
CHAPTER 4: POWER OPTIONS

This chapter describes the options available for powering your GRiDCASE 1535 EXP computer and the external devices attached to it. You may already have some of these items. If not, you can obtain them by contacting a GRiD representative.

THE POWER OPTIONS

Table 4-1 summarizes the power options available. Each option is explained in greater detail following the table.

Table 4-1. Power Options for Your GRiDCASE 1535 EXP Computer

Power Source	Description
Internal/External AC Power Pack Model 34170	When used internally, the AC power pack fits into the power pack/accessory slot on the back of the computer and powers the computer, its internal drive, and an external 3½-inch drive (optional).

NOTE: The computer's AC power pack cannot power a 5¼-inch external diskette drive or a tape drive. Each of these devices must be powered by its own power pack.

CAUTION

If you have a 100 MB hard disk, a plasma screen, or an attached expansion tray, you must use the AC power pack externally.

When used externally, the AC power pack powers the computer from an AC wall outlet and can simultaneously recharge a battery pack currently in the power pack/accessory slot. A cord connects the AC power pack to the DC input connector on the back of the computer and to an ordinary wall outlet.

When used externally, the AC power pack provides adequate power for the computer, its internal drive, an optional external 3½-inch drive, and the expansion tray. (See Chapter 7 for power consumption considerations concerning the expansion tray.)

The AC power pack automatically senses the voltage (110 or 220) that your AC wall outlet supplies and sets its internal circuitry accordingly.

Power Source	Description
Internal Battery Pack Model 32111	<p>Powers computer, its internal drive, and optional 3½-inch external floppy drive (optional).</p> <p>NOTE: You cannot use the internal battery pack to provide power for the expansion tray.</p> <p>Actual battery life depends on your system configuration. You must use a separate AC power pack to provide power for an external 5¼-inch floppy drive or external tape drive.</p> <p>The battery pack fits into the power pack/accessory slot on the back of the computer. See the section <i>Recharging Your Battery Pack</i>, below, for methods of recharging the battery pack.</p>
External Attachable Battery Pack Model 32161	<p>Powers computer, its internal drive, optional 3½-inch external floppy drive, and expansion tray. Battery life depends on your system configuration as well as how your system is used. This attachable battery pack clips to the top of the computer at the rear.</p>
CAUTION	
	<p>When the expansion tray is attached, do not plug the AC power pack into the DC connector on the battery pack to recharge the battery unless the computer is turned off.</p>
Cigarette Lighter Adapter Cable Model 32136	<p>Powers computer from the cigarette lighter socket of a car. Provides adequate power for the computer, its internal drive, the expansion tray, and an optional 3½-inch diskette drive.</p>
External Battery Charger Model 32115	<p>Recharges internal battery pack in about 12 hours.</p>

IMPORTANT SAFETY INSTRUCTIONS

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

The power pack is equipped with a three-wire grounding type AC 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 AC power receptacle. 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.

Be certain that the power plug is disconnected (disconnect by pulling the plug and not the cord):

- If the power cord/plug is frayed or otherwise damaged.
- If anything is spilled into the case.
- If the computer or power pack is exposed to rain or other excess moisture.
- If the computer or power pack has been dropped, or the case has been otherwise damaged.

- If the computer or power pack performs in a way that makes you suspect that they need servicing or repair.
- Whenever you clean the case, using only the cleaning procedures given in the following paragraphs.

Be certain to:

- Keep the computer or power pack away from sources of liquids such as wash basins, bath tubs, shower stalls, etc. Any electrical apparatus may be HAZARDOUS in such surroundings.
- Never expose the computer or power pack to the weather, such as rain, snow, etc.
- Read all installation instructions carefully before you plug in the power pack to a wall outlet.
- Save these instructions for reference by you and others.
- Follow all instructions and warnings dealing with the computer or power pack.

Cleaning the case:

- Disconnect the power plug from the wall outlet. (Pull the plug and not the cord.)
- Use a clean, lint-free cloth that has been dampened and wrung out as dry as possible. Use only clean water to dampen the cloth. Wipe the case surface lightly.
- When cleaning the display, use only a dry, soft cloth. A cloth made especially for cleaning glass is best.

