HP PC File Utilities

Version A.01.00

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8600 Soper HIll Road, Everett, WA 98205-1298

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GENERAL INFORMATION

Introduction

PC FILE UTILITIES is a group of MS-DOS programs that converts HP 3563A and HP 3562A instrument files to other file formats. PC FILE UTILITIES contains two sets of programs, LIF (Logical Interchange Format) Utilities and HP 3563A/3562A Conversion Utilities. The LIF Utilities are useful for any type of LIF file. The Conversion Utilities are useful only for HP 3562A and HP 3563A analyzer files.

Minimum Requirements

To run the utilities, you need an IBM PC compatible and MS-DOS 2.1 (or greater). You can run the software from a floppy disk drive or from your hard disk drive (a minimum of two drives are required).

Installation

To install the PC FILE UTILITIES, copy all files on the disk(s) to any directory on your PC. Or, if you do not have a hard disk, you can insert the disk in an internal drive and type commands from there. If you are running the utilities from a floppy drive, you may not address LIF files in that drive.

CAUTION: The file LIF.EXE must be in the same directory as LIFSCAN.EXE, LIFCHK.EXE, LIFLS.EXE, LIFCP.EXEC, LIFRM.EXE, and LIFINIT.EXE.

The utilities are in two groups: the LIF (Logical Interchange Format) Utilities and the HP 3562A/3563A Conversion Utilities.

LIF Utilities	Conversion Utilities
LIFSCAN.EXE	SETUP63.EXE
LIFCHK.EXE	HEADER63.EXE
LIFLS.EXE	DATA63.EXE
LIFCP.EXE	SYNTH63.EXE
LIFRM.EXE	DFDATA63.EXE
LIFINIT.EXE	DFHDR.EXE
LIFDIAG.EXE	VIEWDATA.EXE

LIF UTILITIES

Description

LIF (Logical Interchange Format) is the Hewlett-Packard standard disk format that may be used to exchange files among various HP computer systems and instruments. The LIF programs in the PC FILE UTILITIES make it possible for personal computer users to translate LIF files into MS-DOS file format, and MS-DOS files into LIF format. The utilities support file conversion for both internal drives and external drives (connected on the HP-IB). These utilities can also format and initialize LIF disks on external HP drives.

The LIF utilities consist of the following commands:

LIFSCAN	Checks the PC for internal floppy drives and for HP-IB interface boards and then looks for disk drives connected to HP-IB.
LIFCHK	Verifies that the disk inserted in a designated drive is fully readable by the LIF Utilities. (To abort, type CTRL C.)
LIFLS	Lists the contents of the LIF directory.
LIFCP	Copies a LIF file to a DOS file, a DOS file to a LIF file, or a LIF file to another LIF file.
LIFRM	Deletes a specified file from the LIF directory.
LIFINIT	Optionally formats and initializes a new directory on a LIF disk. (To abort, type CTRL C.)
LIFDIAG	Diagnostic utility useful for performing fast LIF to LIF full disk backups and for recovering data from damaged/corrupted disks.

Hardware and Software Requirements

Use of these utilities requires an IBM PC compatible with the MS-DOS 2.1 operating system (or greater). If you wish to translate or format LIF files located on an external drive you must have an SS/80 drive connected to your PC with an HP-IB card. The LIF utilities recognize all HP SS/80 drives including the HP 9122, HP 9133 (D,H,L), HP 9127A and HP 9153A. Older disk drives (AMIGO command set) such as the HP 9121, HP 9133 (V, X, or XV) will not work. (SS/80 disks are a subset of HP CS/80 disks.) There are no requirements for internal disk drives.

The HP 88500A and HP 82335 HP-IB cards, as well as the National GPIB PCII and AT-GPIB cards are recognized. Make sure that your HP-IB (or National Card) is set to System Controller, the default switch setting.

NOTE: The utilities will work with both an HP and a National card installed simultaneously. For example, you can LIF copy files from a disk drive on the HP card to a disk drive on the NI card.

Both BDAT and ASCII LIF files may be converted to DOS. (Binary LIF files are copied in raw mode.)

NOTE: When using these utilities, remember the following:

* The LIF utilities do not format internal disks (only external).
* It's not possible to initialize a LIF directory onto an unformatted disk.

CAUTION: Disk cache programs may interfere with the LIF utilities access to the internal floppy disk drives and may cause disk read errors or program lockup. We recommend that disk cache programs not be used in conjunction with these utilities.

HELP text

HELP text is available for each LIF utility command, with the exception of LIFSCAN. For a description of a particular command and a list of its options, simply type the command name and press return.

Command and Examples

LIFSCAN Checks the PC for internal floppy drives and for HP-IB interface boards and then looks for disk drives connected to HP-IB.

The drive specifiers of all valid disk drives (SS/80) are displayed. Either a Hewlett-Packard HP-IB card or a National Instrument GPIB-PCII (or GPIB-PCIIA) card (or compatible) will be recognized. The drive specifier for the HP-IB disk drive consists of an address in the following form:

SSAA<UU>:

where SS is the select code of the HP card (1 to 16). For the NI card, this is one plus the board # (e.g., 1 for board "GPIB0" and 2 for board "GPIB1"). AA is the HP-IB address of the disk drive (00 to 07). <UU> is the optional unit of the disk drive (00 to 15). The default unit is 0.

Syntax LIFSCAN

LIFSCAN may be invoked as "LIF SCAN".

Example Type LIFSCAN from your home directory, for the following information:

Drive Specifier	Looking for Disk Drives
A:	Internal Flexible Disk
B:	Internal Flexible Disk
	Found HP 88500A HP-IB Card at Select Code 7
	Found SS/80 Disk at Address 2, HP 9122
702:	Unit 0, Flexible or Removable Disk
70201:	Unit 1, Flexible or Removable Disk

Notes 702: identifies a disk drive at address 2 and unit 0 connected to an HP card at select code 7. If both an HP card and an NI card are connected to the same select code, then only the HP card will be recognized. This is usually not a problem since the customary select code of the HP card is 7, and the customary board name for the NI card is "GPIB0" (select code 1). The LIF Utilities are capable of working with both boards installed simultaneously (e.g., LIF copy from a disk drive on the HP card to a disk drive on the NI card).

LIFSCAN indicates how to address a LIF disk in an external drive, not a DOS disk. If a DOS disk is in your external drive, you cannot access it as "702:" or "70201:". Instead, use the letter drive code that DOS has assigned (e.g., E: or F:).

MS-DOS requires that an external drive be powered up and connected at power-on to be recognized as an MS-DOS drive. The LIF utilities do not require external drives to be on at power-on to be accessible as a LIF drive.

LIFCHK Verifies that the disk inserted in the specified drive is fully readable by the LIF Utilities. This serves two functions: first, to verify that the disk has no bad sectors (to minimize the possibility of corrupted data), and second, to verify that possible spared tracks on the disk will not interfere with the disk's usage on the PC's internal disk drives.

Syntax LIFCHK <d:> [/T] [/A] [/W]

<d:> The drive specifier, e.g., 702: or 70201: for an external drive; A: or B: for an internal drive. All LIF files require a drive specifier.

/T Terse, do not show the Head and Track # as each track is read. This can decrease the verify time.

/A Read every sector on each track instead of just one sector on each track. This is useful if you believe that the disk has possible media problems (not useful for additional checking for spared tracks). This can increase the verify time.

/W Wait for keyboard prompt before and after performing operation. This is useful for a PC with only two disk drives; you can swap out the disk with the PC File Utilities to insert a LIF or DOS disk.

(The default mode (no option) reads one sector on every track and displays the head and track number.)

LIFCHK may be invoked as "LIF CHK" or "LIF CHECK".

Example LIFCHK 702: /A

Notes HP spared tracks on an HP 9122 or HP 9127 disk may not be readable on the internal drive because the spared track may actually reside on a different side (head) of the disk and the PC BIOS may not be capable of finding it. This program verifies that each track can be read by the internal drive.

LIFLS Lists the contents of the LIF directory contained on a designated drive. All files are listed in the order that they are contained on the disk.

Syntax LIFLS <d:> [/L] [/A] [/W]

<d:> The drive specifier, e.g., 702: or 70201: for an external drive, A: or B: for an internal drive.

/L List in long format, giving volume name, volume size, directory start (in decimal), directory size, file type, file size, file start (in decimal), "implementation" field (in hex) and date created. (The implementation field indicates if a security code is present. The code is ignored by the LIF utilities.)

/A List all entries including purged files (PURGED type). Purged files are not accessible by LIFCP.

/W Wait for keyboard prompt before and after performing operation. This is useful for a PC with only two disk drives; you can swap out the disk with the PC File Utilities to insert a LIF or DOS disk.

(The default option lists all normal (not PURGED) files.)

LIFLS may be invoked as "LIF LS" or "LIF DIR".

In the long format, the following special file types are named:

1	ASCII
0	PURGED (only for /A list option)
-2	BINARY
-767	DOS (DOS Directory, don't mess with it)
-5791	BDAT

Example LIFLS 702: /L

(Lists directory in long format)

LIFLS 702: /A > <file name>

(Routes directory listing to a file in your home directory.)

