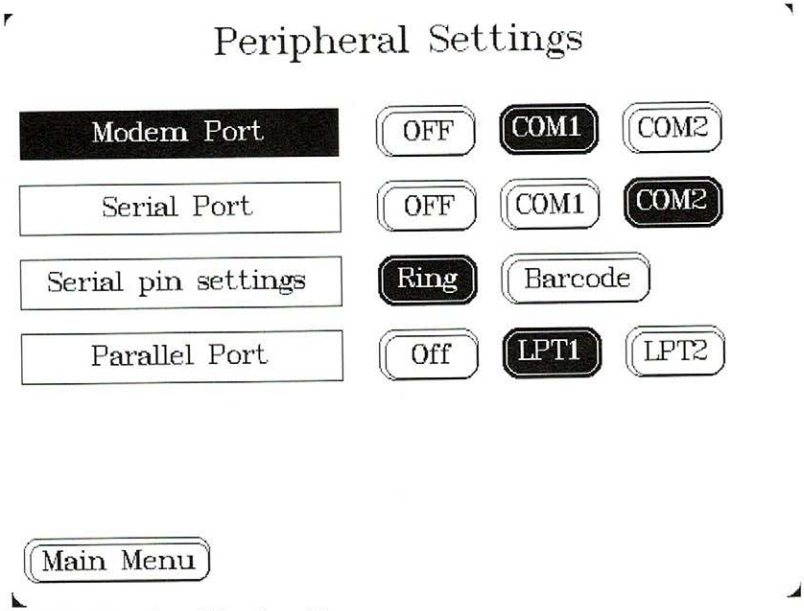


Figure 9-6. Peripheral Settings Menu

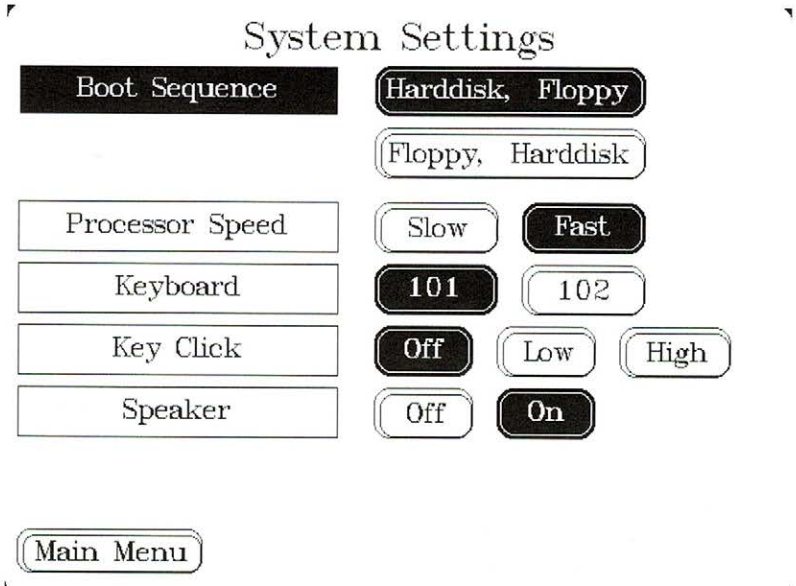


Figure 9-7. System Settings Menu

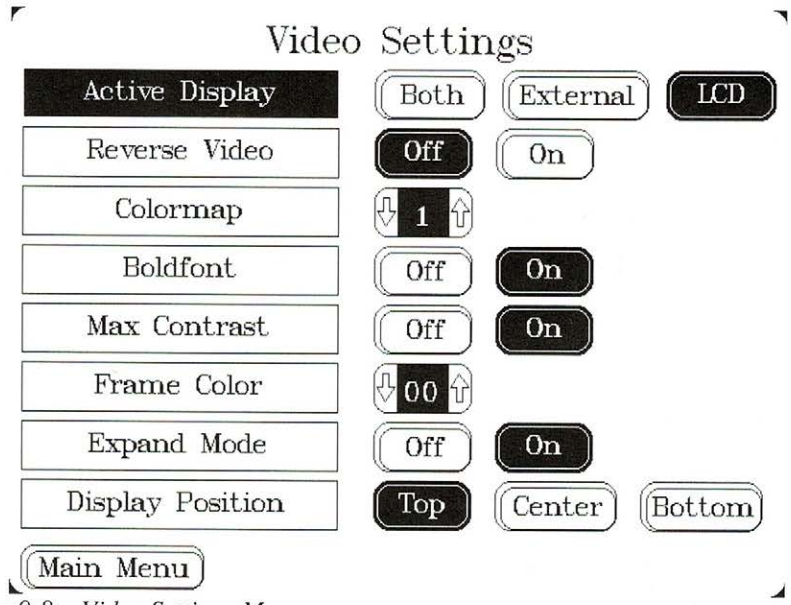


Figure 9-8. Video Settings Menu

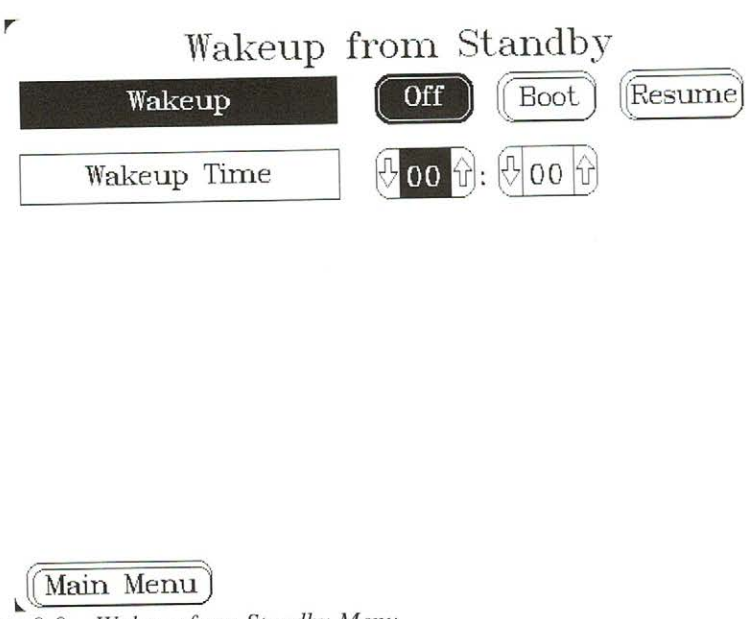


Figure 9-9. Wakeup from Standby Menu

Table 9-2. Configurator Command Summary

Command	Description	Default Setting	Saved
Power			
autostandby	Enables/disables the automatic standby feature.	5 minutes	+
backlite	Controls screen backlight.	5 minutes	+
lowbeep	Controls low battery warning beep.	On	+
harddisk	Controls turning on and off the hard disk.	On	+
standby	Controls entering standby mode.	On	+
Peripheral			
modem	Controls the internal modem.	On & COM2	+
parallel	Controls the parallel port.	On & LPT1	+
serial	Controls the serial port.	COM1 & RING	+
System			
boot	Sets the order of boot devices.	harddisk, extfloppy	+
keyboard	Specifies the keyboard emulation.	101	+
keyclick	Controls whether the keyclick is on or off.	Off	
speaker	Controls the internal speaker.	On	+
speed	Sets the processor speed.	Fast	
Video			
boldfont	Specifies how bold characters are displayed.	On	+
colormap	Sets colormapping	1	+
display	Sets normal or reverse video.	Normal	+
expand	Specifies how much of the screen is used.	On	+
framecolor	Sets the color for the frame.	On	+
maxcontrast	Specifies the character display contrast.	On	+
position	Controls the image location.	Top	+
video	Controls the monitor used.	LCD	+
Wakeup			
wakeup	Schedules system wakeup from standby.	Off	+

Config Autostandby

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

```
config autostandby = 1 | 2 | ... | 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 5 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**.

Note that 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. It works fine with all custom PenRight! applications.

Refer to the command **config standby** (page 9-24) 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 | 2 | ... | 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 the

keyboard) for a certain number of minutes. You can specify from 1 to 17 minutes. The default is 2 minutes. 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 **FN-BkLt** keys on the computer override the config **backlite setti**ng.

Config Boldfont

The **config boldfont** command specifies how characters appear on the internal VGA 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 internal display.

off Characters are generated normally on the internal display. This is standard VGA.

Config Boot

The **config boot** command sets the order of devices to be searched for the operating system when the computer starts up (or boots). This command has the following format:

```
config boot = harddisk | extfloppy
```