CONNECTING THE AC POWER PACK EXTERNALLY

The AC power pack provides power for the GRIDCASE 1535 EXP computer from both 110-volt and 220-volt wall outlets and recharges the battery pack (if installed). Recharging the batteries takes about 12 hours and occurs whether or not your computer is turned on. When used externally, power from the AC power pack will adequately support the computer, its internal drive, an external 3½-inch floppy diskette drive attached to the external peripheral connector, and an expansion tray. If you have a 100 MB hard disk, a plasma screen, or an attached expansion tray, you *must* use the AC power pack externally.

The AC power pack comes with an AC power cord and a DC output cable.

To install the AC power pack externally, follow the steps listed below.

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

CAUTION

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

3. Plug one end of the DC output cable into the power pack and the other end into the DC input connector on the back of the computer.
4. Attach the female end of the AC power cord to the power cord socket on the back of the power pack.
5. Plug the male end of the AC power cord into a wall outlet that accepts a three-prong plug (see Figure 4-1). If you use a plug adapter, make sure it is properly grounded. Ensure that the power pack is resting on its bottom so that none of the air vents on the sides or top are blocked.
6. Turn on any attached external devices.
7. Turn on the computer.

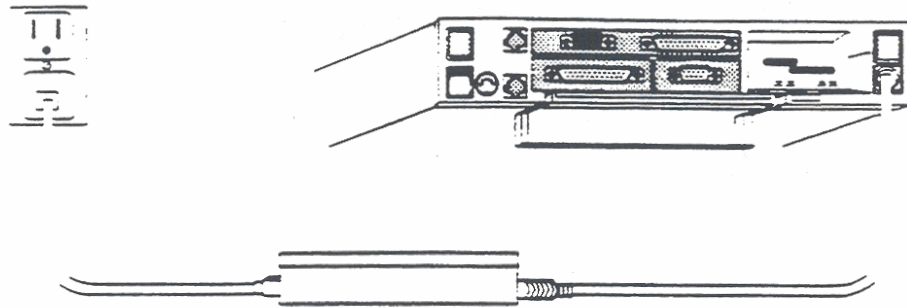


Figure 4-1. Installing the AC Power Pack Externally

NOTE: For best results, do not continually recharge a battery for more than 48 hours at a time.

CONNECTING THE AC POWER PACK INTERNALLY

The AC power pack, when used internally, provides power for your GRiDCASE 1535 EXP computer with LCD screen from either a 110-volt or 220-volt wall outlet. When used internally, the AC power pack supplies power adequate for a computer equipped with an LCD screen, its internal drive, and a 3½-inch external diskette drive (if attached).

NOTE: When used internally, the AC power pack cannot power an attached expansion tray, a 100 MB hard disk, or any peripherals other than the 3½-inch pocket floppy diskette drive. Further, you cannot use the AC power pack internally if your computer is equipped with a plasma screen.

To install the AC power pack internally, follow the steps listed below.

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

CAUTION

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

3. Remove the DC output cable from the power pack.
4. Hold the power pack with the socket for the power cord facing you.
5. Attach the female end of the AC power cord to the power cord socket on the back of the power pack.
6. Insert the power pack into the power pack/accessory slot on the back of the computer until it clicks into place (see Figure 4-2).

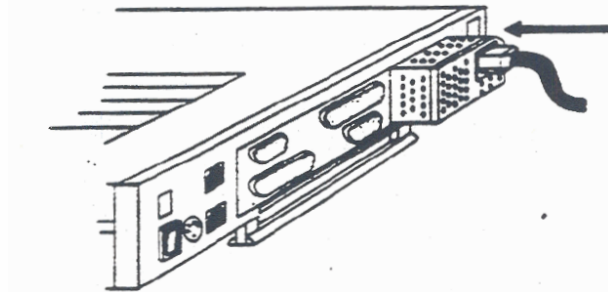


Figure 4-2. Installing the AC Power Pack Internally

7. Plug the male end of the AC power cord into a wall outlet that accepts a three-prong plug. If an adapter is used, make sure it is properly grounded.
8. Turn on any attached external devices.
9. Turn on the computer.

