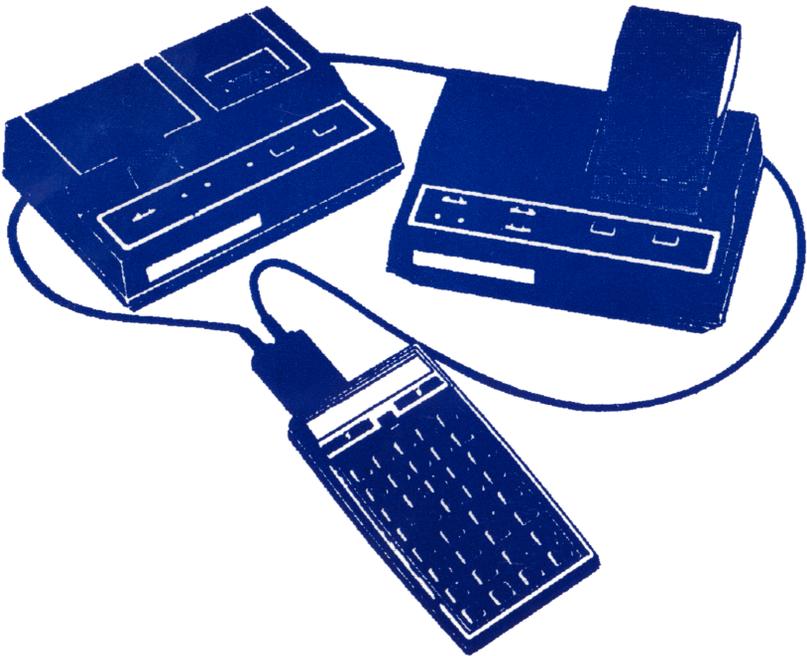


ELI-IL™

HP-IL® MASS STORAGE AND
PRINTER DEVICE EMULATOR



ECLIPSE LOGIC INC.

ELI-IL™

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PRINTER DEVICE EMULATOR**

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The ELI-IL enables the user to store HP-41 data registers, stack, flags, user keys, and programs on the PC's disk storage. The convenience of a hand-held unit in the field is important. However, you are limited in the amount of data you can store in your hand-held unit. The ELI-IL resolves this concern by letting you download/upload to/from your PC's disk storage for virtually unlimited storage capabilities.

The ELI-IL is an invaluable tool for debugging programs written by you on the HP-41. Viewing the output of the HP-41 on your PC's monitor or printer makes for quick and easy program debugging.

Due to emulation of the HP-41 printer, the ELI-IL allows you to print all HP-41 output on your PC's printer. The HP-41's output can also be directed to an ASCII text file to be inserted into a database, wordprocessing, or spreadsheet environment such as Lotus Symphony, or 1-2-3, etc.

The translate facility allows you to write programs on your PC and then via disk storage transfer these programs to your HP-41. The translate facility also works in reverse:

HP-41 => Disk => ELI-41/PC. Furthermore, the translate function gives you the opportunity to download data and programs to your PC. Once the downloading has occurred, the ELI-41 gives you the further capabilities needed to manipulate the programs on your PC.

The ELI-IL requires the use of the Hewlett-Packard HPIL card for the PC and the HP82160 HPIL interface for the calculator.

ECLIPSE LOGIC INC.

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Introduction

There are quite a few software programs on the market that perform as controllers on an HPIL loop. Unfortunately, these programs will not work with the HP-41 series calculators. When another controller is present on the HPIL loop, the HP-41 handheld will simply shut down. It will continue to pass instructions around the loop, but its capabilities are circumvented as it will no longer function as either a **talker** or as a **listener** on the loop. The ELI-IL program now fills that gap by enabling the PC to be involved with the loop as a **talker** and as a **listener** and not a **controller**¹.

The ELI-IL program was initially constructed as a support product for the ELI-41 program to enable program storage/retrieval and as a mechanism enabling transfer of such programs between the ELI-41 and the handheld HP-41 calculator. It was also an experiment to see if a dual purpose device could be developed that could operate as both a mass storage device and a printer (or screen display) at the same time. This program accomplishes this and much more. The functions accessible to the user with the use of this program make it valuable as a stand alone product and not only an extension to the ELI-41 program. HP-41 users can find an abundance of functions useful to them whether they possess the ELI-41 scientific calculator program or not.

The mass storage facility makes storage and retrieval of programs, user keys, status, and memory registers almost instantaneous. In fact, all of the HPIL interface functions have been implemented for the digital cassette drive (the only mass storage device available to the HP-41). Additionally, an internal directory function makes a directory display of the stored material much faster than the HP-41 display method.

1 Basic familiarity with the HPIL loop protocol and operation may be gained from "*The HP-IL Interface Specification*" (82166-90017)

The printer functions will display to the PC screen (half screen), a printer (if one is attached to the PC), or to a disk file for later use. Although the half screen limits line display length to 37 characters, any longer lines will wrap to the next line with a special character display denoting the wrap around without the presence of a line feed character. Line lengths are not limited at all. Line lengths of 132 characters for PC printers is quite practical and can be implemented. Text file storage of program generated data base records of 256 character blocks could be implemented by the user easily. In short, the user is able to generate any line length desired for textfile or printer output.

I.1. Sample Session

Let's consider a sample session to familiarize us with the functionality of the ELI-IL and translate a program file into our HPSIDE1.PAK emulated tape for eventual loading into an HP-41 calculator. Lets assume that the program file had been developed and debugged on the PC and is now ready for use with the handheld. Let us further assume that the program file resides in a different directory than the current one.

So we load the ELI-IL using a single sided emulated tape side.

```
CD A:\INTER  
ELI-IL /1
```

Upon entry to the program the user is greeted by the Copyright screen. Press the <ENTER> key to continue into the program. If there was no HPSIDE1.PAK file existing in the current directory one will be created. A slight time delay would be experienced while this file is being created.

Table 1: Supply the current directory

HPIL	DOS		
	> Filename	Ext.	Size <
	README	1ST	646
	READ	ME1	42829
	READ	ME2	41888
	READ	ME3	28282
	INTER		<DIR>
	ELI-IL	EXE	49684
	ELI-IL	INI	53
	HPSIDE1	PAK	65536
	DATATR	PGM	384
	LOADRG	PGM	116
	DATATR	SRC	498
	LOADRG	SRC	225

DIR PROC: LOOP NON-ACTIVE Current path: A:\INTER\			
Choose the default directory. Enter accepts.			
Dir keys	Open	Close	Prev Next Make Enter chooses
		TRANSL	LOGGING
		OFF	OFF
		AUX-OUT	SCREEN

The current path portion of the screen display indicates that the current directory is A:\INTER\. That is the directory any program files we translate out of the HP directory will go. But we are concerned about loading one into the directory so let's get to loading it.

- f** (file translate facility)
- v** (Verbose option)
- 2** (Verbose display speed)
- p** (PC-HP file translate)

What we do here is to choose the file translate facility by pressing the <f> key. The function key display changes to reflect the new set of functions available. We then press the <v> key to choose the Verbose option so that we can see the translate listing on the screen as the translate progresses. The next entry of <2> selects the delay added to every display time (a choice of <0> would scroll the display too fast to be readable). Next, we start the actual translate operation by pressing the <p> key.