Notes HP 3563A (or HP 3562A) files are all of type BDAT and the first two letters of the file name specifies the file type as follows:

A1-A5	Aseq1 through Aseq5	
AM	Amath	
CF	Cv Fit	(S domain Curve Fit)
CS	Capture	
DA	Data	
DM	Demod	(Delete Frequency)
FL	Fault	(Fault Log)
SE	State	
ST	Synth	(S domain)
TH	Thrupt	
TL	Test	(Test Log)
ZF	Z CvFt	(Z domain Curve Fit, only on HP 3563A)
ZT	Z Snth	(Z domain Synth, only on HP 3563A)
PI	Pictur	(Display graphics, only on HP 3563A)

LIFCP Copies a LIF file to a DOS file, a DOS file to a LIF file, or a LIF file to another LIF file. At least one of the files must be in a LIF directory (source or destination file). The full path name must be specified for a LIF file. This may be one of the internal flexible disk drives (e.g., A: or B:) or it may be an external HP-IB disk drive (e.g., 700: or 70001:).

Syntax LIFCP <sfile> <dfile> [/B] [/A] [/R] [/T:<fileType>] [/N] [/S:<lineSize>] [/I:<impl>] [/W]

<sfile> Source path and file name (must include drive specifier if file is LIF).

<dfile> Destination path and file name (must include drive specifier if file is LIF).

/B BDAT file copy (use only for DOS to LIF).

/A ASCII file copy (use for DOS to LIF).

/R Raw file copy (DOS to LIF or LIF to DOS). Do not convert file (copy as is).

/T:<fileType> (LIF destination only)
Set the file type for the destination file to the specified file type (in decimal). This may be specified in decimal or hexadecimal (prefix with '0x'). The file type specified will not affect any possible file conversions.

/N Do not translate to valid LIF file name.

/S:<lineSize>
Maximum line size for DOS to LIF ASCII file transfer (default 256 characters).

/I:<impl>
Set the implementation field for the destination LIF file (DOS to LIF or LIF to LIF). This may be specified in decimal or hexadecimal (prefix with '0x').

/W Wait for keyboard prompt before and after performing operation. This is useful for a PC with only two disk drives; you can swap out the disk with the PC File Utilities to insert a LIF or DOS disk.

LIFCP may be invoked as "LIF CP" or "LIF COPY".

Example LIFCP 702:DAFREQ DSK_FREQ

(LIF to DOS copy from an external drive to your current PC directory.)

LIFCP 77PSD 702:77PSD /N

(DOS to LIF copy from home directory to external drive. /N option is used to force the LIF file name to begin with a number. If /N were not typed the file name would be X77PSD. NOTE: Invalid LIF filenames may cause files to be inaccessible by another LIF system, e.g., Pascal workstations or HP BASIC.)

LIFCP 702:DAFREQ E:FREQ

(DOS to LIF copy from DOS external drive to LIF external drive.)

LIFCP LONG.ASC 702:LONGLINES /S:1000

(DOS to LIF copy forcing long line length.)

Notes Any specified LIF file name is automatically translated to contain a valid LIF file name as follows: shifts lower to upper case, allows '_' and digits (0-9), translates '.' to '_', and translates all other characters to the letter 'X'. If the first character is not a letter, then the file name will be preceded by the letter 'X'. LIFCP truncates file names to 10 characters.

Only two types of file conversions (i.e., not raw copy) are allowed between LIF and DOS files: ASCII and BDAT. LIF Binary files are not converted.

For a LIF to DOS file copy, LIF ASCII files are converted to DOS ASCII files and LIF BDAT files are converted to DOS Binary files. All other files are copied in raw mode (exactly as they appear in the LIF file). The automatic conversions for LIF ASCII and BDAT files may be turned off with the raw option (/R).

If a directory is specified as a destination, then a file with the same name as the source file will be created. If only a directory is specified as a source, then all files in the directory will be copied. For a DOS to LIF file copy, the file will be converted to either ASCII or BDAT automatically if no format conversion is specified (/A, /B, or /R).

If the first 80 characters of the DOS file contain only printable ASCII characters (or tab, carriage return, or line feed), then the file will be converted to LIF ASCII, otherwise it will be converted to LIF BDAT. The file may be forced to be converted to LIF ASCII with the ASCII option (/A). A file may be forced to be converted to BDAT format by specifying the BDAT option (/B) and a raw copy (no conversions) can be specified with the raw option (/R).

DOS file ---------->>>> LIF file

BINARY (no option)	becomes	BDAT
ASCII (no option)	becomes	ASCII
BINARY (with /A option)	becomes	ASCII
ASCII (with /B option)	becomes	BDAT

LIF file ---------->>>> DOS file

BDAT	becomes	BINARY
ASCII	becomes	ASCII

If the input file is ASCII, for a DOS to LIF copy, then the input lines will be truncated to the value set by /S option (default is 256 characters). If truncations occurs, the following message will appear:

WARNING: line "X" truncated from "n" to "n" characters.

Use the /S option to increase the maximum input line length. Note that the /S option does not need to be specified for LIF to LIF or LIF to DOS file copies.

For a LIF to LIF file copy, all files are copied as is (no conversion) with the destination file created with the same file type as the source file.

Multiple files may be copied if the source file specification is a directory or the wildcards '*' (match 0 or more of any character) or '?' (match 1 occurrence of any character) are used. In this case, the destination file specification should also be a directory. Each file will be copied to this directory. If the destination is not a directory, then all files will be copied to the same destination file (not appended). This is only useful to copy files to your screen or to a printer, as LIFCP will not write to an existing file (except CON or PRN devices).

Example LIFCP a:\DOSdir 702:

(Copies all the DOS files in the directory \DOSdir to the LIF disk at 702:)

LIFCP *.doc 702:

(Copies all the DOS files with the suffix ".doc" to LIF disk at 702:)

LIFRM Removes (deletes) the specified file from the LIF directory.

Syntax LIFRM <file> [/N] [/F] [/W]

<file> File name. Must include drive specifier (702:, A:, etc.).

/N Do not translate to valid LIF file name.

/F Force remove (i.e., external DOS directory).

/W Wait for keyboard prompt before and after performing operation. This is useful for a PC with only two disk drives; you can swap out the disk with the PC File Utilities to insert a LIF or DOS disk.

LIFRM may be invoked as "LIF RM" or "LIF DEL".

Example LIFRM 702:00data

(This looks for a file called X00DATA. If it doesn't exist, it won't remove any files.)

LIFRM 702:00data /N

(This will remove a file with the name "00data".)

Notes When you type in the name of a file (except where /N is specified), this utility automatically converts a valid LIF file name as follows: shifts lower to upper case, allows '_' and digits (0-9), translates '.' to '_', and translates all other characters to the letter 'X'. If the first character is not a letter, then the file name will be preceded by the letter 'X'. LIFRM truncates file names to 10 characters.

Care must be exercised with this command because a DOS directory on an external HP-IB disk drive (e.g., an HP 9133D) is actually a LIF directory with one entry (e.g., VOLUME000) and can be removed with this utility only by specifying the /F option.

LIFINIT The command LIFINIT optionally formats and initializes a new directory on a LIF disk.

Syntax LIFINIT <d>:[name] [/F] [/O:<opt>] [/I:<intrlv>] [/W]

<d>: Drive specifier (702:, A:).

/F Format disk before initializing directory. This operation may take a few minutes to complete. This operation may not be necessary if the disk is already formatted.

/O:<opt> Format option. This integer number specifies the disk sector size and other disk drive dependent information. Refer to your disk drive owner's manual for possible values and their specific meaning. (If you have an HP 9122 or HP 9127, see below.) If not specified, then a format option of 0 is used. The format option is only used if format disk (/F) is specified.

/I:<intrlv>
Sector interleave factor. A value of 1 is the default. The interleave factor is only used if format disk (/F) is specified.

/W Wait for keyboard prompt before and after performing operation. This is useful for a PC with only two disk drives; you can swap out the disk with the PC File Utilities to insert a LIF or DOS disk.

LIFINIT may be invoked as "LIF INIT".

CAUTION: Do not eject disk while formatting.

Example LIFINIT 702: HALL /F

(Formats a disk in an external drive)

LIFINIT 702: HALL /F /O:4 /I:2

(Formats a single-sided disk on an HP 9122D)

Notes The [name] specified (in this case "HALL") is the new LIF directory's volume name and is automatically translated to contain a valid LIF volume name as follows: shifts lower to upper case, allows '_' and digits (0-9), translates '.' to '_', and translates all other characters to the letter 'X'. If the first character is not a letter, then the volume name will be preceded by the letter 'X'. LIFINIT truncates file names to 6 characters. If no name is specified, then the LIF volume name will be blank.

Disks can only be formatted on external HP-IB disk drives (i.e., not on internal flexible disk drives).

HP 9122D FORMATTING OPTIONS

If you have an HP 9122D and wish to use it to format and initialize disks with the LIF utilities, make sure you use the following format options.

Format Option	Bytes/ Sector	Double- or Single-sided Formatting	Kbytes of Storage
0,1	256	Double-sided	630K
2	512	Double-sided	710K
3	1024	Double-sided	788K
4	256	Single-sided	270K

HP 9127A FORMATTING OPTIONS

If you have an HP 9127A and wish to use it to format and initialize disks with the LIF utilities, make sure you use the following format options.

Format Option	Bytes/ Sector	Double- or Single-sided Formatting	Kbytes of Storage
0,1	256	Double-sided	270K
3	1024	Double-sided	378K

Do not use format options 2, 4, 5, or 6. This will create a DOS format disk which is incompatible with LIF.

CAUTION: The HP 3562A and HP 3563A only support a sector size of 256 Bytes.

