

Drive95™

Portable Disk Drive for the HP 95LX

Sparcom



User's Manual

The Portable Professional™

Drive95™ Portable Disk Drive

Includes:

DOS device driver software for the HP 95LX and other PC compatible computers.

FileManager™ program for the HP 48SX.

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Notice

For warranty information, see Appendix C.

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Chapter 1

Getting Started

In This Chapter

- ☐ Drive95 Description and Features
 - ☐ File Management
 - ☐ HP 95LX 'Filer'
 - ☐ HP 48SX 'FileManager'
 - ☐ Installing Device Driver Software for the HP 95LX
 - ☐ The CONFIG.SYS File and the HP 95LX
 - ☐ Installing FileManager for the HP 48SX
-

Quick Start:

HP 95LX owners: Turn to page 1-4.

HP 48SX owners: Turn to page 1-7.

Drive95 Description and Features

The Sparcom Drive95 is a portable data storage device. The drive makes it easy to move data and program files between the HP 95LX and a personal computer, or another HP 95LX. The drive also works with the HP 48SX calculator. It uses 3.5" floppy disks in both 720 K and 1.44Mbyte densities. Disks must be formatted before data can be stored on them. The Drive95 can format disks in 720K and 1.44Mbyte densities.

Installation requires nothing more than the supplied cable. The Kermit built into the HP 95LX or 48SX is used to load the driver files from the supplied disk. Once these are loaded, operation is almost transparent.

The Drive95 is battery powered, for convenient use far from a wall plug. The rechargeable batteries are good for about ten hours when used for normal file storage purposes. A wall transformer is included for recharging the batteries, as well as a cable for connection to the HP 48SX or HP 95LX.

If you lose your wall transformer Sparcom recommends that you order another from Sparcom. If you cannot wait for delivery, try Radio Shack part number 273-1610. However, Sparcom does not recommend this action.

You may position the Drive95 in any orientation you wish, it does not matter.

The drive electronics have 'cache' memory built-in to reduce the amount of disk access required; when the memory fills or the file transfer is finished, the disk motor 'wakes up' and the data is written. This method greatly increases battery life, since the disk drive motor is the single largest user of power. Automatic power-on and-off also prolongs battery life.

Drive95 can be connected to a desktop PC for cases where a 3.5" disk drive may be needed or an extra drive is required. The device driver software (included) and a serial port are all that is needed.

The drive also uses a file transfer program called Kermit to move data. Kermit provides a way to divide the data into 'packets', which are sent over the serial port to the calculator or computer. Kermit is a public domain program; no fee is charged for its use, and it can be freely copied and shared. The HP 48SX, HP 95LX and Drive95 all have a version of Kermit 'built-in' to their operating systems. A version of Kermit for the IBM-PC/XT/AT and compatible machines is provided FREE with the Drive95.

File Management

The HP 95LX uses a built-in, file management program called 'Filer'. The HP 48SX does not have a built-in file management program, but Sparcom provides a file management program for you. This program is called 'FileManager' and can be loaded onto your HP 48SX using the Drive95 and the accompanying software installation disk.

Chapter 1 will show you how to operate and load these programs onto your HP 95LX and HP 48SX using the Drive95. Chapter 2 will show you how to use these programs with the HP 95LX and the Drive95. Chapter 3 will show you how to use these programs with the HP 48SX and the Drive95.

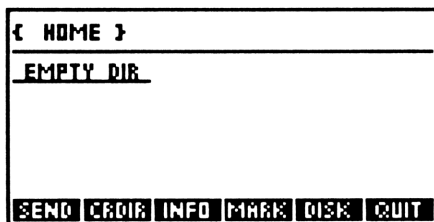
HP 95LX 'Filer'

The HP 95LX comes equipped with a 'Filer' program that provides an easy interface to move, copy, delete and run programs or view data files. This program is accessible by pressing the blue 'Filer' key on the HP 95LX keyboard.

Drive95 is fully compatible with the Filer. In fact, when the device driver software is loaded Drive95 appears to be 'just another disk', just like a RAM card in the expansion slot. (The device driver installation process is outlined in this chapter in section "Installing Device Driver Software for the HP 95LX".) Drive95 is loaded as drive G. Drives D through F are reserved by Hewlett-Packard. For more information on the Filer, see section 20-1 of the HP 95LX User's Guide.

HP 48SX 'FileManager'

By itself, the Drive95 is a powerful data storage device with a broad range of applications. Sparcom also provides FileManager, a screen-based HP 48SX program that makes file transfers, calculator backup and directory management a simple point-and-click operation. In this chapter the section, "Installing FileManager for the HP 48SX" details how to transfer FileManager from the disk into the HP 48SX and install it.



FileManager runs only on the HP48; it does not work on the HP 95LX. The HP 95LX has a built-in 'Filer' program which works in a similar way. With FileManager on the HP 48SX, just point to a directory, mark the files and send them. There's no need to type in file names or remember which Kermit command to use. Backing up the calculator becomes a simple operation.

Directories can be created, files renamed and a report is available on free space in calculator memory and on the disk. FileManager is provided on a 1.44Mbyte disk which is included with Drive95.

Note: In chapters 1, 2 and 3 of this manual, when referring to the HP 48SX, we will use the word 'file' instead of the word 'variable'.

Installing Device Driver Software for the HP 95LX

The CONFIG.SYS file contains special statements which are executed when you reboot your HP 95LX (by pressing **CTRL ALT DEL** at the same time).

As supplied, Drive95 comes with a CONFIG.SYS file which contains only the statement 'DEVICE=C:\DRIVE95.SYS'. This causes the HP 95LX to load the device driver software into memory and activate it. From this point on, any requests for disk drive 'G:' are routed through the device driver and out the serial port to Drive95.

If you already have a CONFIG.SYS file, do not load the new one from the disk supplied with Drive95. Instead, edit your existing CONFIG.SYS file using the Memo application. Depending on the applications you may already have installed, CONFIG.SYS could contain one or more statements. You need to add one statement at the end of the file which says 'DEVICE=C:\DRIVE95.SYS'.

There are additional parameters which may be necessary to make the drive work on machines other than the HP 95LX. The section "Non-HP 95LX Users" in Chapter 2 details these switches and describes the additional features. They are not needed for the HP 95LX.

To install the device driver software on the HP 95LX follow the instructions below exactly.

- **Unpack** the drive, serial cable and wall transformer. **Plug** the transformer into a source of 110 volt 60 cycle AC power. **Plug** the cord into the power socket on the back of the disk drive, since the batteries may not have been fully charged when the drive was shipped. **Plug** the serial cable into the socket on the back of the disk drive .
- **Plug** the other end of the serial cable into the HP 95LX. **Insert** the disk included with Drive95 into the slot on the front. It should seat with a click, and the **button** on the front of the drive will pop out.
- Press **ON** and save any data as necessary. **Close** all open applications by Pressing **MENU** then **Q**.
- Press the blue **↩** key. Press **MENU** **S** **C** **P** **B** **5**. Verify that under 'Port', on the Communications Settings the screen says:
Inter. 1 (COM1).
- Press **ESC** **ESC** **T** **K** **G** and type in the filename 'DRIVE95.SYS'. Press **ENTER**. When prompted to 'Press any key to continue' press **ENTER**. One of the two files you need has now been transferred.

If you already have a CONFIG.SYS file skip the next set of instructions and continue with "If you Find CONFIG.SYS" on this page. If you are not sure proceed with the following.