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

WARNING

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

USING THE INTERNAL BATTERY PACK

The Model 32111 internal battery pack provides power to your GRiDCASE 1535 EXP computer from rechargeable batteries permanently sealed inside the battery pack.

NOTE: You cannot use the internal battery pack to provide power for a 5¼-inch diskette drive, a tape drive, or an expansion tray.

To install the battery pack, follow the steps listed below.

1. Turn off the computer.
2. Hold the battery pack with the label facing you.
3. Insert it into the power pack/accessory slot on the back of the computer until it clicks into place (see Figure 4-3).
4. Turn on the computer.

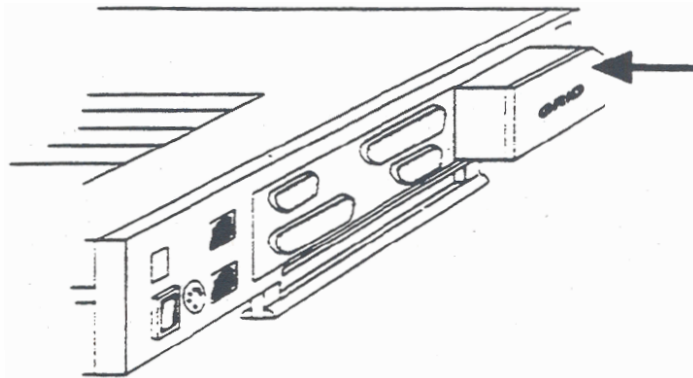


Figure 4-3. Installing the Battery Pack

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

The Life of Your Battery Pack

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. The life of your battery pack depends on the following factors:

- The type of screen—if your computer has a plasma screen, you can increase battery life by lowering the intensity of the display. This decreases the power drain on the battery. If your computer has an LCD screen, you can increase battery life by dimming or turning off the back light when you don't need it (contrast of an LCD screen has no effect on battery life). Overall, computers with plasma screens consume more power than those with LCD screens.
- Display mode—if your computer has the optional 10-inch diagonal plasma screen, it draws about 20% more power when in the 640 by 400 graphic display mode than when in the 640 by 200 mode. The graphic display mode is controlled by the software you run; you cannot explicitly control it.

- The number of processors—if your computer has an optional numeric coprocessor, it requires more power than if it has only the standard 80386 microprocessor.
- The use of the internal diskette drive—to minimize power consumption and maximize battery life, the GRiDCASE 1535 EXP supplies power to the internal floppy diskette drive only when data is being read from or written to the drive. You can therefore extend the working time you achieve on a single battery charge by avoiding unnecessary file access, such as frequent saves, switching back and forth between files, and so on.
- The use of the internal hard disk option—the hard disk uses more power than an internal diskette drive.
- Storage temperature—if the battery pack is stored at temperatures in excess of 90° F for two months or more without recharging, you may have to use and recharge the battery several times before it is again able to hold a full charge.
- Cold starting the computer—turning the computer off and then back on again to reload the operating system consumes considerably more power than performing a warm restart. To perform a warm restart, press and hold the **Ctrl** and **Alt** keys and then press the **Del** key.

NOTE: Do not use any operating system other than that supplied for your GRiDCASE 1535 EXP computer. Other operating systems are not designed to optimize battery life.

Recharging Your Battery Pack

You should always wait for the battery to become fully discharged before recharging your battery pack. The battery charging/battery low indicator turns red or the optional low power beep sounds when it is time for you to recharge the battery. If you frequently recharge your battery pack before it is fully discharged, the batteries may lose some of their capacity.

When the battery charging/battery low indicator turns red, indicating the power in your battery pack is low, don't immediately remove the battery pack. First, save any data you are working with and then turn off the computer and remove the battery pack or supply AC power, if available. Any data currently in main memory is lost.

If you do not have access to AC power, you can install a fresh battery pack.

Once you have supplied dependable power to the computer, you should recharge your battery pack. The method you use to recharge the battery pack depends on the power options available to you, as summarized below.