LIFDIAG LIFDIAG contains diagnostic functions useful for recovering data from damaged/corrupted disks and to perform fast full LIF to LIF disk backups.

The menu line for LIFDIAG contains a menu name followed by a set of command words on the top line on the display. Each command has one letter in red on a color display (bright white on monochrome display) indicating the hot key for that command. Pressing the hot key causes the command to be executed. The currently selected command is in inverse video on a color display (in bright white on monochrome display). As an alternative to using the hot key to execute a command, the currently selected command may be moved by pressing the left or right arrow keys and executed by pressing the <Enter> key.

LIFDIAG Menu:

LifDiag:	**E**dit	**B**ackup	**H**elp	**Q**uit
	^	^	^	^
Hot Keys:	E	B	H	Q

Description:

Edit — Edit logical sectors on a LIF disk, including read sectors (with display in hex/ASCII), write sectors (even to other disk addresses), modify sector contents (in hex, decimal, or ASCII), and find data pattern on disk (specify in hex, decimal, or ASCII). Any number can be specified in hex by prefacing the number with '0x'. Pressing this key will prompt you to enter the disk path of the LIF disk to edit. If an error results in specifying the disk path (e.g. no disk), then the edit menu will not allow the disk to be edited. Press 'Quit' and try 'Edit' again. The size & characteristics of the disk are displayed if no errors are detected.
For a full description of edit functions, see "EDIT Menu."

Backup — Full disk backup between specified source and destination disk (can be the same disk). Either the entire disk may be copied, or just the contiguous file area contained by the LIF files. For damaged disks, there is an option to skip bad sectors that are read/written (they are zeroed out on the destination disk). Any errors are displayed in a special ERRORS window. For a full description of Backup functions, see "BACKUP Menu."

Help — Display command summary on the display.

Quit — Quit LIFDIAG. Pressing this key will ask for confirmation. Press 'Yes' to exit the program.

EDIT Menu:

Edit:	**R**ead	**N**ext	**P**rev	**F**ind	**M**odify	**W**rite	**L**og	**H**elp	**Q**uit
Hot Keys:	R	N	P	F	M	W	O	H	Q

Description:

Read — Read/display the logical sector specified. Logical sectors are always 256 bytes even though physical sectors may be 256, 512 or 1024 bytes long. For example, if the disk has 1024 byte physical sectors, then physical sector 0 is contained in logical sectors 0 through 3. The sector is displayed in hexadecimal (on left side of display) and in printable ASCII (on right side of display).

Next — Read/display the next logical sector (current sector + 1).

Prev — Read/display the previous logical sector (current sector - 1).

Find — Find the specified data pattern between the specified start and stop sectors on the disk. The data pattern may be specified as a string of up to 70 ASCII characters (case sensitive) or up to 35 comma or space separated numbers representing individual bytes. Each number may be specified in decimal or hexadecimal (prefaced with '0x'). This operation can be aborted by pressing the 'ESC' key.

Modify — Modify the currently displayed sector. The offset from the start of the sector is specified as are the new values to place in the sector. The values may be ASCII characters or comma/space separated numbers (bytes). Note: The sector is not modified on the disk until a Write command is performed.

Write — Write the currently displayed sector to the disk, either at the same sector or a different sector on the disk. The logical sector address may be specified in decimal or hexadecimal (prefaced with '0x'). The default sector number is the last sector that was read.

Log — Specifies a log file where the displayed hex/ASCII sector contents will be appended to. For example, 'prn' specifies the printer.

Help — Display command summary on the display.

Quit — Quit editting this disk. WARNING: Always select 'Quit' and 'Edit' again before editting a new disk. The size & characteristics of the disk are only determined when the disk is initially editted.

BACKUP Menu:

Backup:	**G**o	**S**ource	**D**est	**L**ength	**E**rrors	**L**og	**H**elp	**Q**uit
	^	^	^	^	^	^	^	^
Hot Keys:	G	S	D	L	E	O	H	Q

Description:

Go — Start the backup. If the source and destination disks are the same, then you will be prompted to swap source/dest disks. During the backup, the PROGRESS window shows how much of the backup operation has been completed. A backup may be aborted at any time by pressing the 'ESC' key.

Source — Specify the external (e.g. 102:) or internal (e.g. b:) source LIF disk. The source disk should be write protected to prevent accidental erasure of data in the event that the disk is placed in the wrong drive.

Dest — Specify the external (e.g. 102:) or internal (e.g. b:) destination LIF disk. The destination disk must be writeable and already formatted. The destination disk must be large enough to contain the contents of the source disk. A warning will be displayed if the destination is too small for full disk copy.

Length — Specify whether the entire source disk (Full disk) will be copied or only the area of the disk containing up to the last LIF file. Full disk should be specified if the LIF directory has been damaged.

Errors — Specify whether a read/write error will cause the backup to Stop or whether the error is Ignored (the sector is cleared on the destination disk). Any errors are displayed in the ERRORS window.

Log — Specifies a log file where the same errors that are shown in the ERRORS window will be appended to. For example, 'prn' specifies the printer. Note: the log file must be specified before starting the backup.

Help — Display command summary on the display.

Quit — Quit backup function.

ERROR MESSAGES

Cannot format internal disk

The internal disks on the PC cannot be formatted by LIFINIT. Use an HP-IB disk drive to format your disks, if available, or format your disks on another machine.

Disk access (Check media)

Access errors can occur on media that is possibly corrupted. Immediately, try to copy all files off the disk, or just dispose of the disk and use a backup disk. The disk may be salvageable (not the data) if it is re-formatted.

Disk fault (Check disk drive)

Fault errors indicate disk drive hardware failures. Try running your disk drive diagnostics to trace the problem, or just cycle power on the disk drive (a hard reset).

Disk has no media

No disk is in the disk drive being accessed. It is possible that the wrong disk address is being specified by the user. Double check the drive specifier you are using. A common mistake when using the HP 9122 disk drive is incorrectly specifying the disk unit (unit 0 is left drive, unit 1 is right drive).

Disk is not SS/80

Older HP-IB disk drives (Amigo Command Set) can not be used with the LIF utilities. These disks include the HP 9121, HP 9133 (V, X, or XV), HP 82901, or HP 9895. Try using a newer disk drive such as HP 9122, HP 9133 (D, H, or L), or HP 9127A.

Disk is write protected

The target disk for a LIFCP, LIFRM, or LIFINIT is write protected. Check the disk to make sure you really want to modify it, and remove the write protect mechanism on the disk.

Disk lost power

During a LIF utility operation, the disk drive either lost power or the disk was ejected and replaced. This could corrupt data on your disk if a disk was swapped during a LIFCP operation. Do not eject disks during any LIF utility operation.

Disk media is unformatted

The disk may actually be a DOS disk. Try using the DOS command "dir" to check whether this disk is in DOS format. If not, then format the disk (LIFINIT /F) before using it.

Disk reject (Check connections)

Reject errors generally indicate a failure in trying to communicate with an external disk drive. Check the HP-IB cables to make sure they are secure. Also, try disconnecting any other HP-IB devices which may be interfering (e.g., same HP-IB address) with communication to the disk drive. It is also possible for this error to occur if the LIF directory is corrupt.

Disk timeout

The external disk drive did not respond in the time allowed. This can occur if no disk drive is at the specified address, the disk is not connected properly, the disk drive is not turned on, or another device on the HP-IB is interfering with communication.

DOS directory

The external disk drive contains a DOS directory (it actually is a valid LIF directory which contains one file, which is the DOS directory). Be very careful with this directory. If you delete the directory file (via LIFRM) or reinitialize the disk (via LIFINIT), then your DOS directory is lost. You can actually remove this directory by specifying the /F option to LIFRM.

File already exists

The LIFCP utility generates this error if the target file already exists on the LIF disk. Use "LIFRM" to remove the existing file from a LIF disk or "del" to remove the existing file from a DOS disk.

File not found

The source file was not found by LIFRM or LIFCP. Check the spelling of the file name. Remember that LIF file names are only 10 characters long. File names are automatically translated to valid LIF names. If the file name desired is not a valid LIF name, then use the /N option to suppress the name translations.

LIF file system is full

Either the directory area or the data area of the disk is full. Either remove some files from the target disk, or use another disk which has room.

LIF internal error

This error indicates a possible problem with the PC's memory.

Neither file is in a LIF file system

This error is generated by LIFCP if neither the source nor the destination file is in a LIF file system. Check your path names. Remember that only internal floppies and external disk drives may be LIF file systems.

No disk drive

No disk drive was found at the specified unit, but there is a disk drive at the specified address. The disk unit specifier was probably specified incorrectly.

Not a valid drive specifier

The drive specifier was incorrect. Run LIFSCAN to find all valid LIF disk drive specifiers.

Not a valid HP-IB card address

There is no HP HP-IB or NI GPIB-PCII card at the specified address. Run LIFSCAN to verify the HP-IB card address.

Not a valid LIF directory

The disk does not contain a valid LIF directory, but it does contain a valid LIF volume header. Check your disk, it is probably corrupt.

Not a valid LIF file system

The disk does not contain a valid LIF volume header. Check your disk, it is either a DOS disk, or the disk is corrupt.

Not a valid format option

The format option specified on the LIFINIT command is not valid for this disk drive. For example, only the format options 0 through 4 are valid on an HP 9122 disk drive. Refer to your disk drive operator's manual for allowable format options. For HP 9122 or HP 9127 format options, see command LIFINIT.