Table 2: Choose the translate file

HPIL	HP DIR	Ext.	Size <
>	Filename		
	README	1ST	646
	READ	ME1	42829
	READ	ME2	41888
	READ	ME3	28282
	INTER		DIR>
	ELI-IL	EXE	49684
	ELI-IL	INI	53
	HPSIDE1	PAK	65536
	DATATR	PGM	384
	LOADRG	PGM	116
	DATATR	SRC	498
	LOADRG	SRC	225

TRANSLAT: LOOP NON-ACTIVE Current path: A:\INTER\			
Choose the ELI-41 program file to translate.			
Dir keys	Open	Close	Prev Next Make Enter chooses
	ON	OFF	SCREEN

Again the function key display changes to reflect the available keys as those useful in choosing a directory or file entry. We move the highlight bar to the program we wish to translate using the arrow keys, the open directory and PgDn keys till we are pointing to the file "DATATR.PGM". When we choose the file with the <ENTER> key the file will be displayed on the left hand side, line by line, as it is translated.

Table 3: Display the HP directory

HP IL	HP DIR			
19 1000	> Name	Type	Regs.	Bytes <
20 ST/ 00	TONE4	PR	4	24
21 1	TONE5	PR	4	24
22 ST+ 00	TONE6	PR	4	24
23 CLA	TONE7	PR	4	24
24 LBL SETS	TONE8	PR	4	24
25 ARCL IND 02	TONE9	PR	3	16
26 ACA	XEQTEST	PR	5	30
27 CLA	ROOTS	PR	10	69
28 " ,	DATATR	PR	19	130
29 1				
30 ST+ 02				
31 ISG 00				
32 GTO SETS				
33 ADU				
34 ISG 01				
35 GTO TOTAL				
36 END				

TRANSLAT: LOOP NON-ACTIVE Current path: A:\INTERN
 Viewing HP directory only. TRANSL LOGGING AUX-OUT
 Use direction keys and the <ENTER> key to choose. OFF OFF SCREEN

We can verify that the HP directory now contains the file by choosing the HP Directory function.

d (HP directory)

There, as the last entry in the directory is the file we just translated "DATATR" with an extension of "PR", specifying a program file entry.

If the translate was the only thing we wanted to do in this session we can easily exit the program by the repeated entry of the <ESC> key. The last message to display will be:

Do you want to exit? (y,N)

The <y> key must be pressed specifically to exit. The Capitalized "N" signifies that any key press other than <y> will supply NO as the response.

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The Essentials

Two possible parameters are available on the command line with the program name when the program is loaded. These parameters are not position sensitive to the program, so they may appear in any order. An initialization file may also be used to set attributes and in particular these two parameters. The initialization file is read before the command line is processed so the command line arguments will override any parameters installed as defaults by the initialization file. See the description of this initialization file later in this chapter. A possible command line is as follows:

ELI-IL [Number] [/1]

The first of these parameters, Number, is the port address to use for the HPIL Interface Card. This must be supplied on the command line if it has been changed from the the default address of 1700 (hexadecimal) as configured from the factory. This port address must be entered as the first parameter and as a hexadecimal number (with no "/" preceding it). It can be up to four digits long.

The second possible parameter is "/1". This parameter will signify to the program to use a single sided cassette emulation (one 64K file). A "/2" or any other digit will set the program to use double sided emulation.

The ELI-IL program was developed chiefly to be used in a hard disk system. The single sided storage option allows either for a floppy disk system or simply a small system not needing the file storage capacity of both emulation disk files. required file(s) for the current emulated tape side usage. The program initially formats these files for 223

The memory usage of the ELI-IL program is 128K bytes of memory. A good portion of this memory is kept in a "heap" allocation area (during the performance of any function, some of this heap area may be allocated for its execution). The biggest memory hog in the program is the DOS

directory listing function. If a message of "Out of memory" is displayed, limiting the number of directories open and displayed reduces the memory requirement of the directory function and may free up enough memory to perform the function that triggered the message. If the program senses that closing directories will free enough memory for further processing, such a message will also be displayed.

The ELI-IL program can have as many as 5 files open at the same time, in addition to the standard devices (keyboard, console, printer, etc.). So make sure a CONFIG.SYS file exists in the system that states at least FILES = 9. For a more efficient DOS system FILES = 15 or even 20 should be specified.

Upon loading, the program checks the current directory for the presence of two possible files: HPSIDE1.PAK and HPSIDE2.PAK. If the single side parameter (/1) has been entered, the first file is the only one checked. These files simulate the two sides of a cassette tape and contain the directory and records of the files loaded from the HP-41 or the ELI-41 program files. The files are 64K in size. If these emulation files are nonexistent in the current directory, the ELI-IL will create and format the required file(s) for the current emulated tape side usage. The program initially formats these files for 223 directory entries. They may be reinitialized by the HP-41 using the "NEWM" function, and reserve a maximum of 445 directory entries (223 for the single sided emulation usage). Filling fewer entries will speed directory access for the HP-41, as the HP-41 accesses the directory sequentially. Longer directories take more time to read, of course. The number of entries is almost immaterial to the PC as far as access speed; although, a long directory does force the ELI-IL program to allocate more memory to hold the directory.

The HPSIDE?.PAK file(s) are opened by the ELI-IL program for direct access and any changing of the current directory disk on a floppy disk system will inevitably wipe out an area of the changed disk when an HP directory access is made. Because of this, there is no provision in the program for the change of the disk drive identifier.

Be WARNED that all the necessary files, and the HPSIDE?.PAK files (if existing ones are to be used), must be on the same disk drive and in the

current directory when the program is loaded. The ELI-41 program files to be imported into the HP directory must be on the current disk drive. Of course, this is no problem with a hard disk system, with subdirectory usage.

The function of this program essentially fits two categories: activity as an extension to the handheld calculator, and as a translator between HP-41 programs and ELI-41 programs.

When the ELI-IL program is acting as an extension to the HP-41, no intervention with the PC is necessary; rather, all functions are accomplished by key presses on the handheld calculator and the program acts as a listener on the HPIL loop. These functions include the HPIL instructions proper, as well as, printer related functions and mass media oriented instructions. Such activity, if it initiates printer activity or screen display will be displayed to the user on one half (left hand side) of the PC's screen. The second half of the screen is reserved for PC DOS functions and PC initiated activity.

The bulk of the program is devoted to the translation facility and is available even if the PC's HP-IL interface card was not found at startup. To accomplish these translations an interface through the HPIL loop is not necessary. During most of the active PC working of the program the interface loop is deactivated. An interrupt driven program would allow work to be done by the user with the PC and also let the handheld HP-41 use other devices on the interface loop. Further extensions the this program will allow such activity, but with the present release the loop is held until translation activities have been ended.

The PC activity of the program is initiated by the user through the PC keyboard. That activity has been simplified as to enable almost any function to be accomplished by a single keypress. A system of levels may be followed to perform more complicated functions. These levels will be explained later within this manual. The functional keypresses available at any one time are displayed on the bottom line, with the exception of the <ESC> key. This key will terminate the current function and revert back to the previous level, thus, actually producing an escape from the function.

1.1. Initialization file

The single sided tape emulation and the port address used by the HP-IL card may be specified in an initialization file. The name of this file has to be "ELI-IL.INI". It must reside in the current directory when the program is loaded. Or optionally, an environmental string may specify the directory to search for the file of the same name. This environmental string may be entered as "ILINIT = d:path" into the CONFIG.SYS file. The "d:" specifies the drive letter and the path is the full path name, with no ending backslash character. This drive and path name will have the name "\ELI-IL.INI" appended to it, when the search for the initialization file is made.

