Model 32170 GRiDCase Plus 3 1/2-Inch Pocket Diskette Drive

September 1986

Limited Warranty and Limitation of Liability

You should carefully read the following terms and conditions. You will be deemed to have accepted these terms and conditions if you have not returned the product with your proof of purchase to your GRiD dealer, within 5 days of the date of payment.

The term "Products," as used herein, means hardware, hardware parts, and documentation sold by GRiD.

1. Warranty

GRiD warrants that the Products sold hereunder shall be free from defects in materials and workmanship for a period of 90 days after date of shipment. Defective Products will be repaired or replaced, at GRiD's option, by GRiD during the warranty period. You shall notify GRiD of the defective Product within the 90-day period, obtain a Product Repair Order and return the Product to GRiD along with proof of purchase data. If this Product is delivered by mail, you agree to insure the Product or assume the risk of loss or damage in transit, to prepay shipping charges to the warranty service location and to use the original shipping container or equivalent. Contact an authorized GRiD Systems dealer or write to: GRiD Systems Corporation, Customer Service Center, 2535 Garcia Avenue, P.O. Box 7535, Mountain View, CA 94039-7535 for further information.

You are responsible for removing any data or programs or keeping backup copies prior to returning Products to GRiD. GRiD shall not be liable for loss of data contained in any returned equipment.

This warranty is not valid if the Products have been abused, misused, altered, neglected, or if repairs are attempted by unauthorized personnel.

Except as provided above, GRiD makes no warranties, expressed or implied, including any warranty of merchantability or fitness for a particular purpose.

2. Limitation of Liability

In no event will GRiD be liable for special, incidental, or consequential damages, however caused, GRiD's liability under or for breach of this agreement shall be limited to refund of the purchase price.

3. General

You shall not assign this Agreement nor any rights hereunder without the prior written consent of GRiD. GRiD reserves the right to withhold such consent for any reason whatsoever. Subject to the foregoing, this Agreement shall bind and inure to the benefit of the respective parties hereto and their heirs, personal representatives, successors, and assigns.

The Terms and Conditions of this Limited Warranty and Limitation of Liability and of the Class A Software License Agreement represent the entire Agreement between GRiD and you relating to Product purchases and software licensing and may only be modified in writing, signed by both parties.

You acknowledge that you have read this agreement, understand it, and agree to be bound by its terms and conditions.

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About This Book

This manual introduces you to the 32170 Pocket Diskette Drive. It shows you
how to set up and operate the unit, and how to care for it.

Chapter 1: Physical Description

This chapter introduces you to the Model 32170 pocket diskette drive. It lists the accessories included with the diskette drive and gives a detailed description of the front, rear and bottom views of the unit.

The Model 32170 Pocket Diskette Drive is a member of the GRiDCase Computer family of devices. The 32170 is a 3 1/2-inch floppy diskette drive in an extremely compact package. The "Pocket Floppy" requires no power supply of its own; instead it draws its power from the GRiDCase computer it is attached to.

Checking the Contents of the Box Each shipping carton contains the following parts:

o Model 32170 pocket diskette drive

o Model 6203 cable

o Packing materials

o Documentation

Check for shipping damage or missing parts. If there are any problems, contact the GRiD representative who sold you the pocket diskette drive.

Keep the shipping carton and all original packing materials in the event you need to return your pocket diskette drive for service. Do

not ship the unit in a carton other than the original shipping
carton, as damage may result.

Also keep the blank floppy that came in the diskette drive.
Whenever you transport the unit, you should protect the drive by
placing this blank "travel" floppy in it.

The Front View   The front view of the disk unit is shown in Figure 1-1 and is
described in the paragraphs that follow.

Figure 1-1.   Front View of 32170 Pocket Diskette Drive
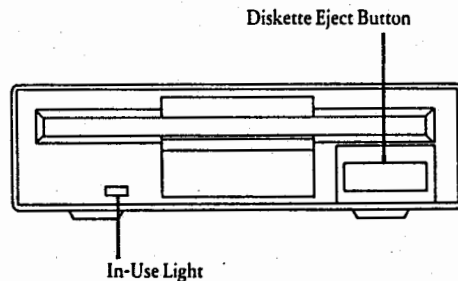
Diskette Drive
The diskette drive is a 3 1/2-inch floppy diskette drive that holds
double-sided, double-density 3 1/2-inch floppy diskettes. For
complete information on using the diskette drive and on the
recommended floppy diskettes, see Chapter 2.