When the computer is turned on, it searches its storage devices in a specific order for the operating system files; when it finds those files, the system boots. This command allows you to change the order in which the storage devices are searched.

To temporarily change the boot sequence, press one of the following keys on your keyboard after the beep when your computer starts up:

H to boot from hard disk

E to boot from the external floppy

Config Colormap

The **config colormap** command sets color mapping on the internal 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 internal 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.

You can change the color mapping modes from the keyboard using the **FN-Color** keys as described on page 2-20. These keystrokes cycle through each of the color mapping modes in order.

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

The **config colormap** command uses preassigned gray shades for colors.

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.

You can change the display mode from the keyboard using the **FN-RvVid** keys as described on page 2-20.

Config Expand

The **config expand** command specifies how much of the internal VGA display is used. This command has the following format:

```
config expand = on | off
```

where

on The system expands video modes that normally do not fill the entire display; improves the graphics image on the internal display (default).

off Information is displayed as defined by the video mode. For example, a 640-by-350 mode does not fill the entire display.

Config Framecolor

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

```
config framecolor = n
```

where

n — 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, such as when the **config expand = off** command has been issued.

Config Harddisk

The **config harddisk** command controls power to the internal hard disk. This command has the following format:

```
config harddisk = on | off | n
```

where

on — Indicates power to the internal hard disk is always on (default).

off — Immediately turns off power to the internal hard disk.

n — Number of minutes from 1 to 20 (the maximum allowed by your hard disk) after which the hard disk is turned off if it has not been accessed.

This option is useful for saving battery power by turning off power to the internal hard disk when it is not being used. If **off** or *n* is specified, the hard disk is automatically powered on when a disk access is required.

CAUTION

This **config** option is designed to help extend battery life. Do not use this option when operating the computer from the power supply; doing so causes unnecessary wear on the hard disk and could shorten its life.

You can turn the hard disk on and off using the **FN-Disk** keys as described on page 2-22.

Config Keyboard

The **config keyboard** option specifies whether your keyboard is emulating a 101-key or 102-key keyboard. This command has the following format:

```
config keyboard = 101 | 102
```

where

101 The standard U.S. keyboard layout is being emulated.

102 A national keyboard layout is being emulated; the left **FN** key is remapped to **Alt-Gr.**

Config Keyclick

The **config keyclick** command controls whether the keys click when they are touched; this applies to both the keyboard and the Screen Keyboard. This command has the following format:

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

If you use Screen Keyboard or the keyboard on your computer, the computer can make a clicking noise each time you touch a key. This audible feedback may be helpful, especially when using Screen Keyboard. This feature is initially set to **off**. To turn it on, specify on.

From the keyboard you can increase the keyclick volume by pressing **Ctrl-Alt-Grey plus(+)**, or decrease the volume by pressing **Ctrl-Alt-Grey minus(–)**. [1] These keystrokes simply cycle through each of the keyclick settings forwards or backwards, respectively.

When you are using the full-screen configurator, the values change in increments of 5, from 5 to 60, rather than showing **low** and **high**.

1 Grey plus and grey minus refer to the plus and minus keys on the numeric keypad.

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 GRiD Convertible 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**.

When **config lowbeep** is set to **on**, your computer may beep when going into or out of standby; this is normal.

Config Maxcontrast

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

```
config maxcontrast = on | off
```

where

on Selects the highest level of contrast possible between a character's foreground color and background color; **on** maximizes the contrast when viewing on an LCD display.

off Maps the color selected by the program to a gray scale on the internal display; **off** is standard VGA compatible (default).

If you are unable to see all the detail or color mapping on the LCD display, set **config maxcontrast = off.**

The **config colormap** option is not active in non-graphics modes when this option is on.

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 = com1 | com2 | off | on
```

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 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.

To use PCMCIA I/O devices, the modem must be turned off.

Config Parallel

The **config parallel** command turns off the parallel port and assigns it a device name.

```
config parallel = off | LPT1 | LPT2 | LPT3
```

The **config parallel** command assigns the parallel port a device name. The parallel port initially is assigned device name LPT1. If you want, you can specify LPT2 or LPT3 to assign it that device name. The **off** option means the parallel port is not set; the parallel port cannot be used until it is assigned.

Config Position

The **config position** command sets the location of the image on the internal VGA display when the image does not use all of the vertical pixels (rows) on the display. This command has the following format:

```
config position = top | center | bottom
```

where

top Indicates the image is to be at the top of the display panel (default).

center Indicates the image is to be centered on the display panel.

bottom Indicates the image is to be at the bottom of the display panel.

This option is used when displaying in a mode that does not use all of the pixels, such as when **config expand = off** is set.

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 bar code reader. This command has the following format:

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

The **config serial** command assigns the serial port 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. The **off** option indicates that the serial port is not assigned to a COM port; the serial port cannot be used until it is assigned. The **on** option turns on the serial port.

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 **config serial** command also changes how the serial port works in order to accommodate a bar code 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 bar code 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 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 (25 MHz). If you specify **slow**, the microprocessor immediately begins operating at its slow speed (12.5 MHz).

You can also switch between fast and slow processor speeds using the keystrokes **FN-LoSpd**.

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 or **FN-StdBy** from the keyboard, 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 9-14) for more information about entering standby mode.

Config Video

The **config video** command allows you to select external video monitors through the monitor port and to turn the internal monitor on or off. This command has the following format:

Syntax

```
config video = internal | external | both
```

where

internal Turns on the internal display (default).

external Turns on the video output connector on the rear panel of the computer. Screen output is displayed on an external monitor connected to the video output connector.

both Simultaneously sends the screen output to both the internal display and the external monitor connected to the video output connector.

You can toggle between the internal display and the external monitor from your keyboard using the **FN-CRT** keys as described on page 2-19.

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]
[,boot |,resume] [off]
```

where

hour 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.

minute 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 *minute* past the hour.

daily Directs the system to wake up from standby every day at *hour:minute*.

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, if you 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 /?

The **config /?** command provides syntax on the options of the **config** command which are available for your computer. This command has the following format:

```
config /?
```

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 hard drive or the Utilities diskette.

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 digitizer is calibrated at the factory and should never need to be recalibrated.

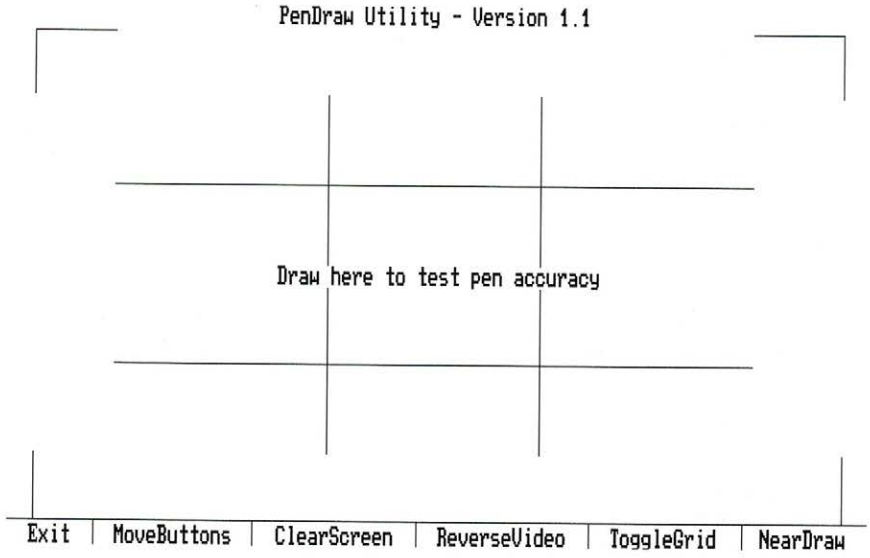


Figure 9-10. Digitizer Test Screen

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 (when the NearDraw button is displayed) or change to Down draw (when 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.

Microsoft Windows

Selecting "Run Microsoft Windows" from the Executive Menu loads the Microsoft Windows for Pen Computing Software.

You can also start Windows by typing the command win from the MS-DOS prompt.

GRiD Systems has added some features to the Control Panel to support the GRiD Convertible computer. These include:

- The Configure option in the Pen icon lets you specify your pen characteristics.
- The Rotate icon shows the directions in which the GRiD Convertible can be rotated.
- The Calibrate icon lets you calibrate your pen and digitizer.
- The GRiD Power icon lets you set the screen backlight timeout and the hard disk timeout.

Exit to DOS

Select this option from the Executive Menu to return to the MS-DOS prompt. You must use the keyboard to continue to enter commands.

Some additional MS-DOS commands have been added by GRiD Systems to allow you to take advantage of various hardware features of your GRiD Convertible computer. These commands are described here. The commands are in the *gridutil* directory on your hard drive and on the diskette labeled GRiD Model 2260 Utilities and Diagnostics.

Cardbatt

The batteries in your storage PC Cards have a life of approximately six months after they are installed. You can check the status of the battery in a card installed in the PCMCIA slot with the **cardbatt** command. The format of this command is:

cardbatt *drive:*

where *drive* is the device designator for the PCMCIA slot (usually either D or E).

The *cmcdd.sys* driver must be loaded in the *config.sys* file in order to run the command.

One of the following messages is issued telling you the battery status:

The PCMCIA battery is good.
The PCMCIA battery is low.
The PCMCIA battery is dead.

If the battery is low, you should change it immediately; refer to the section Changing a Storage PC Card Battery on page 5-6. If the battery is dead, the storage PC Card is no longer usable. It must be reformatted as described in Chapter 5.

Setpass

You can protect your system from unauthorized use by setting a password. If you set a password on your computer, you are required to enter the password each time you turn on or restart the computer.

To set or change a password, type the following command at the DOS prompt:

setpass

The password screen is displayed, giving you the ability to add a new password, change an existing password, or disable the password. The password screen provides all the instructions you need to use the password facility. Once you have set (or enabled) a password, you must enter that exact password each time you turn on or restart the computer to gain access to your files and programs. If you enter a wrong password at the password prompt, your computer will restart each time until you enter the correct password. If you forget your password and are in the U.S., call the GRiD Resource Center at 1-800-654-GRID (4743) for assistance. Outside the U.S., contact your local GRiD representative or distributor. While GRiD Systems will try to help you if you forget your password, remembering the password is your responsibility.