The initialization file uses certain key words to override the default attributes specified within the program. These key words are entered on the left hand side of an equals "=" sign. These are as follows:

PORT = (hex port value to be used)
HIGH = (the attribute for highlighting)
BACKG = (the attribute for the background)
FILE = (the attribute for files)
DIR = (the attribute for directories)
BORDER = (the attribute for borders)
BORDERC = (the attribute for chars in the border)
ERROR = (the attribute for error displays)
MSG = (the attribute for message displays)
FKEYS = (the attribute for function keys)
FKEYH = (the attribute for highlighting func keys)
STAND = (the attribute for everything else)

Besides these two additional key words may be used. One of these is "ONESIDE" to specify a single sided tape emulation. The other is NOBEEP. The NOBEEP disables any use of the machine's beeper as a warning or attention device. Neither uses an equals sign.

NOTE: the "PORT =" value is specified, as on the command line, in hexadecimal notation.

Certain other key words go on the right hand side of the equals sign. This second set of keywords that are assigned to the right hand parameters are as follows:

COLOR ATTRIBUTES

BLACK	0
BLUE	1
GREEN	2
CYAN	3
RED	4
MAGENTA	5
BROWN	6
LTGREY	7
DKGREY	8
LTBLUE	9
LTGREEN	10
LTCYAN	11
LTRED	12
LTMAGENTA	13
YELLOW	14
WHITE	15

MONOCHROME ATTRIBUTES

NORMAL	0X07
BRIGHT	0X0F
REVERSE	0X70

Both color and monochrome attributes may be specified within the file but only monochrome attributes take effect if the display card is interpreted as monochrome at program startup. The same holds true for the color attribute usage.

Each set of parameter key word and assigning key word must reside on a line by itself, with no separating spaces. Key words must not be

abbreviated, and spelled as specified here. Multiple assignments may be made, but the last one assigned is effective. Also any invalid assignments are not made, no errors are displayed but the assignment will not be taken and the default will be.

As an example, the following would specify the directory displays will show files with the standard "NORMAL" attribute and directory entries will be "BRIGHT".

```
ONESIDE  
PORT = 1500  
FILE = NORMAL  
DIR = BRIGHT
```

Additionally, the single sided tape emulation will be used and the HPIL interface port address of 1500 (in hexadecimal) will be used.

The Basic Display Page

The Copyright screen is the first screen display presented to the user upon loading the ELI-IL program. Any keypress will begin the program proper. The next screen is divided vertically in half. The left hand side display is for any activity initiated by the HP-41 hand-held calculator or a Verbose display from a translate operation. The right hand side is assigned to directory display functions, DOS and HP, and loop instruction displays. A directory display of the current DOS directory is the first display on this side of the screen. The screen is also partitioned horizontally on the bottom with a status area display of the current keys that have a function attached, the current directory and the state of various functions. An input area is set aside for text file naming.

2.1. The HPIL Side

Any function that generates screen or printer display will be placed on the left hand side of the screen. Besides the vertical lines outlining and dividing this side a blank character borders either side, with an extra blank on the left hand side. This leaves a window area of 37 characters. If there is output to this side that extends past 37 characters, a special character signifying a continuation line is placed, overwriting the left most blank character. This character (> >) tells the user that the previous line is continued and if sent to the printer, would be a continuous line of characters (without the continuation character). A few functions that could affect this area are:

PRA, PRSTK, PRREG, DIR, PRFLAGS ... etc.

Display can be directed to the printer and to a text file. The <T> or <t> key would enable a text file to receive any display lines that follow until toggled off by the user. If the default directory has not been chosen previously, the user will be prompted for it, and the left hand side of the screen will come into play. The directory having been chosen, the user is further prompted for the name of the text file. Any loop activity generating

output onto right hand side of the screen will be held until the filename (and/or directory) has been chosen.

Printer output also comes from this side of the screen. This is toggled with the <P> or <p> key. Output is begun or terminated immediately upon receipt of this keypress.

Output to text files and the printer is not translated with a few exceptions. The append character ("the lazy T") is altered to an @ character. The up arrow is translated to the caret (^) character. Any HP-41 generated characters that are not within the pure ASCII set may print peculiarly with some printers. HP-41 ESC sequences may do so also.

2.2. The DOS Side

The right hand side of the display is originally set aside for the current directory of the disk file, with the center position pointing to the directory header (if applicable).

Any keypress that eventually calls for a choice by the user of a directory or file from the directory displayed on the DOS side will trigger a reverse highlight bar to highlight the current directory position. The highlight bar disappears when the right hand display activity is terminated.

The right hand side also displays the content of the simulated mass storage directory while interface activity is chosen by the user.

Loop instructions will also appear on this side if the option is selected by pressing the <I> key ("Interface"). The loop instructions scroll vertically off the screen as fast as the loop passes instructions, and no highlight bar is used with this activity as it can not be manipulated by the user.

2.3. The Status Area

The area on the lower part of the screen is reserved for the display of the current state of the toggle keys, the function keys available, and the current directory. The initial display shows the default state of the toggles: TRANSL, LOGGING or TEXTFILE, and AUX OUT.

TRANSL displays ON when translation of program files is taking place. This condition exists when the <F> key ("File translate") is pressed. The function key menu changes to reflect the currently available function keys. The TRANSL toggle is activated by a choice from this level that institutes a translate function. At all other times the toggle will remain OFF.

The LOGGING toggle is turned ON by pressing the the <L> key ("Logging"). The log file receives a copy of the activity on the left side display. When toggled ON a file by the name LOGFILE.TXT is opened in the current directory. If a file by that name from a previous session already exists, it will be erased and the current file will replace it. The continued toggling of LOGGING for this session will append to the file just opened.

The logging feature has one special case. Its present state is saved when the TEXTFILE toggle is activated, and reinstated when TEXTFILE saving is terminated. Only one of the two files can be written to at any particular time.

The TEXTFILE toggle to the ON state will overwrite the current display of LOGGING to TEXTFILE and the ON will be turned on. The user is prompted to choose the current directory for the text file and specify its name. Any loop activity is paused during this prompting and choice, and continued when there is sufficient information to open the file and save the display to the left side display. There is no retroactive retrieval of the display. When TEXTFILE processing is terminated by the press of the toggle, the logging feature is reinstated if it was ON; otherwise, the display will change to show TEXTFILE as OFF.

The third and last toggle is the AUX OUT toggle and is selected by pressing the <P> key ("Print"). This toggle is used to direct a duplicate of the display lines going to the left side display to the printer or not. The display will contain either SCREEN or PRINTER. The output will be sent to the printer as it is produced. The continuation character is for display purposes only (denoting a screen wrapped line) and will not be sent to the printer.

In the upper left corner of this status display area is an area that may be overwritten with "LOOP IS ACTIVE" to inform the user that the loop is

functional. The opposing display, "LOOP IS DISABLED" will display if a PC function is being executed, displaying the loop, or the HPIL card was not found upon startup. Two other displays are used: 'DIR PROC: LOOP NON-ACTIVE', 'TRNSLAT: LOOP NON-ACTIVE'. These show that PC activity is disabling the loop activity. The first denotes the DOS directory functions are active and the second, the translate level is use.

The last of the information displayed in this area is the function keys currently available. A description of these keys and their various levels is given in chapter 4.

The Translate Facility

The translate facility is entered from the Main Command level by pressing the <F> key ("File Translate"). The user is greeted with a new set of function (command) keys. Again, nearly any function can be accomplished by a single keypress. Choices of input files, of course, take some arrow key usage.

Even if an HPIL interface card is not available at the default port address (or a user defined one), the translate facility is still available. This allows generating program files on a machine that does not have the interface card installed.