Not a valid interleave

The interleave value specified on the LIFINIT command is not valid for this disk drive. The allowable values for interleave are 0 through X-1 where X is the # of usable sectors per track. For example, an HP 9122 with 256 byte sectors has 16 sectors per track, so an interleave of 0 through 15 is valid.

Out Of Memory

Not enough memory to read the disk directory or to contain the file system control structures. Free up some memory.

Sector size not supported

Sector size of 512 bytes for a 5 1/4" drive is not usable because it can only be formatted (on a HP 9127A) as DOS format (not LIF). If it is a 3.5" disk, the disk was not formatted with an HP-IB disk drive (HP 9121 or HP 9122 compatible) or the disk is corrupt.

Unknown Option 'x'

This error may be generated by all the commands (except LIFSCAN which has no options). Check your options. Typing the command by itself (no parameters) will list the valid options. Options are not case sensitive and not order dependant.

HP 3563A/3562A CONVERSION UTILITIES

Description

The HP 3563A/3562A Conversion Utilities are programs that translate data files from the HP 3563A and HP 3562A analyzers to ASCII format and formats compatible with two application software packages, PC-MATLAB and MATRIXx. PC-MATLAB, a trademark of The MathWorks, Inc., is a software package for scientific and engineering numeric computation. MATRIXx, a product of Integrated Systems Inc., is a similar PC based package. HP 3563A/3562A data files may be ported to either of these packages using the Conversion Utilities. See the appendix, for examples of how to load HP 3563A or HP 3562A data into these application packages.

There are seven utilities, as follows:

SETUP63 Convert a binary setup state file from the HP 3563A (or HP 3562A) to an ASCII form.

HEADER63 Convert the data header portion of a binary data file from the HP 3563A (or HP 3562A) to an ASCII form.

DATA63 Convert the data portion of a binary data file from the HP 3563A (or HP 3562A) to an ASCII file, a PC-MATLAB MAT-file, or a MATRIXx file.

SYNTH63 Convert a binary synthesis file from the HP 3563A (or HP 3562A) to an ASCII file, a PC-MATLAB MAT-file, or a MATRIXx file.

DFHDR63 Convert the header portion of a binary capture/throughput file from the HP 3563A (or HP 3562A) to an ASCII file.

DFDATA63 Convert the data portion of a binary capture/throughput file from the HP 3563A (or HP 3562A) to either an ASCII file, a PC-MATLAB MAT-file, or a MATRIXx file.

VIEWDATA Graphically display data in a variety of formats with X markers. Data can be imported from ASCII files, HP 3563A/3562A data files, or SDF files.

NOTE: These utilities work only on MS-DOS files. Prior to using them, copy your HP 3563A/3562A files from LIF to DOS using the LIF utilities (LIFCP) described in the first part of this documentation.

Hardware and Software Requirements

Use of these utilities requires an IBM PC compatible with the MSDOS 2.1 operating system (or greater).

HP 3563A/3562A File Format

When the HP 3563A/3562A saves measurement data or instrument states to an HP-IB disk drive, the files are saved in a non-standard binary format used by the instrument. Typically, you need to transfer three pieces of information: your setup state, file header information, and measurement data. A setup state will be in a single file, while the header information will be attached to a data file. Using these utilities, you can separate header and data information into two files.

When you look at these files using the LIF utility command "LIFLS /L", you'll see that the analyzers files are all type BDAT. Data files begin with "DA", setup state files start with "SE", capture files start with "CA" and throughput files start with "TH".

HELP Text

Help text is available for each Conversion Utility command. For a description of a particular command and a list of its options, simply type the command name and press return.

Commands and Examples

SETUP63 Converts a binary setup state file from the HP 3563A (or HP 3562A) to an ASCII form (written to destination file).

Syntax SETUP63 <sfile> <dfile> [/L] [/E]

<sfile> Source path and file name.

<dfile> Destination path and file name.

/L Put labels on each line. The name of each field will be the first 25 characters of each line (approximately as they appear in the HP 3563A or HP 3562A Programming Manual).

/E Expand enumerated types to ASCII names (approximately as they appear in the HP 3563A or HP 3562A Programming Manual).

Example After copying your HP 3563A/3562A file from LIF to DOS using the "LIFCP" command (LIFCP A:SEFREQ FREQ), type:

SETUP63 FREQ FREQ.ASC /L

FREQ.ASC will contain a list of setup parameters, for example:

```
Measurement_mode          0
Measurement_1             2
Measurement_2             5
Window_type               11
Force/Expon_window_1      0
Force/Expon_window_2      1
Average_type              10
Overlap_percentage        0
Number_of_averages        10
Sweep_#_of_averages       1
Trigger_type              18
          etc.
```

To interpret this data, look in the HP 3563A or HP 3562A programming manual at the table "Enumerated Types for Instrument State Values" or use the /E option. (See the appendix for a complete list of example files and a list of labels and their corresponding ennumerated type names.)

Notes

The destination file contains one line for each field in the setup state (except qualifiers, which contain the "bit" and "don't care" fields on one line). Refer to the HP 3563A or HP 3562A programming manuals for a description of the individual fields in the setup state file. All integers, reals, and long reals will be converted to ASCII, strings will be surrounded by double quotes ("), enumerated types will be converted to ASCII integers (unless /E is specified) and qualifiers will be converted to a series of 1, 0, or X.

HEADER63 Converts the data header portion of a binary data file from the HP 3563A (or HP 3562A) to an ASCII form.

Syntax HEADER63 <sfile> <dfile> [/L] [/E]

<sfile> Source path and file name.

<dfile> Destination path and file name.

/L Put labels on each line. The name of each field will be the first 25 characters of each line (approximately as they appear in the HP 3563A or HP 3562A Programming Manual).

/E Expand enumerated types to ASCII names (approximately as they appear in the HP 3563A or HP 3562A Programming Manual).

Example After copying the data file to your PC, using the LIFCP command (LIFCP 702:DAFREQ FREQ1), type:

```
HEADER63 FREQ1 FREQ1.ASC /E
```

You'll get a list, such as

```
Power_spectrum_1
801
801
1
Channel_1
No_channel
87
Frequency
RMS
Volts_squared
Hertz
"AUTO MATH"
""
""
""
True
False
```

Notes

The destination file contains one line for each field in the data header. Refer to the HP 3563A or HP 3562A Programming Manual for description of the individual fields in the data file. All integers, reals, and long reals will be converted to ASCII, strings will be surrounded by double quotes ("), and enumerated types will be converted to ASCII integers (unless /E is specified).

DATA63 Converts the data portion of a binary data file from the HP 3563A (or HP 3562A) to an ASCII file, a PC-MATLAB file, or a MATRIXx file.

Syntax DATA63 <sfile> <dfile> [/L] [/M] [/R] [/X]

<sfile> Source path and file name.

<dfile> Destination path and file name.

/L Create MATLAB File (a binary file).

/M Create MATRIXx File (an ASCII file).

/R Output MATLAB or MATRIXx file matrices in a row instead of a column.

/X Output X axis data.

If neither /L nor /M option is specified, then an ASCII file is created.

Example DATA63 FREQ C:FREQ.MAT /L /X

(Converts your file to a PC-MATLAB file; includes X axis data points. Note that PC-MATLAB searches for a file with the suffix ".MAT" if no suffix is specified. See appendix for more information on loading a file into PC-MATLAB.)

DATA63 FREQ A:\APPLIC\FREQ.MAT /M /R

(Converts your file to MATRIXx row format.)

DATA63 FREQ FREQ.ASC

(Outputs data to an ASCII file.)

Notes A baseband time record contains 2048 real points, a zoom time record contains 1024 complex points, and a spectrum contains either 801 or 1024 real or complex points.

An ASCII file contains one line for each data point (up to 3 fields separated by commas). If the /X option is specified, the first field is the X axis data value. The next field is the real part of the Y data point. If the data is complex, then the last field is the imaginary part of the Y data point.

Both the MATLAB and MATRIXx files contain the following matrix variables:

TraceX	Vector of X values (only if /X is specified).
StartX	Starting X value (only if /X is not specified).
IncrX	Linear X increment between points (only if /X is not specified).
LogX	Log X increment between points (only if /X is not specified).
TraceData	Vector of Y values (may be complex).

If the /X option is not specified, the StartX, IncrX and LogX variables can be used to calculate the X data as follows:

X = (Xlast + IncrX) * LogX

where Xlast is the previous point's X and the first X is StartX.

LogX is non-one for log resolution FFT spectrums and for swept sine log swept spectrums.

SYNTH63 Converts a binary synthesis file from the HP 3563A or HP 3562A to an ASCII file, a PC-MATLAB file, or a MATRIXx file.

Syntax SYNTH63 <sfile> <dfile> [/L] [/M] [/R]

<sfile> Source path and file name.

<dfile> Destination path and file name.

/L Create MATLAB File (a binary file).

/M Create MATRIXx File (an ASCII file).

/R Output MATLAB or MATRIXx file matrices in a row instead of a column.

If neither /L nor /M option is specified, then an ASCII file is created.

Example SYNTH63 FREQ C:FREQ.MAT /L /X

(Converts your file to a PC-MATLAB file; includes X axis data points. Note that PC-MATLAB searches for a file with the suffix ".MAT" if no other suffix is specified. See appendix for more information on loading a file into PC-MATLAB.)

SYNTH63 FREQ A:\APPLIC\FREQ.MAT /M /R

(Converts your file to MATRIXx row format.)

