

GRID[®]

GRiDCASE 1550sx

User's Guide

GRiDCASE 1550sx User's Guide

October 1991

AST ENDUSER & SUPPORT 1-800-727-1278

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

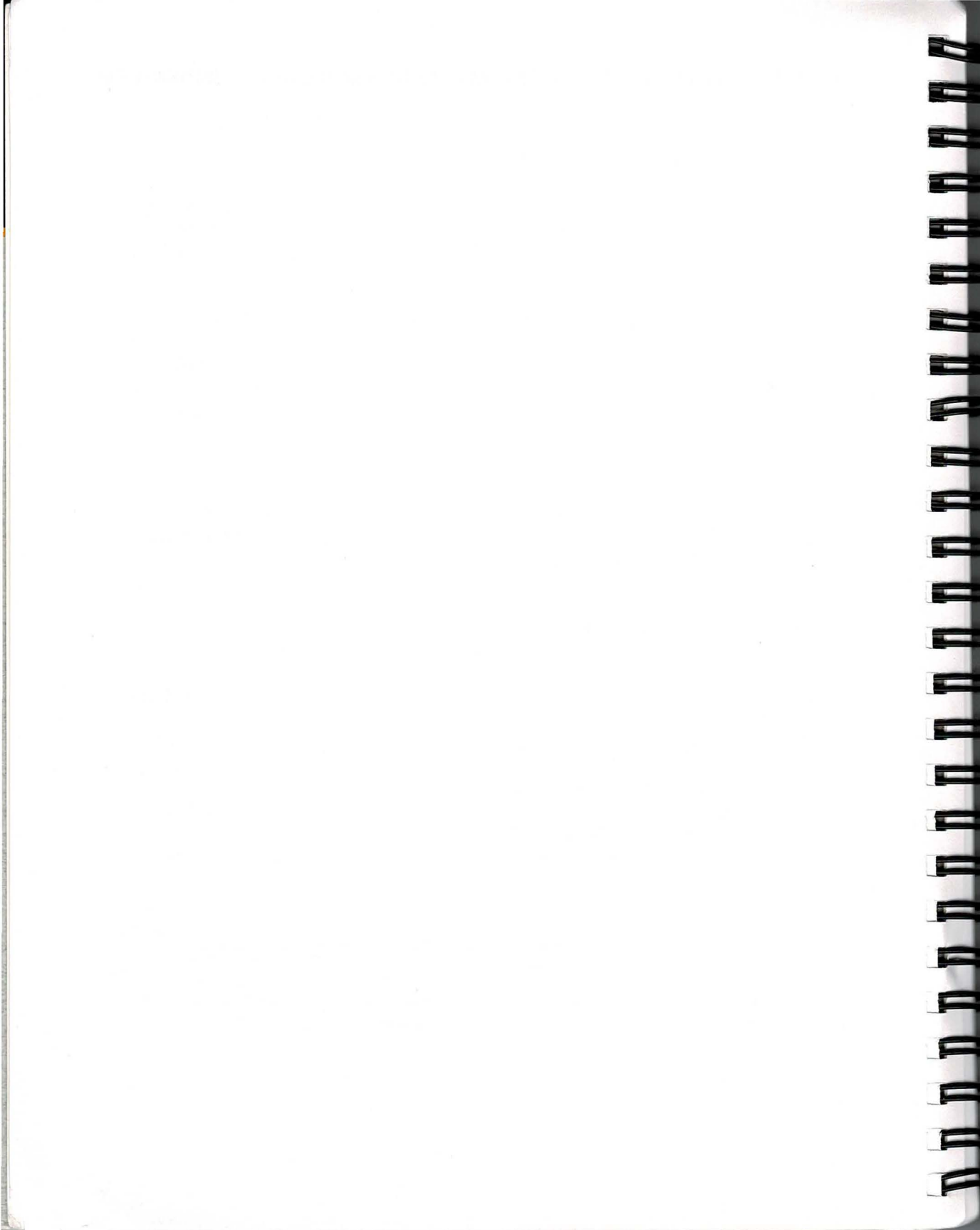
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio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

- 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.
- Ensure that shielded cables are used where required and that cables are properly connected.
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an electrical outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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 Department of Communications (CDC) Statement

This device 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.



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ABOUT THIS BOOK

This manual describes how to operate the GRiDCASE[®] 1550sx[™] computer, from GRiD[®] Systems Corporation. It shows you how to set up your GRiDCASE 1550sx computer, and includes detailed information about how to use all of the computer controls, connectors, and other features.

To begin using your GRiDCASE 1550sx computer, read the step-by-step setup instructions given in Chapter 1.

Manual Organization

This manual is organized as follows:

Chapter 1 explains how to set up and begin using your GRiDCASE 1550sx computer. Read this chapter first.

Chapter 2 thoroughly describes the GRiDCASE 1550sx computer. Every part of the computer is identified and explained.

Chapter 3 describes all of the built-in options that are available for the GRiDCASE 1550sx computer. If you ordered any built-in options for your computer, they are described here.

Chapter 4 describes the options that are available to power your computer.

Chapter 5 describes the use of the internal diskette and the hard disk drives.

Chapter 6 describes the external diskette and tape drives that are available for use with the GRiDCASE 1550sx computer and explains how to connect them.

Chapter 7 explains how to use the Isopoint control bar.

Chapter 8 provides troubleshooting information and explains what to do if you have problems with the computer.

Chapter 9 contains important safety information and describes how to care for and maintain the computer.

Chapter 10 explains how using GRiD MS-DOS on the GRiDCASE 1550sx computer is different from using MS-DOS on other computers. Information also is provided on how to move your application programs and other files to the GRiDCASE 1550sx computer.

Appendix A gives the GRiDCASE 1550sx computer specifications, **Appendix B** shows the keyboard layouts for different national keyboards, and **Appendix C** provides a 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* (Order number: 965800-00), for information on using an optional internal modem and the modem command set.
- *MS-DOS Version 5.0 User's Guide* (Order number: 029570-40), the *MS-DOS Version 5.0 Reference Manual* (Order number: 029570-41), and the *MS-DOS Version 5.0 Supplement* (Order number: 029570-42), for reference information on using MS-DOS.
- *GRiDCASE 1550sx Service Manual* (Order number: 001550-60) for information on diagnostics and repair of the GRiDCASE 1550sx computer.
- *GRiDCASE 1550sx Technical Reference* (Order number: 001550-50) for technical information on the GRiDCASE 1550sx computer.
- *Model 3401 High Density 3½-Inch Pocket Diskette Drive Owner's Manual* (Order number: 003401-40), for information on setting up and operating the external 3.5-inch pocket floppy diskette drive.

- *Model 3402 5¼-Inch Pouch Diskette Drive Owner's Manual* (Order number: 003402-40), for information on setting up and operating the external 5.25-inch double-density pouch floppy diskette drive.
- *Model 3403 40 MB Backup Tape System Owner's Manual* (Order number: 003403-40), for information on setting up and operating the external tape drive.
- *Model 3404 High Density 5¼-inch Pouch Diskette Drive Owner's Manual* (Order number: 003404-40), for information on setting up and operating the external 5.25-inch high-density pouch floppy diskette drive.
- *Model 32162 External Attachable Battery User's Guide* (Order number: 032162-40), for information on using and recharging the external attachable battery pack.
- *GRiDCASE Attachable CD-ROM System User's Guide* (Order number: 003406-40), for information on setting up and operating the attachable CD-ROM system.
- *GRiDCASE 1550sx Expansion Chassis System User's Guide* (Order number: 034115-40), for information on setting up and operating the three-slot expansion chassis.
- *GRiDCASE 1550sx One-Slot Expansion Chassis System User's Guide* (Order number: 034105-40), for information on setting up and operating the one-slot expansion chassis.
- *GRiDCASE 1500 Series Expansion Chassis System Owner's Guide* (Order Number: 034101-40), for information on setting up and operating the five-slot expansion chassis.
- *FaxTalk™ Plus User's Guide* (Order Number: 023140-40), for information on using FaxTalk software with the fax modem.

Notational Conventions

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

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

Occasionally, multi-key operations, such as “press **Fn-F1**,” 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 **Fn-F1**,” you should press the **Fn** key and, while holding it down, press and release the **F1** 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.

CHAPTER 1: GETTING STARTED

This chapter describes how to prepare your GRiDCASE 1550sx computer for use. It covers checking the contents of the shipping box, setting up the computer, starting up (booting) the operating system, setting a password, and closing the computer for travel.

Checking the Contents of the Box

The parts included in the computer shipping carton are shown in Figure 1-1. Unpack the computer from its shipping materials.

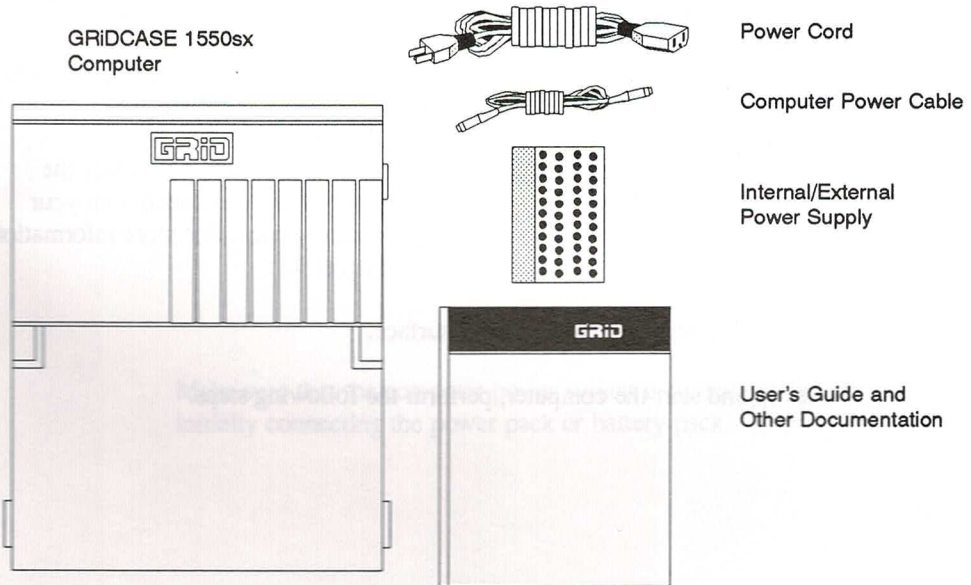


Figure 1-1. Contents of the Box

NOTE: If you ordered a GRiDCASE 1550sx computer with Option 528 (the removable hard drive), the hard drive and case and a diskette will also be included in the shipping box. Refer to Chapter 5 for more information on the removable hard drive.

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 5003, Fremont, California 94537-5003, for further information. Outside the U.S., contact your local GRiD Systems representative or distributor.

Keep the shipping carton and all original packing materials in case you need to return your GRiDCASE 1550sx computer for upgrading or servicing. Do not ship the computer to GRiD Systems until you have received prior authorization from the GRC or your GRiD Systems representative.

Getting Started

This section explains how to get your computer up and running quickly.

MS-DOS has already been installed for you on the internal hard disk. If you have ordered a different operating system, you must install it yourself.

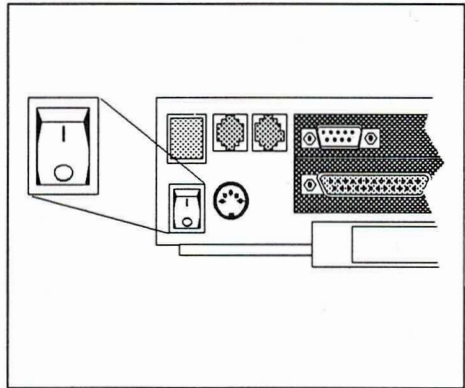
You should have on hand the power supply you plan on using to power the computer. This can be the internal/external power supply included with your computer or the optional internal or external battery pack. For more information on power options for your computer, refer to Chapter 4.

Begin by clearing a sturdy, flat work surface.

To set up and start the computer, perform the following steps.

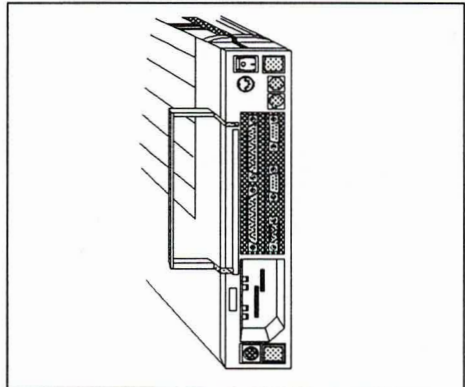
1. **Make sure the power switch is off.**

The power switch is on the back of the computer at the far left as you face the rear of the computer. Press the bottom of this switch to turn off the computer.



2. **Pull down the computer's handle/leg (optional).**

You can use the leg to improve your viewing and/or typing angle. Pivot the leg down 90 degrees to act as a stand. Rest your computer on this leg by placing the leg on your work surface.

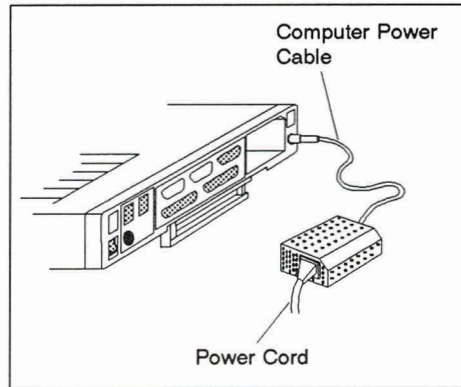


CAUTION

Make sure that the computer power switch is turned off before initially connecting the power pack or battery pack.

- 3a. **If you are using the power supply externally, connect it to the computer and plug it in.**

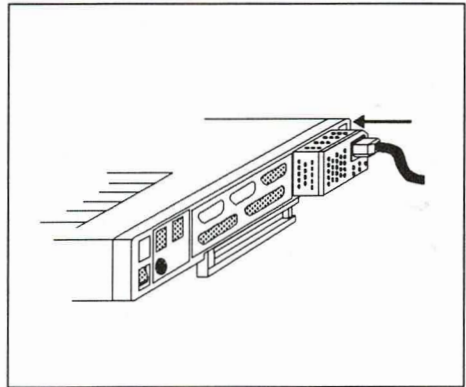
The power supply has a standard power cord and a computer power cable. Plug one end of the computer power cable into the DC Input connector on the back of the computer and the other end into the power supply. Then plug one end of your power cord into the power cord socket on the power supply. Plug the other end into a wall outlet that accepts a three-prong grounded plug. If you use a two-prong plug adapter, make sure it is properly grounded.



NOTE: The computer power cable has locking connectors on both ends. These special connectors prevent the cable from accidentally becoming detached from the power supply or the computer. To release the connector, hold the flat part of the cable where the arrow is located and gently pull the cable until it comes out.

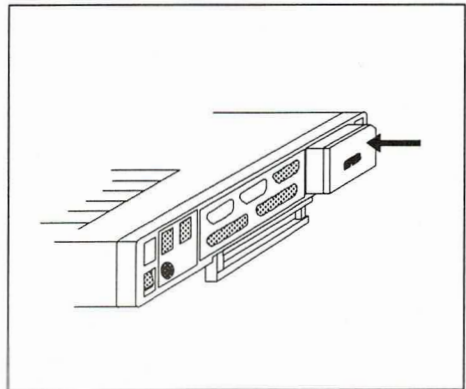
- 3b. **If you are using the power supply internally, insert it into the computer.**

Hold the power supply with the power cord socket facing you. Plug one end of the power cord into the power cord socket on the back of the power supply. Insert the power supply into the power pack slot on the back of the computer until it clicks into place. Then plug the other end of the power cord into a wall outlet that accepts a three-prong plug. If you use a two-prong plug adapter, make sure it is properly grounded.



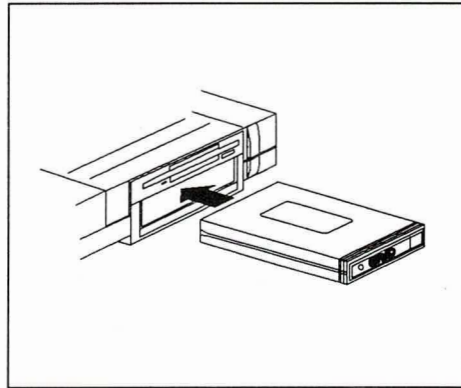
- 3c. **If you are using the battery pack, insert it into the computer.**

Hold the battery pack with the label facing you. Insert it into the power pack slot on the back of the computer until it clicks into place.



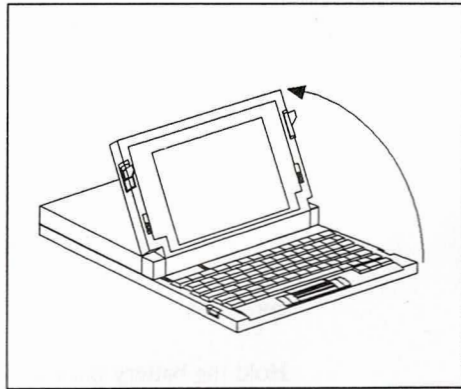
4. **If your computer has a removable hard drive, insert the hard drive.**

Hold the removable hard drive at the end with the label and insert the hard drive into the hard drive slot. Refer to Chapter 5 for additional information on installing and removing the hard drive.



5. **Lift up the computer screen.**

The screen is locked in the closed position by one latch on each side. Pull these latches toward you and lift the screen.

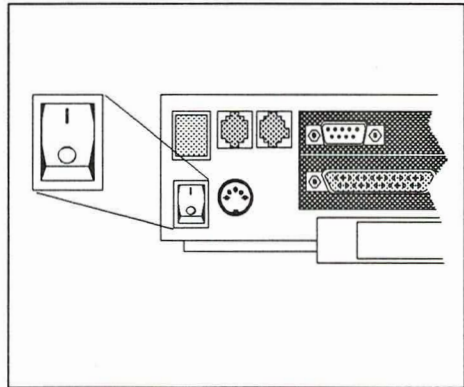


CAUTION

The screen must be treated with care. Never use abrasive substances on the screen. For complete information on cleaning the screen, refer to the section Cleaning the Computer on page 9-4.

6. Turn on the computer.

The power switch is located on the back of the computer. Press the top of this switch to turn on the computer.



When you turn on the computer, it loads the MS-DOS operating system into Random Access Memory (RAM) from the hard disk. This process takes a few seconds.

When the loading is finished, the initial operating system screen is displayed. If the screen is blank, adjust the contrast and brightness controls next to the display until the initial screen appears.

You may want to adjust the screen angle by tilting the screen to the desired position. Also, depending on the lighting conditions, you may need to adjust the brightness of the screen using the brightness control to the left of the screen. Units equipped with Liquid Crystal Display (LCD) screens also have a contrast control immediately to the right of the screen. Push this switch up to increase screen contrast; push it down to decrease the contrast.

NOTE: Increasing the brightness of the computer screen will increase power consumption and, therefore, decrease battery life.

If you want to connect other devices to your computer, such as a printer or floppy diskette drive, refer to Chapters 2 and 6.

CAUTION

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

GRiDCASE 1550sx computers contain low power circuits, which can be damaged by static discharge or transient voltage.

The hard disk in your computer is already formatted and contains all of the MS-DOS operating system files. You can start MS-DOS from the hard disk simply by turning the computer on.

If you should ever need to reload MS-DOS onto the hard disk, use the MS-DOS `sys` command to copy the operating system from a diskette to the hard disk (refer to the *MS-DOS Reference Manual* for details).

NOTE: Do not use any version of MS-DOS other than the one supplied by GRiD Systems for the GRiDCASE 1550sx computer. GRiD MS-DOS is designed to maximize battery life and contains several commands developed specifically for your computer.

Starting Up the Operating System (Booting)

Whenever you turn on the GRiDCASE 1550sx computer, it performs a RAM test and loads the MS-DOS operating system from the hard disk, or a diskette, 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**. 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. This device ordering is shown in Table 1-1. The computer first searches for the operating system software

on the hard disk, and if it does not find the software there, it looks on drive A (either the internal floppy diskette drive or an attached floppy diskette drive set as drive A).

NOTE: On systems equipped with one floppy diskette drive and a hard disk, the operating system is **always** loaded from the hard disk, unless you explicitly override the normal search sequence (see below). This is **unlike** most other IBM AT-compatible computers, which search for the operating system on floppy diskette drive A before looking on the hard disk.

You can override the order in which the computer searches devices and choose the device from which you want the computer to load the operating system software. To start from another device, press the key indicated in Table 1-1 after you turn on the computer and the beep sounds. For example, to start from an external floppy diskette drive on a system with both a hard disk and an internal floppy drive, you would turn on the power, wait for the beep to sound, and then immediately press **E**.

Refer to the *MS-DOS Supplement* for details on using an MS-DOS command to change the boot sequence.

Table 1-1. Order of Devices Searched During Booting

Device	Key
Hard Disk	H
Internal Floppy Disk	F
External Floppy Disk	E

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, your computer will not respond to normal input from the keyboard or pointing device.

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 supply 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.

To override the device search sequence during a warm restart, press the appropriate key indicated in Table 1-1 immediately after the computer beeps.

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 screen display mode, power control and device names for the serial and parallel ports and optional modem, the speed of the computer's microprocessor, and the status of the standby and auto-standby modes. In addition to these, there are several other configuration items.

Some of these features can be set using keystroke combinations—for details, refer to the section Special Function Keys, beginning on page 2-10. All configuration features can be controlled by using GRiD MS-DOS commands—refer to the *MS-DOS Supplement* for details.

Setting a Password

The GRiDCASE 1550sx 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 each time you turn on or restart the computer.

Refer to the *MS-DOS* Supplement for information on using the **setpass** command to set or change a password.

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 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.

Closing the Computer

To prepare your GRiDCASE 1550sx computer for travel, follow the steps listed below:

1. Save any files you are working on. Refer to the documentation for your application program for information on saving files.

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. Remove your working diskette from the internal diskette drive. Make sure the disk in-use light is off before removing the diskette.
3. Turn the computer power switch off.
4. Turn off any external devices connected to the computer.

5. Close the screen panel. Press it down gently until you hear it click shut.
6. Disconnect all cords and cables from the computer, and fold up the computer leg if you had it extended.

Your GRiDCASE 1550sx computer is now ready to move. Don't forget your peripherals, cables, diskettes, manuals, and any accessories you want to take with you.

CHAPTER 2: GETTING TO KNOW YOUR COMPUTER

This chapter introduces you to your GRiDCASE 1550sx computer, giving a detailed description of the top, front, side, and rear views of the computer.

The Top

The top view of the GRiDCASE 1550sx computer is shown in Figure 2-1. Note that the GRiD logo is on the top of the case, toward the rear, and the screen latches are on the sides, toward the front.

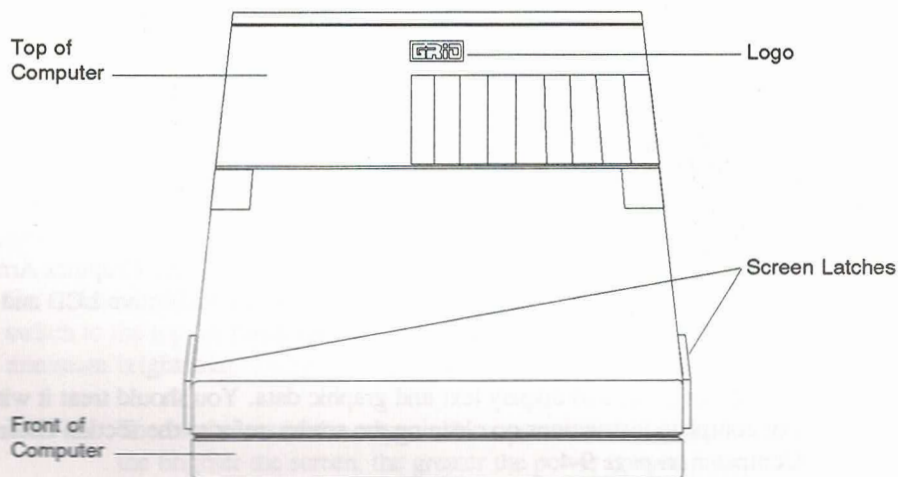


Figure 2-1. Top View

The Front

The front view of the GRiDCASE 1550sx computer is shown in Figure 2-2.