Devices

The **devices** command displays a report of all devices recognized by the system. This command has the following format:

devices

The devices command displays a report of all the devices recognized by the system, including devices installed in the *config.sys* file. Devices installed in the *config.sys* file are referred to as "user-installed" devices.

If the display is in 40-column mode when the **devices** command is used, the display is automatically reset to 80-column mode to display the device list.

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 and has the following syntax:

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

where

OFF Removes *penmouse.com* from memory if it is installed and safe to remove it.

ON Reinitializes the driver and reloads it is it is not loaded.

/L*x* Maps the left mouse button.

/R*x* 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 GRiD Convertible 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: GRID CONVERTIBLE COMPUTER SPECIFICATIONS

Table A-1 shows the model numbers of the different configurations of the GRiD Convertible computers. The computer specifications are given in Table A-2.

Table A-1. GRiD Convertible Computer Model Numbers

Computer Configuration	Model Number
GRiD Convertible with internal hard drive	2260
GRiD Convertible with internal hard drive and V.22bis/V.42bis 2400bps/9600 bpsFAX modem	2261
GRiD Convertible with internal hard drive and V.32bis/V.42bis 14400 bps/9600 bps FAX modem	2262

Table A-2. GRiD Convertible Computer Specifications

Microprocessor	
Main microprocessor	80386SL CPU, operating at 25 or 12.5 MHz
Numeric coprocessor	CX87SLC
Display	
LCD	9.5-inch diagonal, sidelit LCD; 640 x 480-pixel, PC-compatible VGA display, with an aspect ratio of 1:1; 64 gray scales

Table A-2. GRiD Convertible Computer Specifications (continued)

Memory	
RAM	2 MB standard; 4 or 8 MB optional
Storage	
Internal hard drive	
1 MB storage PC Card Model M03-9019	1 MB storage PC Card (68-pin PCMCIA 2.0 standard) fits into the PCMCIA slot.
2 MB storage PC Card Model M03-9021	2 MB storage card (68-pin PCMCIA 2.0 standard) fits into the PCMCIA slot.
Floppy diskette drive	External 3.5-inch high-density (1.44 MB) diskette drive reads, writes, and formats both 1.44 MB and 720 kB diskettes.
Communications Options	
V.22bis/V.42bis 2400 bps/FAX modem	2400 bits-per-second (bps) Hayes Smartmodem 2400 compatible; auto-dial, auto-answer; V.42 and Microcom Networking Protocol (MNP) Classes 2 through 4 error correction, as well as V.42bis and MNP Class 5 data compression support. Supports 9600 bps send/receive Group III facsimile transmission.
V.32bis/V.42bis 14400 bps/FAX modem	14400 bits-per-second (bps) Hayes compatible; auto-dial, auto-answer; V.42 and Microcom Networking Protocol (MNP) Classes 2 through 4 error correction, as well as V.42bis and MNP Class 5 data compression support. Supports 9600 bps send/receive Group III facsimile transmission.

Table A-2. GRiD Convertible Computer Specifications (continued)

Interfaces	
Serial	RS-232C 9-pin, with support for bar code readers.
Monitor	Analog VGA, 15-pin connector.
Phone jack (optional)	One modular telephone jack for internal modem (RJ-12 jack).
Parallel/Floppy	26-pin microminiature connector.
Pen Model G44-1364	Provides a method of input and mouse pointing functions.
Other Features	
System Indicators	Nine LEDs show power/standby, disk activity, processor speed, battery status, CapLk, KeyPd, NmLk, CRT, and ScrLk status.