SYNTH63 FREQ FREQ.ASC

(Outputs data to an ASCII file.)

Notes A synthesis table contains a maximum of 22 poles/zeros, poles/residues, or numerators/denominators (polynomial). It also contains the time delay, system gain, and either scale frequency (s-domain) or sample frequency and z power sign (z-domain).

The first 4 lines of the ASCII file contain the time delay, system gain, scale or sample frequency, and z power sign, respectively. The next line contains the # of poles (or numerators) followed by the # of zeros (or residues or denominators). Each of the following lines contain a complex pole (2 fields) followed by a complex zero (2 fields). This is repeated for all the poles and zeros in the synthesis table. If there are fewer zeros than poles, then the extra zeros contain the value 0.0, 0.0 (and vice versa). (MATLAB and MATRIXx files are not zero filled.)

Both the MATLAB and MATRIXx files contain the following matrix variables:

TimeDelay	Time delay (in seconds)
SysGain	System gain
SynthFreq	Scale frequency (Hz) if s-domain table Sample frequency (Hz) if z-domain table
PoleData	Vector of complex poles (if pole/zero or pole/residue table)
NumerData	Vector of complex numerators (if polynomial table)
ZeroData	Vector of complex zeros (if pole/zero table)
ResData	Vector of complex residues (if pole/residue table)
DenomData	Vector of complex denominators (if polynomial table)
Zpower	1 if negative z powers, 0 if positive z powers. (Only useful for z-domain table.)

DFHDR63 Converts the header portion of a binary capture/throughput file (containing digital filter data) from the HP 3563A (or HP 3562A) to an ASCII form.

Syntax DFHDR <sfile> <dfile> [/L] [/E]

<sfile> Source path and file name.

<dfile) Destination path and file name.

/L Put labels on each line.

/E Expand enumerated types to ASCII names.

Example After copying the capture/throughput file to your PC,using the LIFCP command (LIFCP 702:CAGLITCH GLITCH), type:

```
DFHDR63 GLITCH GLITCH.ASC /L /E
```

You'll get a list, such as

```
Complex_data)_flag              False
Bytes_per_point                 2
Points_per_record               2048
Channel_type                    Channel_1
Bandwidth_units                 Hertz
X_units                         Hertz
Delay_channel                   Channel_2
Delay_count                     0
Partial_record                  0
Interleave                      0
#_of_realtime_records           10
Sectors_per_track               0
Skip_track_[1]                  0
```

Notes The destination file contains one line for each field in the capture/throughput header. Refer to the HP 3563A or HP 3562A Programming Manual for descriptions of the individual fields in the data file. All integers, reals, and long reals will be converted to ASCII, strings will be surrounded by double quotes (`` ''), and enumerated types will be converted to ASCII integers (unless /E is specified).

DFDATA63 Converts the data portion of a binary capture/throughput file (containing digital filter time data) from the HP 3563A (or HP 3562A) to a PC-MATLAB MAT-file, a MATRIXx file, or an ASCII file.

Syntax dfdata63 <sfile> <dfile> [/L] [/M] [/R] [/X] [/O:<ofst>] [/P:<len>] [/C:<chan>]

<sfile> Source path and file name.

<dfile> Destination path and file name.

/L Create MATLAB file (a binary file).

/M Create MATRIXx file (an ASCII file).

/R Output MATLAB or MATRIXx file matrices in a row instead of a column.

/X Output X axis data.

/O:<ofst> Offset from beginning of data (in points) to convert (default 0).

/P:<len> Length of data (in points) to convert (default 20480 points); MATLAB and MATRIXx files can contain up to 32767 points.

/C:<chan> Channel of data to convert (default chan 1 if 2 chans of data).

If neither /L nor /M option is specified, then an ASCII file is created.

Example DFDATA63 GLITCH C:GLITCH.MAT /L /X /P:4096

(Converts up to 4096 points of your file to a PC-MATLAB file; includes X axis data points. Note the PC-MATLAB searches for a file with the suffix ".MAT" if no suffix is specified. See appendix for more information on loading a file into PC-MATLAB.)

DFDATA63 THRUPUT THRUPT.ASC /0:20480 /C:2

(Outputs channel 2 data to an ASCII file after skipping the first 20480 points of the data file.)

Notes

Each capture/throughput record contains 2048 real points (baseband) or 1024 complex points (zoom). A capture file contains up to 10 records of time data, whereas a throughput file contains up to 32767 records.

Since capture/throughput data can be very long, the /O and /P options can be used to select only a portion of the data in a file. The /C option only needs to be specified for a 2 channel throughput file to select channel 2 as the source of data.

An ASCII file contains one line for each data point (up to 3 fields separated by commas). If the /X option is specified, the first field is the X axis data value. The next field is the real part of the Y data point. If the data is complex, then the last field is the imaginary part of the Y data point.

VIEWDATA Graphically displays data in a variety of formats with X marker operations available.

VIEWDATA can import data from ASCII files, SDF files, or HP 3563A/3562A data files.

The menu line for VIEWDATA contains a menu name followed by a set of command words on the top line on the display. Each command has one letter in red on a color display (bright white on monochrome display) indicating the hot key for that command. Pressing the hot key causes the command to be executed. The currently selected command is in inverse video (on color display, entire word in bright white on monochrome display). As an alternative to using the hot key to execute a command, the currently selected command may be moved by pressing the left or right arrow keys and executed by pressing the <Enter> key.

VIEWDATA Menu:

ViewData:	**F**ile	**C**oordinates	**X**scale	**Y**scale	**D**isplay
	^	^	^	^	^
Hot Keys:	F	C	X	Y	D

	Output	**S**ave	**H**elp	**Q**uit
	^	^	^	^
Hot Keys:	O	S	H	Q

Description:

File	Set file type and read data from a file.
Coordinates	Set the Y Coordinates for the displayed data.
Xscale	Set auto/fixed X scaling for the displayed data.
Yscale	Set auto/fixed Y scaling for the displayed data.
Display	Display the data (w/ X marker).
Output	Set the output device (plotter/printer) characteristics.
Save	Save the program configuration to a file.
Help	Display help information.
Quit	Quit this program.

FILE Menu (if Type is ASCII):

```
    File:  Type  Read  Points  Offset  Xvalues  Help  Quit
           ^     ^     ^       ^       ^        ^     ^
Hot Keys:  T     R     P       O       X        H     Q
```

Description:

Type — Set the type of file (ASCII, SDF, or 3563/2 data file).

Read — Read an ASCII file containing delimitted (by comma) numbers. Each line contains one point consisting of an optional X value followed by a real Y value, followed by an optional imaginary Y value.

Points — Specifies the maximum # of points in the file. If there are more points in the file, they are ignored.

Offset — Specifies a # of points at the beginning of the file to skip before reading the specified points.

Xvalues — Specifies whether the first # on each line is an X value for the data point.

Help — Display help information.

Quit — Quit this menu.

FILE Menu (if Type is HP 3563A/3562A):

```
    File:  Type  Read  Help  Quit
           ^     ^     ^     ^
Hot Keys:  T     R     H     Q
```

Description:

Type — Set the type of file (ASCII, SDF, or 3563/2 data file).

Read — Read an HP 3563A/3562A binary data file. It may contain any data. Neither Capture nor Throughput files may be read directly (use dfdata63 to extract data from these files).

Help — Display help information.

Quit — Quit this menu.

FILE Menu (if Type is SDF):

```
    File:  Type  Read  Header  Help  Quit
           ^     ^       ^     ^     ^
Hot Keys:  T     R       D     H     Q
```

Description:

Type — Set the type of file (ASCII, SDF, or HP 3563A/3562A data file).

Read — Read an SDF binary data file. (SDF files are generated by the HP 3566A/3567A analyzer). ASCII SDF data files are not supported. An SDF file may contain multiple results of data where each result may have multiple rows, columns, or scans of data. After you specify the file name, the SDF data header is displayed allowing you to now specify the result, row, and column (if there is more than one), but only the first scan of data may be read. Data files with Linear and Log X spacing may be read, but arbitrary X spacing is not supported.

Header — Display the SDF data header for the specified file showing the results available to be read along with the number of rows and columns associated with each result.

Help — Display help information.

Quit — Quit this menu.

COORDINATES Menu:

Coordinates:	**R**eal	**I**mag	**d**B	**P**hase	N**y**quist	**N**ichols
	^	^	^	^	^	^
Hot Keys:	R	I	D	P	Y	N

Description:

Real	Show the real part of the data.
Imag	Show the imaginary part of the data. If the data is not complex then show zero.
dB	Show deciBels = 10 * log (real^2 + imag^2).
Phase	Show phase of data. If the data is not complex, then show zero.
Nyquist	Show Imaginary vs. Real.
Nichols	Show dB vs. Phase.

XSCALE Menu:

Xscale:	**A**uto	**F**ixed	**L**eft	**R**ight
	^	^	^	^
Hot Keys:	A	F	L	R

Description:

Auto	Show all of the data. Whenever new data is read, the X scale is set to auto.
Fixed	Show only the data between the specified Left and Right X values.
Left	Specify an X limit for the left side of the screen.
Right	Specify an X limit for the right side of the screen.

YSCALE Menu:

```
  Yscale:  Auto   Fixed   Top   Bottom
           ^      ^       ^     ^
Hot Keys:  A      F       T     B
```

Description:

Auto	Show all of the data. Whenever new data is read, the Y scale is set to auto.
Fixed	Show only the data between the specified Top and Bottom Y values.
Top	Specify an Y limit for the top part of the screen.
Bottom	Specify an Y limit for the bottom part of the screen.