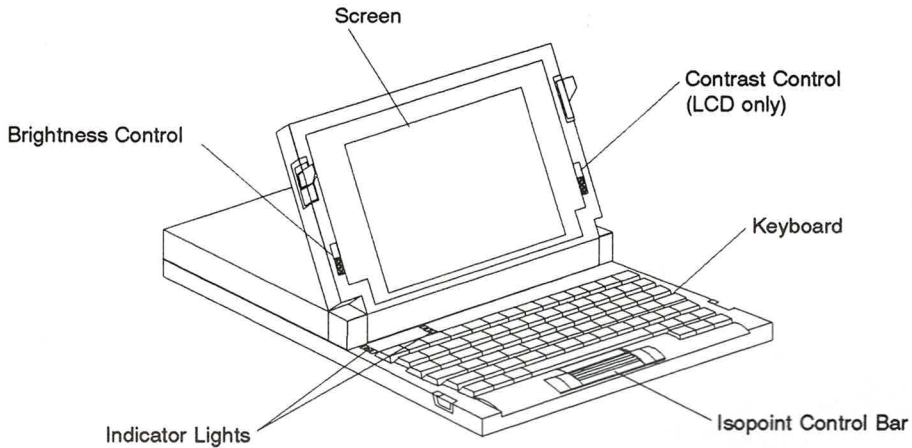


Figure 2-2. Front View

Screen

The GRiDCASE 1550sx computer is equipped with a Video Graphics Array (VGA) backlit LCD screen. Optional VGA backlit transfective LCD and VGA plasma screens are also available.

The screen is used to display text and graphic data. You should treat it with care. For complete instructions on cleaning the screen, refer to the section *Cleaning the Computer* on page 9-4.

The GRiDCASE 1550sx screen has a maximum resolution of 640 by 480 pixels and supports the VGA display standard. The LCD screen also supports Enhanced Graphics Adapter (EGA), Color Graphics Adapter (CGA), Hercules (MGA), and Monochrome Display Adapter (MDA).

Because the screen is monochrome, it uses shades of gray to represent different colors. This is known as color mapping. The LCD screen can display up to 64 different shades of gray simultaneously. The optional plasma screen can display up to seven different shades of gray simultaneously. For instructions on changing how colors are mapped to shades of gray, refer to the subsection Color on page 2-10.

You also can 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 2-24.

Contrast Control (LCD Screen Only)

The contrast control, at the right of the screen, controls the contrast of the LCD screen. This control increases the contrast of the screen when pushed toward the top of the screen, and decreases the contrast when pushed toward the bottom of the screen.

Brightness Control

The brightness control, at the left of the screen, controls the brightness or intensity of the screen.

On an LCD screen, this slide control adjusts the backlight. Push the brightness control all the way to the bottom position to turn the backlight off; push the control all the way to the top position for maximum brightness.

On a plasma screen, the brightness is controlled by a four-position switch; push the switch to the top for maximum brightness; push the switch to the bottom for minimum brightness.

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 brightness to conserve power when using a battery pack.

Indicator Lights

The six indicator lights above the keyboard near the left side of the computer are defined as follows:

- **Processor:** This indicator glows green when the microprocessor is running at slow speed. The GRIDCASE 1550sx is equipped with a dual-speed microprocessor. The 80386SX microprocessor ordinarily runs at 20 MHz; however, it can be slowed to 8 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-Speed**. To switch back to the faster speed, press **Fn-Speed** again.

This indicator flashes green when the computer is in standby mode. When the computer is in standby mode, the screen is blank and the computer appears to be off; this flashing indicator reminds you that it is in standby mode. Press the **spacebar** to exit standby mode.

- **Battery:** This indicator flashes red when the battery pack becomes nearly exhausted. At this point, you may have as little as two minutes of battery power remaining. You should immediately save any files you are working on and then either supply external power or put the computer into standby mode and change battery packs.

If the Battery indicator is flashing red and the Processor indicator is flashing green at the same time, this means that your computer is in low-power standby mode. The computer is in standby mode and the battery is so low that there is not enough power to exit standby mode and return to operating mode. You must connect external power or insert a charged battery pack before you can exit standby mode.

The Battery indicator flashes green when a battery pack is rapid-charging inside the computer, and glows steady green when a battery pack is charging normally. If you have a battery in the power pack/accessory slot and you connect the power supply externally, the power supply begins to recharge the battery pack. For more information about recharging the battery pack, refer to page 4-12.

- **Disk:** This indicator glows green when the hard disk drive is in use and orange when the floppy diskette drive is in use. (The indicator may appear orange-green if fast access to both drives is occurring.) This indicator also shows the status of the removable hard drive and is coordinated with the in-use light on the removable hard drive.

CAUTION

Do not turn off or move the computer or remove a diskette or the optional removable hard disk from the drive while the Disk indicator is lit. This could cause you to lose data stored on the disk.

- **Num Lock:** This indicator glows green when the keyboard is in NumLock mode. To put the keyboard into NumLock mode, press the **NmLk** key. In NumLock mode the numeric keypad embedded in the keyboard returns numeric values only; you cannot use the key's normal values. To turn NumLock off, press the **NmLk** key again.
- **Caps Lock:** This indicator glows green when the keyboard is in CapsLock mode. To put the keyboard into CapsLock mode, press the **CpLk** key. In CapsLock mode, all alphabetic keys return capital letters. To turn CapsLock off, press the **CpLk** key again.
- **Scroll Lock:** 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 2-3 shows the GRiDCASE 1550sx U.S. keyboard. The keyboard provides you with all of the functionality of the IBM AT 101-key keyboard. The keys marked in blue are used together with the **F_n** key to provide some functions.

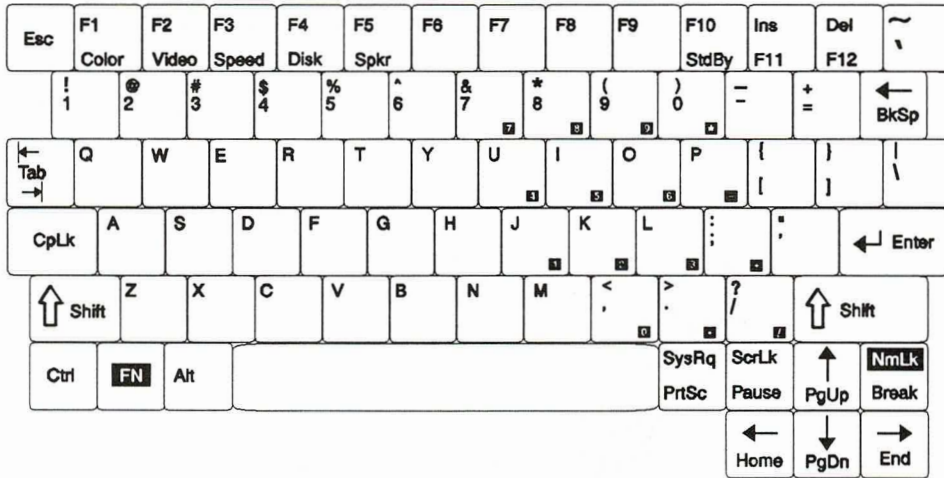


Figure 2-3. GRiDCASE 1550sx Keyboard

The six special functions marked in blue on keys **F1** through **F5** and **F10** are used to take advantage of some of the special features of your GRiDCASE 1550sx computer, such as changing the color mapping or processor speed. These are explained in the next section, Special Function Keys.

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 (in the lower left-hand corner 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. Refer to Appendix B for the layouts of other national keyboards.

Using the Numeric Keypad

To conserve space, the GRiDCASE 1550sx keyboard overlays the numeric keypad keys on the regular alphanumeric keyboard (see Figure 2-4).

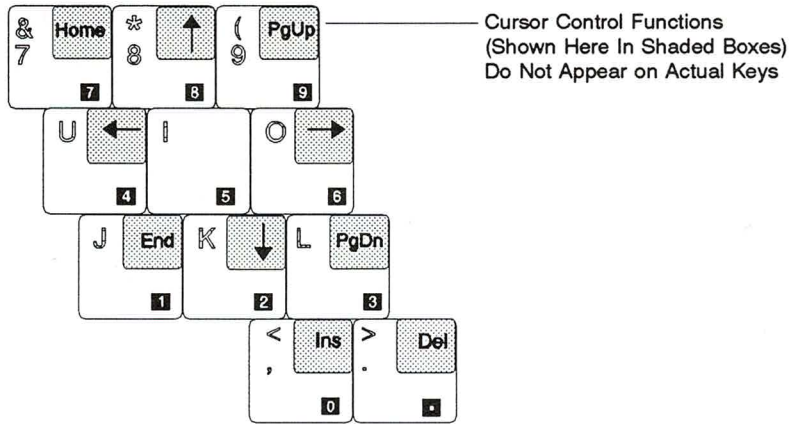


Figure 2-4. Numeric Keypad

To use the numeric keypad keys, you must first put the keyboard into NumLock mode by pressing the **NmLk** key. The Num Lock indicator light will come on.

While the computer is in NumLock mode, the numeric keypad keys return numeric values only. To return the keys to their alphanumeric values, press **NmLk** again.

Table 2-1 shows different ways of accessing numbers, cursor control functions, and alphanumeric characters, depending on whether or not the keyboard is in NumLock mode.

Table 2-1. Numeric Keypad Functions

Key Sequence	NumLock Off	NumLock On
Keypad key	Alphanumeric characters	Numbers
Fn-Keypad key	Cursor control keys	Alphanumeric characters
Shift-Fn-Keypad key	Numbers or Shift-Cursor control keys*	Shift-Alphanumeric characters
Shift-Keypad key	Shift-Alphanumeric characters	Cursor control keys

*Depends on the application

Table 2-2 lists IBM PC special keys and their GRiDCASE 1550sx equivalents, for keys that are different between the two computers.

Table 2-2. IBM PC Special Keys and GRiDCASE 1550sx Equivalents

Function Keys	
IBM Key	GRiDCASE 1550sx Key
F11	Fn-F11
F12	Fn-F12
Cursor Control Keys	
IBM Key	GRiDCASE 1550sx Key
End	Fn-End
Home	Fn-Home
PgDn	Fn-PgDn
PgUp	Fn-PgUp
Typewriter Keyboard Keys	
IBM Key	GRiDCASE 1550sx Key
Backspace	BkSp
Ctrl-Break	Fn-Break
Caps Lock	CpLk
Shift-Print Screen	Fn-PrtSc
Pause	Fn-Pause
Scroll Lock	ScrLk
Alt (left)	Alt
Alt (right)	Fn-Alt
Ctrl (left)	Ctrl
Ctrl (right)	Fn-Ctrl

Numeric Keypad Keys

IBM Key	GRiDCASE 1550sx Key
Num Lock	NmLk
Gray +	numeric keypad + (;)
Gray -	numeric keypad - (P)
Gray *	numeric keypad * (0)
Gray /	numeric keypad / (/)
Gray .	numeric keypad . (.)
Gray Enter	Fn-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 (.)
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 (.)
Del	Shift-numeric keypad . (.)

NOTE: Although the cursor control keys are not labeled on the GRiD 1550sx numeric keypad, the keys perform the same functions as on the IBM numeric keypad. When the keyboard is in NumLock mode, hold down the **Shift** key and press numeric keypad keys to access the cursor control keys. When the keyboard is not in NumLock mode, hold down the **Fn** key and press numeric keypad keys to access the cursor control keys.

Special Function Keys

There are six special function keys color-coded in blue on the keys **F1** through **F5** and **F10: Color, Video, Speed, Disk, Spkr, and StdBy.**

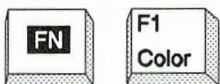
These function keys control special features of your GRiDCASE 1550sx computer. To use one of these keys, press **Fn** along with the key. The following sections describe these functions.

GRiD Systems also provides MS-DOS commands as an additional method of controlling these functions—refer to the *MS-DOS Supplement* for details.

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 set 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 seven 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 seventh 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. You can use MS-DOS commands to control screen contrast and color mapping—refer to the *MS-DOS Supplement* for details.

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

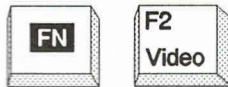


Pressing **Fn-Alt-Color** toggles the internal screen between dark characters on a light background and light characters on a dark background. This commonly is referred to as reverse video. In some cases, you may find reverse video to be more pleasing to look at than normal video.

Video

The **Video** key controls the video output of the computer. You can select the display used for your computer operation: the built-in screen or an external monitor. The displays cannot be used simultaneously.

The following key combination toggles the video output between the built-in screen and an external monitor:



By default, the computer video signal is sent to the built-in screen and data is displayed there. When you press **Fn-Video**, 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. Each time you press **Fn-Video**, the video output is toggled between the built-in display and an external display.

Speed

The **Speed** key controls the speed of the computer microprocessor. When you press the following keys, the microprocessor toggles between its fast (20 MHz) and slow (8 MHz) speeds:



The Processor 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.

Disk

The **Disk** key shuts off power to either the internal or the removable hard disk. This is useful for saving battery power when you are not using the hard disk. The hard disk is automatically turned on as soon as a disk access is required. When you press the following keys, the hard disk motor is turned off:



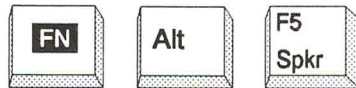
Spkr

The **Spkr** key controls the volume of the computer speaker. The speaker has four volume levels: high, medium, low, and off. The default setting is medium. When you press the following keys, the speaker volume is set to the next volume level, in the order listed. After the off setting, the speaker is set to high volume.



The speaker volume setting is saved when you turn off or restart the computer.

The following key combination controls the volume of the audible key click:



Whenever you press a key, the computer can make a clicking noise to let you know that a key was pressed. The key click has three volume levels: off, low, and high. Initially, the key click volume is turned off, but you can press **Fn-Alt-Spkr** to change to the next higher volume level. After the high setting, the key click volume is set to off again.

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 Processor indicator flashes green to remind you that the computer is in standby mode. To return to normal operation, press the **spacebar**; 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.

Isopoint Control Bar

The Isopoint control bar is a pointing device built into the front edge of the computer keyboard. This device is used like a mouse to control the pointer in graphical software. The Isopoint control bar emulates a Microsoft bus mouse.

For information on how to install the Isopoint driver software and operate the pointing device, refer to Chapter 7.

The Side

Figures 2-5 and 2-6 show the side view of the GRiDCASE 1550sx computer in various configurations.

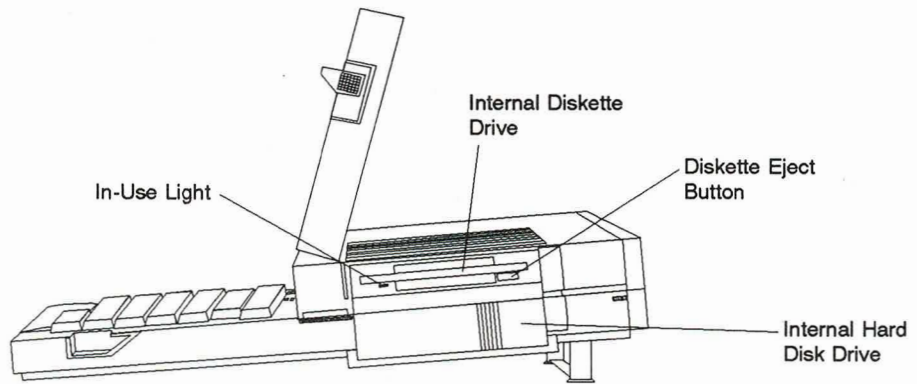


Figure 2-5. Side View of a GRiDCASE 1550sx Computer with a Floppy Drive and an Internal Hard Drive

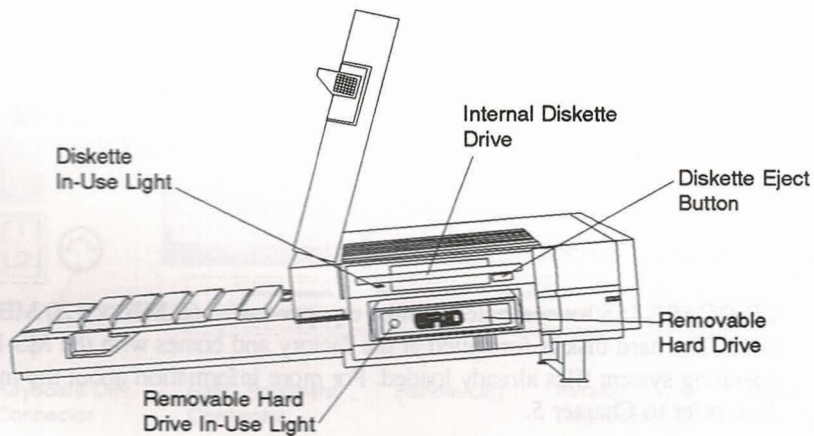


Figure 2-6. Side View of a GRiDCASE 1550sx Computer with a Floppy Drive and a Removable Hard Drive

Internal Diskette Drive

The internal diskette drive uses 3.5-inch double-sided, high-density floppy diskettes capable of storing 1.44 megabytes (MB) of data each. This drive also can read, write, and format double-density 720 kilobyte (kB) diskettes. For more detailed information about using the drive and about floppy diskettes, refer to Chapter 5.

Diskette Eject Button

The diskette eject button is located on the lower right corner of the internal diskette drive. Press this button to remove a diskette from the diskette drive. When you press the diskette eject button, the diskette pops part way out of the drive, allowing you to grasp and fully remove it.

In-Use Light

The in-use light is located on the lower left corner of the internal diskette drive. The in-use light is lit whenever the drive is accessing a file. The Disk indicator at the upper left of the keyboard also glows orange whenever the diskette in-use light is lit.

CAUTION

Never eject a floppy diskette when the in-use light is lit (unless you are prompted by the computer to do so). The in-use light indicates that file access is taking place. Ejecting the floppy diskette during file access can damage files.

Internal Hard Disk Drive

GRiDCASE 1550sx computers can be equipped with 60 MB or 120 MB hard disks. The hard disk is formatted at the factory and comes with the MS-DOS operating system files already loaded. For more information about the internal hard disk, refer to Chapter 5.

Removable Hard Disk Drive

GRiDCASE 1550sx computers can be equipped with 60 MB removable hard drives. The hard drive is inserted into the hard drive slot on the right side of the computer. The removable hard disk is formatted at the factory and comes with the MS-DOS operating system files and the removable hard disk driver already loaded. The in-use light on the removable hard drive is coordinated with the Disk indicator above the keyboard. For more information about the removable hard drive, refer to Chapter 5.

CAUTION

Never remove the removable hard drive when the in-use light is lit. The in-use light indicates that file access is taking place. Removing the hard drive during file access can damage files.

The Rear

The rear view of the GRiDCASE 1550sx computer is shown in Figure 2-7. Each item is explained on the following pages. To help you with setting up, a label containing all of the connector names appears on the handle/leg below the connectors.

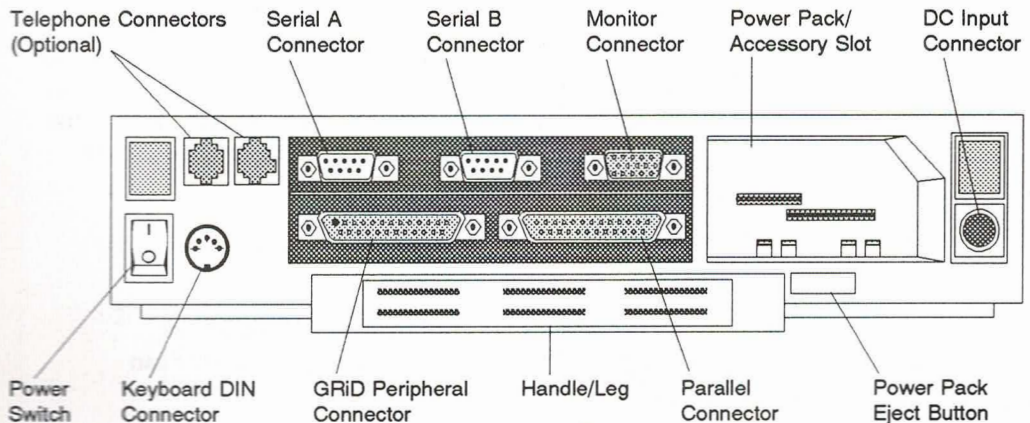


Figure 2-7. Rear View

NOTE: The GRiDCASE 1550sx computer has been FCC-certified under test conditions which include the use of SHIELDED cables between the computer and peripherals. 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 peripherals to your computer. Telephone cables do not require shielding.

Handle/Leg

The handle/leg contains a label identifying the connectors on the back of the computer. To use this mechanism as a leg, pivot it down away from the computer to a 90 degree angle. This props up the back of the computer to provide a more comfortable typing angle.

To use the handle, pivot the handle/leg up into its closed position and pull it straight out from the computer. It slides out a few inches to make a carrying handle. We recommend carrying the computer inside a carrying case for maximum protection.

Power Switch

The power switch turns on and off the computer. To turn on the computer, press the top of the switch (marked "I"). To turn it off, press the bottom of the switch (marked "O"). You also can use this switch to restart the computer. Refer to the section Warm Restart, on page 1-9, for more information about restarting the computer.

CAUTION

Never turn off the computer when the in-use light for any storage device is lit. The in-use light means that file access may be taking place; turning off the computer at this time can destroy data.

Use the power switch to turn off the computer rather than unplugging the power supply. When the power switch is left on but no power is supplied to the computer, the bridge battery continues to provide standby power to the GRiDCASE 1550sx until the bridge battery is fully discharged.

CAUTION

Turn off the power switch rather than unplugging the computer. Leaving the power switch on may result in the bridge battery being drained.

Keyboard DIN Connector

The keyboard 5-pin DIN connector connects the computer to an external IBM AT-compatible 101/102-key keyboard or a keypad. Refer to Appendix C for the pinouts for the keyboard connector.

Connecting a Keyboard or Keypad to the DIN Connector

You can connect an IBM AT 101/102-key keyboard, any other 100 percent AT-compatible keyboard, or a GRiD-supplied keypad to your GRiDCASE 1550sx computer by following the steps listed below.

1. Turn off the computer and any other external devices.

CAUTION

Before connecting or disconnecting a keyboard, keypad, or any other external device, turn off the power to both the computer and (if applicable) the external device. Failure to do so may damage your unit.

2. Plug the keyboard or keypad cord into the keyboard DIN connector on the back of the computer. The cord fits into the connector in only one way. Be sure to correctly match up the end of the cord with the connector pins.
3. Turn on any external devices, and then turn on the computer.

You can now use either the external keyboard or keypad, or the built-in computer keyboard.

Telephone Connectors (Optional)

Computers equipped with an internal U.S. modem have two telephone connectors. (Some computers using non-U.S. modems may have only one connector.) The telephone connectors let you access the optional internal modem. The connectors are standard modular jacks. The jack labeled LINE (on the right) is for the cord that ordinarily plugs into the back of your telephone. This is an 8-pin RJ-45C jack. The jack labeled PHONE (on the left) is for an optional cord to connect your telephone to the computer. This is a 6-pin RJ-12C jack. Both jacks accept the U.S. standard 6-pin RJ-11C modular telephone plug. Refer to Appendix C for the pinouts for the telephone connectors.

One jack connects the modem to the telephone system, and the other connects the modem to your telephone. If you use both jacks, you can switch back and forth between modem and telephone use without moving the cord from the modem to the telephone and vice versa. You cannot, however, use the modem and the telephone at the same time. For more information on using the internal modem, refer to the section Modem, on page 3-4, and refer to the *Internal Modem User's Guide*. For information about connecting the computer to the telephone line in the United Kingdom, refer to the *Internal Modem User's Guide*.

The modem initially is assigned the device name COM1. You can use an MS-DOS command to change the device name of the modem and to turn it on and off. Refer to the *MS-DOS Supplement* for more information.