To Determine if you Have a CONFIG.SYS File

- Pressing **MENU** then **Q** to close the COMM application.
- Press the blue **□** button.
- This will open the C:\ directory. Scroll through the list and check for the file CONFIG.SYS. If you do not find it there and a RAM card is installed, try the A:\ directory.
- Press **F5**
- Type A:
- Press **ENTER**. This will open the A:\ directory. Scroll through the list and check for the file CONFIG.SYS. If you do not find it there either, then you do not have a CONFIG.SYS file. Skip the next set of instructions and proceed with "If you Do Not Have a CONFIG.SYS File" on the next page.

If you Find CONFIG.SYS

- Press **MENU** **Q** to get out of the Filer application.
- Press the blue **□** key. Press **MENU** **F** **O**. Verify that the screen says:

File to open:

C:_DAT*.TXT

- Repeatedly press **←** (backspace key) until the line is blank.

If your CONFIG.SYS file is on A:

- Type A:*. *

or If your CONFIG.SYS file is on C:

- Type C:*. *
- Press **ENTER**. Use the arrow keys to highlight CONFIG.SYS. Press **ENTER**.

On the next available line

- Type: DEVICE=DRIVE95.SYS
- Press **ENTER** **MENU** **F** **S**. The screen prompt reads: File to save:

A:\CONFIG.SYS (if on A:\ drive) -or- C:\CONFIG.SYS (if on C:\ drive)

- Press **ENTER**. The screen prompt reads: Replace current file? y or n
- Press **Y** **MENU** then **Q**.
- Reboot by pressing **CTRL** **ALT** **DEL** at the same time.

If you Do Not Have a CONFIG.SYS File





Warning! If you already have a 'CONFIG.SYS' file, the following procedure will destroy it. If you're not sure if you have one, read "To Determine if you Have a CONFIG.SYS File" on the preceeding page.

- Press **MENU** then **Q** to get out of whatever application you are in.
- Press the blue **↻** key. Press **MENU** **S** **C** **P** **B** **5**. Verify that under 'Port' on the Communications Settings screen says:
Inter. 1 (COM1).
- Press **ESC** **ESC** **T** **K** **G** and type in the filename 'CONFIG.SYS'. Press **ENTER**. When prompted to 'Press any key to continue' press **ENTER**.
- Press **ESC** **ESC** **Q** to exit the COMM application.
- Reboot the HP 95LX by holding down the **CTRL** **ALT** **DEL** keys simultaneously. You'll see the screen change. Watch for "Drive95 Floppy Disk Device Driver" at the top line of one of the paragraphs. From this point on, the Drive95 appears as drive G:, and is accessed as a normal disk drive, just like a RAM card or the internal drive C:\.

For more information on the use of Drive95 with the HP 95LX skip ahead to Chapter 2.




Installing FileManager for the HP 48SX

Follow these steps exactly in order to install the FileManager program on the HP 48.

- **Unpack** the drive, serial cable and wall transformer. **Plug** the transformer into a source of 110 volt 60 cycle AC power. **Plug** the cord into the power socket on the back of the disk drive, since the batteries may not have been fully charged when the drive was shipped. **Plug** the serial cable into the socket on the back of the disk drive.
- **Plug** the other end of the serial cable into the HP 48. **Insert** the FileManager disk included with the drive into the slot on the front. It should seat with a click, and the button on the front of the drive will pop out.
- **Switch** on the calculator and change to the HOME directory. Press  (HOME) and check that 'HOME' is in the upper left corner. If the clock display is on, turn it off. Press  **EST** (MODES)  then the softkey **CLK**. **CLK** is a toggle, and pressing it will turn the clock display on or off. Next, press  **PRG** (I/O), then the softkey **SETUP**. The I/O Setup menu will display. Pressing the softkeys will allow you to change and match the screen to the one below. Make sure that the screen matches. THIS IS IMPORTANT!

```

I/O setup menu
IR/wire:      wire
ASCII/binary: binary
baud:        9600
parity:      none 0
checksum type: 3
translate code:3
IR/WI  ASCII  BAUD  PARIT  CKSM  TRAN
```

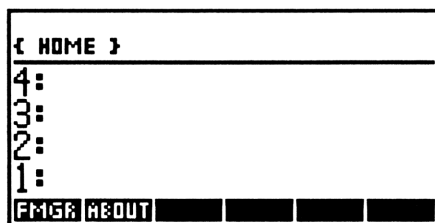
- Now press   **FMLIB** **ENTER**  **PRG** (I/O) **KGET**. This retrieves a library called FMLIB from the disk drive, and stores it in the home directory of the calculator. As the packets of data are transmitted, the drive lights will flash and the calculator display will show the packet numbers that are being sent.

Up to this point you have accessed FMLIB from the disk. In order to store the program as a library on the HP 48SX you must follow these steps:

- Press **[VAR]** to get the file list on the menu keys. Find and press **FMLIB**. This recalls the library object to the stack.
- Press **0** (the number zero) then **[STO]** to save FileManager in port 0. The library must be saved in a RAM memory port before it can be used. If you have a RAM card in port 1 or 2, you may store FileManager in port 1 or 2. But for learning purposes use 0.
- In order for the HP 48SX to recognize FileManager as a library: Turn the calculator off, then back on again. The FileManager library will automatically attach itself to the HOME directory.

You now have FMLIB stored as a file and a library on your HP 48. In order to create more memory space you will need to purge the FMLIB file from memory.

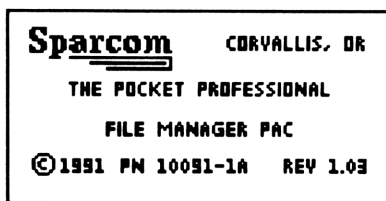
- Press **[]** **FMLIB** **[]** **[DEL]** (PURGE) to remove the extra FMLIB file.



- Next, press **[]** **[]** (LIBRARY).
- Press **FMGR** to select the FileManager library. Press **FMGR** again to start the program. The HOME directory will display and **FMGR** will appear on the softkey menu.

For more information on the use of Drive95 with HP 48SX skip ahead to Chapter 3.

FileManager Version

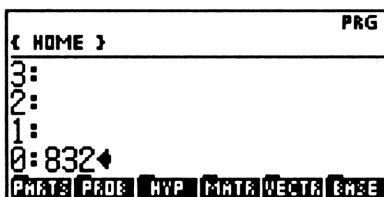


- To display the FileManager version number, press **ABOUT**.
- Press **ATTN** to return to the stack display.

Removing FileManager

Under normal conditions you do not want to remove the FileManager Library. If you are running out of memory, you may wish to remove the library to free 8511 bytes. To do so the following information is provided.

- Switch to the HOME directory and put the library number (832) on the stack, tagged with the port where it is stored. Earlier we used port 0. 0:832 describes the FileManager library when it is located in port 0. Your screen should look like the one below:



- Press **←** **VAR** **NXT** **DETAC** to detach the library from the port.
- Re-enter the library number (832 only) and press **←** **DEL** (PURGE) to purge the library from memory.

HP 48SX Owners:

Unfortunately, there is no equivalent to the 'CONFIG.SYS' file for the HP 48SX. The calculator can't be fooled into thinking there's an extra 'RAM card' sitting in the serial port, and you can't execute programs directly from disk.

There is no way currently to make this possible. As new programming techniques are developed, Sparcom will keep registered owners of Drive95 up to date on the latest firmware revisions and new programs. Send in the warranty card to be certain you're on the mailing list.

