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FESWMS-2DH OPERATION

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Dear FESWMS-2DH Users:

Enclosed is an update of the Basic FESWMS package. The update corrects some errors in the installation menu and also includes additional options. These changes are:

1. The installation did not correctly set a path to the data input editors for DINMOD < FLOMOD and ANOMOD. This has been corrected. For initial setup of the data, the use of the input data editor is highly suggested.
2. A description of the menu system has been included. This explains some of the functions of the menu and how it can help you perform your work better.
3. A TRI2QUAD program has been included that converts two adjacent triangular elements into one element based upon certain conditions. See the menu system to implement.
4. A GRIDPACK program has been added that compacts your element grid system so that the elements that are not required for the flow solution can be eliminated from the element grid system. This will decrease the computational time. See the menu system to implement.

Later, we will be sending more information on items number 3 and 4, however, if you are adventuresome, go ahead and try them on one of the example problems.

If you have only the ENHANCED BASIC system, delete all the files in your current PROGRAMS subdirectory of the FESWMS directory and reinstall using the enclosed diskette.

If you have the Extended version, perform the same procedure as for the BASIC system using the enclosed diskette and reinstall your Extended version using your original Extended version diskette.

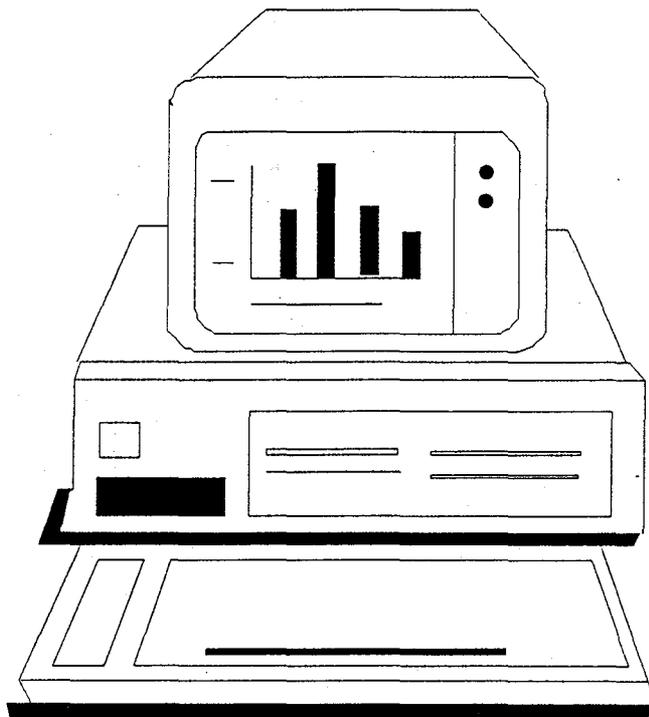
If you have any questions, please call.

FESWMS-2DH OPERATION

FESWMS-2DH OPERATION ON A MICROCOMPUTER

Version 2 of the Finite Element Surface-Water Modeling System: Two-Dimensional Flow in a Horizontal Plane (FESWMS-2DH) will run on an IBM or compatible microcomputer that has the following hardware/software:

- At least 640 kilobytes of Random Access Memory (RAM) with at least 520,000 bytes of base memory free for program execution.
- A math coprocessor (80x87). A math coprocessor increases computational speed by a factor of 5 to 10.
- MS-DOS (or PC-DOS) 2.1 or greater.
- Either two high-density floppy diskette drives, or one floppy diskette drive (low or high density) and a hard drive. A hard drive is highly recommended because of the much faster read/write speeds provided and the fact that a lot of information will be read from and written to disk storage. However, it is possible to operate the modeling system on a computer that has two floppy drives (these have to be at least 720-kilobyte drives).



FESWMS-2DH INSTALLATION

Installation of FESWMS-2DH can be done automatically by placing the first FESWMS-2DH diskette in your floppy diskette drive and typing "INSTALL" (do not type the quote marks). The screen shown below will appear and you will be prompted for the letter designation of the drive where the system is to be installed. A main directory named FESWMS is created on this drive. It is a good idea to keep all of your FESWMS-2DH files in subdirectories under FESWMS, using one subdirectory for each modeling project. All of the FESWMS-2DH programs and ancillary files are kept in a subdirectory named PROGRAMS. A message will be written to the screen as each file is copied from the floppy to your destination directory. If a file of the same name already exists in your destination directory you will be asked if you want to overwrite that file.

FESWMS-2DH Installation

This program controls installation of the Finite Element Surface Water Modeling System (FESWMS-2DH) on an MS-DOS or PC-DOS micro-computer. You need a hard disk drive installed and enough storage space to load and run the programs. Please answer the following questions to install the FESWMS-2DH programs. Press any key...

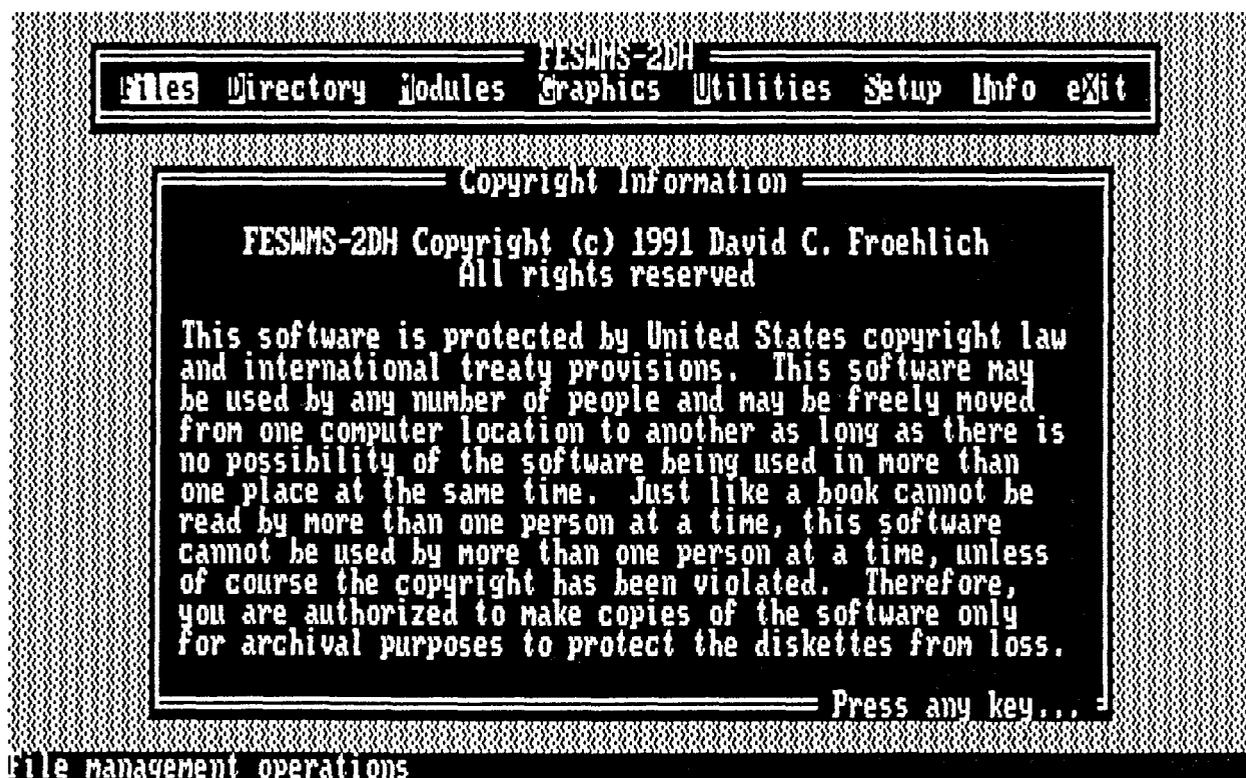
FESWMS-2DH programs are installed under a main directory named FESWMS in a subdirectory named PROGRAMS. Press the letter of the disk drive where the programs are to be installed

Drive: [C] C

Install programs on drive C? [Y/n]

FESWMS-2DH SYSTEM CONTROL PROGRAM

The FESWMS-2DH System Control Program (SCP) provides a comprehensive operating environment for the modeling system. The SCP enables convenient access to all of the FESWMS-2DH modules, allows files and directories to be managed easily, and contains a number of utilities that greatly simplify a modeling project. Utilities include graphic display of output on a screen, printer, or plotter; a calculator for simple arithmetic; and a calendar so you always know what day it is. To run the SCP after the modeling system has been installed on your computer, just type "FESWMS" (do not type the quotes ") from any directory on your disk and the screen shown below will appear on your monitor.. If you were not already in the directory where you would like to do your work (that is, the working directory), you can move about your disk quite easily while in the operating environment provided by the SCP.