Serial Connectors

The two 9-pin, RS-232C serial connectors allow you to connect your computer to external modems, serial printers, and other standard PC-compatible serial devices. Refer to Appendix C for the pinouts for the serial connector.

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

Serial port A initially is assigned device name COM2 and serial port B is assigned COM3. You can use MS-DOS commands to change the device names of the serial ports and to turn them on and off. Refer to the *MS-DOS Supplement* for more information.

Connecting An External Modem to the Serial Connector

You can connect any external modem that is compatible with the software you are using (using a Model 6400 serial cable) to either of the serial connectors on the rear panel of the computer. Refer to the manual that accompanies the software for the correct switch settings for your modem.

After the switches are set, you are ready to connect your modem to the computer. Perform the following steps.

1. Turn off the computer, modem, and any other peripherals.

CAUTION

Before connecting or disconnecting a modem or any other external device, turn off the power to both the computer and the external device. Failure to do so may damage your unit.

2. Attach the Model 6400 serial cable to the serial connector on the back of your modem.
3. Attach the other end of the cable to one of the serial connectors on the back of the computer.
4. Plug in the power cord from the modem into a wall outlet.
5. Turn on the modem (and any other peripherals), and then turn on the computer.

Connecting a Printer to the Serial Connector

You can connect a serial printer to either of the serial connectors on the rear panel of the computer. Refer to the printer manual to select the cable recommended for an IBM AT or compatible computer.

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 serial printer to the computer, perform the following steps.

1. Turn off the computer, the printer, and any other peripherals.

CAUTION

Before connecting or disconnecting a printer or any other external device, turn off the power to both the computer and the external device. Failure to do so may damage your unit.

2. Attach the serial cable to one of the serial connectors 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.

Parallel Connector

The parallel connector allows you to connect the computer to printers, plotters, and other standard PC-compatible parallel devices using a Model 6220 parallel printer cable. The trapezoidal or "D" shape makes an improper connection impossible. Refer to Appendix C for the pinouts for the parallel connector.

You can use the MS-DOS **mode lptn** command to change the characteristics for IBM-compatible printers connected to the parallel port. For instructions on using this command, refer to the *MS-DOS Reference Manual*.

You can use an MS-DOS command to change the device name (LPT1, LPT2, etc.) of the parallel port and to turn it on and off. Refer to the *MS-DOS Supplement* for more information.

NOTE: The parallel connector is physically similar to the GRiD peripheral connector. **Do not connect a GRiD external drive to the parallel connector.** A drive connected in this way will not work.

Connecting a Printer to the Parallel Connector

Read the previous section, Connecting a Printer to the Serial Connector. You must follow the same procedures before connecting a printer to the parallel connector. To connect a parallel printer to the computer, perform the following steps.

1. Turn off the computer, the printer, and any other peripherals.

CAUTION

Before connecting or disconnecting a printer or any other external device, turn off the power to both the computer and the external device. Failure to do so may damage your unit.

2. Attach the parallel printer cable to the parallel connector on the back of the computer.
3. Attach the other end of the parallel printer cable to the parallel 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.

GRiD Peripheral Connector

You can connect one of the following external devices to the GRiD peripheral connector on your GRiDCASE 1550sx computer (check with your GRiD Systems representative for new peripherals that may become available):

- Model 3401 3.5-inch Pocket Floppy Diskette Drive (1.44 MB)
- Model 3402 5.25-inch Pouch Floppy Diskette Drive (360 kB)
- Model 3403 40 MB or greater Backup Tape System
- Model 3404 High-Density 5.25-inch Pouch Floppy Diskette Drive (1.2 MB)

NOTE: The 3.5-inch pocket diskette drive receives its power through the GRiD peripheral connector. The 5.25-inch pouch diskette drives and the tape drive receive their power from their own power supplies.

Though this port looks like the parallel port, it supports only GRiD-supplied external diskette and tape drives. Refer to Appendix C for the pinouts for the GRiD peripheral connector. You cannot plug the cable for any other device into this connector—one of the pin holes not used by the drive cable connector is blocked to prevent an improper connection. Do not attempt to force any cable onto this connector. For more information on connecting an external drive, refer to Chapter 6.

CAUTION

Before connecting or disconnecting any external device, turn off the power to both the computer and the external device. Failure to do so may damage your unit.

Monitor Connector

The monitor connector allows you to connect an external monitor to the GRiDCASE 1550sx computer. The monitor connector is a 15-pin VGA monitor connector. Refer to Appendix C for the pinouts for the monitor connector.

Connecting an External Monitor to the Monitor Connector

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

1. Turn off the computer, the monitor, and any attached devices.

CAUTION

Before connecting or disconnecting a monitor or any external device, turn off the power to both the computer and 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.

NOTE: You cannot display data simultaneously on the built-in screen and on an external monitor. To switch back and forth between the built-in and external displays, press **Fn-Video**.

Power Pack/Accessory Slot

The internal/external power supply or battery pack fits into the power pack/accessory slot. Refer to Chapter 4 for a description of these items and how to use them.

This slot also contains the expansion bus connectors that allow you to add GRiDCASE expansion products to your computer. Expansion products include expansion cartridges that fit inside the slot. Additionally, the One-Slot Expansion Chassis System and the Expansion Chassis System use these connectors and can accommodate standard PC expansion cards. The CD-ROM interface cartridge, used with the Model 3406 Attachable CD-ROM System, also fits into this slot. Refer to Appendix C for the pinouts for the expansion connectors.

NOTE: Older style GRiD expansion cartridges have a flange that prevents the computer power cord from being plugged in. These cartridges need to be modified before they can be used in the GRiDCASE 1550sx computer. Contact your GRiD representative or the GRiD Resource Center for assistance.

The expansion bus connectors are accessible only when you power the computer externally.

Power Pack Eject Button

The power pack eject button, immediately below the power pack/accessory slot, ejects the battery pack, the internal/external power supply, or the expansion chassis I/O cable. (Expansion cartridges are equipped with their own pull knobs for easy removal from the power pack/accessory slot.)

CAUTION

Always save your work and turn the computer off or put it into standby mode before ejecting the battery pack or power supply from the power pack slot; any data in main memory (RAM) is lost if there is no other source of power to the computer and it is not in standby mode.

Also, never remove the battery pack or power supply when the in-use light for any storage device is lit. The in-use light means that file access may be taking place; removing power at this time can destroy data.

DC Input Connector

The dc input connector accepts the plug from the internal/external power supply, the attachable battery pack, or the optional cigarette lighter adapter cable. Refer to Appendix C for the pinouts for the dc input connector. Refer to Chapter 4 for details on power options.

The dc input connector is a locking connector. This prevents the power cable from accidentally becoming detached from the computer. To release the connector, hold the flat part of the power cable where the arrow is located and gently pull the cable until it comes out.

CHAPTER 3: BUILT-IN OPTIONS

This chapter describes the built-in options available from GRiD Systems Corporation to enhance the performance of your GRiDCASE 1550sx computer. Built-in options are those options that are installed at the factory and include the display, system RAM, disk drives, modems, and coprocessor.

The Built-in Options

The built-in options available for the GRiDCASE 1550sx computer are summarized in Table 3-1. Each option is described in greater detail following the table.

Table 3-1. Built-in Options Available for the GRiDCASE 1550sx Computer

Option Name and Option Number	Description
Display:	
VGA Plasma Display Option 505	This display replaces the standard backlit VGA LCD screen and provides a 640-pixel by 480-pixel light-emitting VGA gas plasma screen.
VGA Transflective Display Option 506	This display replaces the standard backlit VGA LCD screen and provides a 640-pixel by 480-pixel backlit transflective VGA screen.
System RAM:	
4 MB System RAM Option 511	4 MB of main memory in place of the standard 2 MB.
8 MB System RAM Option 513	8 MB of main memory in place of the standard 2 MB.

Option Name and Option Number	Description
Mass Storage:	
Floppy Disk and 60 MB Hard Disk Option 524	60 MB internal hard disk drive comes with internal floppy diskette drive.
Floppy Disk and 120 MB Hard Disk Option 525	120 MB internal hard disk drive comes with internal floppy diskette drive.
Floppy Disk and 60 MB Removable Hard Drive Option 528	60 MB removable hard disk comes with internal floppy diskette drive.
Modems:	
U.S. V.42bis 2400 bps Option 531	Internal Hayes-compatible modem with V.42 and MNP Levels 2 through 4 error correction and V.42bis and MNP Level 5 data compression.
U.K. MNP 2400 bps Option 533	Internal Hayes-compatible modem with MNP Levels 2 through 4 error correction and MNP Level 5 data compression for use in the United Kingdom.
U.S. V.42bis 2400 bps/FAX Option 535	Same as Option 531 plus 9600 bps send/receive Group III facsimile.
U.S. V.32bis/V.42bis 14,400 bps/ FAX Option 538	Internal Hayes-compatible modem with V.42 and MNP Levels 2 through 4 error correction, and V.42bis and MNP Level 5 data compression, plus 9600 bps send/receive Group III facsimile.
Coprocessor:	
80387SX Numeric Coprocessor Option 541	Provides faster operation for math-intensive applications (for example, spread sheets, vector graphics, etc.).

Display

A VGA backlit transfective display is available in place of the VGA backlit LCD display. Transfective displays provide enhanced viewing in sunlight. The VGA transfective display measures 10 inches diagonally. Its resolution is 640 by 480 pixels, and its aspect ratio is 1:1.

A VGA gas plasma display is also available in place of the VGA backlit LCD display. Gas plasma displays, unlike LCDs, are light emitting and may therefore be more appropriate when ambient lighting conditions are poor or variable. The VGA gas plasma display measures 10 inches diagonally. Its resolution is 640 by 480 pixels, and its aspect ratio is 1.1:1. The display has a contrast ratio of 20:1.

System RAM

The GRiDCASE 1550sx computer is available in 2 MB (standard), 4 MB, and 8 MB system RAM configurations. RAM above 1 MB can be configured as either extended memory or LIM EMS (Lotus/Intel/Microsoft Expanded Memory Specification) 3.2 memory. Refer to the *MS-DOS Supplement* for details on configuring the GRiDCASE 1550sx memory using an MS-DOS command.

Mass Storage

The internal hard disk options provide 60 MB or 120 MB of nonvolatile storage. Hard disks come formatted and contain all of the MS-DOS operating system files. Each option also includes a 3.5-inch high-density (1.44 MB) floppy diskette drive.

The removable hard drive option provides 60 MB of storage. Hard drives come formatted and contain all of the MS-DOS operating system files as well as the driver for the removable drive. The option also includes a 3.5-inch high-density (1.44 MB) floppy diskette drive.

NOTE: All removable drives being used in the same computer must have the same version of MS-DOS.

Numeric Coprocessor

An 80387SX numeric coprocessor is available for the GRiDCASE 1550sx 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 and/or required.

Modem

Internal modems are available for GRiDCASE 1550sx computers for several countries; contact your GRiD Systems sales representative for information. The internal modem transmits and receives data through the telephone system. Because the modem resides inside the computer, it provides greater convenience than an external modem when you are traveling or moving your equipment. The internal modem operates through most standard telephone systems in the U.S., Canada, or the U.K.

The optional V.42bis 2400 bits-per-second (bps) modem can both transmit and receive data at 300, 1200, or 2400 bps. It also provides V.42 and Microcom Networking Protocol (MNP) Levels 2 through 4 error detection and correction and V.42bis and MNP Level 5 data compression to ensure that data is exchanged quickly and error-free. The modem operates with the industry-standard set of AT commands.

The V.32bis/V.42bis 14,400 bps modem includes all of the features of the V.42bis 2400 bps modem. It can also transmit and receive data at 14,400 bps.

Both the 2400 and 14,400 bps modems are also available with optional Group III facsimile capability to send and receive fax documents at 9600, 7200, 4800, or 2400 bps. Both models are EIA-578 Class 1 compatible so they can be used with a variety of fax software packages.

An MNP modem is also available for use in the United Kingdom. This host complies with the conditions set out in the General Approval granted to GRiD Computer Systems Limited.

Connecting the Telephone Line

Assuming your telephone uses a standard, plug-in modular jack, your telephone cord plugs directly into the telephone connector on the back of the computer. Most offices and residences now use the standard plug-in jack connector. If you have a different kind of telephone connector, refer to the next section, *Alternative Telephone Connections*.

NOTE: The modular jacks and plugs used on most telephones in the United States are 6-pin RJ-11C connectors. The GRiDCASE 1550sx internal modem has one 6-pin RJ-12C jack and one 8-pin RJ-45C jack for compliance with international standards. Both of these jacks accept RJ-11C plugs and are compatible with them. Refer to Appendix C for the pinouts for the jacks.

To connect a GRiDCASE 1550sx computer to the telephone system, unplug the cord from the back of your telephone and plug it into the LINE telephone connector on the back of the computer (see Figure 3-1). For information about connecting the computer to the telephone line in the United Kingdom, refer to the *Internal Modem User's Guide*.

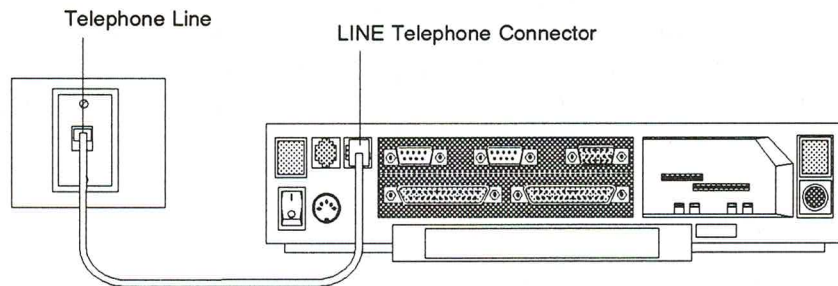


Figure 3-1. Computer Connected to Telephone System

To use your telephone while your computer is connected to the same telephone line, you will need another telephone cord. Connect the computer to the telephone line and then use the second telephone cord to connect the telephone to the PHONE telephone connector, as shown in Figure 3-2 (U.S. and Canada only).

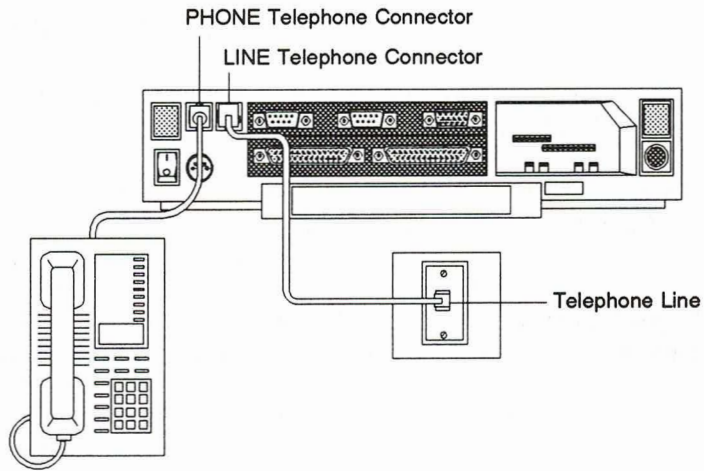


Figure 3-2. Computer and Telephone Connected to Telephone System (U.S. and Canada)

With the appropriate software, you can use the same telephone line either to speak on the telephone or to transmit and receive data from another computer. However, you cannot talk and send data at the same time.

NOTE: The computer modem will not function with digital 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 jacks on the computer. If you are unsure whether your internal modem will work with your PBX telephone system, contact your local GRiD representative.

Alternative Telephone Connections

Some telephone systems 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 connector.

Some older telephone systems use four-prong connectors. These require an adapter available from any electronics store. (One such adapter is the Radio Shack Model 279-351, which is available in the U.S.)

Some offices use large Amphenol connectors for telephones 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 adapters which are available in the U.S.)

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. The following couplers are available:

- The Konexx Modem Connection Adapter (GRiD Model 34022), which allows direct electronic connection to telephones not equipped with modular connectors. This adapter plugs into the handset jack on the telephone base and supports both voice and data modes, all baud rates, and several different types of telephones.
- The GRiD Acoustic Modem Adapter (GRiD Model 32180), which attaches to almost any size and shape handset. This adapter supports 300 bps communications and, in many cases, can be used in 1200 bps or faster communications if the telephone line quality is good.
- The Black Jack (from the Microperipheral Corporation), which attaches to telephone handsets with round mouthpieces that can be unscrewed. This adapter supports communication speeds up to 1200 bps.

There are also many models of acoustic couplers available with built-in modems. These attach to the serial connectors of the computer. Most can transmit at 300 bps, and some can transmit at 1200 bps. These are available at many computer stores.

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 in the telephone line.

The modem initially is assigned the MS-DOS device name COM1. You can use MS-DOS commands to change the device name of the modem, to turn it on and off, and to change other operating parameters—refer to the *MS-DOS Supplement*. Refer to the *Internal Modem User's Guide* for more information on controlling the modem.

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

The *FaxTalk™ Plus User's Guide* describes the FaxTalk software used for sending and receiving facsimiles with the FAX-capable modems.

CHAPTER 4: POWERING YOUR COMPUTER

This chapter describes standby mode, the options available for powering your GRiDCASE 1550sx computer, and other power considerations.

Important Safety Instructions

This computer is intended to be electrically grounded when connected through its power pack to an external source of power.

The power pack is equipped with a three-wire grounding-type power receptacle and is supplied with a mating power cable that has a plug at each end. Both plugs have a third (grounding) pin that 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 plugs.

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 one of the power management features of your GRiDCASE 1550sx computer. In standby mode, all computer systems are turned off, except for the system Random Access Memory (RAM). Because the computer system RAM continues to receive power, your application and work files are maintained exactly as you left them. All other computer systems are turned off, so battery usage is reduced by over 95 percent.

When your computer is in standby mode, the screen goes blank and the computer appears to be off, but your work is preserved. The Processor indicator light flashes green to remind you that your computer is in standby mode. We recommend that you save the file you are working on before putting the computer into standby mode.

NOTE: Standby mode operates with most software, but does not operate with some types of applications and operating environments written especially for 386 computers. For example, standby cannot be used when Windows 3.0 is running in its standard or enhanced modes.¹

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.

¹ The standby feature operates only when the 80386 microprocessor is running in real mode. If you are running software that uses the protected mode of the 80386 microprocessor, the computer will not enter standby. This protects you from losing data by preventing the operation of standby if the microprocessor is running in protected mode. Protected mode software takes direct control of the computer hardware, and therefore it cannot be saved in standby. Windows 3.0 in its standard or enhanced modes is a protected mode environment.

How to Enter Standby Mode

You can put your computer into standby mode in two ways:

- By pressing **Fn-StdBy**
- By using an MS-DOS command

GRiD MS-DOS provides several commands for putting your computer into standby mode—refer to the *MS-DOS Supplement* for details on using these commands.

Exiting Standby Mode

Press the **spacebar** on the internal keyboard to return to operating mode. There is a short delay of a few seconds while the hard disk spins up before you can begin using the computer. If you go into standby mode to change the battery or to conserve battery power while you are away from the machine, pressing the **spacebar** returns your files to the same status as they were when you entered standby mode.

Notes Regarding Standby Mode

- Standby mode has been tested with a wide range of "off-the-shelf" MS-DOS applications. Some MS-DOS applications may not work properly; some applications 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.
- 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 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 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 and low power standby features if you are using a non-MS-DOS operating system.
- The computer cannot enter standby mode if the 80386 microprocessor is in protected mode. This means that standby mode will not work with applications that run in protected mode such as Lotus 1-2-3 Release 3 or Windows 3.0 in standard or enhanced 386 modes, or any 386 memory managers that use protected mode such as EMM386 and QEMM.

Power Options

Table 4-1 summarizes the power options available for your computer. Each option is described in greater detail following the table. You may already have some of these items. If not, you may obtain any of these options by contacting your GRiD representative.

Table 4-1. Power Options for Your GRiDCASE 1550sx Computer

Power Source	Description
Internal/External Power Supply Model 34173	<p>When used externally, the internal/external power supply powers the computer and an external 3.5-inch diskette drive (optional) from a wall outlet, and simultaneously recharges the internal battery pack in the power pack slot. A computer power cable connects the power supply to the dc input connector on the back of the computer. A power cord connects the power supply to a three-prong wall outlet. The power supply converts alternating current (ac) into direct current (dc) for the computer and the drive(s).</p> <p>There is no voltage switch—the power supply automatically senses the voltage (110 or 220) that your wall outlet supplies and sets it for you.</p>
Internal Battery Pack Model 32153	<p>Rechargeable battery pack powers the computer and an external 3.5-inch floppy drive (optional). Actual battery life depends on your particular system configuration. This battery pack fits into the power pack slot on the back of the computer and is recharged when the power supply is plugged in and connected to the computer externally, even when the computer is turned off. Refer to the section Recharging the Battery Pack on page 4-12, for information on how to recharge the battery.</p>
External Attachable Battery Pack Model 32162	<p>Attachable battery pack powers the computer and an external 3.5-inch floppy drive (optional). It provides two to three times more battery life than the internal battery pack. Actual battery life depends on your particular system configuration and how your system is used.</p>
Cigarette Lighter Adapter Cable Model 32134	<p>Powers the computer and an external 3.5-inch floppy drive (optional) from the cigarette lighter socket of a car.</p>

NOTE: Except for the 3.5-inch external diskette drive, external drives connected to the GRiDCASE 1550sx computer do not receive their power from the computer. External 5.25-inch diskette and tape drives require their own power supplies and cannot run from a battery.

Connecting the Internal/External Power Supply Externally

The internal/external power supply provides power for the GRiDCASE 1550sx computer from either a 110-volt or a 220-volt outlet and recharges the internal battery pack (if installed). Recharging the battery pack takes about two hours if the computer is in standby mode or off, and takes about eight hours if the computer is in normal operating mode. When used externally, power from the power supply will support the computer and an external 3.5-inch diskette drive attached to the GRiD peripheral connector.

The power supply comes with a North American power cord and a computer power cable. Power cords for countries outside North America are available from GRiD Systems. Refer to Appendix A for more information.

To install the power supply externally, follow the steps listed below (see Figure 4-1).

1. Turn off the computer and any attached external devices.

CAUTION

Before connecting or disconnecting the power supply or any other external device, turn off the power. Failure to do so may damage your unit.

2. Plug one end of the computer power cable into the power supply and the other end into the dc input connector on the back of the computer. Hold the locking connector on the power cable with the arrow facing up when you plug it in.
3. Plug the female end of the power cord into the power cord socket on the back of the power supply.

4. Plug the male end of the power cord into a wall outlet that accepts a three-prong plug. If you use a two-prong plug adapter, make sure it is properly grounded. Ensure that the power supply is resting on its bottom so that none of the air vents on the sides or top are blocked.

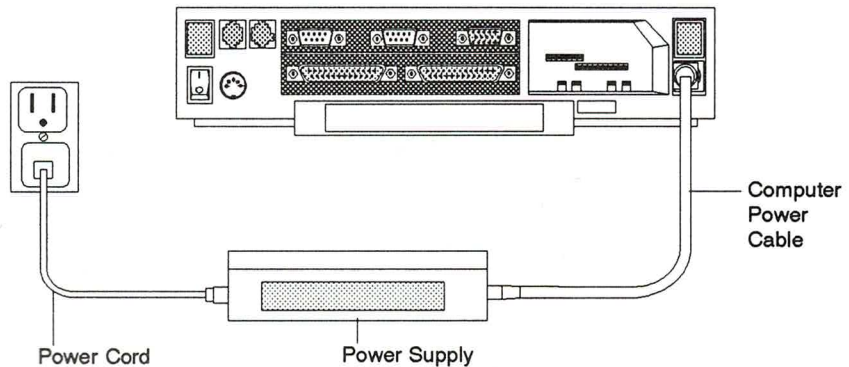


Figure 4-1. Connecting the Power Supply Externally

5. Turn on any attached external devices, and then turn on the computer.

NOTE: For best results, do not continually recharge a battery for more than 48 hours at a time. This won't damage the battery pack, but it may appear to lose some of its capacity.