Diskette Eject Button
The diskette eject button at the bottom right of the diskette slot
is used to eject the floppy diskette currently in the diskette
drive. To remove a diskette, push in the diskette eject button
until the floppy diskette pops out.

In-Use Light
The In-Use light, located to the left of the diskette slot,
indicates when the floppy diskette drive is being accessed.

CAUTION: Never turn off the computer when the in-use light is lit;
this indicates that file access is taking place. Doing so could
destroy files. Additionally, never remove a floppy diskette when
the in-use light is illuminated, as this may damage your floppy
diskette or diskette drive.

The Rear View   The rear view of the disk unit is shown in Figure 1-2 and is described in the paragraphs that follow.

Figure 1-2.   Rear View of 32170 Pocket Diskette Drive
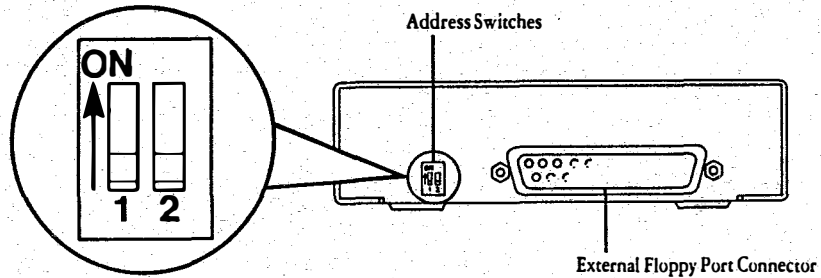
External Floppy Port Connector
The external floppy port connector on the diskette drive is used to connect the pocket diskette drive to the computer. The connector is a 25-pin jack (female) connector. Chapter 2 gives instructions on connecting the diskette drive to your computer.

Address Switches
The address switches, located on the left hand side of the back of the pocket diskette drive, set an address that the computer uses to direct data to and from the diskette drive. The switch settings also determine the sequence in which the computer addresses multiple devices. Consult Appendix A to determine the correct switch settings for your device.

Chapter 2: Set Up and Operation

This chapter shows you how to set up and operate your Model 32170
Pocket Diskette Drive.

To set up the pocket diskette drive, you need the following items:

o GRiDCase Plus Computer

o 32170 Pocket Diskette Drive

o 6203 External Floppy Port Cable

Power Requirements The 32170 Pocket Diskette Drive draws its power from the
GRiDCase Plus; no external power supply needs to be attached to the
32170. It can be used with any of the power options available to
your GRiDCase Plus (internal or external battery, internal or
external AC power). The external AC power pack, when connnected to
the GRiDCase Plus, can supply power to the GRiDCase Plus, the 32170,
and one external storage device attached to the GRiDCase Plus
external bus port. To power additional external bus storage
devices, it is recommend that you use a 2200 base station.

Connecting the 32170 Pocket Diskette Drive to the Computer You use the Model
6203 external floppy port cable to connect the pocket diskette drive
to the GRiDCase Plus Computer.

CAUTION: Always turn off the power before connecting or
disconnecting any device to the external floppy port. Failure to do
so may damage your computer and/or diskette drive.

The 6203 cable has two male ends. Attach one end of the external
floppy port cable to the external floppy port connector on the right
side of the GRiDCase Plus. Attach the cable's other end to the
floppy port connector on the back of the 32170 pocket diskette
drive.

Because of its trapezoidal shape, the cable plugs into the connector
in only one way. If it doesn't fit in easily the first time, turn
the end of the cable upside down. Gently tighten the thumbscrews on
each end of the cable. Be careful not to overtighten the
thumbscrews as you may damage the connector.

CAUTION: Only use the cable provided with the pocket diskette drive
to attach it to your computer (GRiD cable model 6203). Any other
cable may cause damage to your computer or to the diskette drive.

Figure 2-1 shows an external floppy port cable connecting the 32170
Pocket Diskette Drive to the GRiDCase Plus.

Figure 2-1. Cable connecting 32170 Pocket Diskette Drive to
GRiDCase Plus

Pocket Floppy
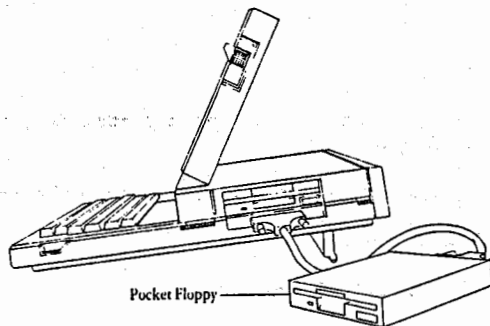
The address switches on the pocket diskette drive must be set
properly. These switches set the device's address, allowing the
computer to exchange data with it. Consult Appendix A to determine
the correct switch settings.