DISPLAY Menu:

```
          Xpos  Peak  Min  <-Mkr->  ^Zoomv  Home<PgUpMovePgDn>End
          ^     ^     ^    ^     ^  ^    ^  ^    ^           ^   ^
Hot Keys: X     P     M    <-    ->  ^    v  Home PgUp    PgDn End

            +Menu- InsMkrDel Output Quit
            ^    ^ ^       ^ ^      ^
Hot Keys:   +    - Ins   Del O      Q
```

Description:

X	Enter the X position of the marker.
P	Marker to Peak.
M	Marker to Minimum.
<-	Move marker left (hold down key for marker speed up).
->	Move marker right.
^	(arrow up) Zoom in by factor of 2 (centered about marker).
v	(arrow down) Zoom out by factor of 2 (centered about marker).
PgUp	Scroll half a screen towards beginning of the data.
PgDn	Scroll half a screen towards end of the data.
Home	Move to beginning of the data.
End	Move to end of the data.
+	Turn menu on.
-	Turn menu off (useful before Shift-PrintScreen).
Ins	Turn marker on.
Del	Turn marker off.
O	Output display to plotter/printer
Q	Quit display.

OUTPUT Menu:

```
  Output:  Type   Device   Baud   Help   Quit
           ^      ^        ^      ^      ^
Hot Keys:  T      D        B      H      Q
```

Description:

When the trace is displayed, pressing the 'O' key will output the screen to the selected printer or plotter. This menu selects the parameters controlling output to the plot/print device.

Type — Set the type of output device (printer or plotter). Only HP-GL plotters and PCL printers (e.g. DeskJet, LaserJet) are supported. The DOS Shift-PrintScreen key sequence may also be used to generate direct printer dumps. In this case, the DOS 'GRAPHICS' command must be used to select the printer type (e.g. GRAPHICS DESKJET).

Device — Set the destination device of the output operation. Plot/print operations are supported to the parallel printer ports (LPT1 through LPT4), serial ports (COM1 through COM4), or to a file. Serial plotters/printers must be set up as 8 bit data, 1 stop bit, no parity. Serial printers need to be set up to allow XON/XOFF handshaking. Serial plotters use software handshaking. For a plotter, pen 1 is used for annotation, grid, and markers; pen 2 is used for the trace data.

Baud — Set the baud rate of the serial plotter/printer (NONE, 1200, 2400, 4800, or 9600 baud). If NONE is specified, then the serial port is not configured by VIEWDATA. In this case, the serial port must be set up with the DOS 'MODE' command (e.g. MODE COM1:96,N,8,1,B).

Help — Display help information.

Quit — Quit this menu.

SAVE Menu:

```
    Save:  Config  Quit
           ^       ^
Hot Keys:  C       Q
```

Description:

Config	Save the current configuration to the file "viewdata.ini" in the same directory as "viewdata.exe".
Quit	Quit this menu.

ERROR MESSAGES

Unknown Option 'x'

This error may be generated by all the commands. Check your options. Typing the command by itself (no parameters) will list the valid options. Options are not case sensitive and not order dependant.

Cannot open output file

This error is generated if the output file cannot be opened with write permissions. Check for a valid path/file name. Also, check to see if the file is write protected.

Cannot open input file

This error is generated if the input file cannot be opened with read permissions. Check for a valid path/file name. Also, check to see if the file is read protected.

Out of Memory

Data63 can generate this error if it cannot allocate a enough memory to fully contain the data portion of the file specified. Check to see if the input file is a valid HP 3562A/3563A data file. If it is not, then garbage in, garbage out (or out of memory). If it is a valid file, then you need to free up some memory.

APPENDIX A

How to transfer HP 3563A (or HP 3562A) data into PC-MATLAB and MATRIXx application packages

The following examples demonstrate:

1. How to move an HP 3563A (or HP 3562A) file to MATRIXx or PC-MATLAB file format
2. How to load a converted file into MATRIXx
3. How to load a converted file into PC-MATLAB

1. HP 3563A to MATRIXx or PC-MATLAB file formats

STEP 1: Save measurement setup and data from the HP 3563A to a LIF disk.

STEP 2: Insert the disk into a drive attached to your PC. Use the command LIFSCAN to identify disk (simply type LIFSCAN from the directory which contains your LIF utilities). If your LIF disk is in a HP 9122 connected to your PC, the results will resemble:

```
  Drive
Specifier          Looking for Disk Drives
=========      ==============================

  A:                 Internal Flexible Disk
  B:                 Internal Flexible Disk

                     Found HP 88500A HP-IB Card at Select Code 7
                       Found SS/80 Disk at Address 2, HP 9122
  702:                   Unit 0, Flexible or Removable Disk
  70201:                 Unit 1, Flexible or Removable Disk
```

STEP 3: Do a directory of your disk, using the command LIFLS.

LIFLS 702: /L

You'll see:

```
    filename    type    start    size  implement    created
=================================================================
    SESTATE1    BDAT      155       4   20200080    89/08/03 16:16:08
    DAFRF       BDAT      173       2   20200080    89/03/04 12:51:03
```

STEP 4: Copy the setup and data files from LIF to your DOS home directory.

```
LIFCP 702:SESTATE1 STATE1
LIFCP 702:DAFRF FRF
```

(See Appendix B for file listing of FRF.HDR)

STEP 5: Copy setup and header information to ASCII files

```
HEADER63 FRF FRF.HDR /L /E
SETUP63 STATE1 STATE1.SET /L /E
```

(See Appendix B for file listing of STATE1.SET)

STEP 6: Copy data information to either MATRIXx or PC-MATLAB format. Use the /X option to get X trace values. PC-MATLAB files are binary, MATRIXx are ASCII.

```
DATA63 FRF FRF.MAT /L /X      (PC-MATLAB)
DATA63 FRF FRF.MAT /M /X      (MATRIXx)
```

2. Loading a File into PC-MATLAB

STEP1: To load FRF.MAT, type:

```
load a:FRF.MAT
```

STEP2: To see x axis values, type:

```
TraceX
```

To see y axis values, type:

```
TraceData
```

STEP3: To plot x and y values on the screen (real data), type:

```
plot(TraceX, TraceData)
```

For imaginary values:

```
plot(TraceX,imag(TraceData))
```

To display dB on y axis:

```
plot(TraceX,10.*log10(TraceData.*conj(TraceData)))
```

STEP4: To send screen plots to an HP-GL plotter:

After plotting on the screen, from inside PCMATLAB, type:

meta FRF (creates file FRF.MET)

From MS-DOS, type:

gpp FRF /dhpgl (creates HPGL plot file)

3. Loading a File into MATRIXx

STEP1: To load FRF.MAT, type:

load ('FRF.MAT')

STEP2: To see x axis values, type:

TraceX

To see y axis values, type:

TraceData

STEP3: To plot x and y values on the screen (real data), type:

plot(TraceX, TraceData)

For imaginary values:

plot(TraceX,imag(TraceData))

To display dB on y axis:

plot(TraceX,10*.434294482*log(TraceData.*conjg(TraceData)))

STEP4: To send screen dumps to an HP-IB Printer:

plot(TraceX,TraceData,'PRINTER')

APPENDIX B

Example File Listings

STATE1.SET

Measurement_mode	Linear_resolution
Measurement_1	Frequency_response
Measurement_2	Frequency_response
Window_type	Uniform
Force/Expon_window_1	Force
Force/Expon_window_2	Exponential
Average_type	Averaging_off
Overlap_percentage	0
Number_of_averages	10
Sweep_#_of_averages	1
Trigger_type	Source_trigger
Trigger_slope	Positive
Preview_type	Preview_off
Sample_type	External_sample
Range_units_chan_1	Volts
Range_units_chan_2	Volts
Range_type_1	Auto_range_off
Range_type_2	Auto_range_off
Input_coupling_1	DC
Input_coupling_2	DC
Source_type	Periodic_chirp
Chirp_percent	70
Burst_percent	70
Sweep_direction	Up
Sweep_mode	Log_sweep
Ext_sample_freq_units	Hertz
Bandwidth_units	Hertz
Log_span_index	3
Log_start_index	9
Sweep_rate_units	Seconds/Decade
Auto_gain_ref_chan	Channel_1
Demod_channels	Channels_1&2
Demod_type_chan_1	AM
Demod_type_chan_2	AM
Source_level_units	Volts
Source_offset_units	Volts
Trigger_level_units	Volts
Capt/Thru_length_units	Records
EU_label_1	""
EU_label_2	""
Auto_carrier_on/off	True
Time_average_on/off	False
Auto/fixed_resolution	False
Auto_gain_on/off	False
Auto/fixed_integrate	False
Fast_average_on/off	False
Overload_reject_on/off	False
Chan_1_float/ground	True