Connecting the Internal/External Power Supply Internally

The power supply, when used internally, provides power for the GRiDCASE 1550sx computer and the optional 3.5-inch pocket floppy diskette drive from either a 110-volt or 220-volt outlet. When the power supply is used internally, a fan runs inside the computer to keep it cool.

To install the power supply internally, follow the steps listed below (see Figure 4-2).

1. Turn off the computer and any attached external devices.

CAUTION

Before connecting or disconnecting the power supply or any external device, turn off the power. Failure to do so may damage your unit.

2. Remove the computer power cable from the power supply. Hold the flat end of the connector where the arrow is located and gently pull until the cable is released.
3. Plug the female end of the power cord into the socket on the power supply.
4. Insert the power supply into the power pack slot on the back of the computer until it clicks into place (see Figure 4-2).

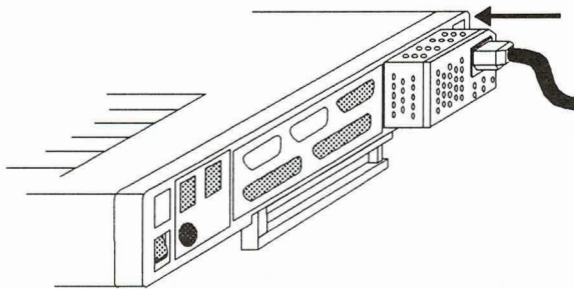


Figure 4-2. Connecting the Power Supply Internally

5. Plug the male end of the power cord into a power outlet that accepts a three-prong plug. If you use a two-prong plug adapter, make sure it is properly grounded.
6. Turn on any attached external devices, and then turn on the computer.

To remove the power supply, push in the power pack eject button (below and to the right of the power pack slot) until the power supply pops out.

WARNING

During use, the power supply can become quite warm, particularly when it is installed internally. When you eject the power supply, touch it lightly to test its temperature before grasping it firmly to remove it. You may have to let it sit for several minutes before handling it comfortably.

Installing the Internal Battery Pack

The internal battery pack provides power to your GRiDCASE 1550sx computer and a 3.5-inch external diskette drive (optional) from rechargeable batteries permanently sealed inside the battery pack.

To install the battery pack, follow the steps listed below (see Figure 4-3).

1. Turn off the computer or put it in standby and turn off any attached external devices.
2. Hold the battery pack with the label facing you and the metal contacts facing towards the computer.
3. Insert it into the power pack slot on the back of the computer until it clicks into place (see Figure 4-3).
4. Turn on any attached external devices, and then turn on the computer.

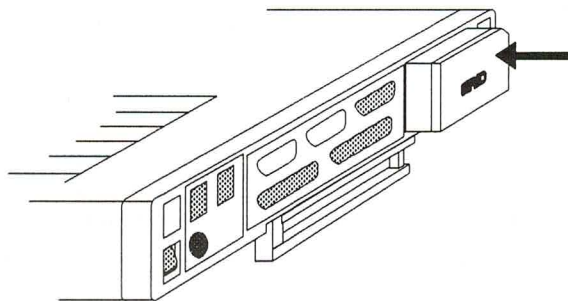


Figure 4-3. Installing the Internal Battery Pack

To remove the battery pack, push in the power pack eject button (below and to the right of the power pack slot) until the battery pack pops out.

Optimizing Battery Life

The battery life you can expect varies, depending on the configuration and use of your system. You will get the maximum capacity out of your battery pack after you have fully discharged and recharged it about three times. To get the most operating time from your battery pack, follow these suggestions:

- Decrease the intensity of or turn off the LCD screen backlight when you don't need it (the contrast of an LCD screen has no effect on battery life). This decreases the power drain on the battery.

You can configure the computer so that the LCD backlight is turned off if you have not typed on the keyboard or the screen has not changed for a few minutes. Refer to the *MS-DOS Supplement* for details.

- Decrease the brightness of the plasma screen when the higher intensity is not required.
- 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 **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 subsection Standby Mode on page 4-2. For information on enabling standby mode and the automatic standby feature, refer to the *MS-DOS Supplement*.

- Reduce your use of the floppy diskette and hard disk drives. You can extend the working time you achieve on a single battery charge by avoiding unnecessary file access (e.g., frequent saves, switching back and forth between files, etc.). You also can save power by turning off the hard disk when you are not accessing it. To do this, press **Fn-Disk**. The hard disk automatically turns on when a disk access is required.

You can configure the computer so that the hard disk is turned off automatically if it has not been accessed for a few minutes. This feature is controlled by an MS-DOS command; refer to the *MS-DOS Supplement* for details.

- Operate the computer at its slower speed if it does not matter how fast it operates. To switch the computer between fast and slow speeds, press **Fn-Speed**. This feature can also be controlled by an MS-DOS command; refer to the *MS-DOS Supplement* for details.
- If you have an optional internal modem, turn off the modem port when it is not being used. This feature is controlled by an MS-DOS command; refer to the *MS-DOS Supplement* for details.
- Turn off the serial and parallel ports when they are not being used. These features are controlled by MS-DOS commands; refer to the *MS-DOS Supplement* for details.
- Be sure that the computer sleep mode is activated. Sleep mode causes the computer's microprocessor to stop whenever it has nothing to do. Sleep mode is normally activated; you can use an MS-DOS command to activate it if it has been turned off. Refer to the *MS-DOS Supplement* for details.
- Don't cold start the computer if you can perform a warm restart instead—turning the computer off and then on again to reload the operating system consumes more power than performing a warm restart. To perform a warm restart, press **Ctrl-Alt-Del**.
- Wait for the battery pack to become fully discharged before you recharge it. If you frequently recharge your battery pack before it is fully discharged, the batteries may lose some of their capacity; they will not last as long after each charge.
- Do not overcharge the battery pack. This could happen if you leave the battery pack inside the computer which is connected to a power outlet for more than a few days. You cannot damage the battery pack or the computer by overcharging the battery pack, but the battery pack may appear to lose some of its capacity.

- Don't store the battery at high temperatures. If the battery pack is stored at temperatures over 32° C (90° F) for two months or more without recharging, you may have to use and recharge the battery pack several times before it is again able to hold a full charge.

Your computer battery life depends to a great degree on your particular computer configuration. For example, options such as an internal modem and an 80387SX numeric coprocessor require additional power to operate.

NOTE: Do not use any version of MS-DOS other than the one supplied by GRiD Systems for the GRiDCASE 1550sx computer. GRiD MS-DOS is designed to maximize battery life.

Recharging the Battery Pack

When the Battery indicator flashes red, indicating the power in your battery pack is low, don't immediately remove the battery pack. First, save any data you are working on. Then supply external power, if available, or put the computer into standby mode and change battery packs. The bridge battery, inside the computer, maintains standby mode power while you change battery packs.

To recharge an exhausted battery pack, leave the discharged battery pack in the computer power pack slot and connect the power supply to the computer externally, as explained above. The battery pack rapid-charges in about 2.5 hours if the computer is in standby mode or off. If the computer is on and in normal operating mode, the battery pack recharges normally in about 8 hours. The Battery indicator flashes green if the battery is rapid-charging and glows steady green if the battery is charging normally.

The Attachable Battery Pack

The external attachable battery pack is a lead-acid battery capable of providing two to three times more battery life than the internal battery pack. The attachable battery pack attaches to the top of the GRiDCASE 1550sx at the rear.

Refer to the *Model 32162 External Attachable Battery User's Guide* for instructions on attaching the battery to the GRiDCASE 1550sx and for directions on using the battery.

Connecting the Cigarette Lighter Adapter Cable

The cigarette lighter adapter cable lets you power your computer from the cigarette lighter socket of a car.

To connect the adapter, follow the steps listed below.

1. Turn off the computer and any attached external devices.

CAUTION

Before connecting or disconnecting the cigarette lighter adapter or any external device, turn off the power. Failure to do so may damage your unit.

2. Plug the cigarette lighter end of the adapter cable into the cigarette lighter socket of the car.
3. Plug the smaller end of the adapter cable into the dc input connector on the back of the computer (see Figure 4-4).
4. Turn on any attached external devices, and then turn on the computer.

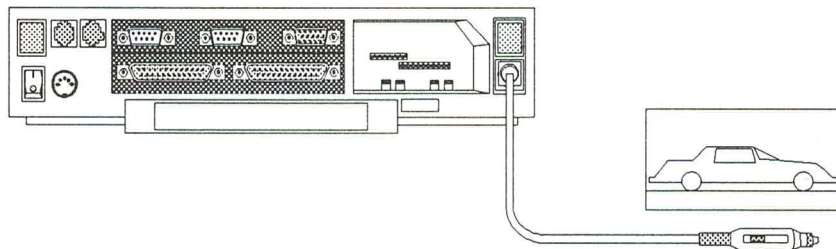


Figure 4-4. Connecting the Cigarette Lighter Adapter Cable

CAUTION

Many automobiles cause voltage surges or drops to the cigarette lighter socket when the engine is started. If the computer is connected to the cigarette lighter socket when you start the engine, the computer may be turned off momentarily. This causes the loss of any data currently in main memory. You should save any files you are working on before starting the vehicle's engine. We recommend having the battery pack installed in your computer to ensure continuous power while operating from a car cigarette-lighter socket.

The plug on the cigarette lighter adapter cable contains a 5-amp fast blow fuse. Should this fuse blow, replace it with a fuse of the same value to prevent damage to your computer. (The Radio Shack part number for this fuse is 270-1278.)

NOTE: The internal battery pack receives only a partial charge when you power the computer from the cigarette lighter adapter cable. To fully recharge the internal battery, you must supply external power to the computer.

Internal Bridge Battery

The internal *bridge* battery is a small rechargeable battery that is contained inside the GRiDCASE 1550sx computer. It is not user-accessible.

The bridge battery supplies enough power for the computer to operate only in standby mode. It is designed so that you do not have to turn the computer off to change battery packs; you just have to press **Fn-StdBy** 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 **spacebar** on the internal keyboard.

NOTE: We recommend that you save the file you are working on before pressing **Fn-StdBy** to put the computer into standby mode.

When fully charged, the bridge battery can supply about half an hour of standby mode power. However, the bridge battery may not be fully charged, so we recommend changing battery packs without delay when in standby mode.

Every time the computer is turned on, the bridge battery is quick-charged for five minutes and then trickle-charged continuously. This ensures that you have at least five minutes of standby mode power so that you can change battery packs without turning off the power.

The bridge battery recharges automatically whenever external power is supplied to the computer; the computer does not need to be turned on unless it is powered by the internal battery pack. The bridge battery recharges no matter how the computer is being powered (power supply, battery pack, or cigarette lighter adapter). It takes approximately 13 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 with no other power source connected.

CHAPTER 5: USING THE INTERNAL DISKETTE AND HARD DISK DRIVES

This chapter describes how to use the internal diskette and the internal and removable hard disk drives. The diskette drive is located on the side of your computer and accepts both double-density and high-density 3.5-inch floppy diskettes. The hard disk also is located on the side of the computer.

Taking Care of the Diskette Drive

Observe the following rules for taking care of the internal 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 internal 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. One 3.5-inch floppy diskette stores up to 1.44 MB of data.

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 drives used in GRiDCASE 1550sx computers 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 internal diskette drive. Refer to the *MS-DOS Reference Manual* 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 GRiDCASE 1550sx computer must have the following characteristics:

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

Figure 5-1 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.

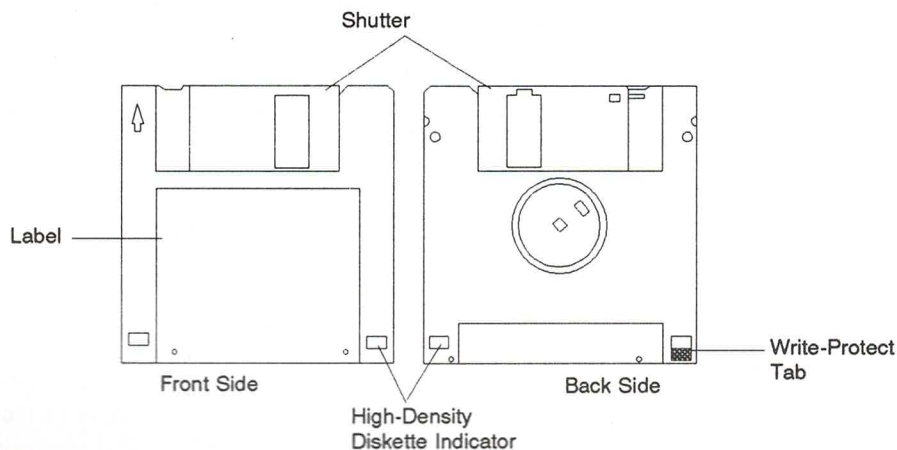


Figure 5-1. High-Density Floppy Diskette

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 5-2).
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.

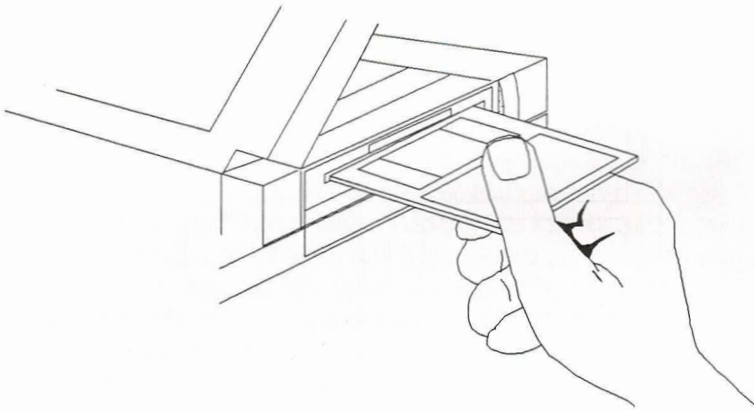


Figure 5-2. Inserting a Floppy Diskette into the Drive

To remove a diskette, push the diskette eject button 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 5-1). 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 your *MS-DOS Reference Manual*.

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 disk drive in your computer 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 *MS-DOS Reference Manual* 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 (60° to 70° F).

- Never use a damaged diskette.
- Do not remove a diskette from the drive while the in-use light is on, unless prompted to do so by the computer. 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 cigarette 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 *MS-DOS Reference Manual*.

If your system is equipped with an external tape drive, you can back up your floppy diskettes to tape. The tape drive comes with its own software and documentation.

Taking Care of Your Internal Hard Disk

Although the internal hard disk in your GRiDCASE 1550sx computer is ruggedly built to withstand the shocks that come with transporting your system, you should treat the hard disk with the same care you would give any valuable piece of equipment.

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. This safety feature ensures that neither your data nor the disk is damaged when the computer is moved. Whenever the computer is turned off, the disk heads are parked, and it is then safe to move your computer.

CAUTION

Never move or turn off your computer when the hard disk in-use indicator is lit; this could cause loss of data.

Backing Up Files on the Hard Disk

It is a good idea to make backup copies of important files that you use on your computer no matter what storage device you use. Because a hard disk can hold so much information, it is even more important to regularly back up the files on the hard disk.

To copy the files to diskettes, use the MS-DOS **copy**, **xcopy**, or **backup** commands. Unless you use **xcopy** or **backup**, you will need to build the same directory structure on the diskette as you have on the hard disk before copying the files. If you have many files, keep in mind that you will need to monitor the copying process so that you can insert a new diskette as one becomes full. Refer to the *MS-DOS Reference Manual* for information about the **copy**, **xcopy**, and **backup** commands.

If your system is equipped with an external tape drive, you can back up your hard disk to tape. Using a tape drive greatly speeds up the backup process. The tape drive comes with its own software and documentation.

The Removable Hard Drive

The removable hard drive provides increased security by allowing you to store the hard drive outside the computer. Additional drives can be used to provide increased storage capacity.

Each hard drive has a tracking number located on the bottom of the drive. The top of the hard drive has a label you can use to identify the drive. Each hard drive also has a carrying case. Figure 5-3 shows the Removable Hard Drive and its case.

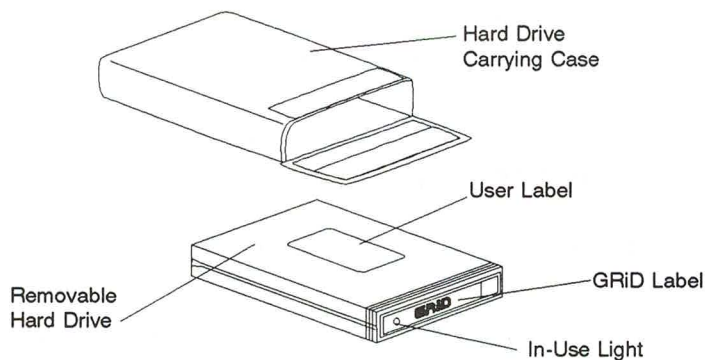


Figure 5-3. The Removable Hard Drive

Installing the Removable Hard Drive

Follow these steps to insert the hard drive into the GRiDCASE 1550sx computer (see Figure 5-4). A removable hard drive must be installed before the computer is turned on. Otherwise, the drive will not be recognized.

1. Hold the drive cartridge right side up at the end with the GRiD label.
2. Push the hard drive into the hard drive slot until it stops. The hard disk drive door automatically recesses into the drive slot. The hard drive extends about one-half inch beyond the side of the computer when it is fully inserted.

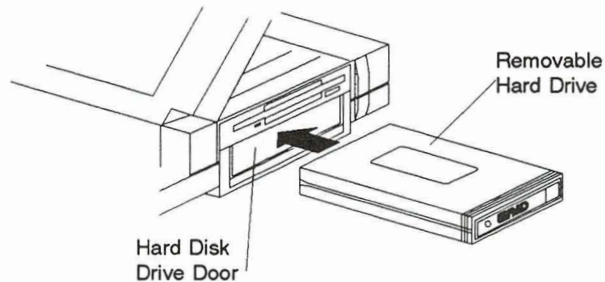


Figure 5-4. Installing the Removable Hard Drive

Removing the Removable Hard Drive

Follow these steps to remove the hard drive from the GRiDCASE 1550sx computer.

1. Verify that the drive in-use light is off. The light on the drive and the Disk indicator light above the keyboard (described on page 2-5) both light at the same time. If you remove the drive while the drive light is on, you may lose data.

CAUTION

Removing the hard drive when the Disk indicator light is on can result in a loss of data.

2. Pull the disk drive straight out.
3. Place the hard disk drive in the carrying case for storage.

The removable hard drive can be removed from the GRiDCASE 1550sx computer and another drive inserted while the power is on. Be sure the Disk indicator light is off before removing the hard drive. If the light is on, you may lose data. Some application programs may not support changing drives while running the application.

CAUTION

Some application programs may not support interchanging removable hard drives. Specifically, changing drives while running Windows will cause your computer to hang.

Be sure the *gridrhd.sys* device driver is included in the *config.sys* file on any device (including floppies) you wish to use to boot your computer. The *gridrhd.sys* file allows you to swap the removable hard disks without damaging the data. Refer to the section Removable Hard Drive Software for information on installing the device driver.

CAUTION

The *gridrhd.sys* file must be installed on any devices used to boot your computer. If the file is not installed when you boot your computer, data on the removable hard disk may be destroyed.

Use the same level of MS-DOS on all removable hard disks. Using different levels of MS-DOS to initialize and format the hard disks can lead to loss of interchangeability between the hard drives. The hard disk included with your GRiDCASE 1550sx was shipped from the factory with MS-DOS Version 5.0 installed.

Caring for the Removable Hard Drive

Although the removable hard disk in your GRiDCASE 1550sx computer is ruggedly built to withstand the shocks that come with transporting your system, you should treat the removable hard disk with the same care you would give any valuable piece of equipment. Be careful not to drop the removable hard drive. Doing so could damage the drive.

CAUTION

Never move or turn off your computer when the hard disk in-use indicator is lit; this could cause loss of data.

Do not attempt to open the drive cartridge. Opening the drive cartridge voids the warranty.

Backing Up Files on the Removable Hard Drive

It is a good idea to make backup copies of important files that you use on your computer no matter what storage device you use. Because a removable hard drive can hold so much information, it is even more important to regularly back up the files on the hard disk.

To copy the files to diskettes, use the MS-DOS **copy**, **xcopy**, or **backup** commands. Unless you use **xcopy** or **backup**, you will need to build the same directory structure on the diskette as you have on the hard disk before copying the files. If you have many files, keep in mind that you will need to monitor the copying process so that you can insert a new diskette as one becomes full. Refer to the *MS-DOS Reference Manual* for information about the **copy**, **xcopy**, and **backup** commands.

Removable Hard Drive Software

The removable hard drive that was shipped with your GRiDCASE 1550sx computer is ready to be installed and used. However, if you purchase additional removable hard drives or if the files on your hard drive are destroyed, you may need to prepare the removable hard drive by running the installation program. The install program is on the diskette labeled Removable Hard Drive Software that was shipped with the removable hard drive.

The removable hard drive must be initialized for use with the operating system. The installation program prepares the cartridges so different size cartridges can be used interchangeably.

Use the same version of MS-DOS on all hard drives being used in your GRiDCASE 1550sx computer.

CAUTION

Use the same version of MS-DOS on all hard drives. If different versions of MS-DOS are used, the removable hard drives are not interchangeable.

The *gridrhd.sys* device driver must be installed on the removable hard drive. This driver allows the GRiDCASE 1550sx to recognize that the removable drive has changed when a new drive is inserted.

Perform the following steps to load the hard drive software:

1. Install the removable hard drive into the GRiDCASE 1550sx computer.
2. Place a bootable MS-DOS floppy diskette into the diskette drive. Be sure the diskette contains the **format** command.
3. Turn on the computer. Press **F** after the beep to boot from the floppy.
4. Remove the MS-DOS floppy diskette, and insert the diskette labeled Removable Hard Drive Software into drive A.
5. Type the following from the A:> prompt:

install

The removable hard drive preparation and automatic software install program will run. Respond to the prompts they appear on the screen.

The prompt for the driver options asks whether Microsoft Windows is being used, whether a beep should sound when a media change is detected, and whether to set the standby timer. These prompts determine the switch settings on the device command; refer to the explanation of these switches later in this section. Respond **N** to the standby timer prompt; use **Fn-Disk** to turn off the hard drive.

The final prompt tells you your computer will reboot.

6. Remove the diskette from drive A.

The installation program performs the following functions:

- The *gridrhd.sys* device driver is copied to the removable hard drive. You are prompted for the name of the directory.
- The *config.sys* file is created or modified.
- The *autoexec.bat* file is created or modified.
- Additional software is copied to the specified directory.

If a *config.sys* file is not present on your boot disk, one is created. If a *config.sys* file is present, it is modified. The original *config.sys* file is renamed to *config.old*; if *config.old* exists, *config.bac* will be used. The following line is added to the *config.sys* file.

```
device=gridrhd.sys /x /B /W
```

where:

- x* The number of the removable hard drive. On a GRiDCASE 1550sx computer, this value is 0.

- /B* This option causes a beep to sound when a hard drive change is detected. Only implement this option if you want audible notification of the hard drive change.

- /W* This option is used for Windows support. It causes the driver to use the default Critical Error Handler unless the error occurs in the DOS Prompt window.

If an *autoexec.bat* file is not present on your boot disk, one is created. If an *autoexec.bat* file is present, it is modified. The original *autoexec.bat* file is renamed to *autoexec.old*. A path to the *\rhd* subdirectory is included in the *autoexec.bat* file.

The *rhdtst.exe* file is a diagnostic program that is copied to your hard drive during the installation procedure. This program should be run when you install your removable hard drive in a new computer or if you suspect a problem with your removable hard drive system. To run the diagnostic program, type **rhdtst** from the system prompt and press **Enter**. The drive is checked and a message is issued telling you whether the removable hard drive is recognized. If the *gridrhd.sys* driver is not installed, a warning is issued.

Troubleshooting

If you attempt to upgrade to MS-DOS Version 5.0 after having an earlier version of MS-DOS on the removable hard drive, you may be unable to perform the upgrade because the MS-DOS upgrade changes some of the configuration sectors on the removable hard drive. To install the MS-DOS Version 5.0 upgrade, perform the following steps.