After the address switches are set, you are ready to connect your
pocket diskette drive to the GRiDCase Plus.

To Connect the 32170 Pocket Diskette Drive to the Computer

1. Turn off the computer and any other devices.

    CAUTION: Always turn off the power before connecting or
    disconnecting any device to the external bus connector or to
    another device. Failure to do so may damage your computer
    and/or diskette drive.

2. Attach one end of the Model 6203 external floppy port cable to
    the connector on the rear panel of the pocket diskette drive.

3. Attach the other end of the external floppy port cable to the
    external floppy port connector on the side of the computer.

4. Turn on the computer.

Operating the 32170 Pocket Diskette Drive   Operation of the pocket diskette
drive consists of inserting and removing floppy diskettes from the
drive.

To Insert a Floppy Diskette

1. Hold the diskette with the larger label side up. An arrow
on the diskette points in the direction you should insert the
diskette; the metal part goes in first (see Figure 2-2).

2. If you do not want to write over this floppy inadvertently,
write protect the diskette by sliding the write-protect tab on
the back-side of the diskette until the hole is uncovered.

3. Push the diskette into the drive until it clicks into place.

Figure 2-2. Inserting a Floppy Diskette into the Diskette Drive
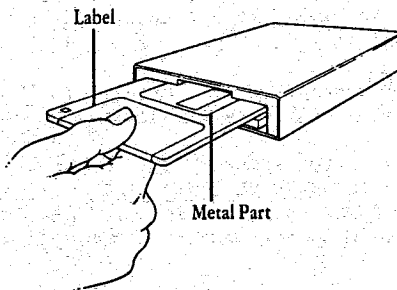
To remove your diskette, push in the diskette eject button until the
floppy diskette pops out.

CAUTION: Never remove a floppy diskette when the in-use light is
lit. The in-use light means that the file access is taking place.
Releasing the floppy diskette at this time could destroy files.

Floppy Diskettes
Floppy diskettes, or "floppies," are plastic disks that have been coated with a magnetic material (much like the coating on audio recording tape). The diskette spins inside a protective plastic case.

One 3 1/2-inch floppy disk stores up to 737,000 thousand characters of data. 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.

CAUTION: Among the variety of diskettes available on the market, certain types, when operating from a GRiDCase Plus diskette device, may either malfunction or cause you to lose data. To avoid this problem, use only the Sony OM-D4440, Xidex 3022-3000, Maxell FM2DD, 3N5337, or Fuji MFNB2 (or equivalent) diskette with the following characteristics:

Double sided
Double density
Soft sectored
135 tpi (tracks per inch)

Formatting Floppy Diskettes   The diskette drive expects floppy diskettes to have their data organized in a very particular format. To ensure that a new diskette can be read and written by the diskette drive, you must format each diskette before the diskette drive can use it.

CAUTION: Formatting any medium erases all data on it. Therefore, when formatting diskettes use extreme caution.

To prepare a diskette for MS-DOS, run the FORMAT command as described in the GRiD MS-DOS Reference: Release 3.2 or Release 2.11 manual. To format a floppy diskette for GRiD-OS, run the Initialize Media program as described in the Management Tools Reference manual.

Write Protecting Floppy Diskettes   If you have data stored on a floppy diskette that you want to protect from being inadvertently written over, you can write protect it by sliding the write-protect tab on the back-side of the diskette until the hole is uncovered.

Taking Care of Floppy Diskettes   To prevent destroying data on your floppy diskettes, treat them with care. Always keep the following tips in mind:

o Do not touch the surface of the diskette underneath 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.

o Keep diskettes away from magnetic office items such as paper clip
   dispensers, magnetic paper holders, telephones, etc.

o Do not set the diskette on top of a TV, color monitor, speaker,
   or CRT.

o Do not expose diskettes to microwaves or infrared rays.

o Do not expose diskettes to temperatures below $50^{\circ}F$ ($10^{\circ}C$) or
   above $140^{\circ}F$ ($60^{\circ}C$).

o For optimum long-term storage, keep diskettes at a temperature
   between 60° and $70^{\circ}F$ (15° to $20^{\circ}C$).

o Never use a damaged diskette.

o Do not remove a diskette from the drive while the in-use light is
   lit. Removing the diskette at this time can destroy data.

o Do not leave your program or data diskettes in the drive while
   traveling. Doing so may seriously damage the diskette. Instead,
   insert the travel diskette provided with the drive or a blank
   diskette into the drive when you are transporting the drive.

o Keep your diskettes away from cigarette smoke.

o Label and date all diskettes. This is especially important when
   making back-up copies.