File management operations

FESWMS-2DH MENU SYSTEM

Operation of FESWMS-2DH is controlled through a system of multi-level menus and windows. The main screen shown below contains a horizontal scrolling menu that provides access to all the major features of the modeling system. Commands needed to navigate the system are described on a following page and are quite simple. Using just the cursor arrow keys <Left>, <Right>, <Up>, and <Down>, along with the <Enter> key, you can access all of the menu items and submenus.



FESWMS-2DH MENU SYSTEM COMMANDS

Only the few commands described below are needed to navigate the items and submenus.

<u>Function</u>	<u>Single Key</u>	<u>Multiple Keys</u>
Move highlight bar left one item on the horizontal menu. If the bar is on the left-most item it wraps to the right-most item.	<Left>	<Ctrl-S>
Move highlight bar right one item on the horizontal menu. If the bar is on the right-most item it wraps to the left-most item.	<Right>	<Ctrl-D>
Move highlight bar up one row on a vertical menu. If the bar is on the top-most item, it wraps to the bottom-most item.	<Up>	<Ctrl-E> or <Ctrl-W>
Move highlight bar down one row on a vertical menu. If the bar is on the bottom-most item, it wraps to the top-most item.	<Down>	<Ctrl-X> or <Ctrl-Z>
Move highlight bar to the left-most item of a horizontal menu or the top-most item of a vertical menu.	<Home>	<Ctrl-Q><S>
Move highlight bar to right-most item of a horizontal menu or the bottom-most item of a vertical menu.	<End>	<Ctrl-Q><D>
Move to the first item on the menu that matches the character pressed. The matching character of an item is highlighted and is usually the first character in the item name.	any alpha- numeric character	--
Select the item that is highlighted.	<Enter>	--
Close the current submenu or window and return to the previous level.	<Esc>	--
Display a help screen showing available hot keys that allow immediate access to menu functions from any point within the menu system.	<F1>	--

FILE LISTING

All the files contained in the current directory (the working directory) of the disk drive are listed in a popup window that appears on the screen as shown below. In addition, other disk drives available on your computer system are shown in square brackets (for example, [A:] and [B:], for drives A and B, respectively). The directory immediately above the working directory (that is, the parent directory) is denoted by two dots (...). To list files in other directories on the current drive or on other drives, move the highlight bar to the desired drive or to the parent directory (...) and press return. Although you will see a listing of the files contained in another directory, the directory will not be changed.

FESWMS-2DR

Files Directory Modules Graphics Utilities Setup Info Exit

List
Browse [A:]
Exit [B:]
Rename ..
Copy
Delete
Move
Print.
Quit

C:\FESWMS\BEND90*.*

	<dir>	1/12/91	7:03p	
	anomod.bak	838	2/21/91	2:24p
	anomod.dat	838	2/21/91	2:24p
	anomod.plt	30493	2/21/91	2:44p
	anomod.prt	3996	2/21/91	2:44p
	dinmod.bak	5996	2/21/91	2:22p
	dinmod.dat	5996	2/21/91	2:22p
	dinmod.fil	56	2/21/91	2:15p
	dinmod.plt	27597	2/21/91	2:43p
	dinmod.prt	19116	2/21/91	2:43p
	flomod.dat	775	2/19/89	10:25p
	flomod.fil	84	2/21/91	2:24p
	flomod.prt	55438	2/21/91	2:44p
	flow.dat	11614	2/21/91	2:44p
	grid.dat	10440	2/21/91	2:43p
	init.dat	11614	2/19/89	10:29p

<Esc> Quit

List files in a directory

FESWMS-2DH FILE MANAGEMENT

A large number of files may be generated during a single modeling project and it is essential to be able to manage these files in a variety of ways. A number of functions are available within the SCP that provide an easy means of managing your files. These functions consist of the following: listing of files in a directory; browsing through a file (that is, viewing the contents of a file without editing); editing a file; renaming a file; copying a file; deleting a file; moving a file from one directory to another; and printing a file.



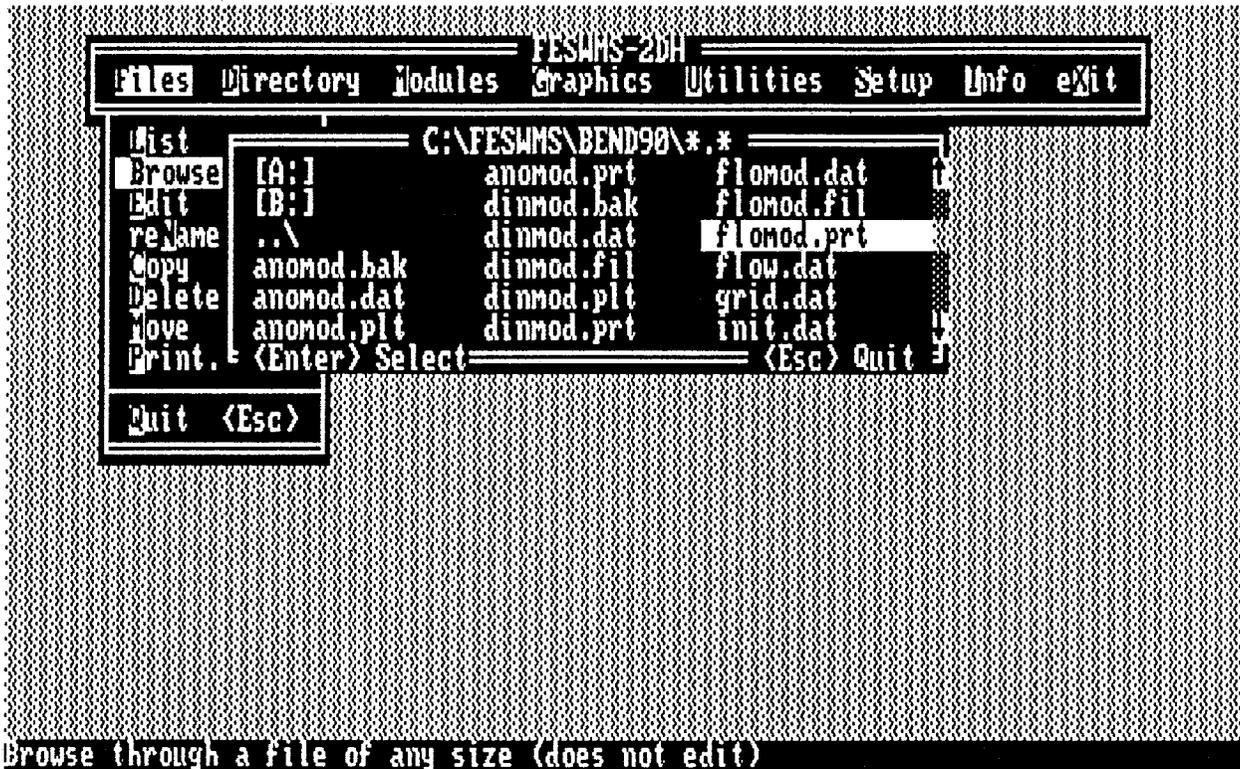
FILE BROWSING

The contents of a file can be examined without changing it using the Browse function. A number of commands are available for moving about a file. You can go immediately to the top or the bottom of a file, jump to a specified line, or search for a specified text string. In addition, parts of a file can be marked as a block and sent to the printer. When the Browse function is selected, a popup window will appear in which you are prompted for the name of the file you wish to view. The default file name is "*. *". This is a search mask that will be used in a subsequent directory file list if you do not enter the name of an existing file, or if you do not enter a different search mask. To view the file or to obtain or file listing press <Enter>. If you want to terminate (quit) the function, press the <Esc> key.