1. Erase the *gridrhd.sys* file from your hard drive and reboot your computer.
2. Perform the MS-DOS 5.0 upgrade.
3. Install the removable hard drive software using the **install** command, as described earlier in this chapter.

The removable hard drive cannot be turned off using the **config harddisk = off** command; to turn off the removable hard drive, press **Fn-Disk**, as described in Chapter 2. Other options of the **config harddisk** command are supported by the removable hard drive.

Using a disk caching program with a removable hard drive is not recommended because you run the risk of losing data. If you do use a cache program, be sure the device driver for the cache program is after the *gridrhd.sys* driver in your *config.sys* file. The only exception to this is for the Smartdrv program; its device driver should be before the *gridrhd.sys* driver.

CHAPTER 6: CONNECTING EXTERNAL DRIVES

This chapter describes how to connect an optional external diskette drive or tape drive to your GRiDCASE 1550sx computer and describes how to set the correct switch settings for these devices. For more detailed information on how to use these drives, refer to the manual that accompanies each drive. The model numbers for the optional external drives are listed in Appendix A.

Connecting a 3.5-inch Pocket Diskette Drive

The external 3.5-inch high-density diskette drive (also called the “pocket floppy”) is equipped with its own diskette drive cable. You must connect the drive to the GRiD peripheral connector (located on the back of the computer) using this special drive cable. The pocket drive receives both its data and its power through the drive cable connected to the computer. Figure 6-1 shows how to properly connect the pocket diskette drive to the computer.

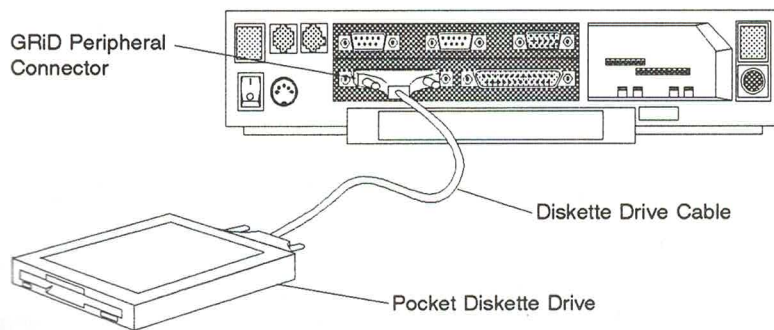


Figure 6-1. Connecting the 3.5-Inch Pocket Diskette Drive

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

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

1. Turn off the computer and any other external devices.

CAUTION

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

2. Set the two address switches on the back of the drive to the correct setting for the configuration you want. These switches set the device's address, allowing the computer to exchange data with it. Refer to the section Switch Settings for the External Drives on page 6-5, to determine the correct switch settings for your diskette drive.
3. Attach one end of the diskette drive cable to the GRiD peripheral connector on the back of the computer. If it doesn't fit in easily the first time, turn the end of the cable over. (The connectors are 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.

CAUTION

Make sure you connect the cable to the GRiD peripheral connector. It is physically possible to attach the cable to the parallel connector. However, the external drive will not work when connected to the parallel connector and may be damaged by such a connection.

4. Attach the other end of the diskette drive cable to the pocket diskette drive.
5. Turn on any attached external devices, and then turn on the computer.

For instructions on how to use the pocket diskette drive, refer to the manual that accompanies the drive.

Connecting a 5.25-inch Pouch Diskette Drive

Two types of external 5.25-inch diskette drives are available for use with the GRiDCASE 1550sx computer: the double-density (360 kB) drive and the high-density (1.2 MB) drive. The instructions contained in this section apply to both drives.

The external 5.25-inch diskette drive (also called the “pouch floppy”) is equipped with its own diskette drive cable. You must connect the drive to the GRiD peripheral connector (located on the back of the computer) using this special drive cable. The pouch diskette drive must be powered by a separate power supply. Each pouch drive comes with a power supply, a power cord, and a diskette drive power cable. Figure 6-2 shows how to properly connect the pouch diskette drive to the computer.

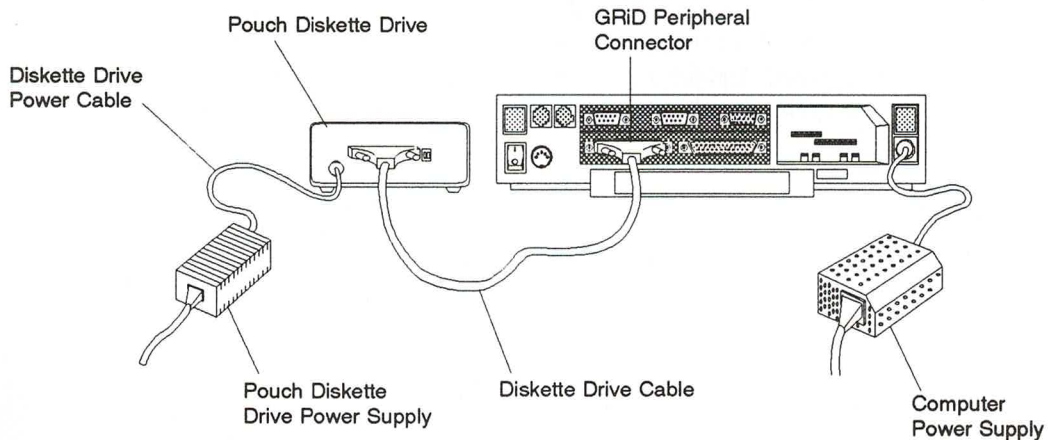


Figure 6-2. Connecting the 5.25-Inch Pouch Diskette Drive

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

1. Turn off the computer and any other external devices.

CAUTION

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

2. Set the two address switches on the back of the drive to the correct switch setting for the configuration you want. These switches set the device's address, allowing the computer to exchange data with it. Refer to the section Switch Settings for the External Drives on page 6-5, for more information on setting the switches.
3. Attach one end of the diskette drive cable to the GRiD peripheral connector on the back of the computer. If it doesn't fit in easily the first time, turn the end of the cable over. (The connectors are D-shaped, and so can only be connected one way.) Tighten the thumbscrews on each side of the connector to attach the cable securely to the computer. Do not overtighten the thumbscrews.

CAUTION

Make sure you connect the cable to the GRiD peripheral connector. It is physically possible to attach the cable to the parallel connector. However, the external drive will not work when connected to the parallel connector and may be damaged by such a connection.

4. Attach the other end of the diskette drive cable to the back of the pouch diskette drive.
5. Plug one end of the diskette drive power cable into the power connector on the back of the diskette drive.
6. Plug the other end of the diskette drive power cable into the diskette drive power supply.
7. Plug one end of the power cord into the power cord socket on the back of the diskette drive power supply.

8. Plug the other end of the power cord into a wall outlet that accepts a three-prong plug. If a two-prong plug adapter is used, make sure it is properly grounded. Ensure that the power supply is resting on its bottom so that none of the air vents on the sides or top are blocked.
9. Turn on any attached external devices, and then turn on the computer.

For instructions on how to use the pouch diskette drive, refer to the manual that accompanies the drive.

Switch Settings for the External Drives

The pocket or pouch floppy diskette drives' address switches are located on the back of the drive to the right of the cable connector. The address switches are shown in Figure 6-3. The setting of these switches determines whether the drive is accessed as drive A or drive B.

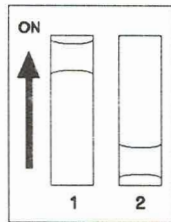


Figure 6-3. Floppy Diskette Drive Address Switches

Table 6-1 shows the possible settings for the floppy diskette drive's address switches.

Table 6-1. Switch Settings for the External Diskette Drives

Address Switch 1	Address Switch 2	External Drive Designator	Internal Drive Designator(s)
DOWN/OFF	DOWN/OFF	A	B & C
UP/ON	DOWN/OFF	B	A & C

In addition to a primary drive designator, MS-DOS assigns a secondary, or logical, device designator to the diskette drives on the system. You can address each of these diskette drives by either its primary or its secondary designator. In effect, you have up to four logical diskette drives (two physical drives, plus two more logical drives).

The letter used as the secondary designator depends on the number of drives present, as shown in Table 6-2.

Table 6-2. Secondary Drive Designators

Configuration	Secondary Designator, Drive A	Secondary Designator, Drive B
One floppy, one hard disk	B	none
Two floppies, one hard disk	D	E

Connecting an External Tape Drive

The external tape drive is equipped with its own tape drive cable. You must connect the drive to the GRiD peripheral connector (located on the back of the computer) using this special drive cable. The tape drive must be powered by a separate power pack. Each tape drive comes with a power supply, a power cord, and a tape drive power cable. Figure 6-4 shows how to properly connect the tape drive to the computer.

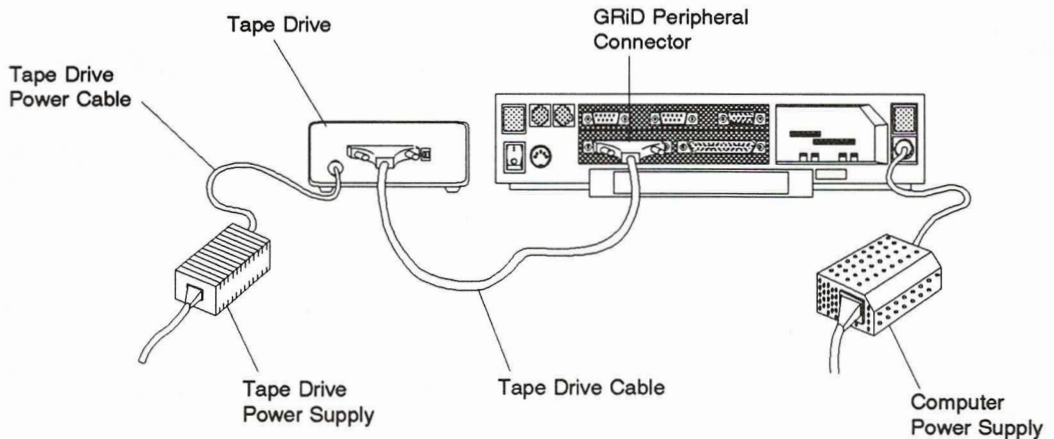


Figure 6-4. Connecting the External Tape Drive

To connect the external tape drive to the computer, perform the following steps.

1. Turn off the computer and any other external devices.

CAUTION

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

2. Set address switch 1 on the back of the drive to the UP or ON position. Set address switch 2 on the back of the drive to the DOWN or OFF position. These switches set the device's address, allowing the computer to exchange data with it.
3. Attach one end of the drive cable to the GRiD peripheral connector on the back of the computer. If it doesn't fit in easily the first time, turn the end of the cable over. (The connectors are D-shaped, and so can only be connected one way.) Tighten the thumbscrews on each side of the connector to attach the cable firmly to the computer. Do not overtighten the thumbscrews.

CAUTION

Make sure you connect the cable to the GRiD peripheral connector. It is physically possible to attach the cable to the parallel connector. However, the external drive will not work when connected to the parallel connector and may be damaged by such a connection.

4. Attach the other end of the drive cable to the back of the tape drive.
5. Plug one end of the tape drive cable into the power connector on the back of the tape drive.
6. Plug the other end of the tape drive cable into the tape drive power supply.
7. Plug one end of the power cord into the power cord socket on the back of the tape drive power supply.
8. Plug the other end of the power cord into a wall outlet that accepts a three-prong plug. If a two-prong plug adapter is used, make sure it is properly grounded. Ensure that the power supply is resting on its bottom so that none of the air vents on the sides or top are blocked.
9. Turn on any attached external devices, and then turn on the computer.

For instructions on how to use the external tape drive, refer to the manual that accompanies the drive.

CHAPTER 7: USING THE ISOPOINT CONTROL BAR

This chapter describes how to use the Isopoint control bar.

The Isopoint control bar is a pointing device built into the front edge of the computer keyboard. This device is used like a mouse to control the pointer in graphical software.

The Isopoint control bar emulates a Microsoft bus mouse.

Moving the Control Bar

The Isopoint control bar can be operated with the side of your thumb or your fingertips. With your hands over the keyboard in typing position, the sides of your thumbs are naturally positioned over the Isopoint control bar. Rest one of your thumbs on the pencil-like rod in the center of the control bar.

To move the pointer up and down on the screen, roll the rod in the center of the control bar away from you or towards you, as shown in Figure 7-1. To move the pointer from side to side on the screen, slide the rod to the left or right, as shown in Figure 7-2.

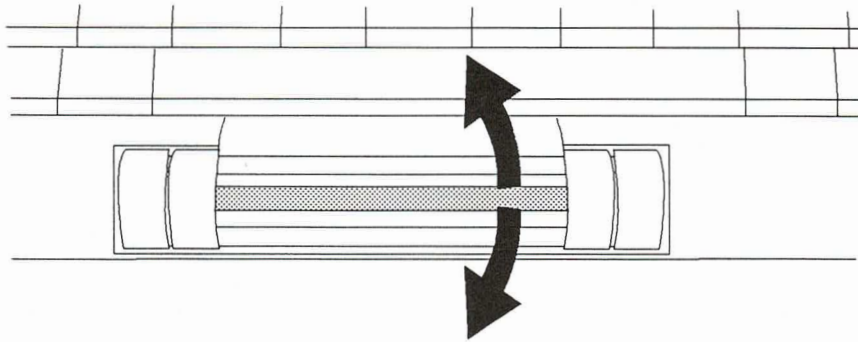


Figure 7-1. Moving Pointer Up and Down

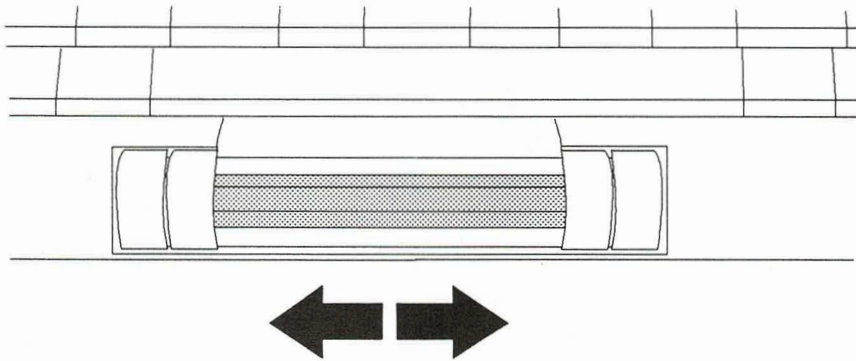


Figure 7-2. Moving Pointer Side to Side

Occasionally, when you are using the control bar in an application, you may find that the rod is as far to one side as it will go, but the pointer on the screen is not as far to the side as you want it. Simply press the rod a little harder towards the side you want to move the pointer and the pointer will continue to move in that direction.

Pressing the rod to the side activates a switch that tells the pointer to keep moving in that direction. The pointer moves at the same speed it was moving before the Isopoint rod hit the side stop.

Using the Buttons

The Isopoint control bar emulates a two-button mouse. The control bar itself, including the two inside buttons, is equivalent to the left mouse button, as shown in Figure 7-3. Pressing any part of the bar or the two inside buttons is the same as clicking the left mouse button.

If you press down on the rod itself, the pointer may move on the screen as you click, depending on how careful you are to prevent the rod from rolling. You may find it better to press down on the part of the control bar just above or below the rod, or on one of the inside buttons.

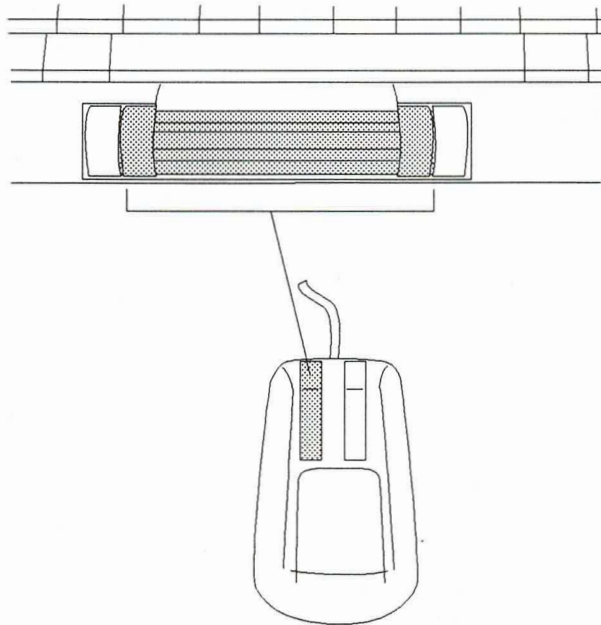


Figure 7-3. Left Mouse Button

The two outside buttons are equivalent to the right mouse button, as shown in Figure 7-4.

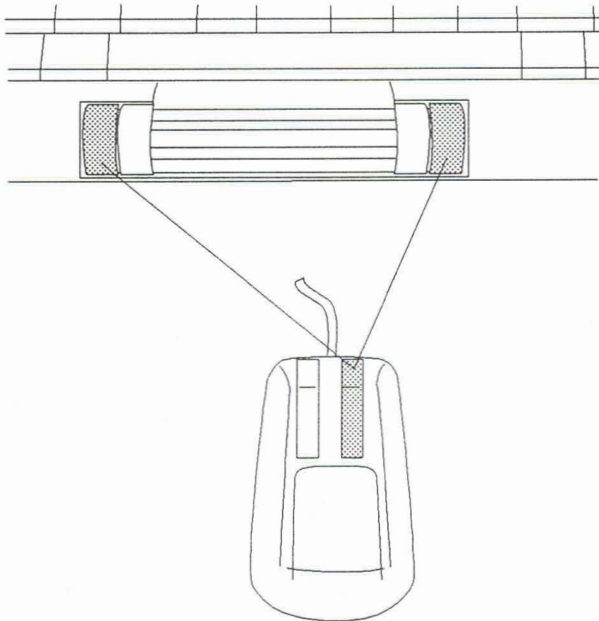


Figure 7-4. Right Mouse Button

The Isopoint control bar can be disassembled for cleaning. Contact your local GRiD representative or the GRiD Resource Center for assistance.

Software Installation

Before you can use the Isopoint control bar in an application, you must install software drivers that enable the application to communicate with the pointing device. Some applications automatically do this for you when you install them. When asked what type of mouse you have, choose Microsoft Bus Mouse, since the Isopoint control bar emulates this type of mouse.

Other applications require that you load the software driver yourself before you run the application each time. Two versions of the Microsoft mouse driver are included with the MS-DOS that came with your computer: *mouse.sys* and *mouse.com*.

Using *Mouse.sys*

If you want to load the Isopoint software driver automatically whenever your computer starts up, use the driver *mouse.sys*. Place a statement similar to the following in your *config.sys* file:

```
device=d:\path\mouse.sys
```

Where *d:\path* is the drive and path where the *mouse.sys* file is stored. If you need information on creating or using the *config.sys* file, refer to the *MS-DOS User's Guide*.

Using *Mouse.com*

If you want to load the Isopoint software driver only at certain times, for example, just before you start a certain application, use the driver *mouse.com*. Simply type the command **mouse** to load the driver. You might want to automate this process by putting this command in a batch file that starts your application. For more information about batch files, refer to the *MS-DOS User's Guide*.

To remove the mouse driver from memory, type the command **mouse off**.

Interrupt Setting

The Isopoint control bar is configured to use interrupt level 5 in your computer. If you need to change this, you can use interrupt 3 or 4. For information on changing the Isopoint interrupt level, refer to the *MS-DOS Supplement*.

Deactivating the Isopoint Control Bar

If you would prefer to use an external mouse connected to a serial port, you can deactivate the Isopoint control bar using an MS-DOS command—refer to the *MS-DOS Supplement* for more information.

The Control Panel

The Control Panel allows you to adjust the Isopoint control bar's sensitivity level and select different movement profiles. The Control Panel allows you to adjust the sensitivity of the control bar and select profiles that are appropriate for the application program you are running.

The control bar sensitivity is the ratio of actual control bar movement to onscreen pointer movement. Different applications may require different sensitivities, and as you become more familiar with the control bar, you may want to change the sensitivity so you can work more quickly. Different control bar profiles cause the pointer to move greater or lesser distances across the display when you move the control bar at different speeds.

Loading the Control Panel

To load the Control Panel, switch to the drive or directory that contains the mouse program files and type **cpanel** at the system prompt.

If you want to remove the Control Panel from memory, switch to the drive or directory that contains the mouse program files and type **cpanel off** at the system prompt.

Viewing the Control Panel

Whenever you are using the Isopoint control bar and have loaded the Control Panel, you can view the control panel by pressing **Ctrl-Alt** and either control bar button. (Refer to the next section, Command Line Switches, for information on how you can change the key/button sequence that pops up the Control Panel.) The Control Panel appears on your screen.

The position of the marker and the number below the sensitivity bar indicate the current sensitivity level. The sensitivity level can vary from 5 to 100 in increments of 5. The default level is 50.

A set of four labels (Slow, Moderate, Fast, and Unaccelerated) allows you to select different movement profiles for the control bar. The movement profiles of the control bar relate the distance the pointer moves across the display to the speed at which you move the control bar.

You can try each of the four selections to see which works best with your application.

Changing the Sensitivity Level

To change the sensitivity level of the control bar, follow these steps:

1. With the Control Panel loaded, press **Ctrl-Alt** and either control bar button to display the Control Panel.
2. Point to the left arrow on the sensitivity bar if you want to decrease the sensitivity level; point to the right arrow if you want to increase the sensitivity level.
3. Click the inside control bar button to move the marker in increments of five in the direction indicated by the arrow, or press and hold down the inside button to move the marker continuously in the direction of the arrow.

The number representing the current sensitivity level changes to reflect the movement of the marker.

You also can change the sensitivity level by placing the pointer directly on top of the marker and, holding down the inside button, dragging the marker in the desired direction on the sensitivity bar.

4. Before you exit the Control Panel, test the changes you made by moving the pointer around the screen.
5. To put the new sensitivity level into effect, point to OK and click the inside control bar button.

You can test the new sensitivity level by moving the pointer around the screen before you click OK.

If you do not want to save the change, point to Cancel and click the inside control bar button.

The level you set remains in effect until you restart your computer or until you use the Control Panel to choose another profile.

Changing the Movement Profile

The movement profile, or profile, controls how far the pointer travels across the screen for a given speed of control bar movement. You can choose from among four supplied profiles. The profiles are listed on the Control Panel. You can select a new profile by using the Control Panel or by adding switches to the command line used to load the mouse driver.

When you move the control bar quickly, even only a small distance, the pointer moves farther across the screen than when you move the control bar slowly. A small, fast movement can move the pointer completely across the screen, while a large, slow movement may move the pointer only an inch or two.

When you select a different profile, you change the ratio between the distance the pointer moves on the display and the speed of control bar movement.

To select a new profile using the Control Panel, follow these steps:

1. Press **Ctrl-Alt** and either control bar button to display the Control Panel.
2. Point to the label corresponding to the desired profile and click the inside control bar button.

You can now move the control bar while observing the pointer on the screen to check the effect of the profile you selected.

3. To put the new profile into effect and exit the Control Panel, click OK.

You can test the new profile by moving the pointer around the screen before you click OK.

To cancel the change and exit the Control Panel, click Cancel.

To restore the original profile and leave the Control Panel on screen, click Reset.

The movement profile you selected remains in effect until you restart your computer or use the Control Panel to select another profile.

If you want to select a profile automatically whenever your computer system loads the mouse driver, you can add switches to the command line to specify the profile you want to use.

You can add the command line switches to the mouse command in your *autoexec.bat* file so they take effect each time you start your computer, or you can add them to a mouse command you type at the DOS prompt whenever you want to use a specific profile.

To select a new profile using the command line switches, type **mouse /pn** at the DOS prompt, where *n* is the number of the profile you want to use. The value of *n* can range from 1-4. If you do not specify a value for *n*, profile number 1 is loaded.

You can also add the **/pn** switch to the mouse command line in your *autoexec.bat* file.

Command Line Switches

Several command line switches for the mouse driver and Control Panel allow you to customize the operation of the Isopoint control bar. You can use the command line switches to change the way some control bar functions work. You can add these switches to the mouse command lines in your *autoexec.bat* file, or you can type **mouse** and the command line switches at your operating system prompt. You can use just one switch, or several switches separated by spaces, in the command line.