The first set of command keys are <V> ("Verbose"), <D> ("Directory"), <H> ("HP-PC"), and <P> ("PC-HP"). The following is an expansion on each option.

3.1. Verbose

The Verbose option allows a listing of the translation to be displayed on the screen while a translation is taking place. Pressing the <V> ("Verbose") key will ask for the display speed from the user. Hitting the <ENTER> key will accept the default speed (displayed). This speed will make it possible to see the translation take place without slowing the actual process very much. Setting the speed to 0 or hitting any character other than one of the acceptable (0-5) keys will also set the speed to 0. A speed set of 0 will scroll the screen too fast to actually make it readable. (It will let you know what is happening though.)

Once the speed has been chosen the command key presentation will be updated making a different key press available. Just like a toggle, Silent is the new option.

If textfile or logging has been turned on from the Main Command level, the display during Verbose will be sent to the textfile or log. This produces an ASCII print file of a program with line numbers.

3.2. HP Directory Display

The DOS directory can be viewed from the Main Command level. Here is where a directory of the HP emulated mass storage can be viewed. The direction keys are available using this display to browse through the HP data file directory. A message will display in the message area of the status window to denote that this is a directory browse. The <ENTER> key will terminate the function, allowing a translate to begin or escape back to a previous level.

3.3. HP-PC translate

Programs written to the emulated mass storage can be translated to the ASCII text format readable by the ELI-41 calculator program. This is the translate facility that accomplishes this. All program lines will be translated just as they were within the HP-41 when they were written using the WRTP function, except for a few exceptions.

Programs are named with the beginning label of the program with a suffix of .PGM attached. Lower case letters are translated to upper case and certain unacceptable characters (to DOS) are translated. These include the /*?. Spaces within labels are translated to underscores.

Upon hitting the <H> ("HP-PC") translate key, the screen will change to display the current directory of available files within the HP media directory (if it was not currently in view). Again the user may use the direction keys to place the highlight bar on the file to translate and press the <ENTER> key to complete the selection. If a program of the same name is currently existent within the current DOS directory the user is prompted whether it is to be overwritten or not. An answer of NO will terminate the translate otherwise the translate is begun. The translate can be aborted by the user at any time by pressing the <ESC> key.

NOTE: an aborted translate will leave an unfinished file in the DOS directory and will require an answer of YES to the request to overwrite it.

If the file translate was aborted by the user because a file existed by the same name in the current DOS directory, three choices are available to the user: A) don't translate the file, B) use the HP-41 to rename the current HP directory name, or C) change the current DOS directory (or make another directory).

NOTE: Make sure that the current DOS directory (displayed in the Status area) is the correct one for the "to" directory of the translated file. The user is not prompted for this directory to speed the process nor does the program require a validation of and does not require a validation of the current directory for each program translate.

The progress of the translate can be viewed within the right display window if the Verbose option was set.

3.4. PC-HP Translate

A program file can be generated in the HP directory by the use of the PC-HP translate key. The screen will change to the DOS directory (if it is not currently being displayed), and the user can use the direction keys, or any of the other DOS directory usage keys to move the highlight bar to point to a PGM file. The <ENTER> key signals that a choice has been made and the translate will begin. This translate can be aborted by the user with the use of the <ESC> key at anytime during the translate.

NOTE: an abort of a file translate into the the HP directory will delete the partially loaded file from the file space and directory, unlike the HP-PC translate.

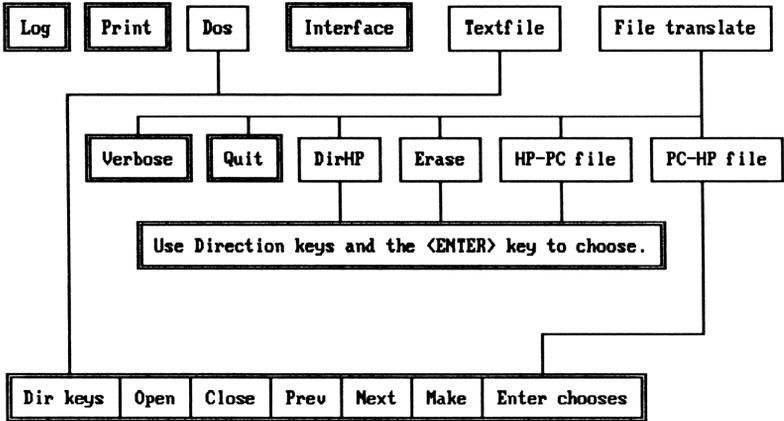
If a file by the same name is existent in the HP directory, the user is informed with a message stating that fact and the translate is aborted. The user has three choices in this case: A) do no translate of the file, or B) use the HP-41 to access the directory to change the existing file's name and direct the translate again, or C) erase the file. The ELI-IL program does not have the means for altering the names of any of the files in the HP directory.

If an instruction that is not within the HP-41 set is found during the translate, the process will not be terminated by the program but the user will be informed of a problem within the translate process. The ELI-41 program has quite a few additional functions not contained within the HP-41, so this is possible. If the program generated on the ELI-41 uses the conversion facility or any instructions not covered by HP-41 ROM sets, it is the responsibility of the user to change these instructions before a translate can be successful.

A listing of the translate progress can be viewed if the Verbose option is in effect. As always, the left window display can be directed to the printer or a textfile.

The Level Expansion

Table 4-4: The Levels



The basic layout of the various command keys available is outlined in Table 4-1 above. Some of the end nodes of the level tree are not really command key displays but the message that displays, prompting for the final entry needed. There is a non-displayed option QUIT that turns off LOGGING and TEXTFILE, and actually resets to the defaults without going to the <ESC> generated exit message. The following is an expansion on the various levels:

4.1. LOG

The Log is a toggle function that allows a running log to be written to a text file. The log content is built from the scrolled display on the left side of the screen. If there is no left window display, there is no log. The log duplicates the function of the text file option except for some special characteristics.

The file written to is always LOGFILE.TXT within the current directory when it is first toggled ON. Also any previous file by the same name is first deleted before the first display line is written onto it. After it is first opened within one session, toggling the log ON and OFF will continue to append to the end of the file first opened. Toggling ON the text file option will temporarily toggle OFF the log file until the text file is closed, at which time, the LOG option is restored.

4.2. PRINT

The Print option toggles the printer option ON or OFF. Any display to the left side of the screen will be sent to the printer. The print line length is limited by the length of the source line and not the 37 character display line length. Also the continuation character displayed on the screen is not sent to the printer. (It was not within the source line.) The printer is assumed to be LPT1.

4.3. INTERFACE

The last toggle of the Main Command menu is the INTERFACE toggle. This allows viewing of the interface instructions that are going around the HPIL loop. A hexadecimal representation of the actual characters is displayed as well as the Hewlett-Packard mnemonics. These pseudo instructions have been slightly modified from Hewlett-Packard's documented mnemonics to represent instructions to the two simulated devices (printer and mass storage) that this program supplies to the loop.

These instructions actually scroll too fast for the user to see all of them. They are meant as a debugging aid to view what is taking place on the loop. Their display does demonstrate to the user the speed of the loop even though they do slow the loop for the time it takes to display them.

4.4. DOS

The DOS function enables the user to choose the current directory and browse around through the directories on the current disk. A new directory can also be defined in this mode. The purpose of this function is to set the current directory for text file or translate functions. A submenu is displayed when this function is chosen enabling the use of special key

press sequences for maneuvering through directories on the current disk. See the submenu below the TEXTFILE option.