Notes:

Chapter 2

Drive 95 and the HP 95LX

In This Chapter

- ☐ Device Drivers and the CONFIG.SYS file
- ☐ Parameters
- ☐ Non-HP 95LX Users
- ☐ Installing FORMAT95.EXE
- ☐ Formatting Disks
- ☐ HP 95LX Hints and Techniques

Device Drivers and the CONFIG.SYS File

Operation of the Drive95 is simple on an MS-DOS machine like the HP 95LX. Drive95 is treated as a 'device' and behaves just like a disk drive would on a desktop PC. Programs can be run directly from Drive95 without having to load them into RAM drive memory first. All of this is managed by a device driver program called 'DRIVE95.SYS'. It is loaded into the root directory (C:\) of the HP 95LX and called from the file CONFIG.SYS. Chapter 1, pages 4 and 5 explain how to load DRIVE95.SYS into the HP 95LX.

Parameters

The device driver (DRIVE95.SYS) instructs the drive at what speeds it should send and receive data. In its default configuration, the device driver communicates with Drive95 at two speeds. It uses 9600 baud for control and handshaking, and 57,600 baud for data transfer. These speeds can be modified by adding additional parameters to the CONFIG.SYS file.

In almost all cases, no modifications need to be made. When any modifications are made they take effect the next time the HP 95LX is rebooted. CONFIG.SYS is called when the HP 95LX is rebooted, and any external device drivers like DRIVE95.SYS are declared there.

The supplied CONFIG.SYS file contains one line:

```
device = DRIVE95.SYS
```

It can be modified by the addition of some parameters:

```
device= DRIVE95.SYS [optional parameters]
```

The optional parameters can be any or all of the following, separated by spaces.

Machine Type Parameters

- | | |
|---------|-------------------------------------|
| ■ PCAT | for medium-to fast AT's and laptops |
| ■ POQET | for slower Poqet notebook PC's |
| ■ HP95 | slow default case, for the HP 95LX |

Example: `device=DRIVE95.SYS PCAT`

Machine type has an effect on retry timing. If the PC runs through its retries and fails, it may not have allowed enough time for the drive to respond. Try a different machine type and see if it helps.

Communication Parameters

Data Baud Rate (H)

- | | |
|----------|--|
| ■ H9600 | for slow PC's and Poquets |
| ■ H19200 | for PC's and AT's |
| ■ H38400 | for fast AT's |
| ■ H57600 | default, for HP 95LX, and fast 386(SX) PC's. |

Example: `device = DRIVE95.SYS H9600`

The data rate may need to be slowed for some machines. Some older machines don't have serial ports that will run reliably at 57600 baud, but most will work at 9600. The data baud rate has a significant effect on the overall speed of operation, and it should be set as high as possible. Start at 9600 and increase the speed until the drive stops working.

Command Baud Rate (L)

- | | |
|----------|-------------|
| ■ L9600 | default |
| ■ L19200 | fast |
| ■ L38400 | faster |
| ■ L57600 | really fast |

Example: device = DRIVE95.SYS L9600

If the command rate is set to other than 9600 baud, switch settings must be changed inside the drive. Contact Sparcom technical support if your application requires this. In general, it won't affect the overall speed much at all, and it complicates your life immensely.

Note: HP 95LX users who also use the HP 48SX with Drive 95 should not change the Command Baud Rate from the default because the HP 48SX cannot communicate at speeds higher than 9600 baud.

Communication Timeout Parameters

The default timeouts can be customized to speed up operation, or to accommodate unusually fast or slow machines. Two operating parameters can be adjusted.

Retry Timeout (R)

Retry timeout sets the length of time that the HP 95LX waits before issuing a retry when a packet is not acknowledged. If this interval is too short, Drive95 never gets a chance to answer before the next retry is attempted. If it's too long, packet errors take a long time to clear out. The R value is set automatically by the machine type when it is specified. It can also be set explicitly by including a parameter.

- | | |
|--------------------|---------------------------------------|
| ■ 0 | for no delay between retries |
| ■ 1 ... 4294967294 | |
| ■ 4294967295 | for a very long delay between retries |

Example: device = DRIVE95.SYS R12800

The higher the number, the longer the delay. Typical values range from 25000 to 500000.

The machine type parameters can be entered as R parameters instead by using their default values:

- | | |
|---------|---------|
| ■ PCAT | R393215 |
| ■ POQET | R131071 |
| ■ HP95 | R65535 |

Baud Rate Change Delay (B)

The baud rate change delay parameter can also be adjusted. When changing baud rates between command and data speeds, the UART chips inside the host computer and Drive95 need a short delay to re-synchronize. If the delay is too short, characters get lost. If the delay is too long, operating speed will drop slightly. The B parameter is set in the same way as the R parameter above. The ratio of the B parameter to the default B parameter should be the same as the ratio of the R parameter to the default R parameter. Typical values are 1/16 of the R parameter.

- | | |
|--------------------|---------------------------------------|
| ■ 0 | for no delay between retries |
| ■ 1 ... 4294967294 | |
| ■ 4294967295 | for a very long delay between retries |

Example: device = DRIVE95.SYS B128000

The machine type parameters can be entered as B parameters instead by using their default values:

- | | |
|---------|---------|
| ■ PCAT | B131071 |
| ■ POQET | B3191 |
| ■ HP95 | B4095 |

Miscellaneous Parameters

Silent Mode (S)

The optional parameter S can be included to invoke silent mode. In this mode, the device driver does not report retries or error messages at the top of the screen. These messages normally provide useful feedback in case of a problem, but can be disabled if your application requires that they not be displayed.

- S

Example: device=DRIVE95.SYS S

Idle Timeout (T)

The disk drive will turn off automatically if you don't use it for a specified amount of time. This specified time is known as idle timeout. The T parameter allows you to set the idle timeout to a value in minutes from 1 - 9.

- T1 auto power off after one minute
- T2 ... T8
- T9 auto power off after nine minutes

Example: `device=DRIVE95.SYS T3`

Parameter Summary

The order of the parameters does not matter unless you are specifying both a Machine Type and a Communication Timeout Parameter (R or B). In this case, the parameter that is the farthest to the right will take effect.

Example: `device= DRIVE95.SYS S T4 R50000 B9000 H57600 L9600`

Non-HP 95LX Users

If you're installing the device driver on a machine other than an HP 95LX, we can't tell you exactly how to install the device driver step-by-step. Here's what you need to accomplish:


- Get the device driver program, DRIVE95.SYS, onto the hard disk/ram card.
- Put the statement '`device=DRIVE95.SYS [optional parameters]`' into your CONFIG.SYS file. The optional parameters should be selected according to the discussion above, but a good starting choice would be:

`device= DRIVE95.SYS PCAT H9600`

- Hook up the disk drive to your COM1 serial port. It only works on COM1. You may need a null-modem connector or a gender-changer depending on the cables you have available. See hardware and interface considerations in the back of chapter 3.
- Reboot your machine to load the device driver. You should see a message indicating that the driver is loading. It will also tell you which drive letter has been assigned to the Drive95. Once you get to the system prompt, the drive should be ready to use.

Installing FORMAT95.EXE

To format a disk from the HP 95LX, you will have to install the 'Format95' program supplied with Drive95.


- Insert the "Drive95 Device Driver Software" disk into the Drive95.
- Press the blue  (FILER) button. Press **[F5]**.
- Type: G:
- Press **[ENTER]**. Use the arrow keys to highlight FORMAT95.EXE. Press **[F2]**.
- Type C: or A: (A: if you have a ram card and wish to store it there).
- Press **[ENTER]**.

Note: The format command included in the HP 95LX DOS will not work since it isn't equipped to handle a serial disk drive.

Formatting Disks

You can format disks from your PC for the Drive95 using the standard MS-DOS command. If you wish to format a disk from your HP 95LX use the following procedure:

Insert the disk to be formatted.