Sensitivity

The following command line switches set the control bar sensitivity level:

/sn Set horizontal and vertical sensitivity

/hn Set horizontal sensitivity only

/vn Set vertical sensitivity only

where *n* is a number in the range 5-100 in increments of 5 and is interpreted in the same manner as a Control Panel setting.

For example, to set the horizontal and vertical sensitivities to 75, you would type **mouse /s75** at the system prompt.

Interrupt Rate

The following command line switch lets you set the interrupt rate for the control bar:

/rn

where *n* is:

- 1 to set a 30 Hz interrupt rate (default setting)
- 2 to set a 50 Hz interrupt rate
- 3 to set a 100 Hz interrupt rate
- 4 to set a 200 Hz interrupt rate

The interrupt rate is the frequency at which the control bar interface is polled for information. Higher interrupt rates decrease the efficiency of the computer microprocessor.

For example, to set the horizontal sensitivity level of 45 and the interrupt rate to 50 Hz, you would type **mouse /h45 /r2**.

Control Panel Invocation

To specify a key/control bar button combination to invoke the Control Panel, use the following command line switches:

/k0 **Ctrl-Alt**-control bar button (default)

/k1 **Ctrl-Shift**-control bar button

/k2 **Ctrl-Alt-Shift**-control bar button

For example, to use the **Ctrl-Shift**-control bar button sequence to invoke the Control Panel, you would type **cpanel /k1**.

Movement Profile

You can use the following switch to load specific movement profiles:

/pn

where *n* is 1, 2, 3, or 4 and corresponds to one of the internal movement profiles listed on the Control Panel.

For example, to use the movement profile switch to specify the internal movement profile 2, you would type **mouse /p2** at the DOS prompt.

Language

You can use the following switches to change the language in which mouse driver and Control Panel messages appear:

/l English (default)

/ld German

/le Spanish

/lf French

/li Italian

/lnl Dutch

/lp Portuguese

/ls Swedish

/lsf Finnish

For example, to make messages appear in French, you would type **mouse /lf** at the DOS prompt.

The Mouse Menu

The Mouse Menu is a Terminate-and-Stay-Resident (TSR) program that allows you to use the Isopoint control bar for certain functions within text-based applications that normally do not support the use of a pointing device.

Loading the Mouse Menu

Before you can load the Mouse Menu, the mouse driver must be loaded. For information on how to load the mouse driver, refer to the section Software Installation, on page 7-4.

To load the Mouse Menu, switch to the drive or directory that contains the mouse program files and type **msmenu** at the system prompt.

When you have finished using your application with Mouse Menu, you should remove the Mouse Menu from memory to avoid interference with other programs. To remove the Mouse Menu from memory, switch to the drive or directory that contains the mouse program files and type **msmenu off** at the system prompt.

Using the Mouse Menu

Once the Mouse Menu is loaded, the Isopoint control bar moves the cursor on the screen like the cursor keys do. The buttons on the Isopoint control bar work as shown in Table 7-1.

Table 7-1. Isopoint Buttons with Mouse Menu

Button	Description
Inside button click (left mouse button)	Your choice. The first time you press this button, a menu will be displayed and you can choose to assign any key to this button. If you want to assign a combination of keys (Shift , Ctrl , or Alt plus another key), highlight and click one of the outside buttons on one of these choices. An additional menu will be displayed to complete the request.
Outside button click (right mouse button)	Equivalent to the Enter key.
Inside and outside buttons clicked together	Equivalent to the Esc key.
Outside button double click	Displays the inside button definition menu. You can reassign the inside button to a new key while you are still in your application.

You can adjust the sensitivity of the pointer movement by using the Control Panel, as explained in the section beginning on page 7-6.

CHAPTER 8: TROUBLESHOOTING

This chapter describes problems that may arise as you set up and use your GRiDCASE 1550sx computer and suggests possible solutions to those problems.

Identifying the Problem

Initial system setup is the time when you are most likely to encounter problems. Setup problems may be due to actual defects in hardware or software, but are much more often caused by easily corrected mistakes made during the setup process. It is important to determine what kind of problem you have.

User Problems in Setting Up the Computer

Table 8-1 lists common problems you might encounter when setting up your computer system. Before you decide that you have a serious hardware or software problem, try to solve the problem using the troubleshooting chart. To use the chart, look for your problem under the heading Symptom, identify the Cause, and follow the suggested Remedy.

Table 8-1. Troubleshooting Chart

Symptom	Cause	Remedy
No response when computer is turned on	No external power	Check that the power supply is plugged into a live power outlet and that the power cord is plugged into the computer.
	Computer was in standby mode	The computer was in standby mode and you actually turned it off, not on. If the screen is blank but the Processor indicator is flashing, the computer is in standby mode—press the spacebar to resume normal operation.
	The computer power cable is not plugged in	Make sure the computer power cable is plugged in at both ends.
	Low battery pack	Recharge the battery pack.
Computer unable to boot	Wrong diskette in internal diskette drive	If booting from floppy, make sure the diskette has the correct operating system software.
	Wrong diskette in pocket or pouch drive	If booting from external drive, make sure operating system software is correct.
	Removable hard drive not installed properly	Remove and reinstall hard drive. Be sure it is right side up and completely pushed in.
	Insufficient power	Try a different power outlet or provide a fresh battery.
	Damaged system diskette or damaged files on the diskette	Make a new working copy of your distribution system diskette.

Symptom	Cause	Remedy
Computer unable to boot	System does not recognize the external drive from which you are trying to load the operating system	Turn off the computer. Make sure all cables and cords are securely connected. Verify address switch settings. Wait at least five seconds; then turn the computer back on.
Internal screen blank	Output is directed to external monitor	Press Fn-Video to switch output back to the built-in screen.
	Contrast or brightness switch set incorrectly	Adjust the screen contrast and/or brightness switches.
Internal screen displays garbage when you switch video output to it from external monitor	Internal screen doesn't support extended VGA modes	Extended VGA modes (higher resolution than 640 by 480 with 16 colors) can only be used with an external monitor.
Cannot change color map	Built-in screen has been configured for maximum contrast (no gray scales)	Use an MS-DOS command to allow gray scales to be displayed—refer to the <i>MS-DOS Supplement</i> for details.
Computer boots, but Battery indicator flashes red	Low battery pack	Recharge the battery pack.
Cannot enter standby mode	386 protected mode in use	Standby mode does not work with any applications or 386 memory managers that are using the 386 protected mode.

Symptom	Cause	Remedy
Cannot leave standby mode	Went into standby mode because of low battery	Supply external power or change the battery pack.
Incorrect date or time on screen	Time-of-day clock set incorrectly	Set correctly using MS-DOS date and time commands.
Isopoint control bar does not function	Application installed wrong	Install your application for a Microsoft Bus Mouse.
	Interrupt conflict	Change the interrupt setting—refer to the <i>MS-DOS Supplement</i> for details.
Internal modem does not function	Telephone line bad	Check telephone line by making a phone call on that line or connect computer to another phone outlet.
	Port or switch settings are incorrect	Set the port and the software switches correctly—refer to the <i>MS-DOS Supplement</i> .
External modem does not function	Telephone line bad	See remedy above.
	Switches set incorrectly	Check that modem configuration switches are set properly (refer to modem manual).
	Bad cable	Replace the cable.

Symptom	Cause	Remedy
No response from external diskette or tape drive	Power supply not plugged in	Make sure the power supply for the external drive (except the 3.5-inch drive) is plugged into a live power outlet. You may need to reboot the computer.
	Not powered correctly	The 5.25-inch diskette drive and tape drive must be powered separately from the computer.
	Cable is not connected correctly	Make sure the cable is connected securely both to the computer's GRiD peripheral connector and to the external drive.
	Incorrect switch settings	Set address switches correctly (refer to Chapter 6).
	Bad cable	Call the GRiD Resource Center at 1-800-654-GRID (4743).
No response when printer is turned on	Not plugged in	Make sure printer is plugged into a live power outlet.
	Cables not connected correctly	Connect cables securely and properly (refer to Chapter 2).
	Switches set incorrectly	Check that printer configuration switches are set properly (refer to printer manual).
	Printer is defective	Run a self-test (refer to printer manual) to check out the printer.
Printer will not print or prints incorrectly	Printer is not on-line	Put printer on-line (refer to printer manual).
	Printer not supported	Check the software manual to make sure the program is configured for and supports the attached printer.
	Switches set incorrectly	Check that printer configuration switches are set properly (refer to printer manual).

Symptom	Cause	Remedy
External keyboard does not function or there is continuous beeping	Not connected to computer	Check that keyboard cable is firmly connected to computer (refer to Chapter 2).
	Incorrect keyboard	Connect an IBM AT or 100% compatible keyboard only.
External monitor screen blank	Not plugged in	Check that cable is firmly connected to computer and monitor's power cord is plugged into wall outlet.
	Not turned on	Check that monitor power is on.
	Output is directed to built-in screen	Press Fn-Video to switch output back to the external monitor.
	Brightness control knob turned down	Check that brightness control knob is turned up sufficiently.
	Not compatible monitor	Connect a compatible monitor.

To help troubleshoot problems, you can use an MS-DOS command to show you the current computer configuration settings. Refer to the *MS-DOS Supplement* for information.

If you encounter a problem that you cannot resolve using the troubleshooting chart, you may have a software or hardware problem.

Software or Hardware Problems

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 U.S. GRiD Customer Support Service (CSS) contract with your computer, call the GRiD Resource Center at 1-800-654-GRID (4743) for help in diagnosing the problem. Make sure you know the tracking number of your computer; it is located on the back of the computer, under the handle (it is visible only when the handle is pulled out). If you are outside the U.S., call your local GRiD representative or distributor for assistance.

If you determine your problem is not a software problem, then you may have a problem with the hardware. Follow the procedure given in the preceding paragraph for help in diagnosing the problem.

Required MS-DOS Files

Certain files are required for your GRiDCASE 1550sx computer to function properly when you first turn it on. You need the file *command.com* and the hidden system files (the hidden files do not show up in a directory listing).

The Gridscan Command

The **gridscan** command reports the status of input/output devices attached to your computer and lists the factory-installed hardware options present. Use **gridscan** under the following circumstances:

- When you need to provide information to GRiD personnel responsible for analyzing a possible malfunction in your system.
- When you want to find out if your GRiDCASE 1550sx computer is equipped with the options your application programs require.

Gridscan is provided on the MS-DOS utilities diskette or on the hard disk. To invoke **gridscan**, enter the command **gridscan** in response to the system prompt. The information provided by the **gridscan** command is summarized below:

- System BIOS Date
- Processor type
- Coprocessor type, if installed
- Amount of conventional RAM installed and free
- Amount of expanded and/or extended memory installed and free
- Type and size of internal hard disk drive
- Type and size of internal and external diskette drives
- Type of other external devices attached
- Keyboard firmware date
- VGA BIOS version
- Modem type and PROM checksum, if installed
- Serial port device names (COM1, COM2, COM3, or COM4)
- Color mapping mode

CHAPTER 9: SAFETY AND MAINTENANCE

This chapter contains important safety information and describes how to care for your GRiDCASE 1550sx computer. Although the GRiDCASE 1550sx computer is basically durable, you should treat it with care, as you would any other precision instrument.

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 GRiDCASE 1550sx 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 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 is designed and tested to comply with various national and international safety agency standards that reflect the current state-of-the-art at the time of manufacture. Use and application of the product requires exercising common sense. It is an electrical device.

Always observe the following warnings. Ignoring these warnings could lead to physical injury or death.

- 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. It is water-resistant, but should not be operated if it is wet or if water has gotten inside the computer.
- Do not operate your computer in any potentially flammable atmosphere, unless it is specially certified for such usage.
- Do not attempt to open the computer case; it contains no user-serviceable parts. Such action voids your warranty and service contract and can damage the computer.
- Arrange any power cords or other cords so they cannot be pulled out or tripped over when the computer is in use.
- If you use a plug adapter with your computer or any attached devices, make sure you properly ground the adapter.
- Do not eject the internal/external power supply without first removing the power cord from the wall socket, as a shock could result.
- Always turn off the computer before unplugging it.

- 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.

Cautions

Always observe the following cautions. Ignoring these cautions could damage your computer.

- Before you connect any device to your computer or disconnect any device from your computer, turn off both the device and the computer, in that order.
- Operate the computer only when the surrounding temperature is between 5° C and 40° C (41° F and 104° F).
- Operate the computer only when the relative humidity level is between 10% and 80% noncondensing.
- Store the computer where the surrounding temperature remains between -20° C and 60° C (-4° F and 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.
- If you are using an external drive, make sure its cable is securely attached at both ends and is not likely to be bumped or pulled.
- Never turn off the computer when the in-use light for any diskette or hard disk drive is lit. Turning off the computer at these times can destroy data on the disk.

Cleaning the Computer

Before cleaning your computer, turn it off. If you are using a power supply, disconnect the power plug from the wall outlet. (Pull the plug and not the cord.)

To clean the case, use a clean, lint-free, soft cloth that has been dampened and wrung out as dry as possible. If necessary, use a mild, nonabrasive detergent.

CAUTION

Never clean the computer with any chemical cleaning agent such as dust wax, spray cleaner, or any abrasive substance. Using chemical cleaning agents may cause damage to the finished surfaces and impair operation of electrical devices.

Wipe the case surface lightly and then dry it.

To clean the screen, use a dry, soft cloth. A cloth made especially for cleaning glass is best. If necessary, slightly dampen the cloth with 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.

Dust the rear panel of the computer with a dry cloth.

The Isopoint control bar can be disassembled for cleaning. Contact your local GRiD representative or the GRiD Resource Center for assistance.

WARNING

To prevent electrical shock, never apply any liquid to the rear panel of your computer or inside a diskette drive opening.

Storing the Computer

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

Traveling with the Computer

When traveling with your computer, keep it in a protective carrying case and carry it with you; avoid 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 your computer as luggage, always pack it in its original shipping carton and packing materials. Any damage incurred due to improper shipping is considered abuse and will not be covered under your computer's warranty.

Airport security x-rays should not damage your computer, peripheral devices, or floppy diskettes. You can, however, ask that your computer be hand-checked.

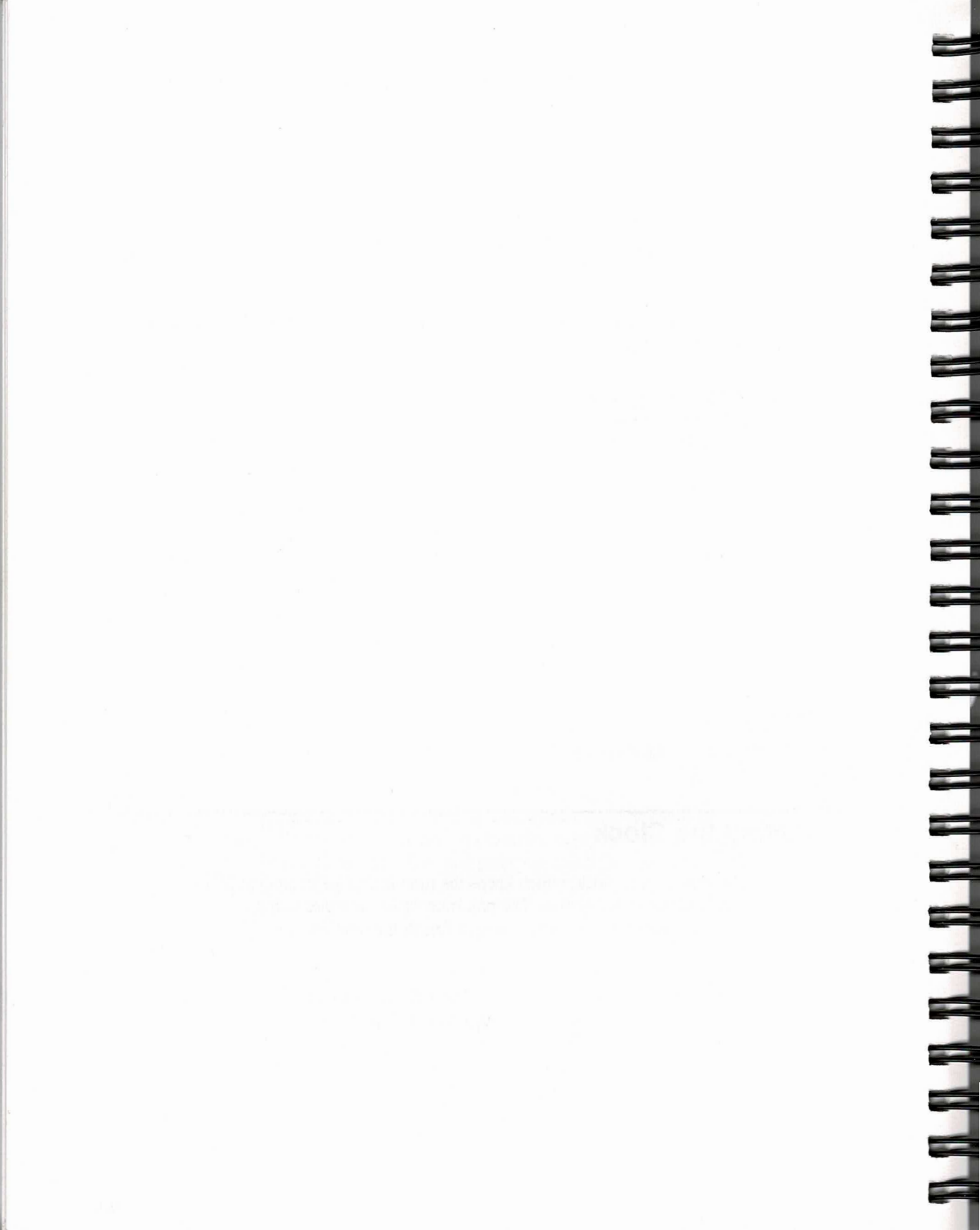
CAUTION

If you are carrying a battery pack inside the computer, make sure that the computer is turned off. Otherwise, the battery pack will discharge during transportation and may cause data to be lost. As an extra precaution, you may want to remove the battery pack from the computer and carry it separately.

Updating the Clock

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

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



CHAPTER 10: USING MS-DOS ON THE GRiDCASE 1550sx COMPUTER

This chapter explains how operating a GRiDCASE 1550sx computer and an IBM AT differ; how the GRiD version of MS-DOS differs from PC-DOS; and how to move applications currently in use on an IBM PC-compatible computer to the GRiDCASE 1550sx computer.

This chapter is not a tutorial for the novice. You may not understand the information in this chapter unless you have operated a personal computer using an MS-DOS application. If you require training in basic MS-DOS skills, inquire at a GRiD Systems Center or local computer store on the availability of MS-DOS classes and about the many tutorials and computer-based training programs available for purchase. Complete information on using MS-DOS can be found in the *MS-DOS User's Guide* and in the *MS-DOS Reference Manual*, and the GRiD enhancements to MS-DOS are documented in the *MS-DOS Supplement*.

What is Different About GRiDCASE 1550sx Computers?

You should be aware of the following differences between operating a GRiDCASE 1550sx computer and an IBM-compatible desktop computer.

- The GRiDCASE 1550sx computer uses a different operating system. You must use GRiD MS-DOS on the GRiDCASE 1550sx computer, not PC-DOS or an MS-DOS operating system made for other computers.
- The GRiDCASE 1550sx keyboard has fewer keys, but all of the functions of an IBM 101/102-key keyboard.
- The GRiDCASE 1550sx computer displays text and images in monochrome; many monitors connected to desktop computers display text and images in full color, if the software supports color.

Why Only GRiD MS-DOS on the GRiDCASE 1550sx Computer?

GRiD MS-DOS is the only MS-DOS operating system that should be run on the GRiDCASE 1550sx computer. Although the GRiDCASE 1550sx computer is fully compatible with the IBM AT, it is not desirable to run PC-DOS on GRiDCASE 1550sx computers.

PC-DOS is licensed to run only on an IBM personal computer, and GRiD MS-DOS to run only on GRiD computers. Although you can interchange application programs, subject to the licensing agreement you have with the software publisher, you cannot interchange operating systems (see Figure 10-1).

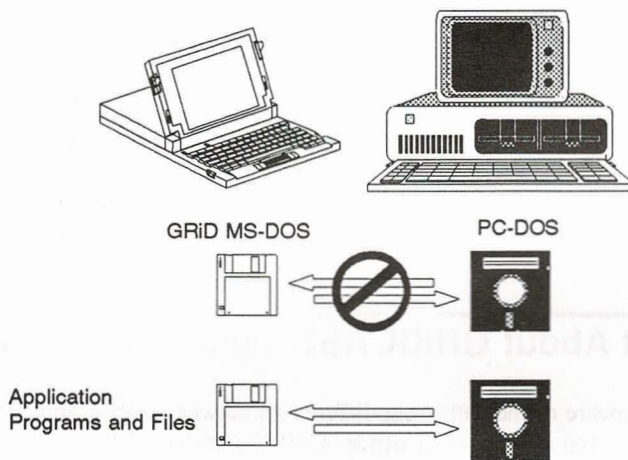


Figure 10-1. GRiDCASE 1550sx Computers Require GRiD MS-DOS

Moreover, GRiD MS-DOS offers the following facilities not available in PC-DOS:

- Only the GRiD MS-DOS **config** command allows you to control unique GRiD hardware features. GRiD MS-DOS maximizes battery life by taking advantage of the hardware features.

- GRiD MS-DOS includes the **info** command for instant, on-line reference information on system commands and facilities.
- GRiD MS-DOS includes the **gridscan** command, which shows the status of input/output devices attached to your computer and lists the factory-installed hardware options.
- GRiD MS-DOS includes the **devices** command, which displays devices and their respective device letters.
- GRiD MS-DOS includes the **setpass** command, which allows you to set and change a password for your computer.

Running BASIC Programs

Programs written in IBM's BASIC or BASICA can run on your GRiDCASE 1550sx computer if you use GRiD's QBASIC instead of IBM's BASIC (refer to Figure 10-2). If you use a batch file that references BASIC or BASICA, change the reference in your batch file or rename the *qbasic.exe* file to *basic.exe* or *basica.exe*, depending on the name specified in the batch file.

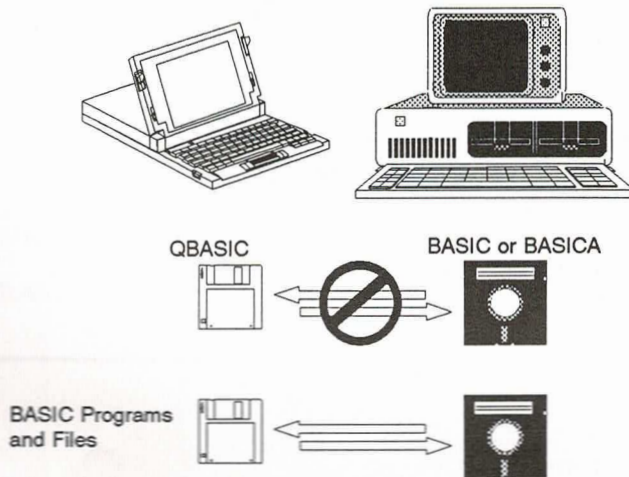


Figure 10-2. Running BASIC Programs on a GRiDCASE 1550sx Computer

The GRiDCASE 1550sx computer does not support light pens, joy sticks, or cassettes; consequently, BASIC programs that require those devices cannot run on a GRiDCASE 1550sx computer.

Moving Application Programs to a GRiDCASE 1550sx Computer

You can take greatest advantage of the full portability of your GRiDCASE 1550sx computer when your application programs and data files reside on the internal hard disk drive or on 3.5-inch diskettes.

You can use the following options to transfer programs from 3.5-inch or 5.25-inch diskettes to your internal hard disk drive:

- If the program is available on 3.5-inch diskettes, simply use the internal 3.5-inch diskette drive to install it on your hard disk. If you don't have an internal diskette drive or the program is supplied on 5.25-inch diskettes, you must use an external diskette drive to install the program. Refer to Chapter 6 for information on connecting and using external diskette drives.
- Use a communication program like LapLink to transfer information between another computer and the GRiDCASE 1550sx computer. This method requires a special cable that connects the serial or parallel ports of the two computers.
- Use the optional internal modem to transfer information between another computer that also has a modem and the GRiDCASE 1550sx computer. This method requires that you have modem communication software installed on the two computers.