4.4.1. DIRECTION KEYS

The arrow keys as well as PgUp and PgDn keys may be used to traverse through the directories and files on the disk drive. A highlight bar will point to the current pointer within the directory. Choosing any file within a directory will set the path to that file as the current directory when the < ENTER > key is pressed.

4.4.2. OPEN

The < O > ("Open") key will open the directory at which the highlight bar is pointing. Subdirectories with many entries may take a while to open. If the highlight bar is not pointing at a subdirectory a message will display stating this and no further action is taken. The compliment of this function is the Close directory function.

4.4.3. CLOSE

The < C > ("Close") key will close the directory within which the highlight bar is located. The memory area used to store the directory entries is freed, enabling some functions to operate if previously unable to run for lack of memory. It is not necessary to be pointing at the actual subdirectory entry, any file within the directory will do. Pointing at a child directory when this command key is pressed will not close the parent directory. If the directory pointed at is not open, nothing is done. The compliment of this function is the Open directory function.

4.4.4. PREVIOUS

The < P > ("Previous") key will move the highlight bar to the previous subdirectory. If there is no previous directory in the listing, this key will go to the top of the directory (root directory). The compliment of this function is the Next directory function.

4.4.5. NEXT

The <N> ("Next directory") key will move the highlight bar to the next subdirectory. This enables skipping over the entries within an open directory with a single keypress. The compliment of this function is the Previous directory function.

4.4.6. MAKE

The <M> ("Make directory") key will make a subdirectory under the currently highlighted subdirectory. The highlight bar must reside on a subdirectory entry, except within the root directory. A prompt message will display and request the name for this new directory. This program will not delete subdirectories so there is no compliment to this function.

4.5. TEXTFILE

The Textfile option allows the display on the left hand side of the display to be captured to a text file as well as the screen. This is useful for saving the output from a PRP function that generates a program listing, or an HP-41 program's output to the printer to be directed into a text file. Generating output for further processing with a PC program would certainly make good use of this function. Field data could be output to a text file for import into a spread sheet, data base or plotting program.

This function will further prompt the user for the current directory and finally for the name of the text file to receive the output. If that filename exists within the current directory, the user will be asked if the choice is to overwrite that file. A negative response (the default) will require a restart of the function to choose another filename.

The TEXTFILE status will be displayed as ON and toggling the "text file save" OFF with the TEXTFILE function key a second time will close the file.

The first prompt for choice of a current directory will display the following submenu just like the DOS function does:

4.6. FILE TRANSLATE

The Translate function will take the user into another level where file translates from ELI-41 and HP-41 formats are accomplished. A new set of command keys are available and visible at this level. If the TEXTFILE or the LOGGING toggle is enabled any display in this mode will also be directed to the associated file as well (if the VERBOSE option is set on).

4.6.1. VERBOSE

The Verbose option allows the progress of the translate to be viewed by the user on the left side display. When this option is chosen, the user is prompted for the speed of the display. This "SPEED" should really be termed "DELAY" as that is how it works. The larger the number (0-5) the longer the display takes. Any number entry other than the numbers available is defaulted to 0, or no delay. The <ENTER> key accepts the current speed as displayed with the prompt.

If the wrong display rate is chosen, it is necessary to stop the display with the SILENT option and then toggle the display back on with the VERBOSE option and enter the proper value.

4.6.2. SILENT

The Silent option will turn off the display and enable very fast translates to take place, as the ELI-IL program does not have to take time to generate the screen display. This is the default mode. The command key menu will change with this keypress showing that the VERBOSE option is now available. (Previously, SILENT was not.) Toggling SILENT mode and back to VERBOSE mode is the only way to reset the display speed.

4.6.3. QUIT

The Quit at this point is an escape method from the translate mode, and not from the program. The <ESC> key may be used for this purpose as well. The <Q> ("Quit") key will not work during an actual translate. The <ESC> key must be used first to abort the translate and then either the <ESC> key again or the <Q> ("Quit") key. The result of the QUIT escape is a return to the Main Command level.

4.6.4. DIR HP

The Dir HP option is used to view a directory of the file content within the mass media storage. All files are displayed in the order in which they were loaded into the mass storage device. Along with the file name, the file type and size in registers (approximately 7 bytes per register) are displayed.

The file types are: PR (Program), KE (user keys), WA (write all memory), ST (status), DA (data storage), ER (HP erased files) and ?? (an unknown file type).

PR type files are program files either generated in a save mode by the HP-41 or the ELI-IL translate mode. The HP-41 has two functions used to save programs: WRTP (write program) and WRTPV (write private program). WRTPV programs differ from the more general WRTP function, in that, restored programs may only executed. They may not be edited, listed or re-recorded. The register size relates how many registers are used by the program in HP-41 memory. Unfortunately, there is no way, at present, for this program to document how many registers must be sized in the HP for the program using the SIZE __ function. Files saved by the HP-41 will save user key assignments to labels within the program file and restore them when the program is retrieved.

KE files are user key storage generated by the HP-41 by use of the WRTK function. Key retrieval by the HP-41 will clear all of the previous key assignments within the HP-41 and assign those contained within the file. The register size amounts to the storage size in the mass media, this may be in conflict with what the HP-41's generated directory may show. The reason being that the HP-41 will display only the register content size of the key file. User key assignments, status and so forth are not register content.

WA files are generated by the HP-41 using the WRTA function. These files contain all the memory content of the HP-41 at the time of the save, registers, key assignments, status and programs. Use of the READA will dump the file back into the HP-41 overwriting everything.

ST files are files generated by the HP-41 with the WRTS function. Using this function, the present status of the HP-41 is copied into the medium. This function will overwrite any file of the same name as the one specified; otherwise, a new one will be generated.

DA files are generated by the HP-41 and store data from the calculator. There is no current method by the ELI-IL program to translate these data files into an ELI-41 format.

The **ER** type files are files erased by the HP-41 but the file space has not yet been re-used by a file save by the HP-41. The ELI-IL program will always append to the end of the current directory. The HP-41 will re-use an erased file's space if a file save is instituted by the HP-41, and the program or data space needed is not larger than the freed space.

?? type files cannot be generated by the HP-41 and this type should never be found. If they do show up an internal error to the ELI-IL program may have generated them. It may be time to copy the HPSIDE?.PAK file with DOS to safeguard your data.

4.6.5. ERASE

The Erase function gives the user a control over the mass storage device not afforded by the HPIL loop instructions. Upon hitting the Erase key the HP directory will appear if not already visible on the right display side. The highlighted prompt area will request the HP file to erase from the HP directory. The direction keys may be used to move the highlight to the file to erase and the <ENTER> key begins the deletion process.

A file erased by the HP-41 is not actually erased, but, rather, marked for deletion. If at a later time a file of the same length or less than the previously erased one is saved, the HP-41 may overwrite the space used by the erased file. If the file that replaces the erased one is much smaller than the previous one much space becomes unavailable. This is far from efficient but the HP-41 does not have the capability to physically close-up the file space released by an erased file.

The ELI-IL program gives the user this capability. File space is freed by this program by physically moving the directory entries, as well as the file space, closing up the released space. Once erased from the space there is no way to retrieve ELI-IL erased files. Files closer to the beginning of a large directory may take a while to erase because of the large amount of data that must be moved.

4.6.6. HP to PC

This is the first of the two translate functions. The direction is from the mass media to a DOS ASCII file in the format that the ELI-41 program can execute.

Upon pressing the <H> ("HP-PC") command key, the right hand screen will be altered to the HP storage directory if that display was not currently being displayed. The highlight bar will overlay the current file. The directional keys may be used to point to the file desired for translate and the <ENTER> key will cause the actual translate process to begin.