FILE BROWSING (CONTINUED)

Accepting the default file name (that is, the search mask *.*) by pressing <Enter>, causes a popup window containing the working directory file listing to appear. You can select a file for browsing from this list, or list the files in another directory by moving the highlight bar using the cursor arrow keys <Left>, <Right>, <Up>, and <Down>, and then pressing the <Enter> key. You can terminate (quit) the function at any time by pressing the <Esc> key.



FILE BROWSING (CONTINUED)

The file browser screen is shown below. The browse window is 79 columns wide and 24 rows high. Files that contain more than 79 columns per row can be viewed by scrolling the window right and left to view different sections of the file. The name of the file being viewed, number of the line at the top of the window, and the number of the column at the left of the window are indicated on the top line or *status line*. The vertical slide bar in the right-most column of the screen shows the relative position of the top-most line within the file. Commands needed to move through the file, search for specified text strings, mark blocks of text, send marked blocks to a printer, and toggle browser options are described on the following page.

```

FLOMOD.PRT                               Line 234   Col 1
*** SOLUTION PARAMETERS ***
Number of elements...: 287
Number of equations...: 2089
MAX frontwidth.....: 102
RMS frontwidth.....: 66
AVG frontwidth.....: 64

*** CROSS SECTION TOTAL FLOW COMPUTATION ***

Section no. 1:
Total flow = 9430.00 ft^3/s
Ave WS elev = 92.39 ft

Node Flow rate   Node Flow rate   Node Flow rate   Node Flow rate   Node Flow rate
no. (ft^3/s)    no. (ft^3/s)    no. (ft^3/s)    no. (ft^3/s)    no. (ft^3/s)
-----
1014    58.70    1015    291.55    1016    199.79    1017    450.88    1018    217.6
1019    351.27    1020     79.68    1021     42.49    1022     32.53    1023    126.9
1024    312.65    1025   1077.56    1026    301.09    1027     98.66    1028    520.2
1029   2329.21    1030   1057.92    1031   1518.05    1032    363.09
-----

```

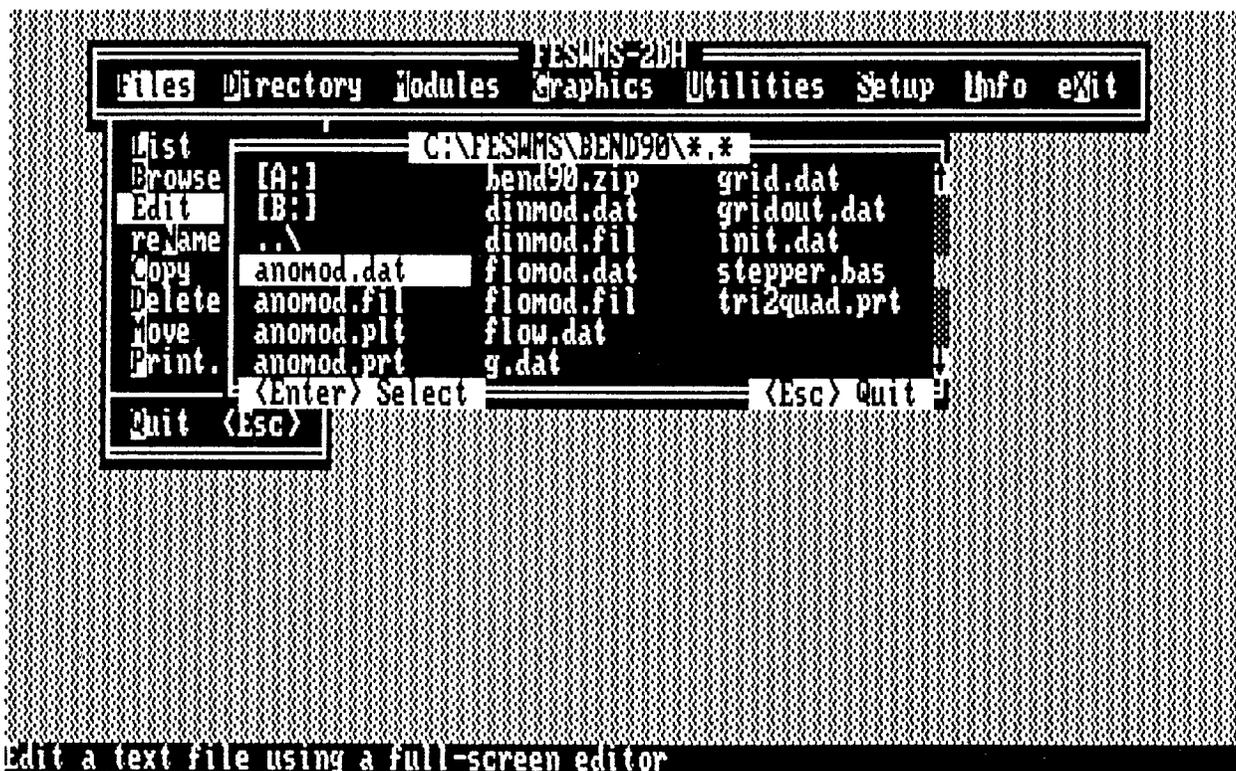
FILE BROWSER COMMANDS

Browser key commands are described below:

Function	Single Key	Multiple Keys
Scroll window left one column	<Left>	<Ctrl-S>
Scroll window right one column	<Right>	<Ctrl-D>
Scroll window left 10 columns	--	<Ctrl-Left> or <Ctrl-A>
Scroll window right 10 columns	--	<Ctrl-Right> or <Ctrl-F>
Scroll window to column 1	<Home>	<Ctrl-Q><S>
Scroll to end of the longest line	<End>	<Ctrl-Q><D>
Scroll window up one page	<PgUp>	<Ctrl-R>
Scroll window down one page	<PgDn>	<Ctrl-C>
Scroll to beginning of the file	--	<Ctrl-PgUp> or <Ctrl-Q><R>
Scroll to end of the file	--	<Ctrl-PgDn> or <Ctrl-Q><C>
Scroll to a specified line	--	<Ctrl-J><L>
Scroll window up one line	<Up>	<Ctrl-E> or <Ctrl-W>
Scroll window down one line	<Down>	<Ctrl-X> or <Ctrl-Z>
Load a new file	<F3>	--
Mark the top-most line in the window as the start of a block	<F7>	<Ctrl-K>
Mark the top-most line in the window as the end of a block	<F8>	<Ctrl-K><K>
Mark the bottom-most line in the window as the end of a block	--	<Ctrl-B><K>
Jump to beginning of marked block	--	<Ctrl-Q>
Jump to end of marked block	--	<Ctrl-Q><K>
Toggle the display of marked blocks on/off	--	<Ctrl-K><H>
Write currently displayed block to a file	--	<Ctrl-K><W>
Print the currently displayed block	--	<Ctrl-K><P>
Find a specified text string	--	<Ctrl-Q><F>
Repeat last text-string search	--	<Ctrl-L>
Set a text marker at the start of the line at the top of the window	--	<Ctrl-K><#>; # = 1..10
Jump to a specified text marker	--	<Ctrl-Q><#>; # = 1..10
Toggle between ASCII/hex text modes	--	<Ctrl-H> or <Alt-H>
Toggle tab expansion on/off	--	<Ctrl-Q><T>
Quit browsing	<Esc>	<Ctrl-Break>

FILE EDITING

The text editor allows entry and modification of information in a file that can be stored for later use and/or further modification. Text refers to a sequence of characters and/or lines that are being edited. Depending on the context, the term *file* may refer to a physical file stored on a disk or to the text of a file that is being edited. A number of commands are available for moving about and editing a file. When the Edit function is selected, a popup window will appear in which you are prompted for the name of the file you want to edit. The default file name is the search mask "*./*", which will be used in a subsequent directory file list if you do not enter the name of an existing file or a different search mask. To edit the file or obtain a directory listing press <Enter>. Press <Esc> if you want to terminate (quit) the function.