- Press **[MENU]** **[Q]**. Then press .
- Press **[F5]**.
- Type: C: or A: depending on where FORMAT95.EXE resides.
- Press **[ENTER]**. Using the arrow keys highlight FORMAT95.EXE.
- Press **[F4]**.

The first prompt asks whether to format a 720K or 1.44Mbyte disk. 1.44Mbyte high-density disks have an HD logo in the upper right corner, and a square hole in the lower right corner opposite the write-protect tab. Conversely, a 720 disk does not. A 720 disk will commonly have Double Sided or DD written on them.

- Type: 720 or 144. Press **[ENTER]**.

A prompt now asks for a volume name. Any combination up to eleven characters is acceptable. You can also choose not to name it and simply press enter.

- Type the volume name. Press **[ENTER]**.

OR

- Press **[ENTER]** to leave the volume unnamed.

A prompt asks if you want to: Verify disk after format [Y]?

With verify ON a format takes about eleven minutes, but every sector is individually 100% tested. If you select 'N' the verification will be skipped. The format will only take two minutes, but there's a chance that bad sectors exist that could corrupt your data files.

Finally, a confirmation prompt asks if you really want to do this.

- Press and to begin formatting the disk.

Formatting a disk destroys all of the data on it, permanently! Be sure this is what you really mean to do!

The formatting will begin, and the program will end. The drive continues to work; it's received its commands and it will shut off after the format is complete. While the drive is formatting, the green light will blink and it will ignore all requests from the serial port. The yellow light on the front of the drive will shut off when formatting is done.

HP 95LX Hints and Techniques

In general, you can use Drive95 for anything you would do with a RAM card or the internal drive C:. This includes program or data storage, and program execution. The built-in applications are fully compatible with Drive95.

Backing up the HP 95LX

You can back up your entire machine with a few simple steps.

- Press **[C]**, then press **[M][O][D][Y]**.
- Press **[F5]** the root directory, C:\.
- Press **[ALT][F5]** (Tag All Files) to place a tag on all files.
- Press **[F2]** and type in 'G:\' to direct the copy to Drive95.

The contents of the root directory and all subdirectories will be copied to the floppy disk, providing you with a complete image of drive C:. This same procedure works for backing up a RAM card such as A:\

Lotus Worksheets

Worksheet files can be stored on G: and accessed directly without bringing them into the HP 95LX first. This conserves memory in the HP 95LX and frees up space for the execution of larger programs.

Frequently Used Programs

These are best stored on C: or A:, since execution from a RAM disk is considerably faster than from a serial disk drive.

Games and Utilities


Keep these on a floppy disk. Loading time is not usually a factor for games, and utility programs are small enough that they will execute quickly from a floppy. Execution speed for games is not affected by running from Drive95.

Program Installation

Many programs for the HP 95LX come with installation routines which can be quite cumbersome. You can simplify the installation process in many cases by tagging and copying the files over to C: or A: by using the Filer.

- Insert desired disk into Drive 95.
- Press **[C]**. Press **[F5]**.
- Type G:
- Press **[ENTER]**. Select the files you want to transfer by highlighting them then press **[F9]**. You can highlight more than one.
- Press **[F2]**.
- Type C: or A: depending on where you want the files copied to.

In other cases, you may elect to run the program directly from the floppy disk to minimize the use of space C:\ or A:\.

- Insert desired disk into Drive95.
- Press . Press **F5**.
- Type G:
- Press **ENTER**. Select the file you want to transfer by highlighting it then press **F4**.

System Manager Compliant Programs

System Manager compliant (.EXM) programs can be run from Drive95, provided that they are appropriately declared in C:_DAT\APNAME.LST and Drive95 is attached at the time the HP 95LX is rebooted. The files must be present on the disk when the reboot is performed. For more information refer to Appendix A.

Notes:

Chapter 3

Drive95 and the HP 48SX

In This Chapter

- ☐ Controls and Key Usage
- ☐ HP 48SX Directory Screen Display
- ☐ Moving Around the Directory
- ☐ Marking Files
- ☐ Sending and Getting Files on the Disk
- ☐ Deleting Files
- ☐ Creating and Deleting Directories
- ☐ File and Directory Information
- ☐ Switching Between Calculator and Disk Drive
- ☐ Backing Up and Restoring Memory
- ☐ Available Free Space
- ☐ Renaming a File or Directory
- ☐ Exiting FileManager
- ☐ Changing Disks and Power Off
- ☐ Disk Drive Version
- ☐ Installing Format48
- ☐ Formatting Disks

Controls and Key Usage

In general, using FileManager involves pointing to an object or group of objects and performing an operation. That operation might be a SEND or GET, or it might just be a MARK to tag the object for later use. Only SEND, GET and PURGE also operate on marked objects; all other operations work on the highlighted object.

To avoid confusion, keystrokes will be shown as the actual key sequence needed for the operation, followed by the operation name in parentheses. For example, entering the I/O menu would be described:

Press   (I/O).

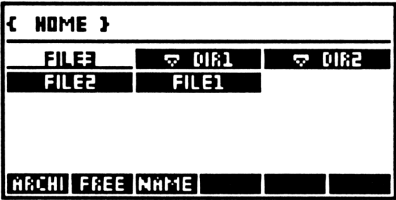
HP 48SX Directory Screen Display

At startup, FileManager displays the contents of the current directory on the calculator. Each item represents a single object. Items prefixed by the ▽ character indicate directories which may contain additional files. The top line of the display shows the current directory path. On the bottom line of the display are a group of menu keys.



- SEND** Sends a file to the disk
- CDRDIR** Create a directory on the HP 48SX
- INFO** Show info about an item
- MARK** Mark a file for later SEND or PURGE
- DISK** Switch to disk directory
- QUIT** Exit FileManager

Press **NXT** to see more softkey menu options:



- ARCHI** Backup calculator memory to disk
- FREE** Report on free space
- NAME** Rename a file or directory

To view the current directory on the disk in Drive95: Press **[NXT] [DISK]**. After the directory has been read from the disk, the disk directory will be displayed and the menu will change slightly.

\		
▼ DIR1	▼ DIR2	▼ DIR3
FILE1	FILE2	FILE3
FILE4		
GET CRRDIR INFO MARK HP48 QUIT		

- GET** Get a file from the disk
- CRRDIR** Create a directory on the disk
- INFO** Show info about an item
- MARK** Mark a file for later GET
- HP48** Switch back to the calculator directory
- QUIT** Exit FileManager

















Press **[NXT]** to see more softkey menu options:

\		
▼ DIR1	▼ DIR2	▼ DIR3
FILE1	FILE2	FILE3
FILE4		
FREE NAME DIR VER		

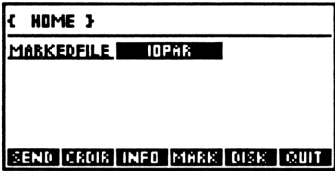
- FREE** Report on free space
- NAME** Rename a file
- DIR** Force a directory read from disk
- VER** Report disk drive firmware revision


Press **[NXT] [HP48]** to return to the calculator directory.

Moving Around the Directory



To select individual files or directories, use the cursor keys  to move the highlight to the desired item. Use  and  to move up or down a page at a time.  and  move to the top or bottom of the list of files. If the highlighted item is a directory, press **ENTER** to open it and display its contents. To move up out of a directory, press  (UP). To return to the HOME directory, press  (HOME).

Marking Files



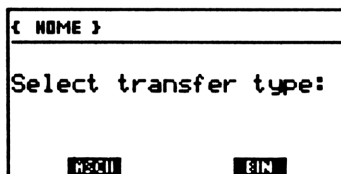
Groups of files can be marked and then transferred all at once. This is useful when you want to send, copy, delete, transfer, etc. more than one or a certain group of files. To mark files for transfer, move to each file desired using the arrow keys and press **MARK**. A  symbol will appear in front of the filename.