If you have an:

Then:

Internal/External AC
Power Pack

Leave the discharged battery pack in the power pack/accessory slot and connect the AC power pack to the computer externally, as explained above. The batteries recharge in about 12 hours regardless of whether the computer is on or off. While the battery pack is charging, the battery charging/battery low indicator turns green.

External Battery
Charger

Insert the battery pack into the charger as explained below in the section **USING THE EXTERNAL BATTERY CHARGER**. The batteries recharge in about 12 hours.

CONNECTING THE ATTACHABLE BATTERY PACK

The Model 32161 external attachable battery pack provides two to three times as much power as the internal battery pack. The attachable battery pack attaches to the top of the GRiDCASE 1535 EXP computer at the rear.

To connect the attachable battery pack, follow the steps listed below.

1. Turn off the computer.

CAUTION

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

2. Remove the two plastic caps (see Figure 4-4) from the rear of the computer. Insert the blade of a small flat-head screwdriver along the edge of a cap to pop it off. A phillips-head screw is visible under each cap.

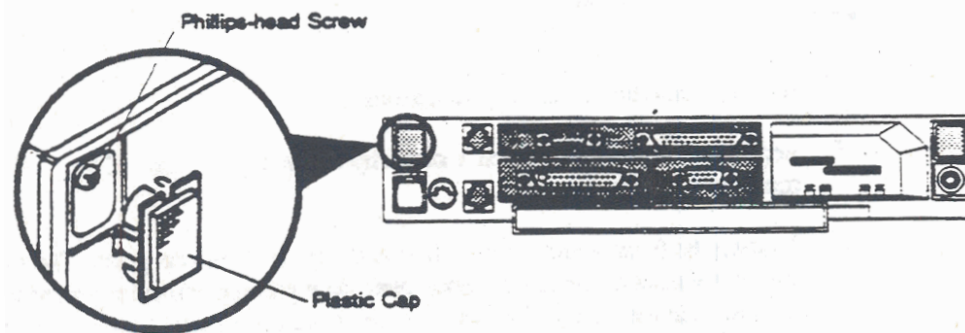


Figure 4-4. Removing Plastic Cap from Rear of Computer

3. Unscrew and remove one of the phillips-head screws.
4. Insert one of the washers and plastic latch clips into the hole, making sure that the concave end of the washer faces towards the computer. Then insert one of the phillips-head screws supplied with the battery pack and gently tighten the screw. Figure 4-5 shows the correct position of the washer and the latch clip. Note that the screws supplied with the battery pack are longer than those originally in the computer.

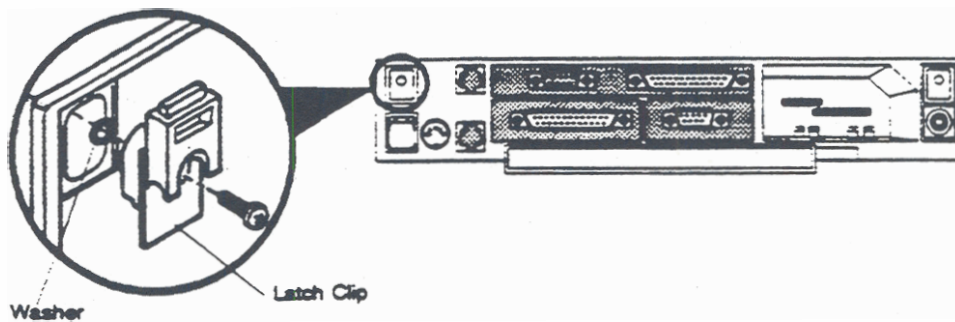


Figure 4-5. Attaching Latch Clip to Computer

5. Repeat steps 3 and 4 to attach a latch clip to the opposite side of the computer's rear panel.
6. Position the front of the battery towards the front of the computer. The metal tabs at the front of the battery hook over the top of the computer behind the display. Tilt the display forward in order to hook the metal tabs over the top edge of the computer.
7. Attach the latches on the battery to the latch clips on the computer by hooking the bottom of each latch over the latch clip and gently pushing the top end of the latch towards the computer (see Figure 4-6).