THE WALL STREET JOURNAL



Dave Carpenter...

“Brigsley, we don’t use white-out on the computer screen.”

FILE EDITOR COMMANDS (CONTINUED)

Function	Single Key	Multiple Keys
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File Commands

Save the file then continue editing.	<F2>	<Ctrl-K><S>
Load a new file; if the current file has been modified the user will be asked if he wants to save it.	<F3>	--
Quit editing; ignore any changes made to the text.	--	<Ctrl-K><Q>
Save the current file then load a new file	--	<Ctrl-K><D>
Save the current file under a different name	--	<Ctrl-K><N>
Save the file then quit	<F10>	<Ctrl-K><X>

Block Commands

as the start of a block	<F7>	<Ctrl-K>
Mark the top-most line in the window as the end of a block	<F8>	<Ctrl-K><K>
Mark the bottom-most line in the window as the end of a block	--	<Ctrl-B><K>
Jump to beginning of marked block	--	<Ctrl-Q>
Jump to end of marked block	--	<Ctrl-Q><K>
Toggle the display of marked blocks on/off	--	<Ctrl-K><H>
Write currently displayed block to a file	--	<Ctrl-K><W>
Write currently displayed block to the printer	--	<Ctrl-K><P>
Find a specified text string	--	<Ctrl-Q><F>
Repeat last text-string search	--	<Ctrl-L>
Set a text marker at the start of the line at the top of the window	--	<Ctrl-K><#>; # = 1..10
Jump to a specified text marker	--	<Ctrl-Q><#>; # = 1..10
Toggle between ASCII/hex text modes	--	<Ctrl-H> or <Alt-H>
Toggle tab expansion on/off	--	<Ctrl-Q><T>

FILE EDITOR COMMAND HELP

Help for File Editor Commands can be obtained by pressing <F1> (that is, the F1 key). The window that appears on the screen displays command function groups. Move the highlight bar to the group that is related to what you want to do and press <Enter> to obtain a detailed listing of the commands within that function group.

```

Line: 1      Column: 1      54% Insert: On  Indent: On  Word wrap: On
SAMS
Alexander Creek @ SH-10 near St. Francisville, Louisiana
  2  3  1  0  0  1  0  1  0
PLOT
Alexander Creek
  0  0
    .250 .0 Editor Commands == <Enter> Select
    .000 .0 Cursor Movement Commands .000
ELEM
  1  1  2  Insert and Delete Commands
  2  3  4  File Commands
  3  5  6  Block Commands
  4  7  8  Text Search and Replace Commands
  5  9  10 Text Marker Commands
  6  11 12 Mode Toggles and Option Setting Commands
  7  13 14 Miscellaneous Commands
  8  15 16 Keys: ↑ ++ PgUp PgDn == <Esc> Quit
  9  17 18 17 26 56 55 54 28 27 4 0
 10 19 18 19 24 58 57 56 26 25 4 0
 14 58 59 21 22 60 59 58 24 23 4 0
 15 56 57 58 64 73 74 76 75 65 4 0
 16 54 55 58 75 76 77 0 0 0 4 0
 17 52 53 56 77 76 112 111 79 78 4 0
      54 79 111 110 109 81 80 4 0
  
```

FILE EDITOR COMMAND HELP — CURSOR MOVEMENT COMMANDS

The cursor movement command screen is shown below.

Line: 1		Column: 1		54%		Insert: On		Indent: On		Word wrap: On		
SWMS		Cursor Movement Commands										
Alexan		Function	Single Key	Multiple Keys								
2		-----										
PLOT		Move left one character	<Left>	<Ctrl-S>								
Alexan		Move right one character	<Right>	<Ctrl-D>								
0		Move left one word	--	<Ctrl-Left> or <Ctrl-A>								
		Move right one word	--	<Ctrl-Right> or <Ctrl-F>								
		Move to next tab stop	<Tab>	<Ctrl-I>								
ELEM		Move to beginning of line	<Home>	<Ctrl-Q><S>								
1		Move to end of line	<End>	<Ctrl-Q><D>								
2		Move up one line	<Up>	<Ctrl-E>								
3		Move down one line	<Down>	<Ctrl-X>								
4		Scroll up one line	--	<Ctrl-W>								
5		Scroll down one line	--	<Ctrl-Z>								
6		Scroll up one page	<PgUp>	<Ctrl-R>								
7		Scroll down one page	<PgDn>	<Ctrl-C>								
8		Move to top of window	--	<Ctrl-Home> or <Ctrl-Q><E>								
9		Move to bottom of window	--	<Ctrl-End> or <Ctrl-Q><X>								
10		Move to beginning of file	--	<Ctrl-PgUp> or <Ctrl-Q><R>								
14		Move to end of file	--	<Ctrl-PgDn> or <Ctrl-Q><C>								
15		Move to a specified line	--	<Ctrl-J><L>								
16		Press any key...										
17		52	53	54	79	111	110	109	81	80	4	0