To mark all files, press  **MARK**. To remove all file marks, press  **MARK**.

Sending and Getting Files on the Disk

To send a calculator file or directory to the disk in the Drive95, move the highlight to that item and press **SEND**. The next screen asks whether this should be an ASCII or binary transfer.



Select **ASCII** for text data or a program file to be sent in human-readable form.

If this file will only be used by another HP 48SX, the **BIN** mode should be selected; for example, library objects or other binary machine language files. The file will be transmitted to the disk drive.

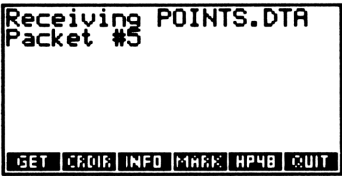
If a group of files have been marked for SEND, the ASCII or BIN choice applies to all of the marked files.



The green light on the front of the drive will flicker as the data is sent. The HP 48SX display will report the filename and the number of packets transmitted. After the file transfer has been completed, the yellow light on the disk drive will light up as the data is written to the disk.

Pressing **ON** (ATTN) before beginning the transfer will stop it and return to the directory display. If X is pressed after the transfer has started, the transfer will be halted and the calculator will exit from FileManager.

To get a file from the disk: Press **DISK** to access the disk directory. Use the softkeys to access the file desired. Press **GET** to get the file from the disk.



The yellow light on the drive will glow as the file is read from the disk into memory, then the green light will flicker as the data is transmitted to the calculator. As this happens, the calculator will display the number of data packets received.

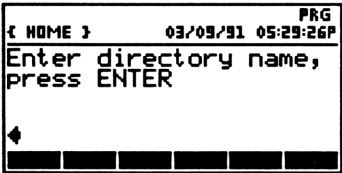
When the transfer is complete, FileManager returns to a directory display.

Deleting Files

To delete or purge a file you must first be in the directory where your file exists.

Press **⏏** **⏏** **⏏** **FILENAME** **ENTER**. The filename appears on the stack. Press **⏏** **DEL** (PURGE). Once removed, return to the HOME menu. Press **⏏** **⏏**.

Creating and Deleting Directories



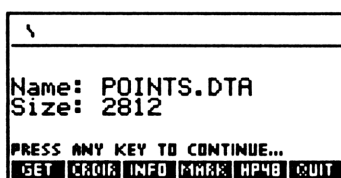
To make a new directory, move to the directory in which the new one should be created and press **DIR**. Enter the directory name and press **ENTER**. The directory will show up in the display, and it can be entered by pointing to it and pressing **ENTER**.

To delete directory, point to it and press **☐DEL** (PURGE). The item selected will be purged only if **YES** is selected at the confirmation screen.

Press **NO** or **☐ON** (ATTN) to return to the directory display without purging.

If a group of files have been marked for purging, a YES or NO prompt is presented for each file. Press **☐ON** (ATTN) to cancel the entire operation, or press **NO** to skip only this file and go on to the next one.

File and Directory Information



To get the size and filename of an item in the directory display, point to it and press **INFO**. The complete filename and size in bytes will be displayed. Press any key to return to the directory display.

Switching Between Calculator and Disk Drive

Pressing the **DISK** menu key will change to the disk drive and display its directory. The menu key will change to **HP48**. Pressing it again switches back to the directory on the calculator. The directory information is retained for both the disk drive and the calculator. If files are transferred, they move to or from the directories which have been selected.

Backing up and Restoring Memory

To perform a full backup of all main memory and merged memory cards, switch to the HP 48SX directory and press **ARCHI**. A prompt screen appears, asking for an archive name. Type the archive name and press **ENTER**. The calculator memory will be backed up onto the disk, using the standard binary archive format.

To restore the calculator from an archive, first read the cautions about RESTORE in the HP 48SX Owner's Manual. Do not continue until these restrictions are understood. See page 648-9 of the HP 48SX Owner's Manual Volume II, for more information.

CAUTION:

RESTORE causes loss of all data and flags currently in user memory. RESTORE overwrites the entire contents of user memory with the contents of the backup object. Libraries are lost.

When ready, transfer the archive to the HP 48SX. Check the I/O SETUP.

Press **[F6] [PRG]** (I/O), then the softkey **SETUP**. The I/O Setup menu will be displayed. Pressing the softkeys will allow you to change and match the screen to the one below. Make sure that the screen matches. THIS IS IMPORTANT!

```

      I/O setup menu
IR/wire:      wire
ASCII/binary: binary
baud:         9600
parity:       none 0
checksum type: 3
translate code:3
[IR/W] [ASCII] [BAUD] [PARIT] [CHECKM] [TRAN]
```

At this point, in order to restore your files from the archive file, your calculator needs to be cleared. If your calculator is not already clear, perform the procedure on page 101 of your HP 48SX Owner's Manual, Volume I, called "Clearing All Memory".

CAUTION: Performing the above procedure will totally wipe out your calculator's memory. Be sure you have a proper archive file on disk.

Press **[F2] [F2]** ARCHIVENAME **ENTER** **[F6] (I/O) KGET** to get the archive from the disk.

Press **[VAR]** to see the file menu softkeys and press the one corresponding to the archive just transferred. Press **[F6] [VAR] [NXT] [NXT] RESTORE** to restore the HOME directory and all sub-directories.

Available Free Space

```
\FMLIB
Disk space: 1421824
HP 48 free: 20445.50
PRESS ANY KEY TO CONTINUE...
FREE NAME DIR VER
```

Press **FREE** to see the amount of free space available on the disk and in the calculator's memory. Press **INFO** to view the size of the file. If the amount of memory shown is less than the size of the file, the file transfer will fail. Delete some un-needed files from calculator memory (page 6, this Chapter) or if the file is larger than the free space on the calculator install another memory card in the calculator to get additional space. If the file is larger than the free space on the disk use a different disk or delete some files from a nearly-full disk.

If a new disk is used, it must be formatted before use. The disk drive can format a disk using the separate format utility program supplied on the FileManager disk (page 12, this Chapter). Disks can also be purchased pre-formatted from several companies. Either 720K or 1.44Mbyte 3-1/2" disks will work.

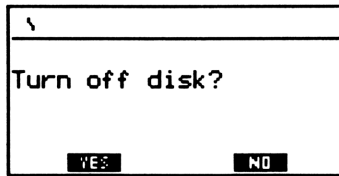
Renaming a File or Directory

```
PRG
{ NAME } 03/03/91 05:28:00P
Enter new name,
press ENTER
```

To change the name of an item, select it and press **NAME**.

The existing item's name is displayed on the bottom line of the screen. Edit this line to create the new name for the item and press **ENTER**. The screen will display a directory with the new directory name or filename.

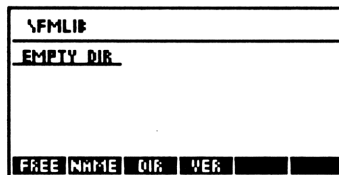
Exiting FileManager





To exit, press **QUIT**. Press **YES** to turn off the disk drive power, or **NO** to leave it on. The drive will automatically power down after about five minutes of inactivity.

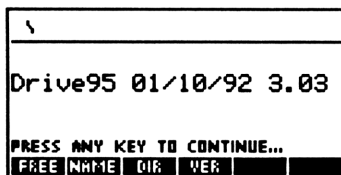
Changing Disks and Power Off

When the disk has been changed, or if the drive has been turned off, it is necessary to re-read the directory to avoid confusion. The disk drive cannot detect that the disk has been changed, and it doesn't remember which directory it was in if it has been turned off while FileManager is running.