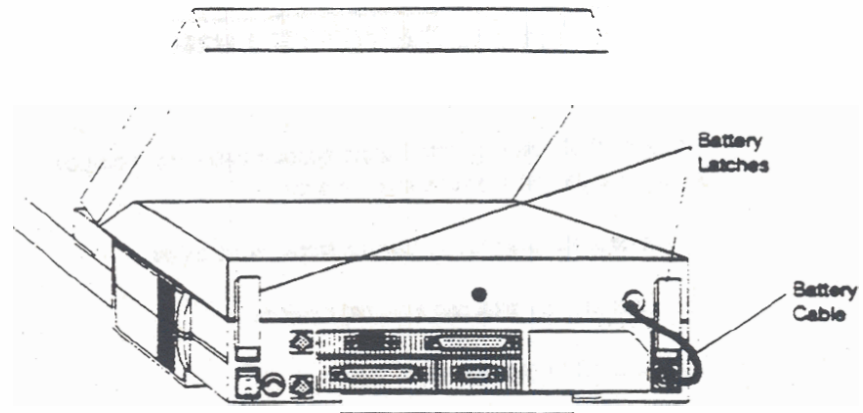


Figure 4-6. Attachable Battery Clipped to Computer

8. Plug the DC cable on the back of the battery pack into the DC power connector on the back of the computer.
9. Turn on the computer.

To conserve battery pack power, follow the guidelines given in the earlier section on the internal battery pack. When the external battery pack begins to lose power, the red battery low indicator on the front of the computer will light. When this happens, save your data immediately. Then supply AC power to your computer or use an internal battery pack. You can recharge the attachable battery pack by plugging it into the AC power pack shipped with your computer. Refer to the information provided with the attachable battery pack for more detailed recharging instructions.

CAUTION

If you have an expansion tray attached, do not plug the AC power pack into the battery pack to recharge the battery when the computer is turned on. The battery pack can only be recharged when the computer is turned off.

CONNECTING THE CIGARETTE LIGHTER ADAPTER CABLE

The Model 32136 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 any attached external devices.
2. Turn off the computer.

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.

3. Plug the cigarette lighter end of the adapter cable into the cigarette lighter socket of the car.
4. Plug the smaller end of the adapter cable into the DC input connector on the back of the computer (see Figure 4-7).
5. Turn on any attached external devices.
6. Turn on the computer.

CAUTION

Many automobiles cause voltage surges or sags 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 reboot, causing the loss of any data currently in main memory. If you are powering your computer from a car cigarette lighter socket, and the vehicle's engine is not running, save any files you are working on before starting the vehicle's engine.

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.

You can avoid possible power interruption by keeping a charged battery pack in the computer while operating from a car. As long as power is being received through the cigarette lighter adapter cable, there is no drain on the internal battery. The adapter will, in fact, provide sufficient power to partially recharge the battery. If power from the adapter is cut off, however, the battery ensures continuous power to the computer, thus preventing any loss of data.

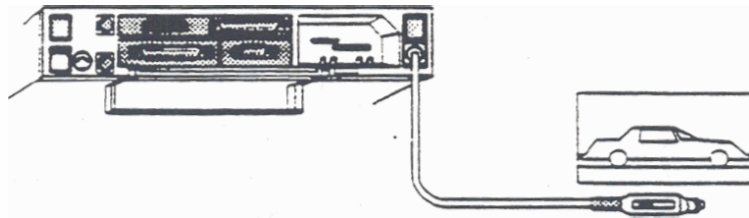


Figure 4-7. Connecting the Cigarette Lighter Adapter Cable

NOTE: As mentioned above, the battery pack receives only a partial charge when you power the computer from the cigarette lighter adapter cable. To fully recharge a battery pack, you must supply AC power to the computer.

USING THE EXTERNAL BATTERY CHARGER

The Model 32115 external battery charger fully recharges your internal battery pack in about 12 hours. The external battery charger comes with a Y cable that has three DC jacks, two male and one female. The third connector on this cord allows you to run your computer while the battery is recharging (see Figure 4-8). To recharge the battery pack, follow the steps listed below.