The first label statement within the chosen program will generate the filename that will be used for the file in the current DOS directory displayed in the STATUS area. Certain characters will be altered to stay within the DOS file naming conventions. If a file by the same name currently exists within the current DOS directory, the user will be prompted whether to continue with overwrite or abort. The "(y,N)" specifies that the default is to NOT overwrite. A "y" or "Y" must specifically be entered to continue and overwrite it. The only way to rename the file within the HP directory is by use of the RENAME function from the HP-41. Or finally, the program within the HP directory may be erased.

The TRANSL toggle will be altered to ON while the file is being translated. If the VERBOSE option is set, a listing will be generated on the left hand side of the display. Furthermore, if the print or TEXTFILE option has been set from the previous level the listing will also be directed to the appropriate output device.

The <ESC> key may be used by the user to terminate the translate any time before the end of the program being translated. The translate will be aborted and the output file will be closed but not erased. This is kind of a left handed method of saving subroutines.

4.6.7. PC to HP

The PC-HP translate function translates ELI-41 or text editor generated ASCII programs into the mass storage media. The first label in the program names the file entry within the HP directory. The ELI-IL program will refuse to translate files of the same name as those within the HP directory. The HP-41 must either be used to rename the existing file within the directory before the translate can be accomplished, or the label within the PC program must be altered. The DOS filename may or may not be of the same name as the label statement, but the label is the critical factor here.

The same listing and file directing capabilities of the HP-PC translate function are usable here, as well. The <ESC> key can also be used here to abort the translate at any point prior to the translate of the end statement. In the event that an abort is affected either by the user or the program (bad instruction encountered), the HP directory entry will be erased completely.

The HP-41 has the advantage of containing the program in memory to be written into the mass media, the translate facility only knows the length of the program after the translation process. For this reason, the PC-HP translate can only append to the end of the existing directory; and therefore, to the file area. The HP-41 can sense the length of the program being written and take an area previously occupied by an erased file entry.

NOTE: The ELI-41 program can neither generate nor execute synthetic programming instructions. A text editor may be used, though, to generate or alter an existing program to include such instructions and the file should load correctly. For instance, the common STO A function could actually be viewed as STO 102 within the ASCII text file. There is insufficient room in this manual to instruct on the methodology of synthetic programming, but this knowledge could speed entry of certain programs using this ELI-IL program over the normal entry through the hand-held calculator. Testing of the ELI-IL program has shown that programs containing synthetic instructions may be stored and retrieved successfully.

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Descriptions of the Mnemonics

While the HPIL instructions are being displayed, the mnemonics scroll up the right side window. Numeric extensions may be attached to certain mnemonics. The purpose of this chapter is to familiarize the user with the meaning of these mnemonics and their appropriate numeric display.

The ELI-IL program attempts to act in a transparent manner to the user as two devices on the loop. Fortunately, each of these devices is driven separately by the controller, so the program can actually switch the availability of either device to be present on the loop as required by the controller. The flow of the loop instructions will show this if displayed.

Unfortunately, the loop instructions can not be slowed to a display useful to the user, or even controlled by the user, because a certain time frame must be adhered to or the controller will suspect an error condition exists and shut down the loop.

An non-displayed function key for the logging function is available to the user. The HPIL loop instruction display must be toggled on with the Interface toggle. The heading at the top of the display page will show "LOOP". While this display is present, hit the <H> ("HP log") key and the heading will change to "L LOOP" denoting Listing the LOOP instructions. Displayed instructions will be sent to a pre-named logging diskfile of "HLOG". Instructions are sent to this file only as long as the instructions are being displayed to the screen. If the loop instruction display is toggled off the HLOG file" is not closed. It can only be closed by again displaying the loop instructions <I> ("INTERFACE") and pressing the <H> ("HP log") key. All the files in use by the program are closed on an MS-DOS machine when the program is ended.

The following is a description of each of the possible mnemonics displayable and their possible meanings:

- AAD** Reflects an **AUTO ADDRESS** instruction has been received to have all devices assume the address received by the instruction, increment the address portion and send it to the next device on the loop.
- AAU** Reflects an **UNAUTO ADDRESS** instruction has been received by the device. This instruction is sent to the next device on the loop, and the device re-assumes its default address.
- DCL** Reflects a **DEVICE CLEAR** instruction has been received.
- DDL** Reflects a **DEVICE LISTEN** instruction. This instruction is displayed if the number of the device included within the instruction is not the assigned number of this device. The **MDDL** instruction, or **MY DEVICE LISTEN**, would display if this device was the object of the instruction.
- DDT** Reflects a **DEVICE TALK** instruction. This is an instruction to the device numbered within the instruction to become a **TALKER** on the loop. The number following the mnemonic notes the device being instructed.
- DOA** Reflects a **DATA** byte has been received. The numeric shows the actual hexadecimal representation of the data byte. This type of mnemonic only follows a talker or listener activation instruction, and represents data to be processed by such device.
- DOE** Reflects an **END OF DATA** instruction or **END BYTE** has been received. The byte received is actual data but has been flagged as the last byte to the group being sent.
- ETD** Reflects **DATA** sent by this device as a talker. Normally represents data requested for status or device's ID.
-

- ETE** Reflects the last DATA byte to be sent by the talker and also reflects an error condition exists. Any data byte traveling on the loop can add this mnemonic to the present loop content to inform the controller that an error condition exists. The controller will normally request status from each device around the loop to find out the sender of the error flag.
- ETO** Reflects an end of DATA byte sent with no error condition.
- ETS** Reflects a STATUS BYTE is being sent on the loop by the active TALKER.
- GET** Reflects a DEVICE TRIGGER instruction has been sent on the loop. Any device that receives this data byte as a trigger signal will act upon the instruction. This instruction could be used to activate a sleeping device or trigger a ammeter to send the present reading held by the device.
- GTL** Reflects a GOTO LOCAL instruction sent on the loop.
- GUNL** Reflects a GENERAL UNLISTEN command to shut down all listeners on the loop to go back to standby condition.
- GUNT** Reflects a GENERAL UNTALK command sent around the loop. There can only be one TALKER active at any one time, but this instruction eliminates the controller's need to address any device directly.
- IFCR** Reflects an INTERFACE CLEAR instruction was received. All devices on the loop assume their default address, and an AAD (Auto Address) instruction is needed for the controller to be able to address devices on the loop.

- LPD** Reflects a LOOP POWER DOWN instruction was received. This is the normal instruction sent by the HP-41 when it does not know how to correct an error condition. The effect of the instruction is that all devices must be reassigned addressing. The operation previous to the instruction is aborted.
- MLD1** Reflects a DDL instruction was received by the printer device section of this program. The instruction was not converted but, rather, this device displays the instruction as its own. Printer type listener instructions are to follow as the printer has been enabled to receive instructions.
- MLD2** Reflects a DDL instruction was received by the mass storage device portion of the program, enabling it as a LISTENER on the loop. Certain mass storage device instructions are sure to follow.
- MTD1** Reflects a DDT instruction has been received by the printer portion of the program. The printer is enabled as a TALKER on the loop. The talker functions of a printer are restricted to sending ID and status information.
- MTD2** Reflects a DDT instruction has been received by the mass storage device portion of the program. The mass storage device has many TALKER type operations. These are summarized at the end of this chapter.
- MUNT** Reflects a UNTalk instruction has been received by one of the devices generated by this program. The M at the first refers the device considering the instruction as its own. Only one TALKER can be active on loop at any one time.