Backing Up Files on Floppy Diskette   We cannot overemphasize the
importance of making copies of your important files. This process
of "backing up" files protects your work from accidental data loss
due to writing one file over another, power failure, media failures,
etc. Make backups of files daily, if not more often.

MS-DOS users can make back-up copies using the XCOPY, COPY, BACKUP
or DISKCOPY commands as described in the MS-DOS Reference: Release
2.11 or Version 3.2 manual. For a discussion on backing up your
GRiD Software files by duplicating them to floppy diskettes, refer
to the Duplicate command (CODE-D) in GRiDManager as described in the
GRiD Management Tools Reference or the Duplicate Media program as
described in the GRiD Software manual.

Starting Up the Operating System (Booting)   The computer follows a specific order when choosing the storage device from which to load the operating system software. This device ordering is shown in Table 2-1. The computer first searches for the operating system software in ROM, and if it does not find the software there, it looks on the hard disk system, and so on.

You can override the normal loading sequence and choose the device from which you want the computer to load the operating system software. To start from another device, hold down the key indicated in Table 2-1 for several seconds as you turn on the power switch. For example, to start from your external floppy you would press E while turning on the power.

Table 2-1.   Order of Devices Searched During Loading

Device	Keys	
Read Only Memory (ROM)	R	
Hard Disk	H	(Internal or external hard disk, depending on switch settings)
Internal Floppy	F	(Internal floppy or pocket flopy[1])
External Floppy	E	(Pocket floppy[1] or a floppy connected to the external bus, depending on switch settings)

[1]If your GRiDCase Plus is equipped with internal floppy disk drive, then pressing the "F" key will cause the operating system to be loaded from the internal floppy drive and "E" will load from the pocket diskette drive (depending on other external device switch settings). If your GRiDCase Plus is equipped with internal hard disk, then pressing the "F" key when starting your system will cause the operating system to be loaded from the pocket diskette drive.

NOTE: If you have several of the same types of devices connected to your computer, the computer will search the first device (designated by the address switch settings) for the operating system software. For example, if you have two hard disks and two diskette drives, the computer searches the first hard disk, then the internal floppy, and finally the first diskette drive. See Appendix A for information on switch settings for multiple devices of the same type.

The steps below show you how to load the operating system from a 3

1/2-inch pocket floppy diskette and how to return the precedence to the internal floppy.

To Start Your Computer from the Pocket Diskette Drive

1. Turn off the computer.

2. Insert the system diskette (the diskette that contains the operating system) into the pocket diskette drive.

3. Set the address switches on the pocket diskette drive to 00 (off, off). Refer to Appendix A for more information on device address switch settings.

4. Turn on the computer while holding down the F key on the keyboard for several seconds.

The diskette drive will activate and the in-use light will light up as the computer loads the operating system from the floppy diskette. If the diskette does not contain the operating system software, an error message is displayed.

To Return Control to the Internal Floppy

1. If you have the MS-DOS system diskette inserted in the internal diskette drive, you can return control to the internal drive by typing B: (if the external diskette drive is drive A) or by typing A: (if the external diskette drive is drive B). The switch settings described in Appendix A determine whether the external diskette drive is drive A or B.

2. If you have the GRiD-OS system diskette inserted in the internal diskette drive, you can return control to this device by selecting Internal Floppy as the device on the File form.

Chapter 3: Maintenance

This chapter describes how to care for your GRiD 32170 Pocket Diskette Drive. Although the pocket diskette drive is basically durable, you should treat it as you would any precision instrument -- with care.

Warnings   Observe the following warnings. Not following these warnings could lead to possible physical injury.

o Do not operate the pocket diskette drive in a dirty or dusty environment.

o Do not get the pocket diskette drive wet; electrical equipment should not be operated in a moist environment.

o Do not operate your pocket diskette drive in any potentially flammable atmosphere.

o Do not attempt to open the pocket diskette drive case; it contains no user-serviceable parts. Such action can damage the pocket diskette drive.

o Make sure you properly ground any AC power wall adapter.