Audio	Internal speaker, voice quality.
Clock/calendar	Internal, lithium battery-powered.
Bridge battery	Internal, NiCad battery provides standby mode power while changing the battery pack.

Table A-2. GRiD Convertible Computer Specifications (continued)

Power	
Computer requirements	8 to 15 Vdc, 17 W, 100 mV p-p max. noise.
Sources:	
Battery (Model G44-1377)	Removable, rechargeable A-cell battery pack provides 2-4 hours of life in full use, 6-8 hours of life in typical use.
Power supply (Model G44-1368)	Requires 100-240 Vac, at 47-63 or 400 Hz, autosensing; supplies 12 Vdc, 30 W (without battery charging).
Auto adapter (Model G44-1384)	Connects power from a 12 Vdc cigarette-lighter socket.
Optional battery (Model G44-1379)	Removable, rechargeable C-cell battery pack provides approximately 60 percent more battery life than the A-cell battery.

Floppy Diskette Drive Specifications	
Capacity formatted	1,474 kB and 737 kB
Transfer rate (kilobits/sec)	250 and 500
Maximum recording density (bpi)	17,434
Track density (tpi)	135
Rotation speed (rpm)	300
Average seek time (msec)	95
Track-to-track seek time (msec)	3
Average latency (msec)	100

Table A-2. GRiD Convertible Computer Specifications (continued)

Physical Characteristics	
Case	Die-cast magnesium and injection-molded thermoplastic
Weight	5.5 lbs (2.5 Kg), with standard battery pack 6.0 lbs (2.7 Kg), with optional battery pack
Height	1.6 inches (4.2 cm)
Width	11.5 inches (29.2 cm)
Depth	9.3 inches (23.7 cm)
Temperature	
Operating	5° to 40° C (41° to 104° F)
Storage	-20° to 60° C (-4° to 140° F)
Relative humidity	
Operating	10% to 80% noncondensing
Storage	5% to 90% noncondensing
Shock tolerance	
Operating	10g
Nonoperating	80g
Vibration tolerance	
Operating	5-200-5 Hz at 1.0g
Nonoperating	5-200-5 Hz at 4.0g
Altitude	
Operating	10,000 feet (3,048 meters)
Nonoperating	40,000 feet (12,191 meters)
Electrostatic discharge	12 kV

Table A-3. GRiD Convertible Power Budget

Feature	Watts
Backlight Maximum Brightness	3.5
Backlight Minimum Brightness	1.75
LCD	.37
Hard Disk Seeking	1.77
Hard Disk Idle	1.45
Hard Disk Spun Down	.10
Modem Connected	.48
Modem Idle	.08
CRT Video Electronics	.20
Floppy Drive Seeking	1.45
Floppy Drive Idle	.11
CPU High Speed	6.24
CPU Low Speed	5.84
CPU Idle	3.74
Standby Power with 2 MB DRAM	.54
Standby Power with 4 MB DRAM	.59
Standby Power with 8 MB DRAM	.65

Table A-4. Sample Battery Life Calculations

Feature	Number of Watts Required
Backlight Minimum - 100%	1.75
LCD On - 100%	.37
Hard Disk (5% seek, 10% idle, 85% spun down)	.3815
Modem Idle - 100%	.08
CRT Off	0
No floppy	0
CPU (75% idle, 25% full speed)	4.365
Total watts required	6.88
A-cell battery life (13.44 Watt hours)	1.95 hours @ 6.9 Watts
C-cell battery life (22.08 Watt hours)	3.21 hours @ 6.9 Watts

APPENDIX B:
ADDING OPTIONAL RAM

Your computer comes with 2 MB of RAM. However, you can install an internal 2 MB module for a total of 4 MB of memory, or a 6 MB module for a total of 8 MB of memory.

The computer has 640 kB of standard memory and 1408 kB of extended memory. Depending on the requirements of the operating system and the applications you run, you can configure extra memory you add as extended or expanded memory, using a software expanded memory driver.

Perform the following steps to install the RAM module.

1. Turn off the computer and unplug the power supply.

CAUTION

You must turn off the computer before attempting to install the RAM. Otherwise, you may damage your computer.