A variety of unexpected results could occur if the drive tries to read or write a file without re-reading the disk's directory first. To reset the disk directory, switch to the disk directory display (if not already there) and press   (HOME) or press **NEXT DIR**. The current disk directory will be displayed.

Disk Drive Version





Press **VER** to see what version of software is in the disk drive. If a problem occurs, make a note of this version number before calling for service.

Installing Format48

To format disks with Drive95, you'll need a special program. If you haven't already done so, use FileManager to load the Format48 program into your HP48. It may be stored in any directory, but it might be helpful to put it in a utility directory so you can find it later. Instructions for creating a directory are on page 6 of this Chapter.

Follow these steps exactly in order to install the Format48 program on the HP 48SX.

- **Unpack** the drive, serial cable and wall transformer. **Plug** the transformer into a source of 110 volt 60 cycle AC power. **Plug** the cord into the power socket on the back of the disk drive, since the batteries may not have been fully charged when the drive was shipped. **Plug** the serial cable into the socket on the back of the disk drive.
- **Plug** the other end of the serial cable into the HP 48SX. **Insert** the File-Manager disk included with the drive into the slot on the front. It should seat with a click, and the **button** on the front of the drive will pop out.
- Press   (LIBRARY). Press **FMGR**. Press **DISK**. The screen will display messages regarding connection between the Drive95 and the HP 48SX and the number of packets being sent between the two.
- Use the arrow keys to highlight **FORMAT48**. Press **GET**. The screen will display messages regarding connection between the Drive95 and the HP 48SX and the number of packets being sent between the two.
- The file FORMAT48 has been sent. Press **QUIT**. You will be prompted: Turn off disk? YES or NO. Press **NO**.

Formatting Disks

Disks can be purchased either blank or formatted. If they are formatted, information has been written on them to tell the operating system where to put the data files. If you purchase formatted disks, make sure they are formatted for IBM or MS-DOS, not Macintosh. If you buy blank disks, they may be formatted in a PC or compatible, or in the Drive95.

To format disks with your HP 48SX and Drive95 you will need the assistance of the program Format48. If you haven't already installed Format48 then read the above procedure "Installing Format48".

Insert the disk to be formatted into the drive. Change the directory on the HP 48SX to wherever you stored the Format48 program.

Press **VAR**

Find the softkey labeled **FORM** and press it to begin the format program.

**The format operation destroys all data on the disk!
Be absolutely certain that nothing on the disk is
wanted before you format it!**

The following screen will appear:

SPARCOM FORMAT 48	
Title	Untitled
Size	1.44m
Verify	No
TITLE	SIZE
VERIFY	QUIT

The softkeys function as follows:

Title	lets you edit the title
Size	lets you toggle between 1.44M and 720K
Verify	lets you toggle between Yes and No
Quit	returns to the previous softkey menu.

- Enter or edit the volume name.
- Select the disk size to be formatted. A 1.44Mbyte high-density disk has a HD logo in the upper right corner next to the shutter. It also has a square hole in the lower right corner, opposite the write-protect tab. Do not format 1.44Mbyte disks as 720K, or vice versa. It won't work.
- Verify-Yes or No. With verify off a format takes about two minutes, but bad sectors will not be detected. With verify on a format takes about eleven minutes, but each track and sector is 100% tested.
- Press **ENTER** to format a disk using the current settings.
- Press **QUIT** to quit and return to the previous softkey menu.

The drive will begin to format the disk. The green light will blink, and it will make a ticking noise as it steps across each track, writing the formatting data on the disk.

When the format is finished, the yellow light on the drive will shut off.

Appendix A

Using System Manager Compliant Programs with the HP 95LX

In This Appendix

- ☐ System Manager Compliant Programs
- ☐ Configuring APNAME.LST
- ☐ Key Sequence Table
- ☐ Example

System Manager Compliant Programs

System Manager compliant programs are programs which behave like built in applications. They have a filename extension of .EXM and are activated by pressing a key sequence. This key sequence is specified in the file called APNAME.LST.

These programs can be run from Drive95, provided that:

- They are appropriately declared in C:_DAT\APNAME.LST
- Drive95 must be attached at the time the 95LX is rebooted.
- The files must be present on the inserted disk when the reboot is performed.

Most System Manager compliant programs are either commercial products or public domain/shareware. These can be transferred to a disk which can then be inserted into Drive95 for use with the 95LX.

However, there are two hidden system manager compliant programs in the ROM of the HP 95LX that we can use as an example.

- C:_SYS\HB.EXM called Hearts & Bones
- C:_SYS\TFOX.EXM called TigerFox



Before we can use these programs we must first assign them a key sequence in the APNAME.LST file.

Configuring APNAME.LST







APNAME.LST is a system configuration file that contains the key sequences to activate System Manager compliant programs. Proceed with the following steps to configure APNAME.LST.

Editing APNAME.LST

First check to see if you already have a file called APNAME.LST.

- Press .
- Use the arrow keys to highlight the directory _DAT
- Press . This will open the directory _DAT. Scroll through the list and check for the file APNAME.LST.


IF YOU FIND IT:

- Press   to get out of the Filer application.
- Press  then .
- Make sure FILE is highlighted, Press 
- Make sure OPEN is highlighted, Press 

The screen will display:



File to open:

C:_DAT*.TXT




- Press  (backspace key) only once, Type *.*

The screen should display:

C:_DAT*.*

- Press 
- This opens a group of files for you to edit. Select APNAME.LST.
- Press  and use the arrow keys to move the cursor to the end of the file and skip ahead to “Adding Key Sequences” at the top of the next page.

IF YOU DO NOT FIND IT:

- Press   to get out of the Filer application.
- Press  and continue at the top of the next page at “Adding Key Sequences”.

Adding Key Sequences

- Type:

C:_SYS\HB.EXM,AB00,Hearts&Bones

C:_SYS\TFOX.EXM,AE00,TigerFox

In the first example above HB.EXM represents the FILE, AB00 represents the KEY SEQUENCE, Hearts & Bones represents the NAME of the program.

(Note: AB00 is AB zero zero not the letters oh oh also; AE00 is AE zero zero not the letters oh oh)

- Press **MENU** **F** **S**. Either edit or type the filename so that it matches the one below:

C:_DATA\APNAME.LST

- Press **ENTER** to save.
- If the file already existed, the prompt “Replace current file? (Y/N)” will appear. Press **Y**.
- Press **MENU** **Q** and repeat until you have quit all applications.
- Press the **CTRL** **ALT** **DEL** keys simultaneously to reboot the HP 95LX.

Now the key sequences have been defined.

- Press **ALT** **[]** (AB00) simultaneously to run Hearts & Bones.
- Press **CTRL** **[]** (AE00) simultaneously to run TigerFox.

Other key sequences are listed in the Key Sequence table below:

Key Sequence Table:

KEYS:	Shift	Control	Alt	Shift + Control
FILER	A400	AE00	AB00	AA00
COMM	2960	B200	AF00	
APPT	297E	B600	B300	
PHONE	0221	BA00	B700	
MEMO	0423	BE00	BB00	
123	0524	C200	BF00	
HP CALC	0826	C600	C300	

Note: 0 in the above chart is zero not the letter oh.

Example

For example, to run a System Manager compliant program version of chess from drive G:\ add the following line to the APNAME.LST file.

G:\CHESS.EXM,B300,Chess

- Insert the disk containing CHESS.EXM into Drive95 and reboot.
- To play chess, press **ALT** and **⌂** simultaneously.