Chan_2_float/ground	True
Time_throughput_on/off	False
Demodulation_on/off	False
EU_or_volts_chan_1	False
EU_or_volts_chan_2	False
Manual/auto_arm	False
Demod_preview_on/off	False
Delete_freq_on/off	False
Lin_res_Fstart_pegged	True
Swept_Fstart_pegged	True
Force_length_chan_1	1000
Force_length_chan_2	1000
Expon_time_constant_1	1000
Expon_time_constant_2	1000
Sweep_time	123
Sweep_rate	0.0365854
Sweep_resolution	200
Sweep_integrate_time	0.05
Auto_gain_level	0.005
Auto_gain_limit	0.005
Source_level	4
EU_value_chan_1	1
EU_value_chan_2	1
Trigger_delay_chan_1	0
Trigger_delay_chan_2	0
Integrate_var_thresh	0.05
Capt/thru_length	10
Frequency_span	3046.88
Time_record_length	0.262564
Frequency_resolution	3.80859
Time_resolution	0.000128205
External_sample_rate	7800
Sample_rate_(actual)	7800
Range_channel_1	5.12
Range_channel_2	5.12
Preview_time	0
Trigger_level	0
Source_dc_offset	0
Fixed_sine_frequency	125
Start_frequency	0
Center_frequency	1523.44
Sweep_start	100
Sweep_end	100000
Carrier_frequency	50000
Input_1_connection	Source_pod
Input_2_connection	Input_1_pod
Input_1_number_format	Twos_complement
Input_2_number_format	Twos_complement
Clock_1_qualifier	XXXXXXXX
Clock_2_qualifier	XXXXX010
Sample_clock	Input_2_pod
Source_number_format	Twos_complement
Mixed_ratio	1
Arb_source_type	Arb_off

Source_range_units	Volts
Extern_overflow_chan	No_channel
Source_qualifier	XXXXXXXX
Not_used	0
Digital_trigger	False
Source_digital	True
Input_1_data_8_bits	False
Input_2_data_8_bits	False
Input_1_bus_8_bits	False
Input_2_bus_8_bits	False
Input_1_digital	True
Input_2_digital	True
Clock_1_pos_edge	True
Clock_2_pos_edge	True
Sample_clk_pos_edge	True
Source_repeat	False
Input_1_rnd_low_bits	False
Input_2_rnd_low_bits	False
Input_1_auto_16_bits	False
Input_1_last_q0_is_1	True
Input_2_last_q0_is_1	True
Input_2_auto_16_bits	False
Input_1_range_is_source	True
Input_2_range_is_source	True
Not_used	-256
1024_spectrum_lines	False
Input_1_comput_delay	0
Input_2_comput_delay	0
Source_range	5.12
Source_change	1

FRF.HDR

Display_function	Frequency_response
Number_of_elements	801
Displayed_elements	801
Number_of_averages	1
Channel_selection	Channels_1&2
Overflow_status	No_channel
Overlap_percentage	0
Domain	Frequency
Volts_peak/rms	Volts_ (indicates_peak_only)
Amplitude_units	No_amplitude_units
X_axis_units	Hertz
Auto_math_label	"AUTO MATH"
Trace_label	""
EU_label_1	""
EU_label_2	""
Float/Integer	True
Complex/Real	True
Live/Recalled	True
Math_result	False
Real/Complex_input	True

Log/Linear_data	False
Auto_math	False
Real_time_status	False
Measurement_mode	Linear_resolution
Window	Uniform
Demod_type_chan_1	AM
Demod_type_chan_2	AM
Demod_active_chan_1	False
Demod_active_chan_2	False
Average_status	Not_averaged
Not_used	0
Not_used	0
Samp_freq/2_(real)	0
Samp_freq/2_(imag)	0
Not_used	0
Delta_X-axis	3.80859
Max_range_(for_scaling)	1
Start_time_value	0
Expon_wind_const_1	1000
Expon_wind_const_2	1000
EU_value_chan_1	1
EU_value_chan_2	1
Trig_delay_chan_1	0
Trig_delay_chan_2	0
Start_freq_value	0
Start_data_value	0

APPENDIX C

Enumerated Type Names

LABELS	ENUMERATED TYPES
Display_function	
	"No_data"
	"Frequency_response"
	"Power_spectrum_1"
	"Power_spectrum_2"
	"Coherence"
	"Cross_spectrum"
	"Input_time_1"
	"Input_time_2"
	"Input_linear_spectrum_1"
	"Input_linear_spectrum_2"
	"Impulse_response"
	"Cross_correlation"
	"Auto_correlation_1"
	"Auto_correlation_2"
	"Histogram_1"
	"Histogram_2"
	"Cumulative_density_function_1"
	"Cumulative_density_function_2"
	"Probability_density_function_1"
	"Probability_density_function_2"
	"Average_linear_spectrum_1"
	"Average_linear_spectrum_2"
	"Average_time_record_1"
	"Average_time_record_2"
	"Synthesis_pole-zero"
	"Synthesis_pole-residue"
	"Synthesis_polynomial"
	"Synthesis_constant"
	"Windowed_time_record_1"
	"Windowed_time_record_2"
	"Windowed_linear_spectrum_1"
	"Windowed_linear_spectrum_2"
	"Filtered_time_record_1"
	"Filtered_time_record_2"
	"Filtered_linear_spectrum_1"
	"Filtered_linear_spectrum_2"

```
                    "Time_capture_buffer"
                    "Captured_linear_spectrum"
                    "Captured_time_record"
                    "Throughput_time_record_1"
                    "Throughput_time_record_2"

                    "Curve_fit"
                    "Weighting_function"
                    "Not_used"
                    "Orbits"
                    "Demodulation_polar"

                    "Preview_demod_record_1"
                    "Preview_demod_record_2"
                    "Preview_demod_linear_spectrum_1"
                    "Preview_demod_linear_spectrum_2"

Auto_gain_ref_chan
Demod_channels
Channel_selection
Overflow_status
                    "Channel_1"
                    "Channel_2"
                    "Channels_1&2"
                    "No_channel"

Domain
                    "Time"
                    "Frequency"
                    "Voltage_(amplitude)"

Volts_peak/rms
                    "Peak"
                    "RMS"
                    "Volts_(indicates_peak_only)"

Amplitude_units
                    "Volts"
                    "Volts_squared"
                    "PSD_(V2/Hz)"
                    "ESD_(V2s/Hz)"
                    "Root_PSD_(V/Root Hz)"

                    "No_amplitude_units"
                    "Unit_volts"
                    "Unit_volts2"
```

```
Range_units_chan_1
Range_units_chan_2
Ext_sample_freq_units
Bandwidth_units
Sweep_rate_units
Source_level_units
Source_offset_units
Trigger_level_units
Capt/Thru_length_units
Source_range_units
X_axis_units
                        "No_units"
                        "Hertz"
                        "RPM"
                        "Orders"
                        "Seconds"

                        "Revs"
                        "Degrees"
                        "dB"
                        "dBV"
                        "Volts"

                        "V_Root_Hz_(Root_PSD)"
                        "Hertz/Second"
                        "Volts/EU"
                        "Vrms"
                        "V2/Hz_(PSD)"

                        "Percent"
                        "Points"
                        "Records"
                        "Ohms"
                        "Hertz/Octave"

                        "Pulses/Rev"
                        "Decades"
                        "Minutes"
                        "V2s/Hz_(ESD)"
                        "Octave"

                        "Seconds/Decade"
                        "Hz/Point"
                        "Points/Sweep"
                        "Points/Decade"

                        "Points/Octave"
                        "V/Vrms"
                        "V2"
                        "EU_Chan_1"
                        "EU_Chan_2"

                        "EU"
```

```
Measurement_mode
                    "Linear_resolution"
                    "Log_resolution"
                    "Swept_sine"
                    "Time_capture"
                    "Linear_resolution_throughput"

Average_status
                    "No_data"
                    "Not_averaged"
                    "Averaged"

Window
                    "Window_not_applicable"
                    "Hann"
                    "Flat_top"
                    "Uniform"
                    "Exponential"

                    "Force"
                    "Force_chan_1/Expon_chan_2"
                    "Expon_chan_1/Force_chan_2"
                    "User"

Measurement_1
Measurement_2
Window_type
Average_type
Trigger_type
Trigger_slope
Sample_type
Range_type_1
Range_type_2
Input_coupling_1
Input_coupling_2
Source_type
Sweep_direction
Sweep_mode
Demod_type_chan_1
Demod_type_chan_2
                    "Frequency_response"
                    "Cross_correlation"
                    "Power_spectrum"
                    "Auto_correlation"
                    "Histogram"
                    "No_measurement"

                    "Stable"
                    "Exponential"
                    "Peak"
                    "Continuous_peak"
                    "Averaging_off"
```

```
                    "Hanning"
                    "Flat_top"
                    "Uniform"
                    "User_window"
                    "Force/Exponential"

                    "Positive"
                    "Negative"

                    "Free_run"
                    "Channel_1"
                    "Channel_2"
                    "External"
                    "Source_trigger"
                    "HP-IB_trigger"

                    "Internal_sample"
                    "External_sample"

                    "Auto_range_on"
                    "Auto_range_off"
                    "Auto_range_set"

                    "AC"
                    "DC"

                    "Source_off"
                    "Random_noise"
                    "Burst_random"
                    "Periodic_chirp"
                    "Burst_chirp"
                    "Swept_sine"
                    "Fixed_sine"

                    ""

                    "Linear_sweep"
                    "Log_sweep"

                    "Up"
                    "Sweep_hold"
                    "Manual_sweep"
                    "Down"

                    "AM"
                    "FM"
                    "PM"

Force/Expon_window_1
Force/Expon_window_2
                    "Force"
                    "Exponential"
```

```
Input_1_connection
Input_2_connection
Sample_clock
                    "Source_pod"
                    "Input_1_pod"
                    "Input_2_pod"
                    "Qualifier_pod"
                    "External_sample"

Input_1_number_format
Input_2_number_format
Source_number_format
                    "Twos_complement"
                    "Offset_binary"

Arb_source_type
                    "Arb_off"
                    "Pulse"
                    "Step"
                    "Ramp"
                    "Arbitrary"

Preview_type
                    "Manual_preview"
                    "Timed_preview"
                    "Preview_off"
```

LIFSCAN

Checks the PC for internal floppy drives and for HP-IB interface boards and then looks for disk drives connected to HP-IB. The drive specifiers of all disk drives that may contain LIF directories are displayed.