2. Turn over the computer so the bottom is accessible.

3. Use a Phillips-head screwdriver to remove the two screws from the RAM module cover, as shown in Figure B-1.

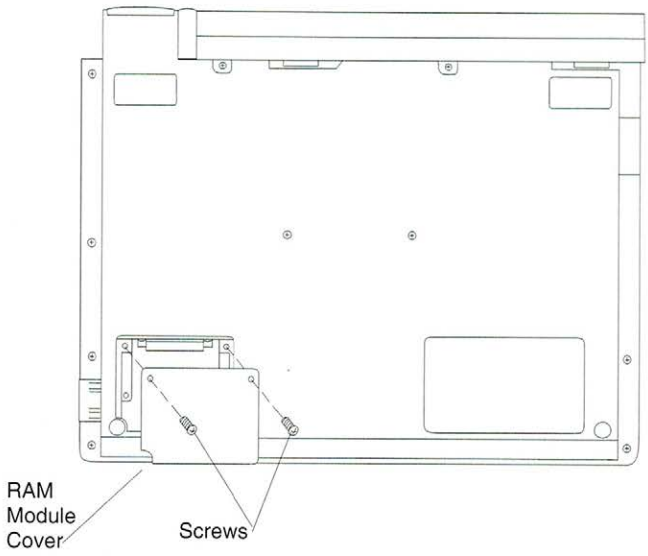


Figure B-1. Removing the RAM Module Cover

4. Lift out the RAM module cover from the bottom of the computer.

CAUTION

Prior to installing the RAM module, touch the metal plate inside the computer with one hand while holding the RAM module in the other hand. This will safely discharge any static charge that may be built up on your body or on the module prior to its installation.

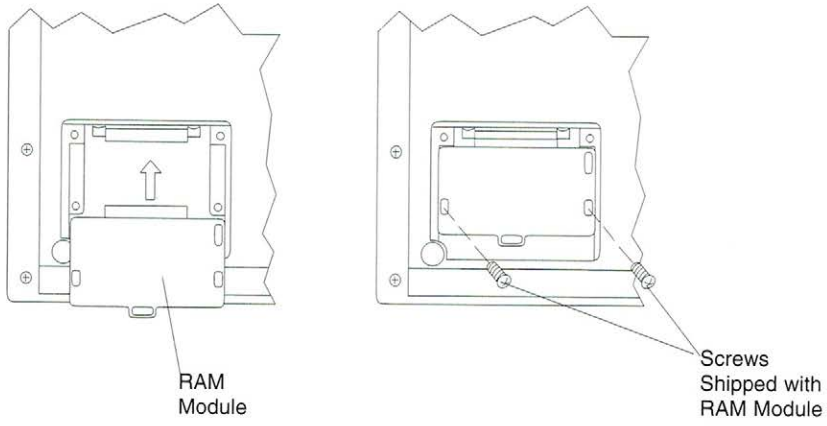


Figure B-2. Installing the RAM Module

5. Position the RAM module so the arrow on the connector is toward the inside of the computer. Install the module by pushing it into the slot until it snaps into position.

6. Install the two screws that were in the box with the RAM module into the positions shown in Figure B-2.

7. Replace the RAM module cover; refer to Figure B-1. Replace the two screws removed in Step 3.

8. Connect the power supply (if you are using one) and turn on the computer.

APPENDIX C: TECHNICAL INFORMATION

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

System Memory

Main memory for the GRiD Convertible computer is two 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 EMS page frame, the BIOS, and other system functions. The first one megabyte of system memory is allocated as shown in Figure C-1.

The starting address of the 64 kB EMS page frame is located at C0000h.

The additional system memory can be used as EMS memory when you install the EMS device driver. Refer to the section Using Expanded Memory, beginning on page 8-3, for more information on using EMS memory.

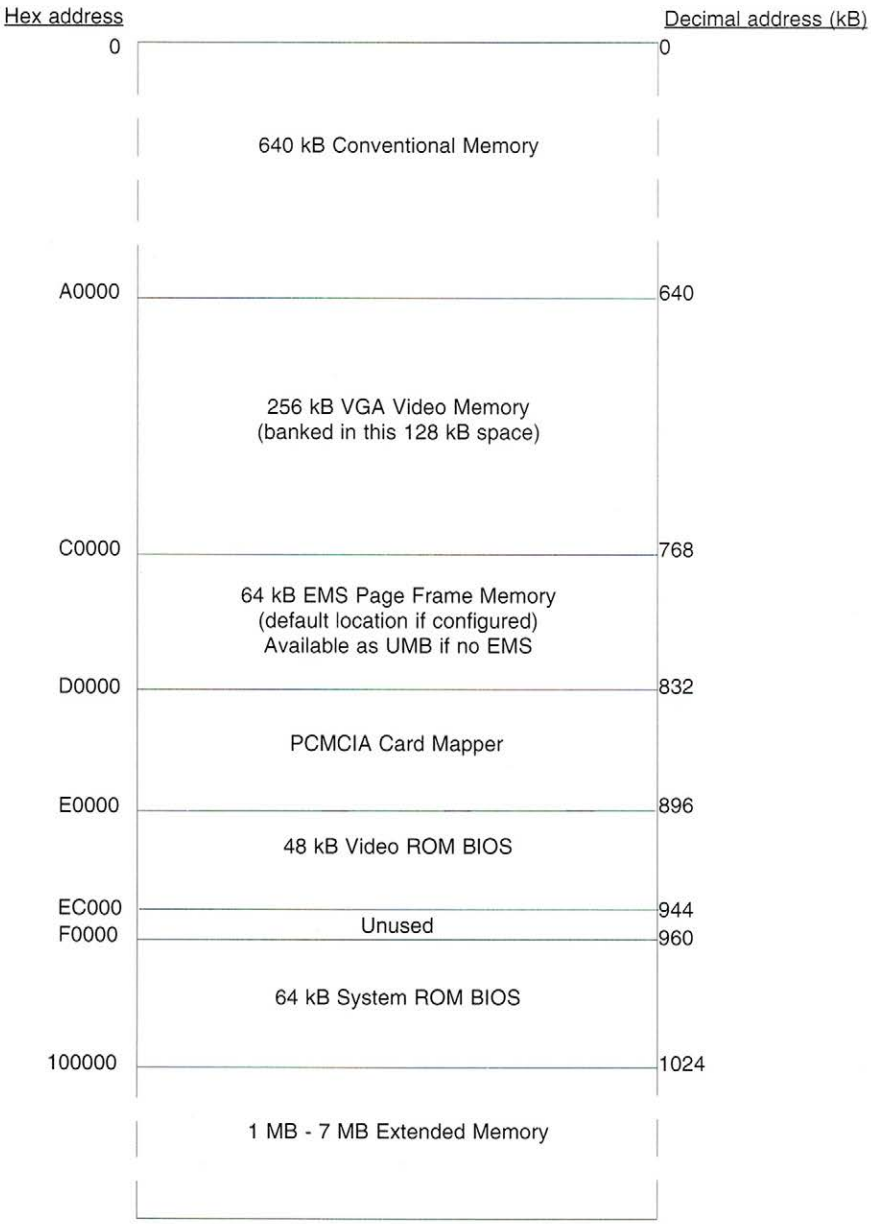


Figure C-1. Memory Map

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.

Power Connector

The power connector is an 8-pin round connector. It is used to connect the power supply to the computer using the power cable.

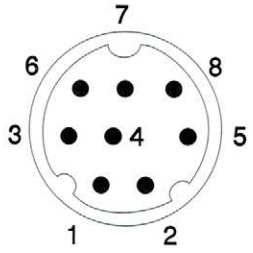


Figure C-2. Power Connector Layout

Table C-1. 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~

Telephone Connector

Computers equipped with an optional internal modem 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 C-3 shows the telephone connector and Table C-2 gives the pinouts for the telephone connector.

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

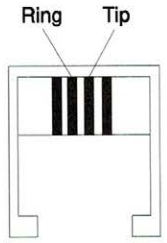


Figure C-3. Telephone Connector

Table C-2. 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

The serial port is a 9-pin D-shaped RS-232C connector. 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 com*n*** and **config serial**. Refer to the MS-DOS Quick Reference in Chapter 8 and the description of the **config serial** command on page 9-23, for further information.

Figure C-4 shows the Serial connector and Table C-3 gives the pinouts for the Serial connector.

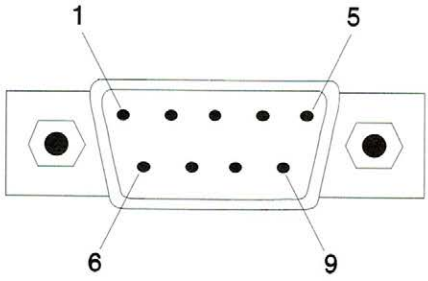


Figure C-4. Serial Connector

Table C-3. 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)

Parallel/Floppy Connector

The D-type 26-pin microminiature connector is used to connect the external floppy diskette drive. It also receives the printer adapter cable and provides a 25-pin D-type parallel connector.

Figure C-5 shows the Parallel/Floppy connector and Table C-4 gives the pinouts for the Parallel/Floppy connector.

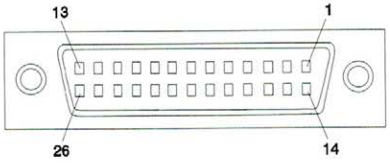


Figure C-5. Parallel/Floppy Connector

Table C-4. Parallel/Floppy Connector Pinouts