1. Place the battery pack inside the charger and secure it with the elastic strap.
2. Connect one male connector on the Y cable to the battery charger.
3. Plug the female connector on the Y cable into the DC jumper cable supplied with the AC power pack.
4. Plug the other end of the DC jumper cable into the AC power pack.
5. If you want to run your computer while the battery is recharging, plug the second male connector on the Y cable into the back of the computer.

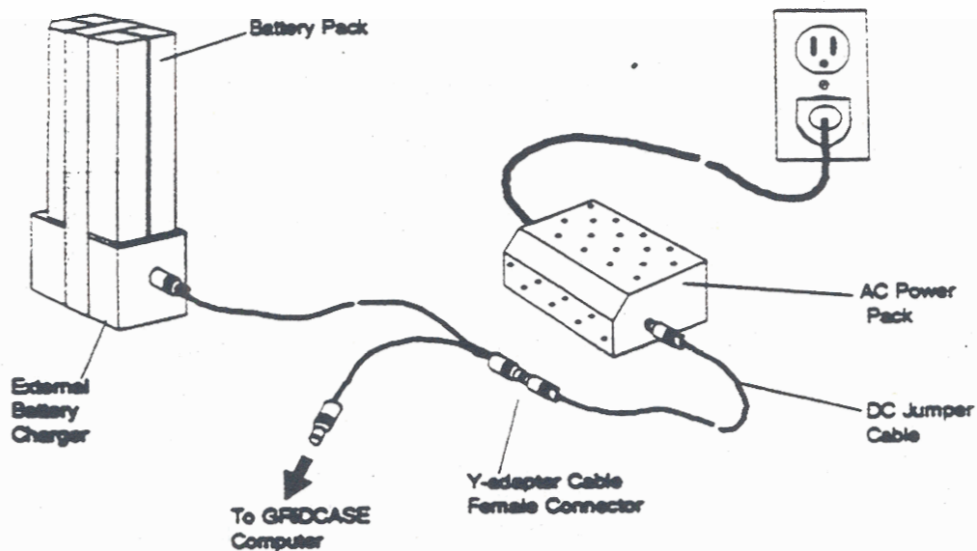


Figure 4-8. Connecting the External Battery Charger

CHAPTER 5: USING THE INTERNAL DISKETTE AND HARD DISK DRIVES

This chapter describes how to use the internal floppy diskette and hard disk drives. Your system can be equipped with either an internal 3½-inch floppy diskette drive or a hard disk drive. The diskette drive, if installed, is located on the side of your computer and accepts both double-density and high-density 3½-inch floppy diskettes. The hard disk, if installed, is also located on the side of the computer.

TAKING CARE OF THE DISKETTE DRIVE(S)

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

- Only use high-quality double-sided, high-density 135 track-per-inch (TPI) 3½-inch floppy diskettes or double-sided, double density 135 TPI 3½-inch floppy diskettes. High-density diskettes store 1.4 MB of data per diskette. Double-density diskettes store 720 KB of data each. Diskettes from the following manufacturers are recommended: Sony, Fuji.
- Never put a damaged or dirty diskette in a drive.
- Never put anything other than a diskette in 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.

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 within 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 3½-inch floppy diskette stores up to 1.4 MB of data.

Two kinds of 3½-inch floppy diskettes are available: double-density and high-density. High-density diskettes have a storage capacity of 1.4 MB. Double-density diskettes have a storage capacity of 720 KB. The diskette drives used in GRiDCASE 1535 EXP computers can read, write, and format diskettes of both kinds. You must be careful, however, not to try to format a 720 KB diskette as a 1.4 MB diskette—see **FORMAT** in Chapter 10.

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

All diskettes you use in your GRiDCASE 1535 EXP computer must have the following characteristics:

- Double-sided
- High-density or double-density
- Soft-sectored
- 135 TPI

Figure 5-1 shows the front and back side of a 3½-inch floppy diskette. 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.