- NRD** Reflects a **DATA NOT READY** instruction from the controller. The effect of this instruction is that any buffers in use are kept, as well as pointers. It does not normally reflect an error condition; more likely, the controller needs time to process the data it has received and needs to hold the loop at its present state until such time as the data has been processed.
- NRE** Reflects a **NOT REMOTE** instruction has been addressed to a device on the loop taking it out of remote to local status.
- OLAD** Reflects a **LAD listen** address was received by this device when it was already a listener expecting instructions. More than one device can be a **LISTENER** on the loop but can only process the data operations appropriate to its nature.
- PPD** Reflects a **PARALLEL POLL DISABLE** instruction has been received. The use of parallel polling can be for error status checking, but a more likely usage is to keep some device in its present state while other devices are polled for status.
- PPE** Reflects a **PARALLEL POLL ENABLE** instruction has been received.
- PPST** Reflects a **PARALLEL POLL STATUS** instruction has been received.
- REN** Reflects a **REMOTE ENABLE** instruction has been received. This instruction is only acted upon by the one addressed
- SAI** Reflects a **SEND ACCESSORY ID** instruction has been received. This is typically a request by the controller to discover the types of devices currently active on the loop.

- SDA** Reflects a SEND DATA instruction has been received. Previous to this the controller has activated and subsequently instructed the device on the information expected. No data is actually resent until the controller actually ask for it by this command.
- SDI** Reflects a SEND ID instruction has been sent to the current TALKER on the loop. The devices emulated by this program can neither return an ID.
- SSRQ** Reflects a SERVICE REQUEST has been instituted by one of the devices emulated here. A status request will follow from the controller to discover where it is an error condition that can be corrected.
- SST** Reflects a SEND STATUS instruction has been received. The current TALKER will send the appropriate bytes reflecting its current status. Refer to the end of this chapter for the possible status bytes that may be returned on the loop from the two devices emulated here.

ELI-IL Usage

The ELI-IL program gives the basic HP-41 user an extension to his machine that opens a door to much more capability than the hand-held machine can do by itself. Some of these functions are simple natural extensions afforded by additional devices attached to the machine to serve their intended function as printer, mass storage device etc... The beauty of the ELI-IL program is that it can use the PC environment to extend these basic functions even further.

Being a companion product to Eclipse Logic's main product: the ELI-41 scientific calculator, a translation function makes development in the PC environment of HP-41 programs a somewhat less painful process and much quicker. Coupled with the use of the Wand to load programs into the HP-41, the translate facility makes available the path to reworking or simply running Hewlett-Packard Solution manual and user group distributed programs in the PC environment.

The printer function makes available the fast display of HP-41 generated printer output on the PC terminal, as well as, directing this output to a regular PC attached printer or even an ASCII text file on disk. A printed program source could conceivably be run through a program translation process that could output a BASIC program to essentially port the program into a stand alone environment.

DATATR:

This program usage is meant for the output of data stored in sequential memory registers to be output to a comma delimited disk file for later processing with a spread sheet or data base program, or simply to the printer for viewing.

Assuming the program has been loaded into the HP-41, and that the registers currently contain the data to be output. The first prompt is display upon executing the program with XEQ DATATR.

REGS PER SET

As if the output was for a data base application, let us assume the records will contain 5 fields. Let us further assume the data contained in the memory registers have this same relationship, of 5 memory registers (sequentially) make up a particular relationship. The answer to the prompt would then be 5. The <R/S> (run/stop) key would then be pressed to indicate the data has been entered. Then the next prompt will appear:

NUMBER OF SETS

The number of register sets involved would be entered here. Let us say that data covers 4 sets of data. The response would then be 4. Again the <R/S> key would be pressed to indicate the response has been made. Of course, the DATATR program needs to know where the data starts, thus the prompt:

BEGINNING REG

Now, here is a critical position. If the output is going to the HP-IL program from the HP-41 and we are sending the data to a text file, we need at this point to make sure the text file option is set to save the output from the program into a text file. The TEXTFILE status should show ON indicating the program is ready to receive input and send it to the proper file.

If all is ready, enter the register that contains the beginning set of data and hit the <R/S> key. Hitting the <T>, ("TEXTFILE") toggle will close the file generated by the HP-IL, and the file is ready for import into the data base program.

NOTE: This routine has been tested, but only on a system that had no other devices on the loop. Additional address constraints may be made if other devices are in use.

Listing 6-1: Data translate

```

LBL "DATATR"          ; Translate data to comma delim file
SF 21                ; Turn on printer function
"REGS PER SET"
PROMPT
STO 03               ; Number of registers per set
"NUMBER OF SETS"
PROMPT
STO 01               ; Total number of sets
"BEGINNING REG"
PROMPT
STO 02               ; First register to be printed
1000
ST/ 01
1
ST + 01              ; Prepare loop control reg
LBL "TOTAL"
RCL 03
STO 00
1000
ST/ 00
1
ST + 00
CLA
LBL "SETS"
ARCL IND 02
ACA
CLA
@,                   ; Put into printers line buffer

```

Listing 6-1: Data translate (continued)

```
1
ST + 02
ISG 00
GTO "SETS" ; Continue for sets loop
ADV
ISG 01
GTO "TOTAL" ; Continue for TOTAL loop
END
```

HELP file use for an HP-41CX

The following are two routines ¹ for storing documentation files in the emulated disk to keep documentation for the HP41-CX type hand-held calculator. An Extended Functions module is also required.

The format of the text within the file is entirely by the needs of the user. By using these or similar routines and storing "Help" files adjacent to their associated program files, program instructions, reminders, warnings and notes can be easily retrieved. As the "Help" files takes essentially the same name as the program it describes, the user is only required to xeq HELP and input the program name. As there is no way at this time to determine the size in registers for a file, that information must also be provided to the program.

To create a "Help" file:

```
XEQ "REMFL"
```

1 Reprinted from "HP-41/HP-IL System Dictionary" Carl E. Reinstein. Corvallis Software, Inc. 1982.

"N LINES?"

Input the estimated number of text lines to be in the file. (Each 9 full lines occupy 1 record on the tape.) Press <R/S> .

"TEXT?"

The program stops in ALPHA mode. Input text and press the <R/S> key till done. When finished, press <R/S> without any ALPHA input.

"FILE NAME?"

Input the name of the associated program followed by the <R/S> key.

The "Help" file will take the same name offset by one space. This feature makes these files distinctive in the Directory listing. If the file is satisfactory, respond to the prompt, "SAVE?" by pressing the <R/S> key.

When the "Help" file is called by the HELP program the space is front of the program name is automatically inserted.

Listing 6-2: HELP file generate

```

LBL "REMFL"           ; Generate a HELP file called from HP-41
CLX
"N LINES?"
PROMPT
4
*
SF 25
"REM"
PURFL
CRFLAS
LBL 00
CF 23

```

Listing 6-2: HELP file generate (continued)

```
SF 25
AON
"TEXT?"
STOP
FC?C 23
GTO 01
APPREC FC?C 25
GTO 00
LBL 01
"REM"
FLSIZE
"FL NAME"
AON
STOP
AOFF
@" "
-1
AROT
X< > Y
CREATE
ASTO X
ASHF
ASTO Y
"SAVE?"
PROMPT
"REM,"
ARCL X
ARCL Y
SAVEAS
CLX
END
```

Listing 6-3: The HELP program

```
LBL "HELP"; call from HP-41 to access help data
FC? 55
GTO 00
ADV
ADV
CF 23
"TITLE?"
AON
STOP
AOFF
SF 12
FS?C 23
PRA
CF 12
ADV
LBL 00
"REMFL SIZE?"
PROMPT
"NAME?"
AON
STOP
AOFF
@" "
-1
AROT
X<>Y
CRFLAS
GETAS
CLX
SEEKPT
ASTO X
ASHF
```

Listing 6-3: The HELP Program (continued)

```
ASTO Y
SF 21
SF 25
LBL 01
GETREC
FS? 25
GTO 02
CLA
ARCL X
ARCL Y
PURFL
CLX
RTN
LBL 02
FS? 55
PRA
FC? 55
AVIEW
GTO 01
END
```

Again the @ stands for the "lazy T" or append sign.