Pin	Signal - Floppy	Signal - Printer
1	Drive Select~	Strobe~
2	Motor On~	Data Bit 0
3	Step~	Data Bit 1
4	Data Write~	Data Bit 2
5	Write Gate~	Data Bit 3
6	Head Select	Data Bit 4
7	Low Density~	Data Bit 5
8	Low Density	Data Bit 6
9	Direction	Data Bit 7
10	Unused	Acknowledge~
11	Write protect	Busy
12	Unused	Paper End~
13	Disk Change	Select
14	Data Read~	Automatic Line Feed~
15	Unused	Error~
16	Track 00~	Initialize~
17	Index~	Select in~
18	Ground	Ground

Pin	Signal - Floppy	Signal - Printer
19	Ground	Ground
20	Ground	Ground
21	Ground	Ground
22	Ground	Ground
23	Ground	Ground
24	Parallel Port Key Low	No connect
25	Floppy Power	No connect
26	Floppy Power	No connect

Figure C-6 shows the Parallel connector on the printer adapter cable, and Table C-5 gives the pinouts for the parallel connector on the printer adapter cable.

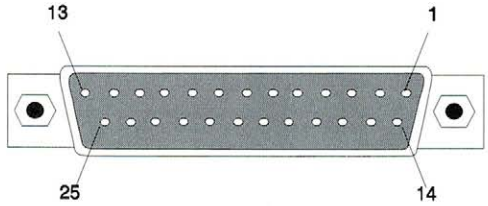


Figure C-6. Parallel Connector on Printer Adapter Cable

Table C-5. Parallel Connector Pinouts

Pin	Signal	Pin	Signal
1	Strobe~	14	Automatic Line Feed~
2	Data Bit 0	15	Error~
3	Data Bit 1	16	Initialize~
4	Data Bit 2	17	Select in~
5	Data Bit 3	18	Ground
6	Data Bit 4	19	Ground
7	Data Bit 5	20	Ground
8	Data Bit 6	21	Ground
9	Data Bit 7	22	Ground
10	Acknowledge~	23	Ground
11	Busy	24	Ground
12	Paper End~	25	Ground
13	Select		

Monitor Connector

The D-type 15-pin Monitor connector supplies analog video signals for an external VGA color video monitor and a composite monochrome signal for a VGA monochrome video monitor.

Figure C-7 shows the Monitor connector and Table C-6 gives the pinouts for the Monitor connector. Table C-7 lists the video modes supported for external monitors.

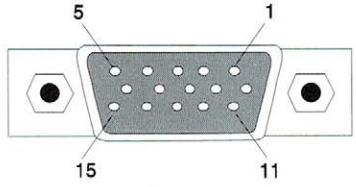


Figure C-7. Monitor Connector

Table C-6. Monitor Connector Pinouts

Pin	Signal
1	Red
2	Green
3	Blue
4	Monitor Type 1
5	Ground
6	Ground
7	Ground
8	Ground
9	Not connected
10	Ground
11	Monitor Type 2
12	Monitor Type 3
13	Horizontal Sync
14	Vertical Sync
15	Not connected

Table C-7. Video Modes for External Monitor

The GRiD Convertible supports all of the standard VGA video modes plus the following extensions.

Mode (Hex)	Resolution	Colors	Type	Supported on Panel?	Standard VGA Monitor?	Multi-sync Monitor?	Text Columns and Rows
40	900x390	16	Text	No	Yes	Yes	100x30
41	800x400	16	Text	No	Yes	Yes	100x50
42	800x480	16	Text	No	Yes	Yes	100x60
43	800x600	16	Text	No	No	Yes	100x75
50	1056x390	16	Text	No	No	Yes	132x30
51	1056x400	16	Text	No	No	Yes	132x50
52	1056x480	16	Text	No	No	Yes	132x60
53	640x480	16	Text	Yes	Yes	Yes	80x60
62	640x450	16	Graphic	Yes	Yes	Yes	80x28
63	720x540	16	Graphic	Yes	Yes	Yes	90x33
64	800x600	16	Graphic	No	No	Yes	100x37
70	360x480	256	Graphic	Yes	Yes	Yes	45x30

Interrupt Allocation

You may occasionally find it necessary to change interrupt assignments for the internal modem and the parallel port. Therefore, the PCIC interrupt configuration is provided in Table C-8.

Table C-8. PCIC Interrupt Configuration

Interrupt	Connection
IRQ15	Direct to 82360SL
IRQ14	No connect
IRQ13	Not supported by 82360SL
IRQ12	Direct to 82360SL
IRQ11	No connect
IRQ10	No connect
IRQ9	Direct to 82360SL
IRQ8	Not supported by 82360SL
IRQ7	Direct to 82360SL (shared with 82360SL parallel port LPT1)
IRQ6	Not supported by 82360SL
IRQ5	Direct to 82360SL (shared with 82360SL parallel port LPT2)
IRQ4	Multiplexed with internal modem and RS-232 ports
IRQ3	Multiplexed with internal modem and RS-232 ports
IRQ2	Not supported by 82360SL
IRQ1	Not supported by 82360SL

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