LIFSCAN

Valid drive specifiers:

letter:	An internal floppy drive (e.g. A: or B:).
SSAA[UU]:	An external HP-IB drive where SS is the select code of the card, AA is the disk address and UU is the optional disk unit (e.g. 702: or 70201:).

LIFCHK

Verifies that the disk inserted in the specified drive is fully readable by the LIF Utilities. This will verify that the disk is not corrupted (no bad sectors) and that possible spared tracks on the disk will not interfere with the disk's usage on the PC's internal disk drives.

LIFCHK <d:> [/T] [/A] [/W]

<d:>	The drive specifier (e.g. 702: for external drive or A: for internal drive) of the LIF directory.
/T	Terse; do not show head and track # as each track is read.
/A	All; read every sector on each track instead of just one sector on each track.
/W	Wait for prompt before / after operation.

LIFLS

Lists the contents of the LIF directory contained on a designated drive.

LIFLS <d:> [/L] [/A] [/W]

<d:>	The drive specifier for the LIF directory.
/L	List in long format with directory information and file name, size, start (in decimal), implementation (in hex), and date created.
/A	List all files including purged files.
/W	Wait for prompt before / after operation.

LIF FILE TYPES

1	ASCII
0	PURGED
-2	BINARY
-767	DOS (directory on HP-IB hard drive)
-5791	BDAT

LIFCP

Copies a LIF file to a DOS file, a DOS file to a LIF file or a LIF file to another LIF file.

LIFCP <sfile> <dfile> [/B] [/A] [/R] [/T:<fileType>] [/N] [/S:<size>] [/I:<impl>] [/W]

<sfile>	Source path and file name.
<dfile>	Destination path and file name.
/B	Force BDAT file copy (DOS to LIF).
/A	Force ASCII file copy (DOS to LIF).
/R	Raw file copy (DOS to LIF or LIF to DOS). No conversions.
/T:<fileType>	(LIF destination only) Set the file type for the destination file to the specified file type.
/N	Do not translate to valid LIF file names.
/S:<size>	Maximum line size for DOS to LIF ASCII file transfer (default is 256 characters).
/I:<impl>	Set implementation field (dec or hex).
/W	Wait for prompt before / after operation.

LIFINIT

Optionally format and initialize a new LIF directory on a disk.

LIFINIT <d>:[name] [/F] [/O:<opt>] [/I:<ntrlv>] [/W]

<d:>	The drive specifier.
[name]	New LIF directory volume name.
/F	Format disk before initializing directory. Disks can only be formatted on external (HP-IB) drives.
/O:<opt>	Format option containing disk drive dependent information (e.g. sector size) to be used only if format disk (/F) is specified (0 is default).
/I:<ntrlv>	Sector interleave to be used only if format disk (/F) is specified (1 is default).
/W	Wait for prompt before / after operation.

HP 3563A FILE TYPES

The first 2 characters of an HP 3563A file name specifies the type of the BDAT file as follows:

A1-A5	Aseq1 - 5	SE	State
AM	Amath	ST	Synth(S-dom)
CF	Cv Fit (S-dom)	TH	Thrupt
CS	Captur	ZF	Z CvFt (Z-dom)
DA	Data	ZT	Z Snth (Z-dom)

LIFRM

Removes (deletes) the specified file from the LIF directory.

LIFRM <file> [/N] [/F] [/W]

<file>	File name. Must include drive specifier (e.g. 702:, A:).
/N	Do not translate to valid LIF file names.
/F	Force removal of external DOS directory.
/W	Wait for prompt before / after operation.

LIFDIAG

Diagnostic utility useful for performing fast LIF to LIF full disk backups and for recovering data from damaged / corrupted disks.

LifDiag: Edit Backup Help Quit

Edit	Display sector edit menu. Enter the disk path of the LIF disk to edit.
Backup	Display LIF to LIF full disk backup menu.
Help	Display command summary.
Quit	Quit LIFDIAG (prompt for confirmation).

Edit: Read Next Prev Find Modify Write Log Help Quit

Read	Read / display the logical sector specified.
Next	Read the next sector (current + 1).
Prev	Read the previous sector (current-1).
Find	Find the specified numeric/ASCII data pattern in the specified disk area.
Modify	Modify the current sector with specified numeric / ASCII data.
Write	Write sector to disk.
Log	Log sectors displayed to file specified.
Help	Display command summary.
Quit	Quit edit menu.

Backup: Go Source Dest Length Errors Log Help Quit

Go	Start the backup (ESC to abort backup).
Source	Specify the source disk.
Dest	Specify the dest disk.
Length	Backup entire disk or contiguous files.
Errors	Whether disk error will stop backup.
Log	Log errors to file specified.
Help	Display command summary.
Quit	Quit backup menu.

SETUP63

Convert a binary setup state file from the HP 3563A (or 3562A) to an ASCII form.

SETUP63 <sfile> <dfile> [/L] [/E]

<sfile>	Source file name.
<dfile>	Destination file name.
/L	Put identifying labels on the first 25 characters of each line.
/E	Expand enumerated types (integers) to ASCII names.

HEADER63

Convert the data header portion of a binary data file from the HP 3563A (or 3562A) to an ASCII form. Command line options same as SETUP63.

DATA63

Convert the data portion of a binary data file from the HP 3563A (or 3562A) to either an ASCII file, a PC-MATLAB file, or a MATRIXx file.

DATA63 <sfile> <dfile> [/L] [/M] [/R] [/X]

<sfile>	Source file name.
<dfile>	Destination file name.
/L	Create MATLAB file (a binary file).
/M	Create MATRIXx file (an ASCII file).
/R	Output MATLAB or MATRIXx file matrices in a row instead of a column.
/X	Output X-axis data.

If neither /L nor /M option is specified, then an ASCII file is created.

SYNTH63

Convert a binary synthesis file from the HP 3563A (or 3562A) to either an ASCII file, a PC-MATLAB file, or a MATRIXx file.

SYNTH63 <sfile> <dfile> [/L] [/M] [/R]

<sfile>	Source file name.
<dfile>	Destination file name.
/L	Create MATLAB file (a binary file).
/M	Create MATRIXx file (an ASCII file).
/R	Output MATLAB or MATRIXx file matrices in a row instead of a column.

PC-MATLAB™ The MathWorks, Inc.
MATRIXx is a product of Integrated Systems Inc.

DFHDR63

Convert the data header portion of a binary capture / throughput file from the HP 3563A (or 3562A) to an ASCII form. Command line options same as SETUP63.

DFDATA63

Convert the data portion of a binary capture / throughput file from the HP 3563A (or 3562A) to either an ASCII file, a PC-MATLAB file, or a MATRIXx file.

DFDATA63 <sfile> <dfile> [/L] [/M] [/R] [/X] [/O:<ofst>] [/P:<len>] [/C:<chan>]

<sfile>	Source file name.
<dfile>	Destination file name.
/L	Create MATLAB file (a binary file).
/M	Create MATRIXx file (an ASCII file).
/R	Output MATLAB or MATRIXx file matrices in a row instead of a column.
/X	Output X-axis data.
/O:<ofst>	Point offset from start of data (default 0).
/P:<len>	Point length of data (default 20480).
/C:<chan>	Channel of data (default 1st chan of data).

If neither /L nor /M option is specified, then an ASCII file is created.

VIEWDATA

Graphically display data in a variety of formats with X markers. Data can be imported from ASCII files, HP 3563/3562 data files, or SDF files.

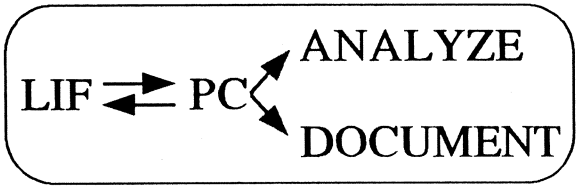
ViewData: File Coordinates Xscale Yscale Display Output Save Help Quit

File	Set file type and read data from a file.
Coordinates	Set Y display coordinates (real, imag, dB, phase, Nyquist, Nichols).
Xscale	Set auto / fixed X display scaling.
Yscale	Set auto / fixed Y display scaling.
Display	Display the data. Can move X marker w/ arrow keys, to peak / min, zoom in / out, scroll data, and plot / print the screen.
Output	Set the output device (plotter / printer) config. Can be serial or parallel HP-GL plotter or PCL printer (or any printer supported by DOS 'GRAPHICS' command).
Save	Save configuration to a file.
Help	Display help information.
Quit	Quit program.

HEWLETT PACKARD

HP PC File Utilities
HP 3563A Option 921

Quick Reference Guide



LIF Utilities

LIFSCAN
LIFCHK
LIFLS
LIFCP
LIFRM
LIFINIT
LIFDIAG

Conversion Utilities

SETUP63
HEADER63
DATA63
SYNTH63
DFHDR63
DFDATA63
VIEWDATA

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