ERROR displays

Various error messages are displayed when an error condition arises during the usage of the ELI-IL program. The following is a description of the error that was encountered that caused the display and the possible remedies for that situation.

Entry must be a subdirectory

An attempt was made to make a subdirectory below an open subdirectory while the highlight bar was not resting upon the directory entry itself. This error should not be encountered within the root directory.

Unable to open program file

An attempt was made to translate to a DOS program file and an error was returned when attempting to open it. The most probable cause is that the CONFIG.SYS file specified to few files with the "FILES =" statement, or none was issued.

The program may have as many as 5 files open before a translate attempt is made. The HPSIDE?.PAK files must be opened, a LOG file could have been opened, a TEXT file could have been opened, and an HP instruction log could be opened. If such, or near this is the case, some other that the HPSIDE?.PAK files may be closed. Also a "FILES = 20" statement in a CONFIG.SYS file may help. Refer to your DOS manual for further assistance in this area.

Another cause could be that there is not enough disk space open on the default disk drive. This would entail an exit from the program to clear disk space.

Operation aborted by user

The user pressed the <ESC> key. This aborts the current operation. If such was not the intention, in most cases, a retry of the operation will be successful.

No memory for hp directory

An attempt was made to view, erase or translate from the HP directory. The program allocates memory dynamically as needed by most functions. The minimum memory needed for execution of the program was found at startup, but memory allocations by various functions has used it up. The biggest user of memory in the program is the DOS directory function. It may be possible to exit back to the DOS directory display and close some of the open subdirectories. That may free up enough memory to attempt again the action that triggered the error response.

If all else fails it may be necessary to free more memory within the system before executing the ELI-IL program.

Trouble open/create of hptape

An attempt was being made to translate an HP directory entry into a DOS program file and an error was encountered within the HPSIDE?.PAK file space. The causes may be many, possible causes are a corrupted emulated tape file, a changed disk (none is allowed), an internal error within the program. Such an error was never encountered during testing. Inform us at Eclipse Logic, Inc. and note the circumstances that preceded the error.

An immediate solution would be to back up the disk file immediately and attempt the operation again. A emulated tape file may be restored but the operation may be more than a casual PC user would want to attempt.

Translate function is only valid for program files

An attempt was made to translate a HP directory file that was not a program file. Possible files are (PR) program files, (KE) user key files, (WA) memory dumps, (ST) status save files, (DA) data files, (ER) erased by HP-41 and (??) illegal files. Only program files and data files may be translated.

The operation should be tried again, noting if another type file was pointed at with the highlight bar, as the last file pointed at will again be the current file when the highlight is turned on.

Duplicate name found in HP DIR

Use the Erase function if needed.

An attempt was made to translate a DOS file into the HP directory when the beginning label matches the name of an existing file within the HP directory. There are a number of solutions that would enable the eventual translate operation.

The HP-41 could be used to rename the file entry within the HP directory. The file could be erased with either the HP-41 or the ELI-IL program. The beginning label within the program on the DOS directory could be changed. Any of these remove the duplicate name match criteria.

HPIL port doesn't initialize

NON-LOOP activity available only.

The program tested the port at the default HPIL card address or the one specified by the user and received invalid responses. The program assumes that there is no HPIL interface card within the machine and disables the functions that send instructions to the HP-IL board.

The ELI-IL program will continue to execute with the PC functions to the program but LOOP access is denied. This is quite a useful function to users that need to load or retrieve programs from the tape emulation media on a machine that does not have the HPIL card, in preparation for a download at a later time.

The HPSIDE?.PAK files can be copied or renamed, just as any other DOS file can be.

Unable to open text file

An attempt was made to open a TEXT file for saving screen display to the left side screen that was unsuccessful. Normally, this would be a result of an error returned by DOS. Possible causes could be a full disk, an invalid DOS file name specified, a disk swap was made making the subdirectory specified invalid or any other function that rendered either the file name

or the subdirectory path to it invalid. A retry with a different name may prove successful.

Trouble opening logging file

The LOGGING toggle key was chosen to create a log file but the file open was unsuccessful. Various DOS error returns could be found for the problem. A few of the possible causes are there is not enough file handles left in the present condition of the machine, there is not enough disk space left on the disk to open the file, or a disk swap has been done losing the current directory pointer. The best solution is to exit the program, check the amount of disk space left, erase or move files if necessary, check the number of the "FILES =" statement in the CONFIG.SYS file and restart the program.

Unable to open program file

A file translate of an ELI-41 program file was attempted. During the open of the file a disk error was encountered. Possible causes could be the directory pathing is incorrect for various reasons or there is insufficient disk space or file handles left to open the file. Closing logs or textfiles may free up enough file handles or the "FILES =" statement in the CONFIG.SYS file should be increased to 20 or so to allow enough. Disk space problems may be taken care of easily by the user.

Not enough memory to execute

The program did not find enough memory for execution free at startup. Usually 128K of memory should be sufficient.

Error while writing file

A text file or DOS directed translate file write encountered a problem. The most probable cause is insufficient disk space to continue. Many other causes could cause this condition, from the simple opening of the disk door to bad media errors. The possibilities other than disk space lack are too difficult to diagnose here.

CATASTROPHIC DISK ERROR!

Just that something almost unrecoverable has happened. Save your files as soon as possible and reboot the machine.

Seek error on read on hp dir

A read of the HP media uncovered a DOS bad return code. The most likely cause is a bad media. An internal error condition within the program may cause this, but examine all other possibilities and reboot the machine to reset disk drives and emulation drivers.

Disk error on hp dir read.

During normal HP directory processing, a direct read of the emulated tape file turned up a disk error. Possible causes are a swapped disk, media error or damaged program. The emulated tape directory may be corrupted. A backup copy should be generated in case a restore of the files is needed.

Disk error on hp dir write.

A direct write of the HP directory during normal file processing uncovered a disk error. The same causes and actions apply here as the previous error in this chapter.

Seek error on read of file.

A disk head seek to the HP directory uncovered an error in the disk system. Normally this would be caused by bad media. Less obvious sources of the problem are directly disk related: open drive door, swapped disk or something of that nature. A backup copy of the HP emulated tape side(s) would be in order here.

Can't find choice in file table

An HP directory file was chosen for translate into a ELI-41 program file. During the directory processing a file name was chosen but not found when searching for the file in the emulated tape file. The most likely cause would be a corrupted file, possibly a media error.

File name exists. Overwrite?(y,N)

An HP directory file has been chosen for translate and the a file already exists of the same name as the first label in the program. This is really not an error, but a request of the user to confirm if the existing file is to be overwritten with the new file. The Capitalized "N" signifies the default is not to overwrite.

Trouble writing logging file.

During the writing of the LOG file, a disk error has been reported. The most likely cause is lack of disk space. Other disk errors applying to disk writes may be the cause also. The disk file is closed automatically by this error. An exit from the program may be necessary to verify the cause. If the ELI-IL program is restarted, the existing LOG file will be overwritten if a logging process is called for.

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