Appendix B

Technical Reference for the Drive95 Portable Disk Drive

In This Appendix

- ☐ HP 48SX and DOS File Naming Conventions
- ☐ Kermit Command Set
- ☐ Hardware and Interface Considerations
- ☐ FCC Regulations and Compliance
- ☐ Error Messages

HP 48SX and DOS File Naming Conventions

DOS filenames are not entirely compatible with the variable names available on the HP 48SX. The HP 48SX can use a great number of characters such as $\alpha\delta\epsilon\phi\text{BE}\Phi\Gamma\text{H}$ which are not legal characters in a DOS filename. Conversely, DOS accepts as legal a filename which starts with a digit; for example 2_25_92.SAV, which is a perfectly legal DOS filename, will not be accepted by the HP 48SX.

HP 48SX variable names:

- cannot start with a digit.
- cannot contain the characters «» # [] { } () ' " : _ . , @ or space.
- cannot be names of commands or reserved words.
- should not be the same as the names of reserved variables.

DOS file names:

- cannot exceed eight characters.
- have a maximum of three characters in the file extension.
- use a period only to divide the filename and extension.
- cannot contain the characters . " / \ < > + : = ; , or space.
- use extensions .EXE and .COM only for DOS executable files.
- use the extension .BAT for DOS batch files.
- use the extension .EXM for System Manager compliant programs.

Kermit Command Set

This section details each of the commands recognized by the Drive95. This information is intended for the use of programmers and advanced users who may wish to make use of the disk drive in other applications, or in ways not supported by FileManager. It is not necessary to know or understand these commands to use the drive for routine data storage using FileManager or the HP 95LX.

Remote Host Commands from MS-DOS

These commands are sent from Kermit on a PC or other computer. These commands cannot be issued from the HP 48SX. The equivalent commands as used on the HP 48SX are discussed in the next section called "Remote Host 'DOS-like' Commands".

These commands cannot be issued from the built-in Kermit on the HP 95LX. That particular version of Kermit does not provide a 'REMOTE' command. A separate copy of MSKermit could be loaded and run, but the device driver supplied with Drive95 provides a much simpler interface.

For a complete discussion of Kermit, see the book 'Kermit, A File Transfer Protocol' by Frank da Cruz, published by Digital Press, 1987.

REMOTE HOST MKDIR *dirname*

Makes a directory '*dirname*' under the current working directory on the disk.

REMOTE HOST RENAME *oldname newname*

Renames a file from '*oldname*' to '*newname*'.

REMOTE HOST VER, REMOTE WHO *.*

Returns the version number of the disk drive firmware. MS-Kermit requires that the *.* be included in the 'who' command.

BYE , LOGOUT

Both of these commands close the files and turn off the disk drive. BYE exits Kermit and turns off the disk drive. LOGOUT simply turns off the drive.

REMOTE DIR *.*

Returns a directory of the disk. MS-Kermit requires that the *.* be included.

REMOTE DELETE *filename*

Erases the named file from the disk, and returns the filename.

REMOTE HOST FORMAT NVsize volname

This will format the disk. Size can be 1.44M or 720K, and volname can be any volume name up to eleven characters. **THIS WILL DESTROY ALL DATA!**

If the disk size is prefixed by NV (no verify) the format will be performed without a read-and-write test of each sector. This method is much quicker, but carries a risk that undetected bad sectors will corrupt a data file.

REMOTE CWD dirname

Changes the working directory. Destination can be one of three places:

- a directory under the current working directory.
- . . , the parent of the current directory.
- \, the root directory.

It returns the current path.

REMOTE HOST RMDIR dirname

Removes a directory from the disk.

REMOTE SPACE *.*

Reports the free space on the disk. MS-Kermit insists that *.* be included.

Remote Host 'DOS-like' Commands

Chapter 33 of the HP 48SX Owner's Manual discusses Kermit as it is implemented on the HP 48SX. The commands below are sent using the PKT command. See page 631 of the manual for a detailed discussion of PKT.

These commands are issued from the HP 48SX to request DOS-like functions from the Drive95. These are termed 'remote host' Kermit commands, and each command is tagged as type 'C'.

"MKDIR dirname" "C" PKT

This command makes a directory within the current working directory on the disk. A directory name is provided, and null string is returned on success. Illegal characters truncate the directory name where they occur.

"RENAME oldname newname" "C" PKT

This command renames a file from 'oldname' to 'newname'. It takes two arguments, and returns "FILE NOT FOUND" on error, and a null string on success.

"VER" "C" PKT

This command returns the version number of the disk drive firmware.

Generic Kermit commands

These commands are issued from the HP 48SX to the Drive95 to perform file operations on the disk. These are termed 'generic' Kermit commands, and each command is tagged as type 'G'.

"C%dirname" "G" PKT

Change directory to dirname. % represents a character whose hexadecimal value is 20h plus the number of characters in the directory name. For example, "C#FOO" "G" PKT can be deciphered as

C—for change directory

#—character 35d, 23h; 20h plus 3, for a three-character directory name

FOO—the directory name

G—a generic Kermit command.

This table lists the character codes for 1 through 12 character filenames.

1—!	2—"	3—#	4—\$
5—%	6—&	7—'	8—(
9—)	10—*	11—+	12—,

If successful, the command returns the current path. It returns "INVALID PATH" if the directory is not present. Note that it may not be possible to type in some characters from the command line. The " symbol, for instance, cannot be used because the HP 48SX thinks it's the delimiter for the quoted string. Also, the backslash character \ cannot be entered directly from the HP 48SX keyboard.

"D" "G" PKT

This command requests a disk directory from the Drive95 and returns a string which looks like this:

```
"DIR
(c) 1991 Sparcom Corporation, Drive95
Directory of \
ABC      128 1-01-90 12:00:00
DEF      604 1-01-90 12:00:00
GHI      362 1-01-90 12:00:00"
```

This is a sample directory of a disk containing three short files. These files were created on the HP 48SX, so they have a default value for the time and date of creation. The Drive95 does not have a real-time clock built in, and Kermit on the

HP 48SX does not transmit a time and date stamp for files. If files were created on a PC, they will have time and date stamps, but those items are ignored by the HP 48SX and FileManager.

“E%name” “G” PKT

This command erases a file. “E” tells the drive that this is an erase. The “%” symbol is a code for the number of characters in the filename as described above under ‘C’. “name” represents the filename, including an extension if any. The command returns the filename if the operation was successful, and returns the string “FILE NOT FOUND” if the file was not on the disk.

“F” “G” PKT

This command switches off the disk drive. The drive returns a string:

“DRIVE POWERED OFF”

“U” “G” PKT

This command returns the amount of free space on the disk. It returns a string which looks like:

“106217 bytes available”

The number of bytes available will vary depending on the number of directories and files existing on the disk. The Drive95 supports DOS formatted disks in both 720K and 1.44Mbyte sizes.

Hardware and Interface Considerations

The drive is equipped with a nine pin serial connector. Only three pins are used. Pin 2 connects to Receive Data, and carries data in TO the drive. Pin 3 is Transmit Data, and carries data FROM the drive to the host computer or calculator. Pin 5 is signal ground, and ties to the internal ground bus of the drive electronics.

There are no user-serviceable parts inside. The rechargeable batteries should outlast the disk drive mechanism, and no adjustments are needed. The read/write heads may be cleaned with any of the commonly available head cleaning kits on the market. No modifications or repairs may be made to the Drive95 in any way without the express written consent of Sparcom. If repairs or modifications are needed, see the warranty section or consult with Sparcom technical support.

FCC Regulations and Compliance

The Federal Communications Commission regulates the use and licensing of all 'computing devices', of which this is one. This device has been tested for compliance with 'Class A' requirements for computing devices used in business, school or non-residential areas. It has not been certified for use at home, in the more-restrictive 'Class B' environment.