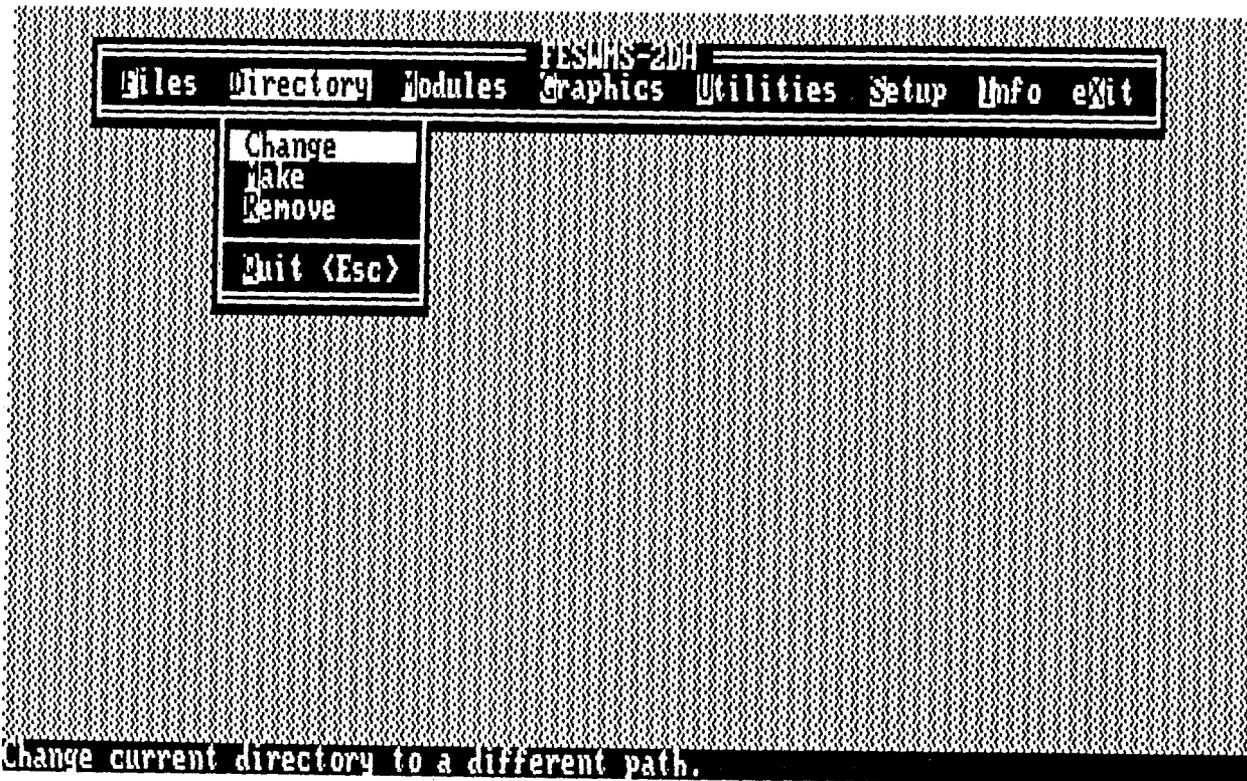
FILE PRINTING

Files can be sent to the DOS print spooler using the Submit function in the Files-Print Menu. However, the DOS print spooler needs to be installed first by executing PRINT.COM before running the FESWMS-2DH System Control Program. Printing of a file can be stopped using the Cancel function of the Files-Print Menu.



FESWMS-2DH DIRECTORY MANAGEMENT

A directory is a subdivision of a floppy or hard disk and provides a convenient way to organize your files. In this way, a directory acts much like a file drawer that holds manila file folders. All of the folders that deal with a certain subject may be placed in a single drawer. The directory on a disk is just like that drawer. On your computer it will be convenient to make a directory that will hold all of the files related to a single project. That way you will not become confused by a large number of files in a single directory, and you will have less of a problem naming files. Directories can even be created within a directory, these become *subdirectories*, and provide even more opportunity to organize the files you create. Using the directory management functions provided by the menu, you can move from directory to directory, create a new directory, or remove an existing directory.



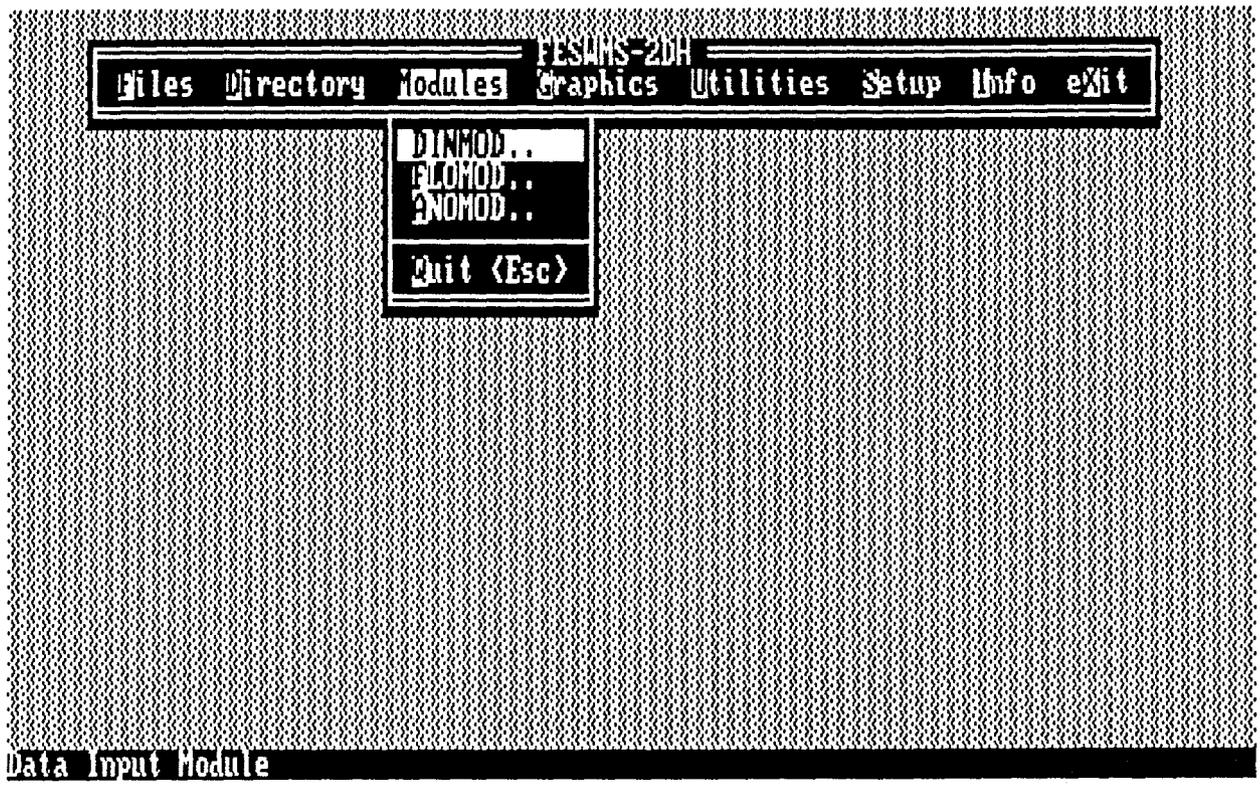
FESWMS-2DH DIRECTORY MANAGEMENT (CONTINUED)

If you want to change from one directory to another, you can enter the directory name or you can just press <RETURN> to obtain a tree-like diagram of the directory structure on your disk. You can move the highlighted cursor through the tree to the directory of your choice. Press <RETURN> to move to that directory, or just press <Esc> to terminate the directory change operation.

```
Files Directory Modules Graphics Utilities Setup Info exit
Directory Selection
fanflo
fanncce
fanzip
feswms
flomod
alex
  without
  spur150
  spur100
manual
anomod
notes
sys386
island
dinmod
utils
utility
test1
tp55
doc
glp
opro
oprohonu
oprodemo
oproobj
s&etools
tpu
tpz
turbo3
utils
ce541
wp51
xsprop
hec1
spower
dams
<Enter> Select  <Esc> Quit
Change current directory to a different path.
```