Cautions   Observe the following cautions. Not following these cautions could damage your unit.

o Always turn off the power to your GRiDCase computer BEFORE attaching or detaching the pocket diskette drive from your

computer. Failure to do so may damage your computer and your
diskette drive.

o Operate the pocket diskette drive only when the surrounding
   temperature is from 41° to 113°F (5° to 45°C).

o Operate the pocket diskette drive only when the relative humidity
   level is from 20% to 80% noncondensing.

o Store the pocket diskette drive where the surrounding temperature
   is from -40° to 149°F (-40° to 65°C).

o Do not store or set up the pocket diskette drive in direct
   sunlight.

o Do not subject the pocket diskette drive to unnecessary shock or
   vibration.

o When cleaning the pocket diskette drive, never use any cleaning
   agent such as dust wax, spray cleaner, or any abrasive substance.

Cleaning Your 32170 Pocket Diskette Drive Before cleaning your pocket
diskette drive, make sure it is disconnected from your computer.

To clean the case, use a slightly damp, soft cloth and, if
necessary, a mild, nonabrasive detergent.

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

Wipe the case clean and then dry it.

If necessary, dust the rear panel of your pocket diskette drive with
a dry cloth.

WARNING: To prevent shock hazard, never apply any liquid inside the
diskette drive opening.

Storing Your 32170 Pocket Diskette Drive Always store your pocket diskette
drive between the temperatures -40° and 149°F (-40° to 65°C). Keep
it in a clean environment, free from dust and dirt.

Traveling With Your 32170 Pocket Diskette Drive When traveling with your
pocket diskette drive, carry it with you instead of checking it as
luggage. Many transportation carriers do not cover the replacement
cost of your disk unit should they lose or damage it. If you do
check it as luggage, always pack it in the original shipping carton
and packing materials that came with your diskette drive.

Always protect your pocket diskette drive by placing the travel diskette provided with the unit or a blank diskette into the drive whenever you transport it.

It should be safe to x-ray the disk unit or any peripherals in airport security checks, but you must make the final decision. You can have it hand-checked, if you wish.

Appendix A: Switch Settings on External Diskette Devices

This appendix gives the switch settings that apply when multiple disk and/or diskette drives are attached to the same GRiDCase Plus, as well as settings for other devices.

NOTE: The switch settings on external devices are read when the GRiDCase Plus starts up. If you change the switch settings after your GRiDCase Plus has started up, you must restart it for the new settings to take effect.

Switch Settings for the Pocket Diskette Drive The pocket diskette drive's address switches are located on the back of the drive to the left of the external floppy port connector. The pocket diskette drive has only two valid switch settings when used with a GRiDCase Plus equipped with an internal floppy drive, and only one valid setting when used with a GRiDCase Plus equipped with an internal hard disk drive.

Table A-1. *Switch Settings for the Pocket Diskette Drive.*

Internal Drive	Switch 1	Switch 2	MS-DOS Device Description
Floppy Disk	off	off	A>
Floppy Disk	off	on	B>
Hard Disk	off	off	A>

Storage devices attached to the GRiDCase Plus' external bus port at the same time the pocket diskette drive is attached may cause the system to recognize the pocket diskette drive by a different device letter. Refer to the configuration information below for more

details.

CAUTION: Never use the same switch setting on two different
diskette drives or two different hard disk drives attached to the
peripheral bus connector. If you do so your GRiDCase Plus will not
initialize.

Device Switch Settings for MS-DOS This section shows the address switch
settings for disk or diskette devices attached to the GRiDCase Plus.
These settings determine the letters that MS-DOS assigns to the
device; you use the device letter when specifying the device in an
MS-DOS command.

Assignment of Device Letters
The settings of the address switches on the back of the GRiD Pocket
Diskette Drive, or on the bottom of GRiD external storage drives,
determine the letters--A, B, C, etc.--that MS-DOS assigns to your
devices.

The two switches on each device can specify one of four different
addresses. Each setting corresponds to a value that MS-DOS uses as
the address, as shown in Table A-2.

NOTE: The switch settings on storage devices are read when the
GRiDCase Plus starts up. If you change the switch settings after
your GRiDCase Plus has started up, you must restart it for the new
settings to take effect.