APPENDIX A: GRIDCASE 1550sx SPECIFICATIONS

Microprocessor

Main microprocessor	80386SX CPU, operating at 20 or 8 MHz
Numeric coprocessor (Option 541)	80387SX

Display

LCD (standard)	10-inch diagonal, backlit LCD; 640 x 480-pixel, PC-compatible VGA display, with an aspect ratio of 1:1; 64 gray scales
Gas Plasma (Option 505)	10-inch diagonal, gas plasma screen; 640 x 480-pixel, PC-compatible VGA display, with an aspect ratio of 1.1:1, a contrast ratio of 20:1; 7 gray scales
Transflective LCD (Option 506)	10-inch diagonal, backlit transflective LCD; 640 x 480-pixel, PC-compatible VGA display, with an aspect ratio of 1:1; 64 gray scales

Memory

RAM	2 MB standard; 4 or 8 MB optional
-----	--------------------------------------

Modem

U.S. V.42bis 2400 bps
(Option 531)

Internal Hayes-compatible modem with V.42 and Microcom Networking Protocol (MNP) Levels 2 through 4 error correction and V.42bis and MNP Level 5 data compression

UK MNP 2400 bps
(Option 533)

Internal Hayes-compatible modem with MNP Levels 2 through 4 error correction and MNP Level 5 data compression for use in the United Kingdom

US V.42bis 2400 bps/FAX
(Option 535)

Same as option 531 plus 9600 bps send/receive Group III facsimile

U.S. V.32bis/V.42bis 14,400 bps/
FAX
(Option 538)

Internal Hayes-compatible modem with V.42 and Microcom Networking Protocol (MNP) Levels 2 through 4 error correction and V.42bis and MNP Level 5 data compression, plus 9600 bps send/receive Group III facsimile

Mass Storage

Internal Diskette Drive and
60 MB Hard Disk
(Option 524)

60 MB hard disk; 3.5-inch high-density
(1.44 MB) diskette drive reads, writes, and
formats both 1.44 MB and 720 kB diskettes

Internal Diskette Drive and
120 MB Hard Disk
(Option 525)

120 MB hard disk; 3.5-inch high-density
(1.44 MB) diskette drive reads, writes, and
formats both 1.44 MB and 720 kB diskettes

Internal Diskette Drive and
60 MB Removable Hard Disk
(Option 528)

60 MB removable hard disk; 3.5-inch
high-density (1.44 MB) diskette drive reads,
writes, and formats both 1.44 MB and 720
kB diskettes

Optional Peripherals

3.5-inch External Diskette Drive (Model 3401)	3.5-inch high-density (1.44 MB) diskette drive reads, writes, and formats both 1.44 MB and 720 kB diskettes. Connects to computer GRiD peripheral connector.
5.25-inch External Diskette Drive (Model 3402)	5.25-inch double-density (360 kB) diskette drive. Connects to computer GRiD peripheral connector.
5.25-inch External High Density Diskette Drive (Model 3404)	5.25-inch high-density (1.2 MB) diskette drive. Connects to computer GRiD peripheral connector.
Tape Backup System (Model 3403)	40 MB capacity; backs up internal hard disk. Connects to GRiD peripheral connector.
CD-ROM System (Model 3406)	Attachable CD-ROM system attaches to top of computer. Connects to expansion bus connector.
Expansion Chassis System (Model 34115)	Provides expansion capability for three expansion cards. Connects to expansion bus connector.
One-Slot Expansion Chassis System (Model 34105)	Provides expansion capability for an expansion card. Connects to expansion bus connector.
Expansion Chassis System (Model 34101)	Provides expansion capability for five expansion cards. Connects to expansion bus connector.

Interfaces

Serial	2 ports, RS-232C 9-pin, PC-compatible
Parallel	Centronics 25-pin, PC-compatible
GRiD Peripheral Connector	25-pin connector provides access to GRiD external diskette and tape drives
Monitor	Analog VGA, 15-pin
Keyboard	5-pin DIN connector for IBM AT-compatible keyboard or keypad (does not support barcode readers)
Phone jacks (optional)	Two modular telephone jacks for internal modem and telephone—one 6-pin RJ-12C jack (PHONE) and one 8-pin RJ-45C jack (LINE)
Expansion Bus	IBM AT-compatible bus available in power pack/accessory slot connectors

Other Features

Audio	Internal speaker
Keyboard	77 keys (alphanumeric), IBM AT-compatible, tactile feedback, standard typewriter keyboard spacing
Pointing Device	Built-in Isopoint control bar emulates a Microsoft bus mouse
System Indicators	Six indicators show processor status, battery status, disk activity, NumLock, CapsLock, and ScrollLock
Clock/calendar	Internal, lithium battery-powered
Bridge battery	Internal, NiCad battery provides standby mode power while changing the battery pack

Power

Computer requirements 9 to 18 Vdc, 60 W, 100 mV p-p max. noise

Sources:

Internal/external power supply (Model 34173) Autosensing; requires 110-240 Vac, at 47-63 or 400 Hz ac; supplies 16.25 Vdc, 60 W

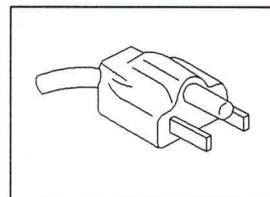
Internal Battery Pack (Model 32153) Removable, rechargeable NiCad battery pack

External attachable battery pack (Model 32162) Attachable rechargeable lead acid pack, provides 2-3 times the battery life of the internal battery pack

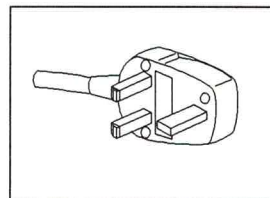
Cigarette lighter adapter (Model 32134) Provides power from a 12 Vdc cigarette-lighter socket

Cords:

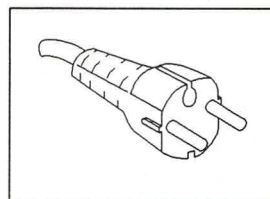
North American (included) 125V, 10A, 18/3 AWG



United Kingdom (Part number: 032142-00) 250V, 13A, Fused, 18/3 AWG



Continental European (Part number: 250042-00) 250V, 10-16A, 18/3 AWG



**Physical Characteristics and Specifications
of GRiDCASE 1550sx Computer**

Case	Magnesium alloy
Weight	12 lbs (5.5 Kg), without battery pack
Height	2.5 in. (6.3 cm)
Width	11.5 in. (29 cm) excluding projections
Length	15 in. (38 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	10% to 90%, noncondensing
Shock tolerance:	
Operating	5g, 10 ms, half-sinewave
Nonoperating	70g, 10 ms, half-sinewave (LCD display); 60g, 10 ms, half-sinewave (plasma display)
Vibration tolerance:	
Operating	5-200-5 Hz at 0.4g
Nonoperating	5-200-5 Hz at 1.5g
Altitude:	
Operating	10,000 feet (3,048 meters)
Nonoperating	40,000 feet (12,191 meters)
Electrostatic discharge	15 kV

**Physical Characteristics and Specifications
of Removable Hard Drive**

Weight	7 oz (198 gr)
Height	.81 in. (2.1 cm)
Width	3.2 in. (8.1 cm)
Length	5.0 in. (12.8 cm)
Shock tolerance:	
Operating	5g, 10 ms, half-sinewave
Nonoperating	100g, 10 ms, half-sinewave
Vibration tolerance:	
Operating	5-200-5 Hz at 0.4g
Nonoperating	5-200-5 Hz at 1.5g
Electrostatic discharge	13 kV

Floppy Diskette Drive Specifications

Capacity formatted	1,474 kB
Transfer rate	250 and 500 kilobits/sec
Maximum recording density	17,434 bpi
Track density	135 tpi
Rotation speed	300 rpm
Average seek time	95 msec
Track-to-track seek time	3 msec
Average latency	100 msec

Hard Drive Specifications

	60 MB Internal Drive	120 MB Internal Drive	60 MB Removable Drive
Capacity Formatted			
Per drive (Mbytes)	60.8	121.7	62.0
Per track (Mbytes)	19,968	19,968	17,408
Per sector (bytes)	512	512	512
Sectors per track	40	40	60
Functional			
Disks	1	2	1
Data heads	2	4	2
Data cylinders	1524	1524	1024
Performance			
Rotational speed (rpm)	3,400	3,400	1,565
Data transfer rate (Mbytes/sec)	1.5	1.5	7.5
Average latency (msec)	8.8	8.8	19.1
Average seek time (msec)	19	19	22
Track-to-track seek time (msec)	8	8	8
Start time (sec)	15	15	2
Stop time (sec)	15	15	3
Start/stop cycles	40,000 (minimum)	40,000 (minimum)	300,000

APPENDIX B: NATIONAL KEYBOARD LAYOUTS

This appendix shows the keyboard layouts for the different national keyboards available on the GRiDCASE 1550sx computer.