"This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

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.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense."

In a nutshell, if it makes the radio whine and the TV set snowy, try to work someplace else. Coiling the cable might help, since most of the emissions measured during testing come from the cable between the calculator or palmtop and the disk drive. Operating from the batteries alone, without the charger hooked up, can also be helpful in reducing radio emission from the disk drive. If such a problem persists, contact Sparcom technical support.

Error Messages

Directory Full

All directory table entries have been used up. Too many files in the root directory. Make subdirectories and put the files there.

File Not Found

The file requested was not found. Try another directory or check spelling.

Lseek Mode Error

Call Sparcom.

File Mode Error

Call Sparcom.

Too Many Files

There are too many files in this directory. Try to keep the number under 50. If the number of files is kept around 20, access will be much faster.

File Already Exists

The name is already used here for a subdirectory and a file of the same name is not permitted. Change the file name or put it somewhere else.

Write Access Denied

The file is marked for 'read only', and cannot be overwritten. If necessary, go to a PC and change the attributes for this file to allow writing.

Invalid File Name

This error should not occur; the Drive95 changes any illegal characters to '!' before writing the file. Call Sparcom if this error message is seen.

Invalid Handle

Call Sparcom.

Invalid Lseek Offset

Call Sparcom.

Multiple Write

There is already a directory of this name present in the current directory.

Disk Is Full

The disk has no space available. Delete some files or put in a fresh disk.

Invalid Path

The directory requested does not exist.

FDC Time Out

Call Sparcom.

FDC Bad Seek

The drive has attempted to seek to a track and has been unable to read back a valid track ID from the disk.

FDC Bad Controller

The disk controller is not responding. Call Sparcom.

FDC Bad CRC

The cyclic redundancy check (CRC) has failed, indicating corrupt data in this sector. The file is probably damaged.

Disk Missing

There is no disk in the drive. Put in a disk and try again.

FDC Record Not Found

The requested data is not in the sector. The file is probably corrupt.

FDC Write Protect

The disk is write-protected. Move the write-protect tab.

FDC Bad Address Mark

The requested data is not available. The file is probably corrupt.

FDC Bad Command

Call Sparcom.

Track Past Limit

Call Sparcom.

Not Implemented Yet

This command is not available in this revision of the firmware. If your warranty card has been sent in, we'll contact you when a major revision is released.

Bad Parameter

The wrong parameters have been passed. Try again after checking syntax and command structure.

Low Battery

The battery is going dead. Plug in the charger before continuing.

Power Off

The drive has switched off.

Appendix C

Warranty and Service

In This Appendix

- ☐ Technical Support
 - ☐ Limited Warranty
 - ☐ If the Drive Requires Service
 - ☐ Environmental Limits
 - ☐ Service Checklist
-

Technical Support

You can get answers to your questions about using your disk drive from Sparcom. If you don't find the information in this manual or in the HP *Owner's Manual*, contact us at :

Sparcom Corporation

Attn: Technical Support

897 NW Grant Avenue

Corvallis, OR 97330, U.S.A.

(503) 757-8416 phone

(503) 753-7821 fax

or send electronic mail:

from **Internet:**

support@sparcom.com

from **Compuserve:**

> Internet:support@sparcom.com

from **FidoNet:**

To:support@sparcom.com

Limited Warranty

What Is Covered

The Drive95 is warranted by Sparcom Corporation against defects in material and workmanship for 180 days from the date of original purchase. If you sell it or give it as a gift, the warranty is automatically transferred to the new owner and remains in effect for the original period. During the warranty period, we will repair or replace (at no charge) a product that proves to be defective, provided you return the product and proof of purchase, shipping prepaid, to Sparcom.

What Is Not Covered

This warranty does not apply if the product has been damaged by accident or misuse or as the result of service or modification by anyone other than Sparcom Corporation.

No other warranty is given. The repair or replacement of a product is your exclusive remedy. ANY OTHER IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS IS LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. IN NO EVENT SHALL SPARCOM CORP. BE LIABLE FOR CONSEQUENTIAL DAMAGES. Products are sold on the basis of specifications applicable at the time of manufacture. Sparcom shall have no obligation to modify or update products, once sold.

If the Drive Requires Service

Sparcom will repair the drive, or replace it with the same model or one of equal or better functionality, whether it is under warranty or not.

Service Charge

There is a fixed charge for standard out-of-warranty repairs. This charge is subject to the customer's local sales or value-added tax, wherever applicable. Damage by accident or misuse is not covered by fixed charges. These charges are individually determined based on time and material.

Shipping Instructions

If your drive requires service, call first for an RMA number. You may be given additional instructions at that time.

- Include your return address and a description of the problem.
- Include proof-of-purchase date if the warranty has not expired.
- Include a purchase order, along with a check, or credit card number and expiration date (VISA or MasterCard) to cover the standard repair charge.
- Ship your drive postage prepaid, in adequate protective packaging to prevent damage. Shipping damage is not covered by the warranty, so insuring the shipment is recommended.
- Include copies of any software or supporting documentation you may have which causes a problem, to aid in troubleshooting. Historically, about half of all returned units are 'no trouble found', in many cases because it was not possible to reproduce the problem at the factory. Any disks provided will be returned with the repaired drive.

Environmental Limits

The reliability of the Pocket Professional depends upon the following temperature and humidity limits:

- Operating temperature: 0 to 45 °C (32 to 113 °F). Operation at extremely high temperatures dramatically shortens the life of the batteries. Low temperature operation can produce erratic results and data errors.
- Storage temperature: -20 to 60 °C (-4 to 140 °F). The batteries should not be frozen or stored at high temperatures, to preserve their energy storage capacity.
- Operating and storage humidity: 90% relative humidity at 40 °C (104 °F) maximum, non-condensing.
- If the drive is to be stored unused for an extended period of time (months), run the drive until the batteries are discharged to prevent their degradation.
- If the drive is moved from a cold location to a warm one, let it adjust to the new temperature for half an hour before use. Condensation inside the drive could cause damage to the disk or electronics.

- The drive is packaged to resist reasonable shock levels, such as those found in a briefcase. It is not designed for or warranted against shock levels caused by dropping or use in extreme environments. The disk drive mechanism is rated for 0.5G shock in operation, or 1.5G shock when in transit. It can survive a drop of 6 inches onto a concrete floor without damage.
- The case is made of ABS plastic and will be damaged by solvents like acetone. If cleaning is required, use a damp rag (not drippy!) and a mild soap if necessary. If you accidentally dump your coffee or a soft drink into it, call Sparcom immediately for instructions.

Service Checklist

- ☐ Read the manual one more time. Maybe the answer is in there.
- ☐ Reproduce the problem. Write down your exact sequence of operations. Sparcom technical support will want to try it too, to identify the cause of the problem. Write down the *exact* symptoms as accurately as you can describe them. For example,

“The green light beside the disk mechanism turns on, then flashes red for a moment. The disk drive makes a clicking noise, and the disk motor can be heard. The yellow light on the disk mechanism flashes on for less than half a second, then turns off. After that a terrible grinding noise occurs and all the lights in the room go out.”

- ☐ Check any manuals that come with software you may be using. Perhaps there’s a clue there.
- ☐ If you’re still stuck, call Sparcom. We may be able to solve the problem over the phone. If not, we’ll want to have the drive sent in for a closer look.
- ☐ If you’re sending it back for service, include any evidence or data. Programs you used, disks that would or wouldn’t work, and anything else you think might provide a clue. These items will be returned, and they can often be crucial to determining the cause of a problem.

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