Table A-2. Device Addresses

Address		
Binary	Decimal	Switch Positions[1]
00	0	off, off
01	1	off, on
10	2	on, off
11	3	on, on

[1] An arrow on the switches indicates the "on" position.

Note: The Model 32170 Pocket Diskette Drive only has two valid
switch settings (00 and 01).

The switch settings shown in the following paragraphs cover the
combination of devices that are most often used.

The remainder of this section is divided into two parts:

o Switch Settings for Typical Device Configurations, which contains
   the settings for the typical combination of diskette and disk
   devices that most users have. You will probably find the

information you need in this section.

o Rules for MS-DOS Device Letter Assignments, which provides
   detailed information on how MS-DOS assigns letters according to
   your switch settings. This section is for users who have an
   unusual combination of disk and diskette devices; read this
   section only if you don't find the settings you need in the first
   section.

Switch Settings For Typical Device Configurations
The switch settings shown in the following paragraphs cover the
combinations of devices that most users have. The following
configurations are covered:

o Configuration 1: 1 internal diskette drive

o Configuration 2: 1 internal and 1 external diskette drive.
                     (Drive B is internal, Drive A is external.)

o Configuration 3: 1 internal and 1 external diskette drive.
                     (Drive A is internal, Drive B is external.)

o Configuration 4: 1 internal diskette drive and 1 hard disk

o Configuration 5: 1 internal and 2 external diskette drives

o Configuration 6: 1 internal and 1 external diskette drive, and 1
                     hard disk

o Configuration 7: 1 internal hard disk

o Configuration 8: 1 internal hard disk and 1 external diskette
                     drive

o Configuration 9: 1 internal hard disk and 1 external hard disk
                     (Drive C is internal, Drive D is external)

o Configuration 10: 1 internal hard disk and 1 external hard disk
                     (Drive D is internal, Drive C is external)

o Configuration 11: 1 internal hard disk, 1 external hard disk, and
                     1 external diskette drive

o Configuration 12: 1 internal hard disk and 2 external diskette
                     drives

Configuration 1:   1 internal diskette drive

Switch Settings	Device Letter	Drive
Not applicable	A, B	Internal diskette drive

NOTE: MS-DOS assigns a second "dummy" device letter to the internal diskette drive and another to the first external diskette drive, if present (shown in the next configuration).   This allows operations for those commands that require both a source and target diskette. For example, on a single drive system, the following command

COPY A:SAMPLE.DAT B:

first reads into RAM the data file SAMPLE.DAT from the diskette currently in the diskette drive.   MS-DOS then prompts you to insert a new diskette before the actually copying the file to its destination diskette.

The following command

DISKCOPY A: B:

copies a 3 1/2-inch source diskette to a target diskette in the internal diskette drive.   MS-DOS prompts you to insert the source and target diskettes at the appropriate times.

Configuration 2:   1 internal and 1 external diskette drive.   Drive B is internal, Drive A is external

Switch Settings	Device Letter	Drive
Not applicable	B, D	Internal diskette drive
0 (off,off)	A, C	External diskette drive

Configuration 3:   1 internal and 1 external diskette drive.   Drive A is internal, Drive B is external

Switch Settings	Device Letter	Drive
Not applicable	A, C	Internal diskette drive
1 (off,on)	B, D	External diskette drive

Configuration 4:   1 internal diskette drive and 1 hard disk

Switch Settings	Device Letter	Drive
Not applicable	A, B	Internal diskette drive
0 (off,off)	C	Hard disk drive

Configuration 5:   1 internal and 2 external diskette drives

Switch Settings	Device Letter	Drive
Not applicable	A, D	Internal diskette drive
1 (off,on)	B, E	External diskette drive 1
2 (on,off)	C	External diskette drive 2

NOTE: If one of the external drives is a pocket diskette drive
connected to the external floppy port on the side of the GRiDCase
Plus, it must be configured as the first external drive (off,on).
The only valid switch settings for the pocket floppy are (off,off)
or (off,on).