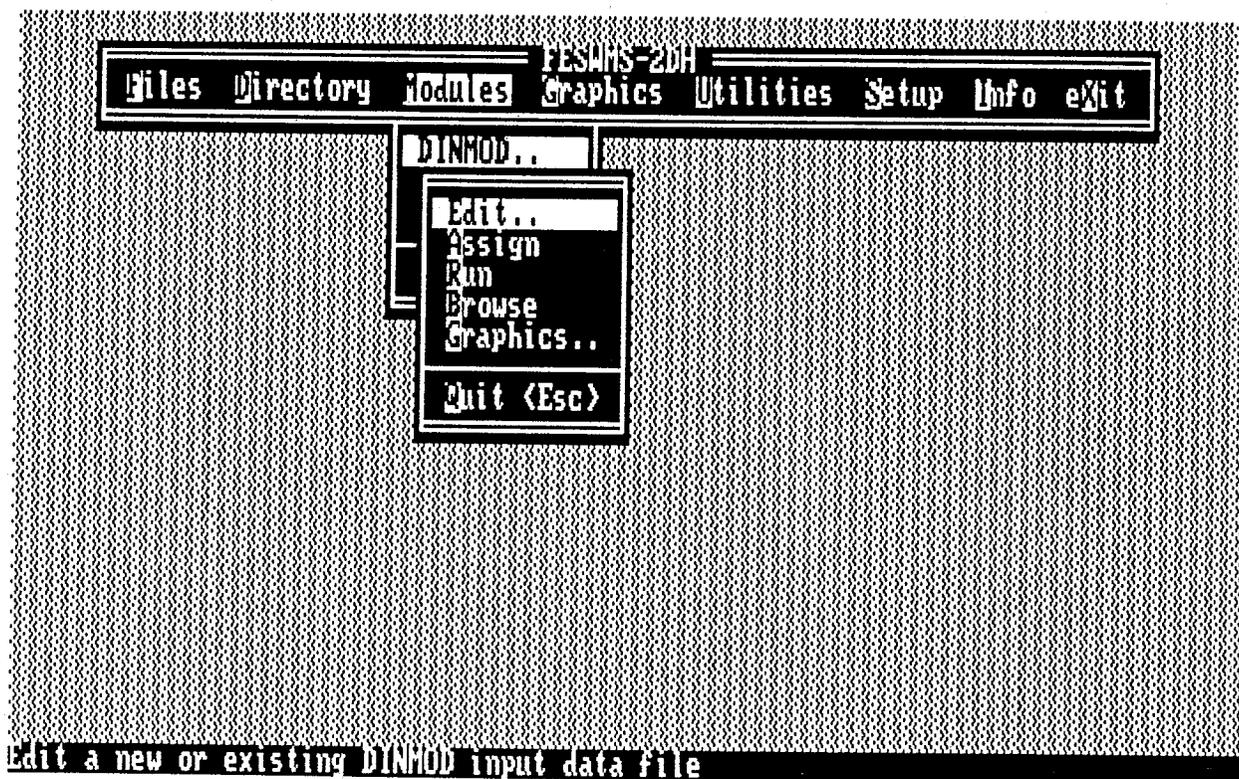
FESWMS-2DH MODULES

FESWMS-2DH Modules can be accessed from the Modules Menu. A submenu is provided for each module from which all aspects of module operation can be controlled.



FESWMS-2DH MODULES (CONTINUED)

All aspects of module operation are controlled from the module submenu including creation/editing of input data files, module execution, browsing of printed output files, and display of graphic output.



FILE EDITING

Two types of file editing programs are available for each FESWMS-2DH module. The first type is called a Data File Editor. This is a program that allows you to enter data for a file and provides a prompt, a description, and the allowable range of each data item. It's not fancy but it works. The second program is just the full-screen file editing program described previously. You can edit a data file but you will probably need to consult the Users Manual to make sure you are entering the correct value in the correct place.



DATA-FILE EDITORS

Data-File Editors are interactive input data file editing programs that can be used to create a new input data file or edit an existing input data file. The programs operate very simply, prompting for each data item and, eventually, writing all the data to the input file in the required format. For each data item, the range of values that will be accepted and any defaults are displayed along with a description of that data item. Although it will be tempting to edit an input data file using the full-screen editor, the data-file editing programs will help avoid entry of incorrect data or modification of the wrong data item.

```
Reading \FESWMS\DINMOD\DINDFE.MES...
```

```
DINMOD Data File Editor -- Version 2.01
```

```
-----  
[1] Create a new DINMOD Input Data File  
[2] Edit an existing DINMOD Data File  
[0] Exit program  
-----
```

```
Option number?
```

```
1
```

```
DINMOD Data Set Input/Edit Options:
```

```
-----  
[1] SWMS - Program control data  
[2] PLOT - Plot control data  
[3] ELEM - Element data  
[4] NODE - Node data  
[5] INTE - Node interpolation data  
[6] AUTO - Automatic grid generation data  
[7] RESE - Element resequencing data  
[0] End data set input/edit  
-----
```

```
Option number?
```

```
0
```

FULL-SCREEN EDITOR

When the full-screen editor is accessed from a module submenu, the name of the assigned input data for that module is automatically supplied as the default file name. To edit a different file, simply begin typing that file name (the default file name will disappear when you press the first key and will be replaced by the name of the file being typed). Or simply press <Spacebar> to erase the default file name then press <Enter> to obtain a file listing from which a file can be selected for editing.



FILE ASSIGNMENT

Names of input data and output data files need to be assigned before running a module. If they are not assigned, default file names will be assumed. In fact, because a number of files may be created for a single simulation, it may be a good idea to retain the default file names. If you develop variants of a particular model, simply place all the files for that variant in a dedicated subdirectory. File names are written to a file having the suffix .FIL that is placed in the directory where you are working. When a module is executed, it first looks for this file to find specified input/output files. If the file is not found, default file names are assumed.

The screenshot displays the FESAMS-2DH software interface. At the top, a menu bar contains the following options: Files, Directory, Modules, Graphics, Utilities, Setup, Info, and Exit. The 'Modules' menu is open, showing a list of options: Exit.., Assign, Run, Browse, and Graphics.. The 'Assign' option is currently selected. Below this, a window titled 'DINMOD I/O File Assignment' is displayed. This window contains the following text:

Input data file.....	DINMOD.DAT
Printed output file.....	DINMOD.PRT
Input network data file.....	GRID.DAT
Output network data file....	GRID.DAT
Graphic output file.....	DINMOD.PLT

At the bottom of the window, it says '<Enter> Accept' on the left and '<Esc> Quit' on the right. Below the window, a status bar reads 'Assign DINMOD input/output file names'.

EXECUTING A MODULE

To execute a module, move the highlight bar to "RUN" and press <Enter>. You will be prompted to make sure to really want to run the program. The SCP executes to program as a child process but first swaps out of memory everything except about 7 kilobytes of code. Hence, you have nearly all available memory for use to run the module from within the SCP.



GRAPHIC DISPLAY OF OUTPUT

FESWMS-2DH graphic output is stored in a file referred to as a "plotfile" which have the file extension ".PLT". Graphic output stored in a plotfile can be displayed on three types of devices:

- (1) A PC screen
- (2) A printer
- (3) A plotter

Make sure you have assigned the correct printer and plotter settings in the Setup section of the main menu. Screen dimensions need to be specified to obtain an undistorted screen plot.

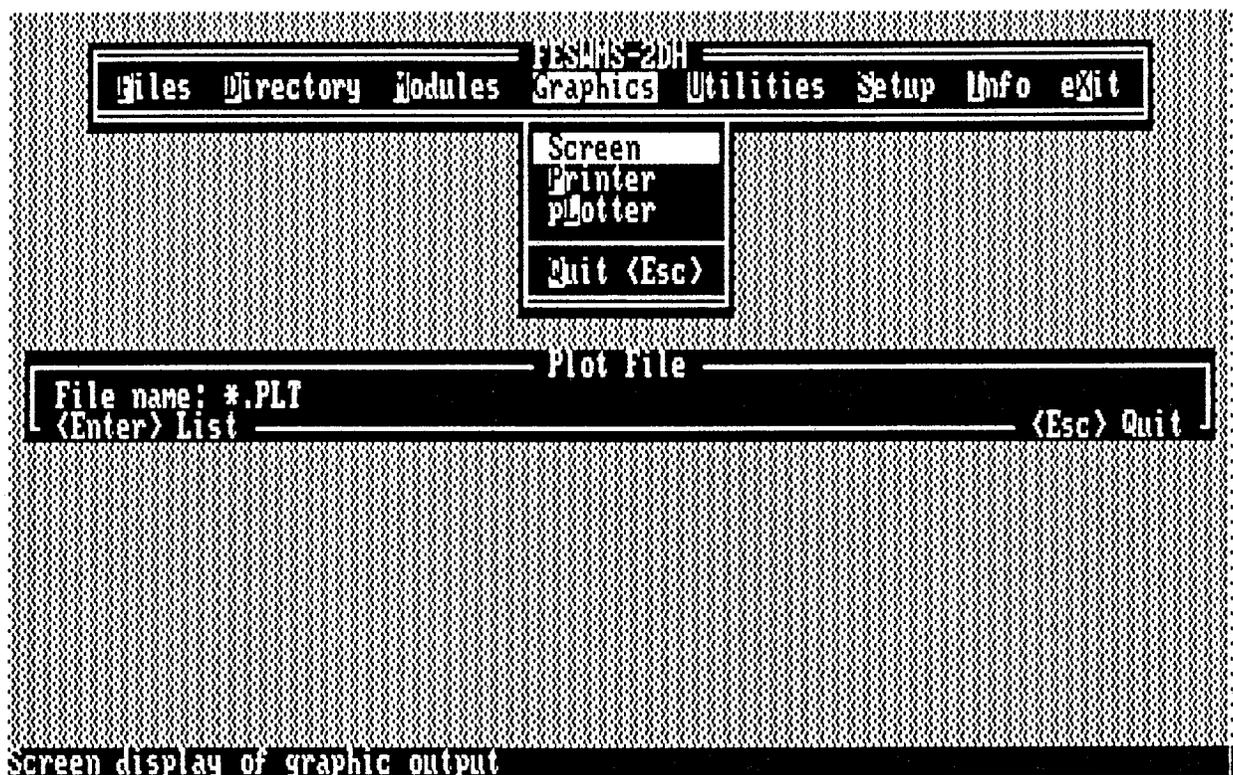


FESWMS-2DH GRAPHICS

FESWMS-2DH graphic output is stored in a file referred to as a "plotfile" which have the file extension ".PLT". Graphic output stored in a plotfile can be displayed on three types of devices:

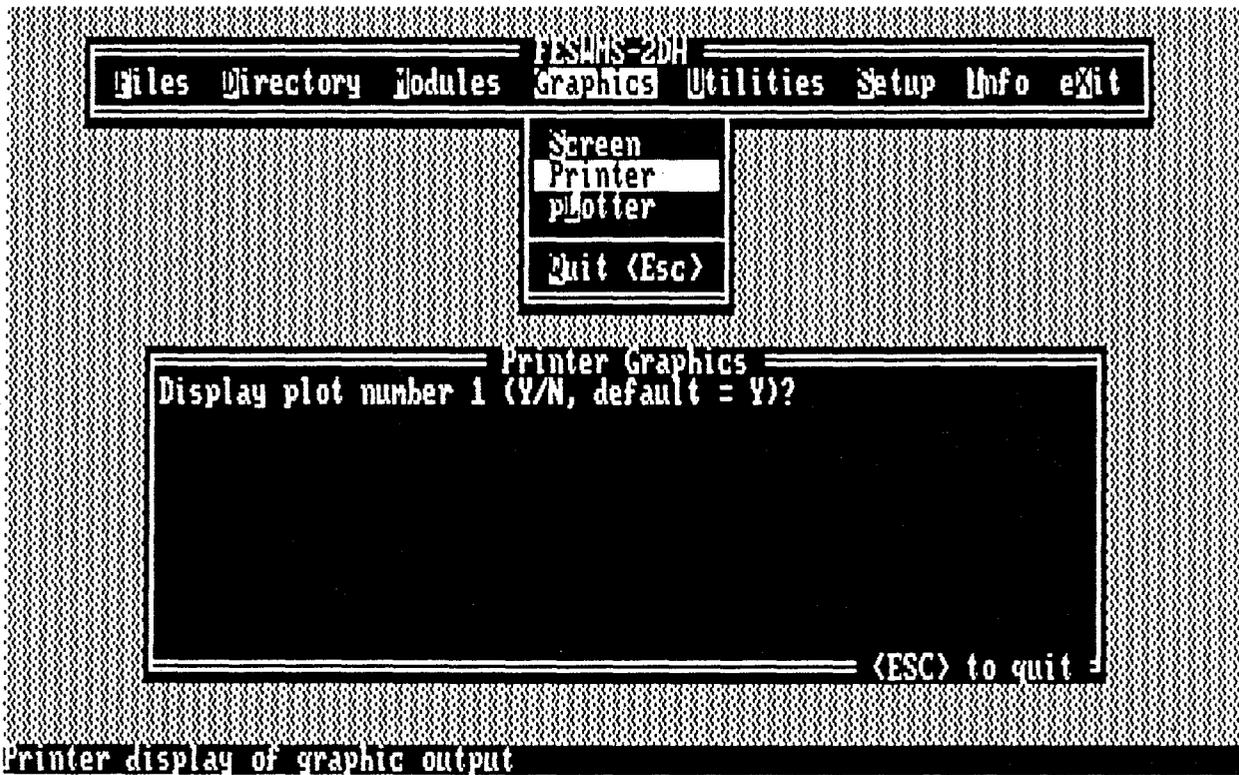
- (1) A PC screen
- (2) A printer
- (3) A plotter

When a device is selected by pressing <Enter>, the file name mask "*.PLT" is displayed. Just press <Enter> to obtain a list of all plot files from which the file to be displayed can be selected. A file list will not be presented if the name of a plotfile is typed at the file name prompt.



PRINTER GRAPHICS

Each plotfile can contain several plots. The program cycles through a plotfile and will prompt you at the start of each to make sure you really want to see that plot. You will be asked to specify X and Y coordinate offsets (in inches), and a plot scale factor. The plot is shifted left or right (X coordinate) and up or down (Y coordinate) according to the offsets, and each coordinate is multiplied by the scale factor.



PRINTER GRAPHICS (CONTINUED)

The plotfile instructions are displayed in the window shown as they are sent to the printer. When all instructions have been sent to the printer it make take a little while for the plot to be printed, even on a laser printer. So please be patient. Also, because of memory limitations, a plot that has a large amount of "dark" space may not be able to be printed at a high resolution. If this is the case, you may be able to print it at a lower resolution, or you can print it in small pieces at the high resolution.

The screenshot shows a software interface with a menu bar at the top containing: Files, Directory, Modules, **FESAMS-2DH**, Graphics, Utilities, Setup, Info, and exit. Below the menu bar is a sub-menu with options: Screen, **Printer**, Plotter, and Quit <Esc>. The main window displays a list of printer instructions:

```
Printer Graphics
Instruction #501: PD8168,1532;
Instruction #502: PU10210,1532;
Instruction #503: PD10210,2042;
Instruction #504: PD8168,2042;
Instruction #505: PU98016,33693;
Instruction #506: PU99037,0;
Instruction #507: IP;
Ejecting page. Please be patient...
Display plot number 2 (Y/N, default = Y)?
```

At the bottom right of the window, it says "<ESC> to quit =". Below the window, the text "Printer display of graphic output" is visible.

UTILITIES

A few utility functions are available in the SCP. These utilities include a popup calculator, a monthly calendar, a program that condenses a finite element network by removed unused node and/or element numbers (GRIDPACK), and a program that combines adjacent triangular elements to form a quadrilateral element if all of a number of conditions are satisfied (TRI2QUAD).



UTILITIES — CALCULATOR AND CALENDAR

FESAMS-2DH

Files Directory Modules Graphics UTILITIES Setup Info exit

Calculator
calendar
Quit <Esc>

Calculator

Float _____ Saved 0

Commands _____

Clear Entry Binary Decimal Hex Float exit
Save Insert And Mod Not Or Xor shl srl
<Esc> Quit

A calculator with five modes of operation

FESAMS-2DH

Files Directory Modules Graphics UTILITIES Setup Info exit

Calculator
calendar
Quit <Esc>

March 1991						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
24	25	26	27	28	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

<Esc> Quit

Quit <ESC> Month <PgUp>, <PgDn> Year <^PgUp>, <^PgDn> Today <^Home>

FESWMS-2DH SETUP

Parameters related to the PC screen, printer, plotter, and graphics tablet, and user-specified file browsing and editing programs can be defined in the Setup function. Setup needs to be done the first time FESWMS-2DH is run. Entered information is then stored in the file FESWMS.CFG which is created in the FESWMS program directory. Once created, the file FESWMS.CFG is read each time the system control program is executed. Parameters or program names can be changed at any time by respecifying the values or names.



SCREEN SETUP

Two screen parameters need to be specified: (1) The screen width, in inches, and (2) the screen height, in inches. These dimensions are used to scale plotted output so that it appears in the proper proportions when displayed on the screen. The screen dimensions can be determined by simply measuring the width and height of the menu screen.