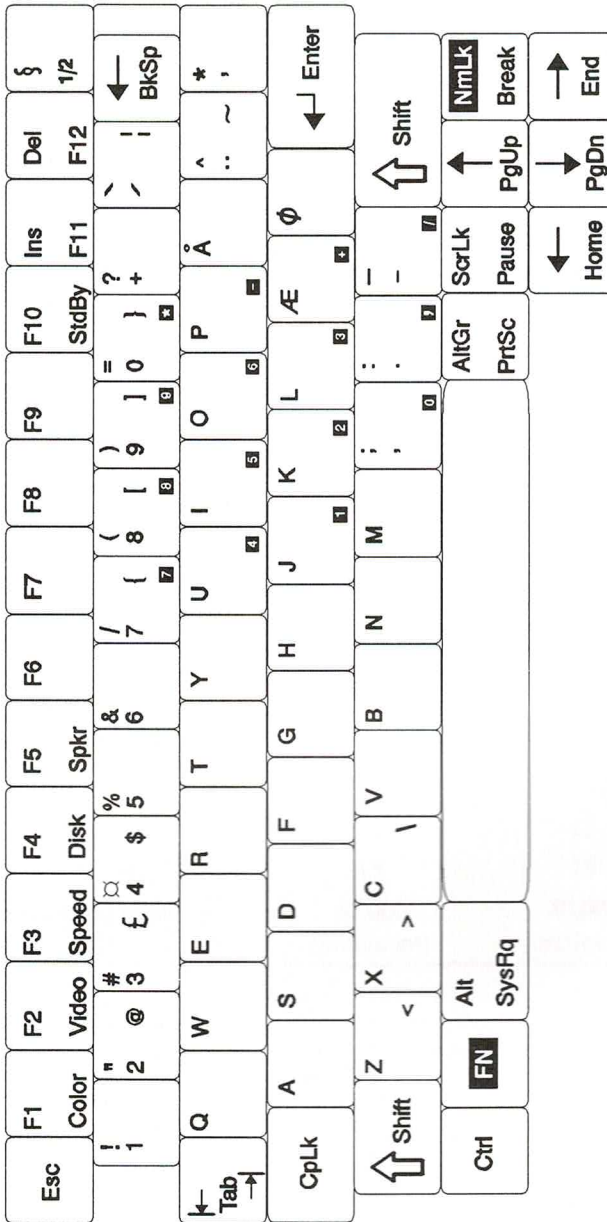


Figure B-1. Danish Keyboard Layout

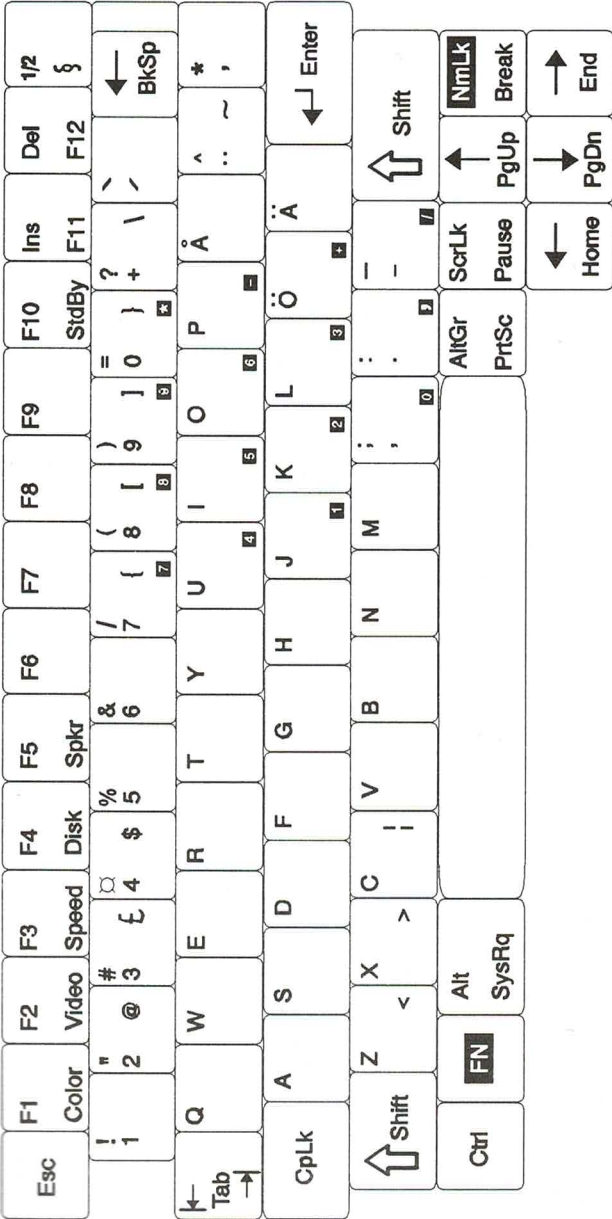


Figure B-2. Finish/Swedish Keyboard Layout

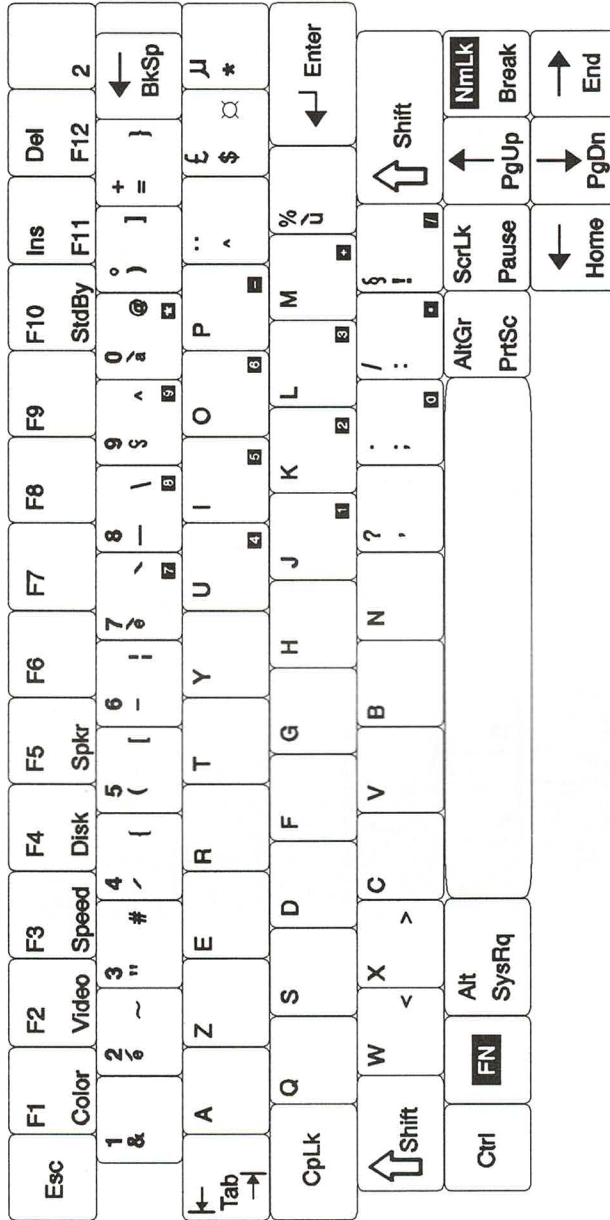


Figure B-3. French Keyboard Layout

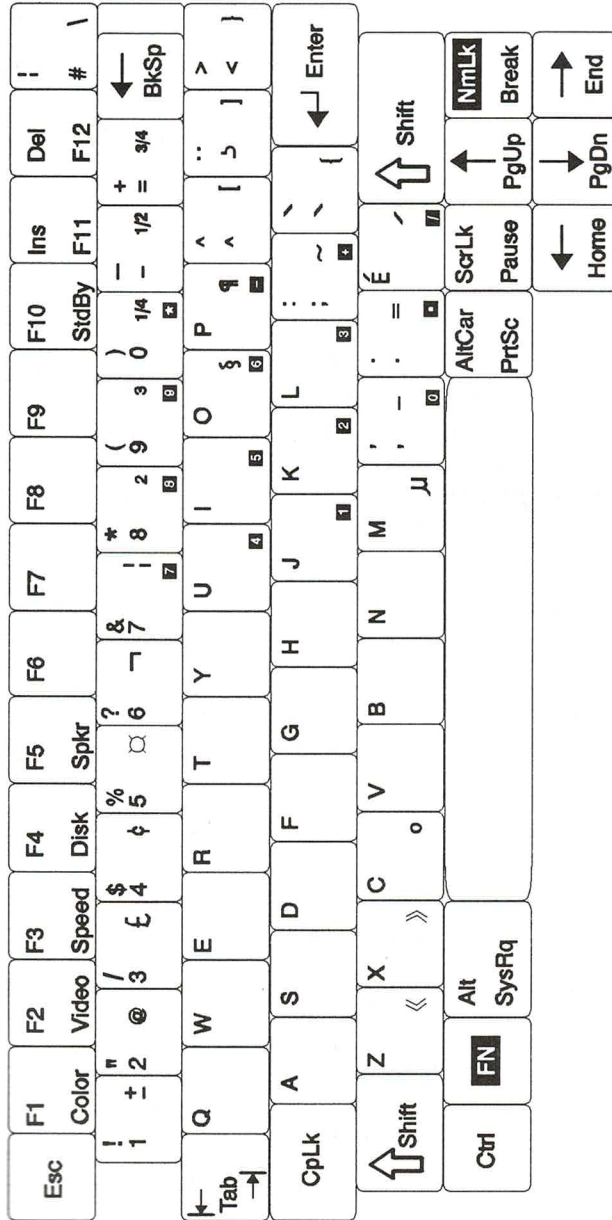


Figure B-4. French-Canadian Keyboard Layout

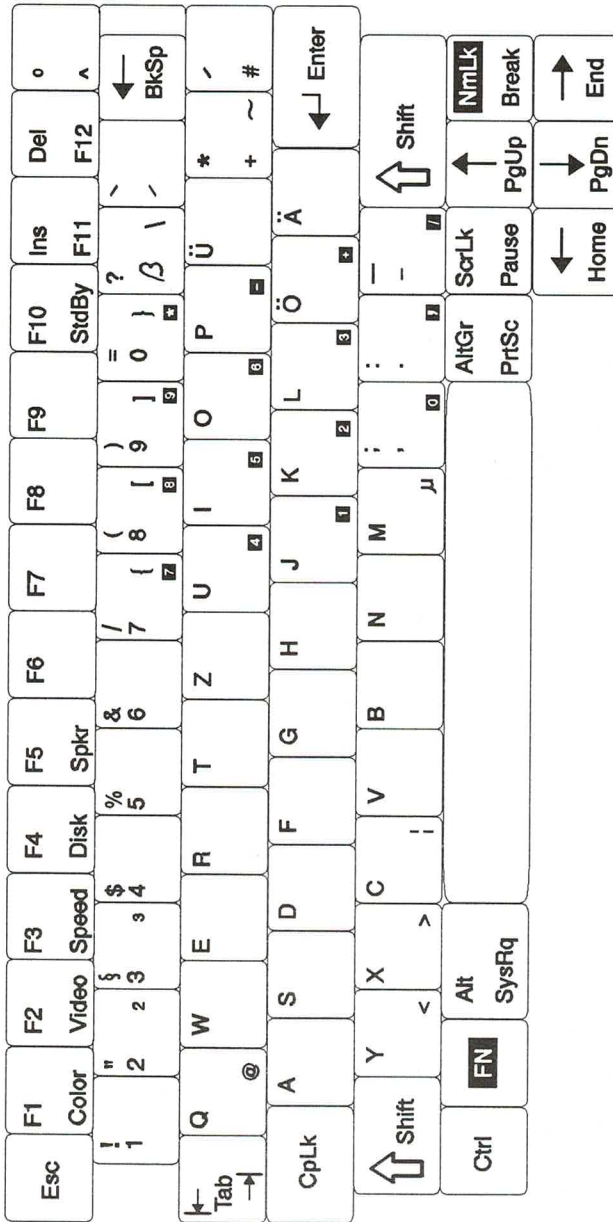


Figure B-5. German Keyboard Layout

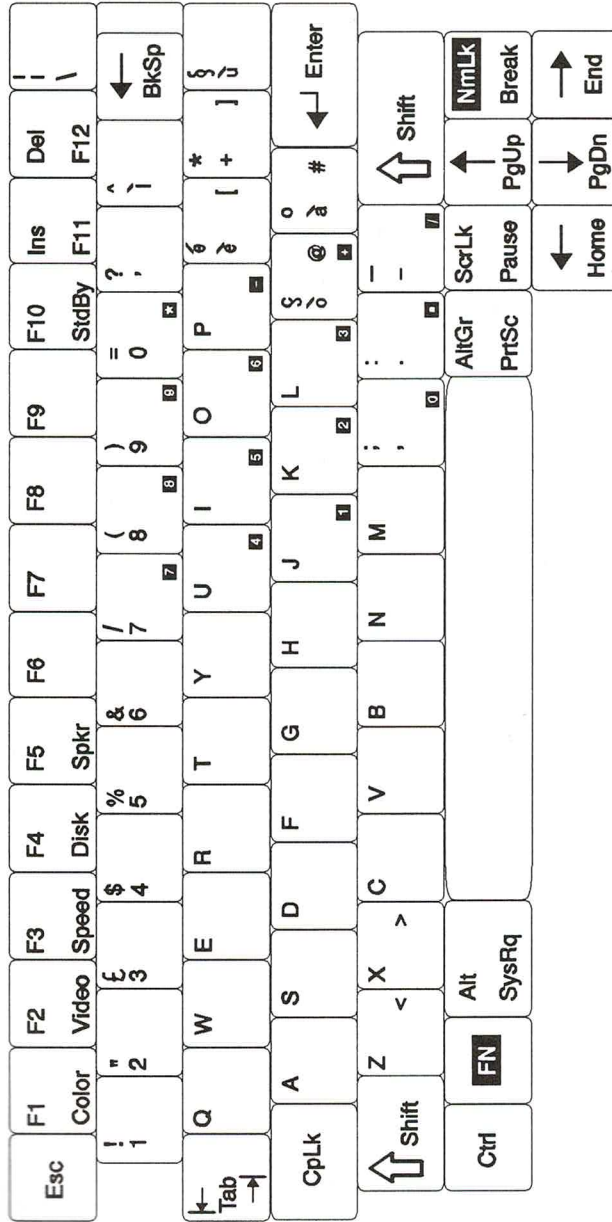


Figure B-6. Italian Keyboard Layout

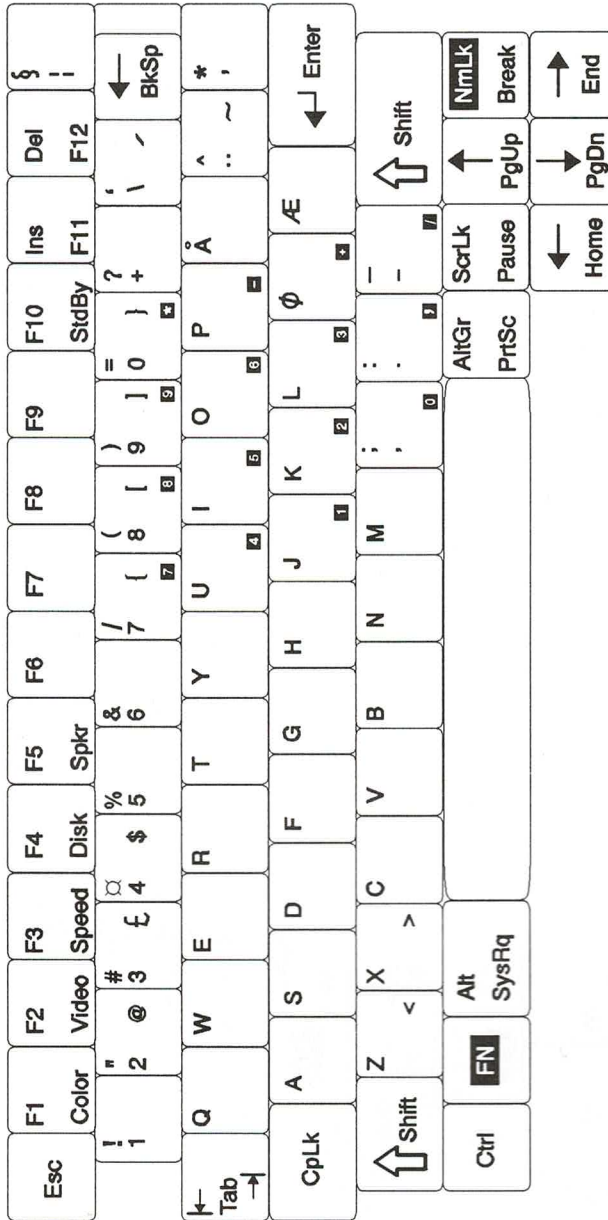


Figure B-7. Norwegian Keyboard Layout

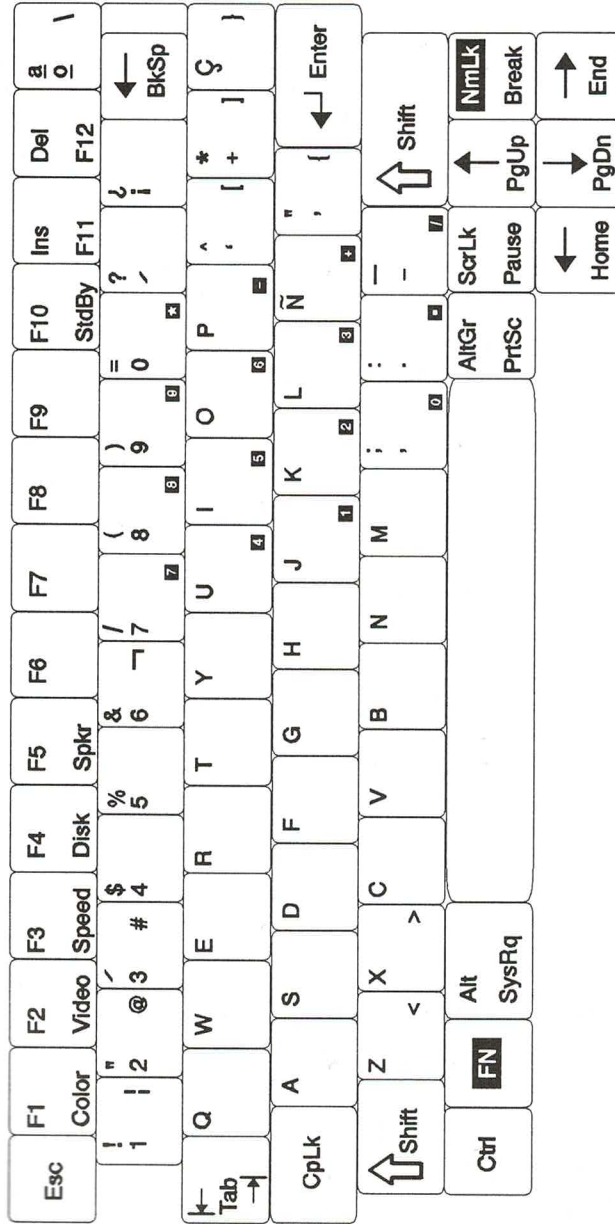


Figure B-8. Spanish Keyboard Layout

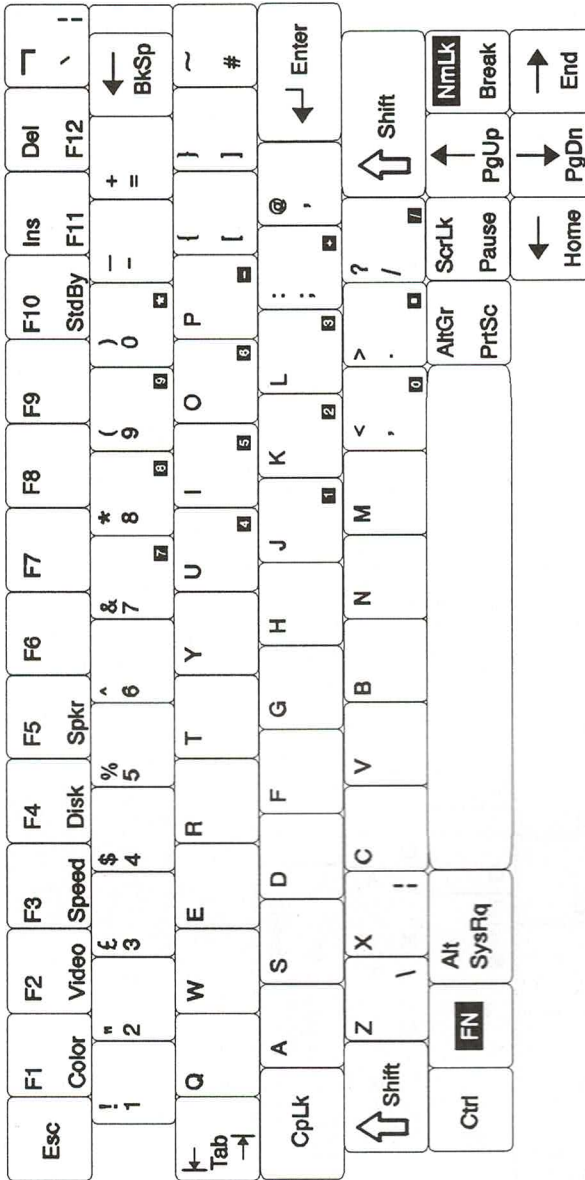


Figure B-9. United Kingdom Keyboard Layout

APPENDIX C: TECHNICAL INFORMATION

This appendix contains technical information about the memory usage in the GRiDCASE 1550sx computer and about the pinouts of the interface connectors.

System Memory

Main memory for the standard GRiDCASE 1550sx computer is two megabytes of dynamic RAM. The main memory can be optionally increased to four or eight megabytes.

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 used for video, the EMS page frame, and the BIOS. 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 by default at C0000h. It can be moved to C4000h, C8000h, CC000h, or D0000h by using an MS-DOS command. Refer to the *MS-DOS Supplement* for more information.

The memory from A0000h to FFFFFh (384 kB) is also used as shadow RAM. The system and video BIOS are copied into shadow RAM to speed their execution. Shadow RAM is also used to store system and video information during standby mode, so it is unavailable for other uses.

Memory starting at 100000h can be configured as EMS or extended memory using an MS-DOS command. Refer to the *MS-DOS Supplement* for more information.

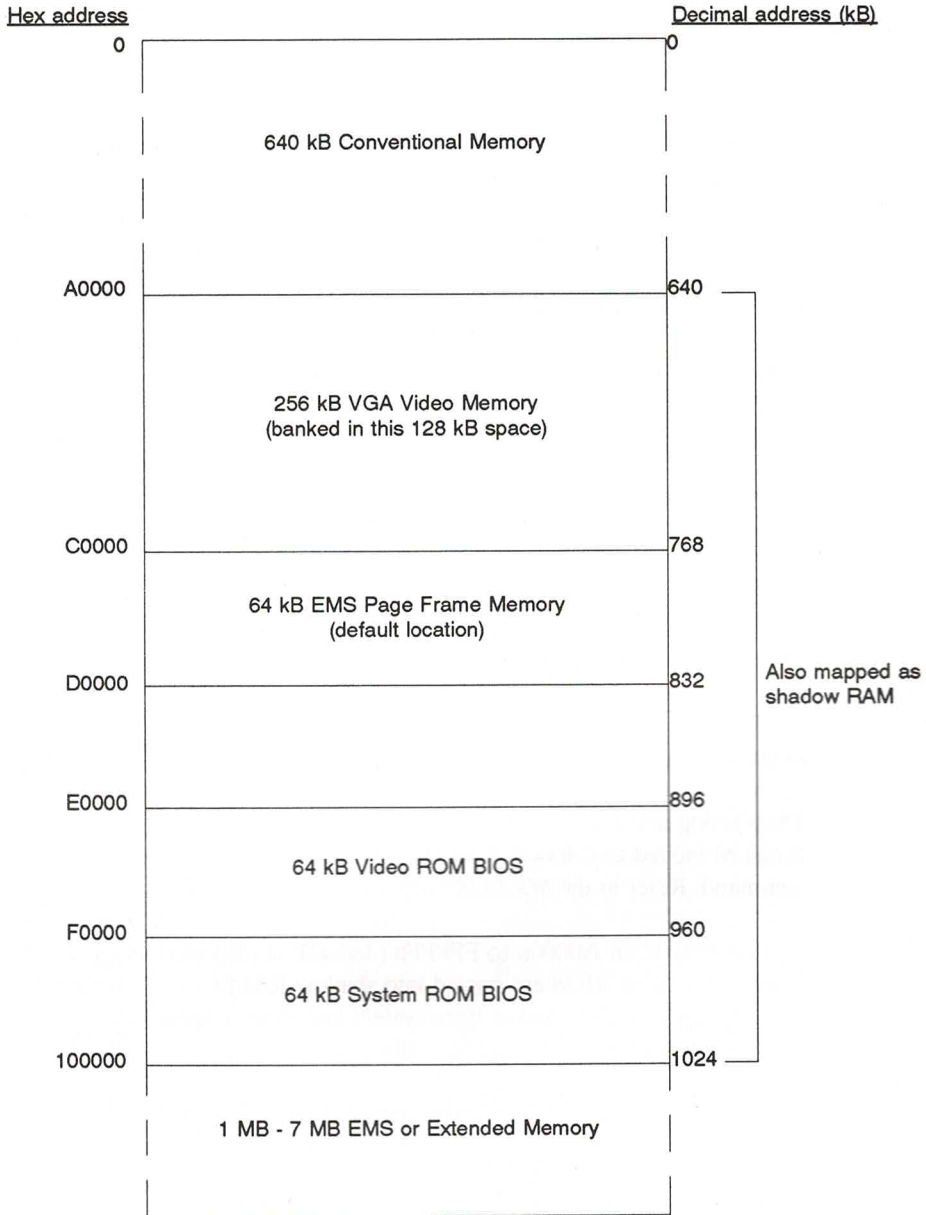


Figure C-1. Memory Map

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.

Serial

There are two D-type 9-pin RS-232C Serial connectors on the computer, labeled SERIAL A and SERIAL B. Each serial port is a Data Terminal Equipment (DTE) input/output port for use with a serial printer, external modem, mouse, plotter or other serial peripheral. You can configure the serial ports using the MS-DOS command **mode comn** and other GRiD MS-DOS commands. Refer to the *MS-DOS Reference Manual* and the *MS-DOS Supplement* for further information.

Figure C-2 shows the Serial connectors and Table C-1 gives the pinouts for the Serial connectors.

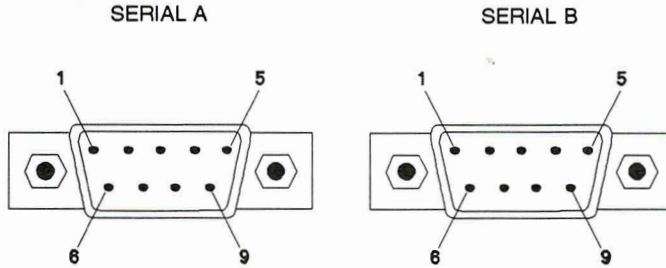


Figure C-2. Serial Connectors

Table C-1. 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

Monitor

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-3 shows the Monitor connector and Table C-2 gives the pinouts for the Monitor connector. Table C-3 lists the video modes supported for external monitors.

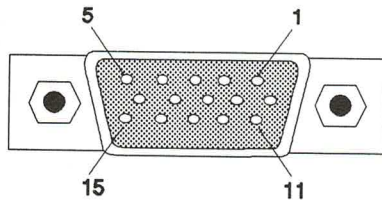


Figure C-3. Monitor Connector

Table C-2. 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-3. Video Modes for External Monitor

Resolution	Colors	Text/Graphics	
CGA Modes			
320x200	16	Text	
640x200	16	Text	
320x200	4	Graphics	
640x200	2	Graphics	
EGA Modes			
320x350	16	Text	
640x350	16	Text	
320x200	16	Graphics	
640x200	16	Graphics	
640x350	2	Graphics	
640x350	16	Graphics	
MDA/Hercules Mode			
720x350	2	Text	
VGA Modes			
360x400	16	Text	
720x400	2	Text	
720x400	16	Text	
640x480	2	Graphics	
640x480	16	Graphics	
320x200	256	Graphics	
Extended Modes			
640x480	16	Text	NOTE: Extended modes require a software driver.
800x400	16	Text	
800x480	16	Text	
800x600	16	Text	
900x390	16	Text	
1056x390	16	Text	
1056x400	16	Text	
1056x480	16	Text	
640x450	16	Graphics	
720x540	16	Graphics	
800x600	16	Graphics	
360x480	256	Graphics	

GRiD Peripheral

The GRiD Peripheral connector provides the signals necessary to connect an external disk or tape drive to the computer. You can connect the following GRiD Systems peripherals to this connector: a 3.5-inch high density (1.44 MB) diskette drive, a 5.25-inch double density (360 kB) diskette drive, a 5.25-inch high density (1.2 MB) diskette drive, or a tape drive (40 MB or greater). Only peripherals manufactured by GRiD Systems should be attached to this connector.

Figure C-4 shows the GRiD Peripheral connector and Table C-4 gives the pinouts for the GRiD Peripheral connector.

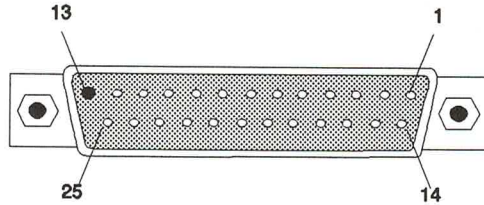


Figure C-4. GRiD Peripheral Connector

Table C-4. GRiD Peripheral Connector Pinouts

Pin	Signal	Pin	Signal
1	Not connected	14	+5V dc
2	Drive Designator~	15	Drive Size~
3	Drive Connected~	16	Side Select~
4	Signal Ground	17	Data Read~
5	Write Protect~	18	Track 00~
6	High Density~	19	Write Gate~
7	Signal Ground	20	Data Write~
8	Tape Detect	21	Step~
9	Direction~	22	Motor~
10	Disk Change~	23	Drive~
11	Low Density~	24	Index~
12	Low Density	25	Not connected
13	Blocked by plastic insert		

Parallel

The D-type 25-pin Parallel connector provides Centronics-type output signals for a parallel printer or other parallel peripheral. The parallel port also supports input on the data lines, so it can be used as a general purpose, parallel input/output port. You can configure the parallel port using the MS-DOS command **mode lptn** and other GRiD MS-DOS commands. Refer to the *MS-DOS Reference Manual* and the *MS-DOS Supplement* for further information.

Figure C-5 shows the Parallel connector and Table C-5 gives the pinouts for the Parallel connector.

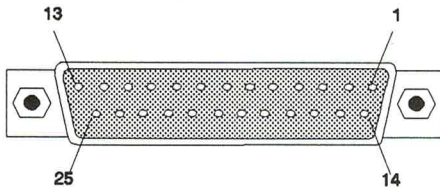


Figure C-5. Parallel Connector

Table C-5. Parallel Connector Pinouts

Pin	Signal	Pin	Signal
1	Strobe~	14	Automatic Line Fee~
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 Out	25	Ground
13	Select		

DC Input

The DC Input connector accepts the plug from the computer power cable, the other end of which connects to a power source such as the internal/external power supply, the attachable battery pack, or the cigarette lighter adapter.

Figure C-6 shows the DC Input connector and Table C-6 gives the pinouts for the DC Input connector.

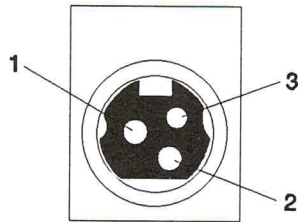


Figure C-6. DC Input Connector

Table C-6. DC Input Connector Pinouts

Pin	Signal
1	16.25 Vdc (accepts 9-18 Vdc)
2	Ground
3	Not connected

Telephone

Computers equipped with an optional internal modem contain two telephone connectors. The Phone connector is a 6-pin RJ-12C connector that allows you to connect a telephone to the computer. In this way you can use the telephone to talk and the computer to transfer data, but not at the same time. Note that this connector may not be available on computers that contain internal modems designed for use outside the U.S. Figure C-7 shows the Phone connector and Table C-7 gives the pinouts for the Phone connector.

The Line connector is an 8-pin RJ-45C connector that connects the telephone line to the internal modem. It contains the signals required for connecting to the U.S. telephone network as well as to non-U.S. telephone networks through a Data Communications Line Interface (DCLI) unit. Figure C-7 shows the Line connector and Table C-8 gives the pinouts for the Line connector.

In the U.S. you can connect the telephone and the line to either telephone connector. The only two pins used in the U.S. are the two center pins in each connector (Ring and Tip) which are wired together in parallel between the two connectors.

Both telephone connectors accept and are compatible with the standard 6-pin RJ-11C telephone plugs that are standard in the U.S.

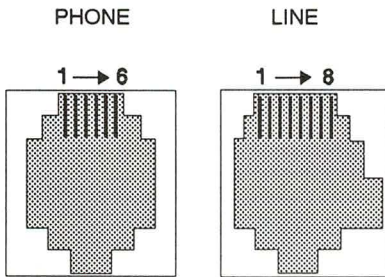


Figure C-7. Telephone Connectors

Table C-7. Phone Connector Pinouts

Pin	Signal
1	Not connected
2	Not connected
3	Ring
4	Tip
5	Not connected
6	Not connected

Table C-8. Line Connector Pinouts

Pin	Signal
1	EQL4
2	EQL3
3	EQL2
4	Ring
5	Tip
6	EQL1
7	IA
8	EQL5

Keyboard

The Keyboard connector is a 5-pin DIN connector that accepts the plug from an external IBM AT-compatible keyboard or a GRiD Systems-supplied numeric keypad. It does not support barcode readers.

Figure C-8 shows the Keyboard connector and Table C-9 gives the pinouts for the Keyboard connector.

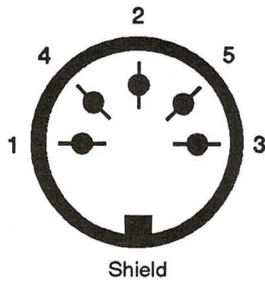


Figure C-8. Keyboard Connector

Table C-9. Keyboard Connector Pinouts

Pin	Signal
1	Keyboard Clock
2	Keyboard Data
3	Not connected
4	Ground
5	+5 Vdc

Expansion Connectors

The Power Pack/Accessory Slot contains a 40-pin and a 60-pin connector.

Figure C-9 shows the expansion slot connectors. Table C-10 gives the pinouts for the 60-pin connector, and Table C-11 gives the pinouts for the 40-pin connector.

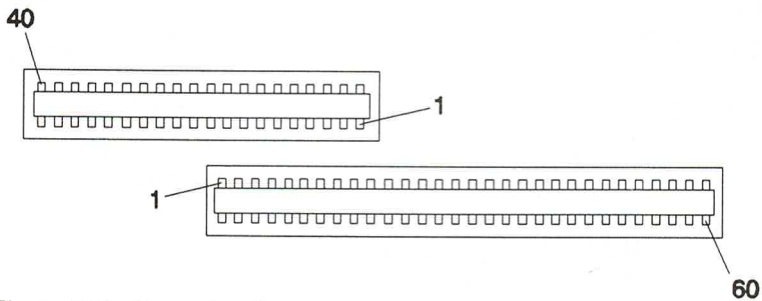


Figure C-9. Expansion Connector

Table C-10. Expansion Slot 60-Pin Connector Pinouts

Pin No.	Signal Name	Direction of Flow	Pin No.	Signal Name	Direction of Flow
1	DACK2~	Output	31	OSC	Output
2	SWPOWER	Power	32	DATA6	I/O
3	DRQ1~	Input	33	IOR~	Output
4	DRQ2~	Input	34	DATA5	I/O
5	DACK3~	Output	35	M12V	Power
6	DRQ3~	Input	36	DATA4	I/O
7	DACK1~	Output	37	ADD0	I/O
8	IOCHRDY	Input	38	DATA3	I/O
9	IRQ5	Input	39	ADD1	I/O
10	IOCK~	Input	40	DATA2	I/O
11	P5V	Power	41	ADD2	I/O
12	BALE	Output	42	DATA1	I/O
13	Signal Ground	Ground	43	ADD3	I/O
14	DATA7	I/O	44	DATA0	I/O
15	Signal Ground	Ground	45	ADD4	I/O
16	IRQ6	Input	46	ADD19	I/O
17	IOW~	Output	47	ADD5	I/O
18	REFRESH~	Output	48	ADD18	I/O
19	IRQ7	Input	49	ADD6	I/O
20	RESET	Output	50	ADD17	I/O
21	SMEMWR~	Output	51	ADD7	I/O
22	BUFAEN	Output	52	ADD16	I/O
23	SMEMRD~	Output	53	ADD8	I/O
24	TC	Output	54	ADD15	I/O
25	IRQ9	Input	55	ADD9	I/O
26	IRQ4	Input	56	ADD14	I/O
27	GRIDBITS3WR~	Output	57	ADD10	I/O
28	SYSCLK	Output	59	ADD13	I/O
29	P12V	Power	59	ADD11	I/O
30	IRQ3	Input	60	ADD12	I/O

Direction is relative to the microprocessor.

The tilde symbol (~) indicates active low (low-true) logic.

Table C-11. Expansion Slot 40-Pin Connector Pinouts

Pin No.	Signal Name	Direction of Flow	Pin No.	Signal Name	Direction of Flow
1	Signal Ground	Ground	21	DACK5~	Output
2	IRQ12	Input	22	LA18	I/O
3	P5V	Power	23	ZEROWS~	Input
4	IRQ11	Input	24	LA19	I/O
5	Signal Ground	Ground	25	EBHE~	I/O
6	IRQ10	Input	26	LA20	I/O
7	IRQ15	Input	27	MEMWR~	Output
8	SPARE1		28	LA23	I/O
9	IRQ14	Input	29	MEMRD~	Output
10	LA17	I/O	30	LA22	I/O
11	MASTER~	Input	31	SWPOWER	Power
12	DRQ7~	Input	32	LA21	I/O
13	IOCS16~	Input	33	DATA8	I/O
14	DACK7~	Output	34	DATA15	I/O
15	MEMCS16~	Input	35	DATA9	I/O
16	DRQ6	Input	36	DATA14	I/O
17	DACK0~	Output	37	DATA10	I/O
18	DACK6~	Output	38	DATA13	I/O
19	DRQ0~	Input	39	DATA11	I/O
20	DRQ5~	Input	40	DATA12	I/O

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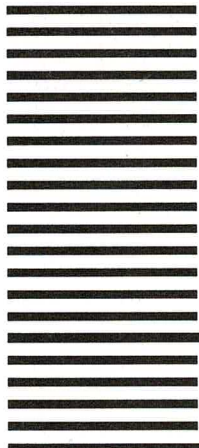
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