Configuration 6:   1 internal and 1 external diskette drive, and 1
external hard disk

Switch Settings	Device Letter	Drive
Not applicable	A, D	Internal diskette drive
1 (off,on)	B, E	External diskette drive
0 (off,off)	C	Hard disk drive

Configuration 7:   1 internal hard disk

Switch Settings	Device Letter	Drive
Not applicable	C	Internal hard disk

Configuration 8:   1 internal hard disk and 1 external diskette
drive

Switch Settings	Device Letter	Drive
Not applicable	C	Internal hard disk
0 (off,off)	A, B	External diskette drive

Configuration 9:   1 internal and 1 external hard disk.   Drive C is internal, Drive D is external

Switch Settings	Device Letter	Drive
Not applicable	C	Internal hard disk
1 (off,on)	D	External hard disk

Configuration 10:   1 internal and 1 external hard disk.   Drive C is external, Drive D is internal

Switch Settings	Device Letter	Drive
Not applicable	D	Internal hard disk
0 (off,off)	C	External hard disk

Configuration 11:   1 internal and 1 external hard disk, and 1 external diskette drive

Switch Settings	Device Letter	Drive
Not applicable	C	Internal hard disk
0 (off,off)	A, B	External diskette drive
1 (off,on)	D	External hard disk

Configuration 12:   1 internal hard disk and 2 external floppy diskette drives

Switch Settings	Device Letter	Drive
Not applicable	C	Internal hard disk
0 (off,off)	A, D	External diskette drive 1
1 (off,on)	B, E	External diskette drive 2

NOTE: The hard disk is assigned the first available (no lower than C) letter after all physical floppy diskette drives have been assigned letters.   The first two floppies addressed are assigned two logical device letters after the hard disk's letter is assigned.

Rules for MS-DOS Device Letter Assignments
This section lists the rules MS-DOS follows in assigning device letters for configurations that have an internal hard disk and for those configurations that have an internal diskette drive. Regardless of the configuration of your computer, you cannot have the same switch settings for two external floppy diskette drives or for two external hard disk drives.   If you do, the system only recognizes one of the devices, and the second device will not be

used. The system can, however, distinguish between an external hard
disk and an external diskette drive that has the same switch
settings.

If You Have an Internal Hard Disk If you have an internal hard disk
and external floppy diskette drives, keep in mind the following
rules:

1. If you have a pocket diskette drive attached to the external
   floppy port, its address switches must be set to 00 (off, off).
   You may not be able to access the pocket diskette drive if you
   fail to do this.

2. If zero, or one, external floppy drives are attached to GRiDCase
   Plus, MS-DOS assigns the letter C to the internal hard disk.
   The internal hard disk doesn't have address switches; MS-DOS
   assumes by default that the setting is 00. If one external
   diskette drive is attached MS-DOS will assign the letters A and
   B to it.

3. When external devices are attached to the GRiDCase Plus, MS-DOS
   assigns letters to them in alphabetical sequence starting with
   A, in the following order:

   Diskette drive(s)
   Hard disk drive(s)
   Logical Diskette drive(s)

4. MS-DOS assigns letters to hard disk devices after assigning
   letters to the internal and external diskette devices. The
   first device letter that can be assigned to a hard disk is C.

5. MS-DOS assigns a second logical device letter to the two
   external diskette drives whose address switches are set to 00
   and 01. The second device letter is assigned whether you have
   two external diskette drives or one external diskette drive and
   the pocket diskette drive.

Switch Settings	Device Letter	Drive
0 (assumed)	C	Internal hard disk
0 (off,off)	A, D	External diskette drive 1
1 (off,on)	B, E	External diskette drive 2

Note: If you have model 32170, the pocket diskette drive can
only be set to 00 in this configuration.

6. MS-DOS alphabetically assigns a letter to each diskette device
    before assigning a second "dummy" letter to the diskette drives
    whose address are 00 and 01.

Switch Settings	Device Letter	Drive
0 (assumed)	E	Internal hard disk
0 (off,off)	A, F	External diskette drive 1
1 (off,on)	B, G	External diskette drive 2
2 (on,off)	C	External diskette drive 3
3 (on,on)	D	External diskette drive 4

7. Letters are assigned to hard disks using the first available
    letter after the physical floppy diskette devices have been
    assigned. Therefore, the letter MS-DOS assigns to the first
    hard disk drive depends on the number of external diskette
    drives present. Device letters are assigned according to the
    address settings as shown below:

Switch Settings	Device Letter	Drive
0 (off,off)	C, E, F, or G^1	Hard Disk Drive 1
1 (off,on)	D, F, G, or H^1	Hard Disk Drive 2
2 (on,off)	E, G, H, or I^1	Hard Disk Drive 3
3 (on,on)	F, H, I, or J^1	Hard Disk Drive 4

8. You CANNOT attach four external hard disks if you have an
    internal hard disk in your system. When one, two or three
    external hard disks are attached the internal hard disk assumes
    the lowest available number as its address (01, 10 or 11). If
    four external drives are attached then there are no more
    addresses available.