PRINTER SETUP

Several printer parameters need to be specified including the following: (1) Printer type; (2) the port to which the printer is connected (LPT1, LPT2, or LPT3); (3) the plot resolution (LOW, MEDIUM, or HIGH); (4) the plot orientation (PORTRAIT or LANDSCAPE); (5) printed page width, in inches; and (6) printed page height, in inches. Items denoted by a heart (for example, printer type) are selected from a pick list that will automatically appear on the screen when the highlight bar is moved to that item. Items denoted by a triangle are selected by pressing the <Space> bar to cycle through a list of choices. A choice is not accepted until the <Enter> key is pressed.

```
Files Directory Modules Graphics Utilities Setup Info exit
Printer Setup
♥Printer type: Hewlette-Packard LaserJet
▶Printer port: LPT1
▶Plot resolution: LOW
▶Plot orientation: PORTRAIT
Page width: 8.00
Page height: 10.50
♥ = pick list    ▶ = <Space> for choices
<Enter> Accept  == <Esc> Quit ==
Screen Printer
pLotter
tAblet
sYstem
Quit <Esc>
Specify printer parameters
```

PRINTER TYPES

The printer types supported for graphic output are defined in the printer pick list that is displayed automatically when the highlight bar is on printer type. Dot matrix printers and laser printers are both supported (including the Hewlette-Packard DeskJet printer). If your printer does not appear on the list (there is a good chance of this because of the many different printers that are available), select the printer that you think most closely resembles yours. Many printers accept the Epson printer control commands so if your printer is not on the list you should select one of the Epson models. Try the generic Epson 9-pin selection if you have a 9-pin dot-matrix printer that does not appear on the list, or try the Epson LQ selection if you have a 24-pin dot-matrix printer that does not appear on the list. Most laser printers not manufactured by Hewlette-Packard do accept the HP laser printer control commands. Hence, if you have a non-HP laser printer, try the Hewlette-Packard LaserJet selection.

```
Files Directory Modules FESAMS-2DH Graphics Utilities Setup Info exit
Printer Setup
Printer type: Hewlette-Packard LaserJet
Printer port: LPT1
Plot resolution: LOW
Plot orientation: PO
Page width: 8.00
Page height: 10.50
v = pick list      > =
<Enter> Accept

Printer List
Generic Epson 9-pin
Epson MX
Epson RX
Epson FX
Epson EX
Epson LX
Epson LQ
IBM 9-pin ProPrinter
IBM QuietWriter
NEC 24-pin
Panasonic 1092i
Toshiba 24-pin
Hewlette-Packard LaserJet
Hewlette-Packard DeskJet
<Enter> Select = <Esc> Quit

Screen
Printer
Plotter
Tablet
System
Quit <Esc>

Specify printer parameters
```

PLOTTER SETUP

Several plotter parameters need to be specified including the following: (1) Plotter type; (2) the port to which the plotter is connected (LPT1, LPT2, LPT3, COM1, or COM2); (3) the baud rate setting of your plotter; (4) the parity setting of your plotter (ODD, EVEN, or NONE); (5) the stop bit setting of your plotter (1 or 2); the data bit setting of your plotter (7 or 8); and the X and Y coordinates of the location of the plot origin (these values are usually zero). Items denoted by a heart (for example, plotter type) are selected from a pick list that will automatically appear on the screen when the highlight bar is moved to that item. Items denoted by a triangle are selected by pressing the <Space> bar to cycle through a list of choices. A choice is not accepted until the <Enter> key is pressed.

```
Files Directory Modules Graphics Utilities Setup Info Exit
Plotter Setup
♥Plotter type: Hewlette-Packard (HPGL)
▶Plotter port: COM2
▶Baud rate: 9600
▶Parity: NONE
▶Stop bits: 1
▶Data bits: 8
Origin X coordinate: 0.00 inches
Origin Y coordinate: 0.00 inches
♥ = pick list    ▶ = <Space> for choices
<Enter> Accept  <Esc> Quit
Screen Printer
Plotter
Tablet
Utilities
Quit <Esc>
Specify plotter parameters
```

PLOTTER TYPES

The plotter types supported are identified in the plotter pick list that is displayed automatically when the highlight bar is on plotter type. If your printer does not appear on the list (there is a good chance of this because of the many different plotters that are available), select the plotter that you think most closely resembles yours. Many plotters accept the Hewlette-Packard Graphics Language (HPGL) commands, so if your plotter is not on the list you should select the Hewlette-Packard plotter and see if it will interpret the HPGL commands that will be sent to it.

```

FESANS-2DA
Files Directory Modules Graphics Utilities Setup Info exit
Plotter Setup
Plotter List
Hewlette-Packard (HPGL)
<Enter> Select = <Esc> Quit
Screen Printer
Plotter
Tablet
System
Quit <Esc>
v = pick list > = <Space> for choices
<Enter> Accept <Esc> Quit
Specify plotter parameters
Plotter type: Hewlette-Packard (HPGL)
Plotter port: COM2
Baud rate: 9600
Parity: NONE
Stop bits: 1
Data bits: 8
```

SYSTEM SETUP

Two built-in features of the System Control Program (SCP) are the full-screen file editor and the file browser. You may (and probably do) have your own programs that do the same things. There are very popular *shareware* programs such as QEDIT (a super file editing program) and LIST (a nifty file listing and browsing program) that are much more powerful than the built-in functions of the SCP. If you have programs that you would like to use instead of the built-in functions you can specify them in the System Setup. Simply enter the complete path name of the file (for example, C:\UTILITIES\LIST.EXE) and this program will be executed in place of the built-in function. The file name to be edited or browsed is included in the command line.



FESWMS-2DH DEVELOPMENT INFORMATION

The screenshot shows a terminal window with a menu bar at the top containing: Files Directory Modules Graphics Utilities Setup Info exit. The title bar reads 'FESWMS-2DH'. Below the menu bar is a 'Copyright' field. The main content area is titled 'Development Information' and contains the following text: 'The current version of FESWMS-2DH is an extension of an earlier modeling system of the same name that I developed for the U.S. Federal Highway Administration. The current version has a greatly improved operational environment, printer graphics display capabilities, and a number of computational enhancements. A heat and solute transport module (HSTMOD), a sediment transport module (SEDMOD), and graphics tablet data entry capabilities will be added to the system soon. Suggestions and comments are welcome and can be sent to me at the following address: David C. Froehlich, Ph.D., P.E. University of Kentucky Department of Civil Engineering Lexington, Kentucky 40506-0046'. At the bottom right of the main area is a 'Press any key...' prompt. The bottom left of the terminal window shows the text 'FESWMS-2DH development information'.

```
FESWMS-2DH
Files Directory Modules Graphics Utilities Setup Info exit
Copyright
Development Information
The current version of FESWMS-2DH is an extension of an
earlier modeling system of the same name that I developed
for the U.S. Federal Highway Administration. The current
version has a greatly improved operational environment,
printer graphics display capabilities, and a number of
computational enhancements. A heat and solute transport
module (HSTMOD), a sediment transport module (SEDMOD),
and graphics tablet data entry capabilities will be added
to the system soon. Suggestions and comments are welcome
and can be sent to me at the following address:

David C. Froehlich, Ph.D., P.E.
University of Kentucky
Department of Civil Engineering
Lexington, Kentucky 40506-0046

Press any key...
FESWMS-2DH development information
```

EXITING THE SYSTEM CONTROL PROGRAM

There are two ways of exiting the System Control Program. The first way is by completely terminating execution of the program. The program will be removed from memory and you will find yourself back in DOS. The second way is by temporarily *shelling* from the SCP to DOS. You can then do whatever you want to in DOS provided you have enough memory (remember that the SCP program is still in memory). When you are ready just type "exit" to return to the SCP. Of course, you could have simply terminated the program and then executed it again. But it takes a few seconds longer to restore the program to memory. So, if you just want a quick temporary exit from the SCP and then a quick return, just "shell" from the program and type "exit" to return.