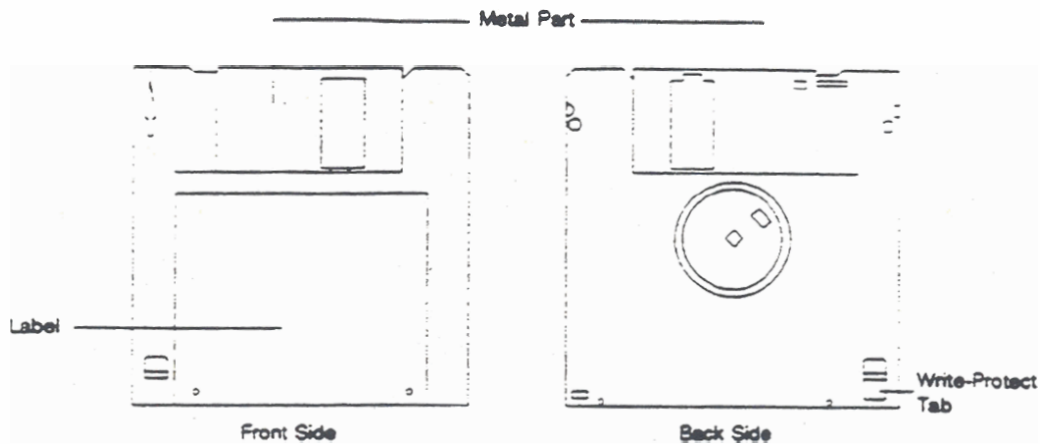


Figure 5-1. Front and Back Sides of Floppy Diskette

Inserting and Removing Floppy Diskettes

To insert a floppy diskette in a drive, follow the steps listed below.

1. If you do not want to inadvertently write over the floppy diskette, write protect the diskette by sliding the write-protect tab on the back-side of the diskette until it uncovers the hole. (See 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 metal part 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 the drive. If you have trouble inserting the diskette, press the eject button on the drive and try again.

To remove a floppy diskette, push the diskette eject button until the diskette pops out of the drive.

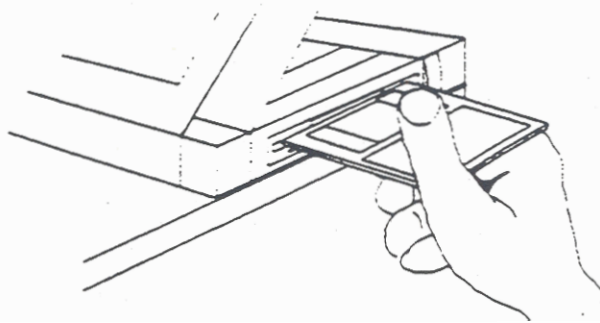


Figure 5-2. Inserting a Floppy Diskette into the Drive

CAUTION

Never release a floppy diskette when the in-use light is on, unless prompted to do so. The in-use light indicates that file access may be taking place. Releasing the floppy diskette at this time, when 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 3½-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 so that you can see clear through the write-protect hole. Once you have done so, it is physically impossible for the diskette drive to write data to the diskette. While the write-protect tab is in this position, you cannot create, alter, or erase files on 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 the 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 attempt to 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 Chapter 10 and in the *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. See the FORMAT command in Chapter 10 for more information on performing the format properly.

Taking Care of Floppy Diskettes

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

- Do not touch the surface of the diskette by moving the metal slide. This slide 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 50° F (10° C) or above 140° F (60° C).
- Keep diskettes away from wall adapters.
- For optimum long-term storage, keep diskettes at a temperature between 60° and 70° F (15° to 20° C).
- 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. 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 back-up copies.

Backing Up Files on Floppy Diskettes

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

You can make back-up copies using the XCOPY or DISKCOPY command as described in the *MS-DOS Reference* manual.

TAKING CARE OF YOUR HARD DISK

Although the internal hard disk in your GRiDCASE 1535 EXP 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. 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 your computer when the hard disk in-use indicator light is on; this could cause loss of data.

Backing Up Files on the Hard Disk

It is a good idea to make back-up 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 command. 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. See the *MS-DOS Reference* manual for information about the COPY, XCOPY, and BACKUP commands.

GRiD supplies the software to simplify hard disk back-up with diskettes. Call your GRiD representative for more information.

If your system is equipped with the pouch tape drive, Model 3403, you can back up your hard disk to tape. Using a tape drive greatly speeds up the back-up process. The tape drive comes with its own software and documentation.