If You Have an Internal Floppy Diskette Drive   If you have an
internal diskette drive, keep in mind the following rules:

1. If no external drives are attached to GRiDCase Plus, MS-DOS
    assigns the letters A and B to the internal diskette drive. The
    internal diskette drive doesn't have address switches; MS-DOS
    assumes by default that the setting is 00.

2. When external devices are attached to the GRiDCase Plus, MS-DOS
    assigns letters to them in alphabetical sequence starting with
    A, in the following order:

    Diskette drive(s)
    Hard disk drive(s)
    Logical diskette drive(s)

3.   MS-DOS assigns a second device letter to the internal diskette
     drive and to the external diskette drive whose address switches
     are set to 01.   If you want the internal diskette drive to be A
     and the external drive to be B, use the following switch
     settings.   (This rule is applicable for either external bus
     floppy drives or external floppy port drives).

Switch Settings	Device Letter	Drive
0 (assumed)	A, C	Internal diskette drive
1 (off,on)	B, D	External diskette drive

4.   Setting the address switch of an external diskette drive to 00
     changes the default setting of the internal diskette drive to
     01.   This reverses the device letter assignments shown in rule 3
     as follows:

Switch Settings	Device Letter	Drive
1 (assumed)	B, D	Internal diskette drive
0 (off,off)	A, C	External diskette drive

     CAUTION: Never set switches on two or more external diskette
     drives to 00 and 01 respectively.   If you do, MS-DOS will not
     recognize the internal drive; a letter is not assigned, and you
     will not be able to use the internal drive.

5.   MS-DOS alphabetically assigns a letter to each diskette device
     before assigning a second "dummy" letter to the internal
     diskette drive and to the first external diskette drive (if
     present), as shown below.

Switch Settings	Device Letter	Drive
0 (assumed)	A, E	Internal diskette drive
1 (off,on)	B, F	External diskette drive 1
2 (on,off)	C	External diskette drive 2
3 (on,on)	D	External diskette drive 3

6.   MS-DOS assigns letters to hard disk devices after assigning
     letters to the internal and external diskette devices.   The
     first device letter that can be assigned to a hard disk is C.   A
     minimum GRiDCase Plus configuration would always contain at
     least the internal diskette drive assigned A and B.

7.   Letters are assigned to hard disks using the first available
     letter after the external devices have been assigned.
     Therefore, the letter MS-DOS assigns to the first hard disk
     drive depends on the number of external diskette drives present.
     Device letters are assigned according to the address settings as
     shown below:

Switch Settings	Device Letter[1]	Drive
0 (off,off)	C, E, F, or G[1]	Hard Disk Drive 1
1 (off,on)	D, F, G, or H[1]	Hard Disk Drive 2
2 (on,off)	E, G, H, or I[1]	Hard Disk Drive 3
3 (on,on)	F, H, I, or J[1]	Hard Disk Drive 4

Device Switch Settings for GRiD-OS The two switches on the bottom of each external storage device must be set so that the attached devices will be recognized in the proper order. Table A-3 shows the address switch settings and corresponding GRiD-OS device description for disk or diskette devices attached to the GRiDCase Plus. Note that the switches are marked with an arrow indicating the "on" position.

Table A-3. Switch Settings for Disk Devices using GRiD-OS

Attached Device(s)	Switch Settings	GRiD-OS Device Description
3.5 or 5.25 inch Pocket Floppy[1]	0 (off,off)	Portable Floppy Disk
1st External Diskette Drive	1 (off,on)	External Floppy Disk 1
2nd External Diskette Drive	2 (on,off)	External Floppy Disk 2
3rd External Diskette Drive	3 (on,on)	External Floppy Disk 3
1st External Hard Disk Drive	0 (off,off)	External Hard Disk 1
2nd External Hard Disk Drive	1 (off,on)	External Hard Disk 2
3rd External Hard Disk Drive	2 (on,off)	External Hard Disk 3
4th External Hard Disk Drive[2]	3 (on,on)	External Hard Disk 4

[1]If you are using a pocket floppy diskette drive you cannot have an external diskette drive attached with the same switch settings of (off,off). If you do this the system will not recognize the pocket floppy drive.

[3]If you have the internal hard disk option on your GRiDCase Plus ,

you cannot attach a fourth external hard disk. If you do this
the system will not recognize the internal hard disk.