Part 1 – Getting Started

INCLUDES:

INTRODUCTION, INSTALLATION, PRINTER SUPPORT

RUNNING DIPS, USING THE MENU SYSTEM

QUICK START TUTORIAL

Introducing DIPS

DIPS is a package designed for the interactive analysis of orientation based geological data. The program is a tool kit capable of many different applications and is designed both for the novice or occasional user, and for the accomplished user of stereographic projection who wishes to utilise more advanced tools in the analysis of geological data.

The DIPS package allows the user to analyse and visualise structural data following the same techniques used in manual stereonets. In addition, many computational features are available, such as statistical contouring of orientation clustering, mean orientation calculation and qualitative and quantitative feature attribute analysis.

With DIPS 4.0 several new utility programs are now supplied, including:

- DEDIT — a DIPS file editor
- DIPCAD — a DIPS–AutoCAD mapping utility, to facilitate input of joint traces on plan (horizontal) drawings in AutoCAD
- DATAVIS — a new utility which allows the user to create a contoured stereonet plot of any oriented data set (arbitrary scalar **data** vs. orientation **vis**ualization).

For a full description of these, see the last chapter (DIPS Utilities) of Part 2 (Reference Manual).

DIPS has been designed for the analysis of features related to the engineering analysis of rock structures, however, the free format of the DIPS data file permits the analysis of any orientation based data.

Layout of DIPS Manual

The DIPS manual is laid out in **THREE** sections:

Part 1 – Getting Started (this section) which includes 1) introduction, installation notes, etc. 2) a Quick Start tutorial for a quick tour of DIPS.

Part 2 – Reference Manual which includes chapters on 1) the DIPS DATA FILE, 2) USING THE ADVANCED VERSION OF DIPS (which describes all of the features available in DIPS), and 3) DIPS UTILITIES.

Part 3 – Tutorial Manual which consists of three tutorials illustrating the more advanced features of DIPS, and various types of analyses which can be performed. The tutorials use files which are supplied with DIPS, and which you will find in the \EXAMPLES subdirectory.

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Disclaimer

The authors disclaim any responsibility for the correctness of the data generated by the DIPS package, or for the consequences resulting from the use thereof. Any use or misuse of this package is the sole responsibility of the user.

Hardware Support

DIPS supports the following hardware:

- IBM PC/XT/286/386/486/Pentium or compatible
- Graphics Display Adapters:
  Video Graphics Array (VGA)
  Enhanced Graphics Adapter (EGA)
  Colour Graphics Adapter (CGA)
  Hercules Monochrome Display Adapter
  ATT 400 Series, Compaq Plasma
  VESA Super VGA
- Microsoft or Logitech Mouse and compatibles (not required)
- 80x87 math coprocessor (not required)
- Printers:
  HP Laserjet, Laserjet III, Laserjet IV
  HP Paintjet, Paintjet XL, Paintjet XL300
  HP Deskjet, Deskjet 1200C
  Epson 9 and 24 Pin

Suggested minimum configuration:

80386 / VGA / 80387 / Mouse

Hard Disk Installation Procedure

DIPS is distributed with a simple installation program. To install DIPS, insert the DIPS disk into the A: or B: drive. Switch to that drive and type `INSTALL`.

Example Installation Process (installed from the A: disk drive)

C:\> `a:`

A:\> `install`

For a "QUICK TOUR" of DIPS, see the Quick Start Tutorial at the end of Part 1– Getting Started

Various files and subdirectories will now be contained in your DIPS directory, including:

dips.exe	DIPS program
dips.uid	User identification file, contains registration information
dedit.exe	DIPS data file editor
dips.ico	DIPS icon for use in Microsoft Windows©
example.dip	An example data file
EXAMPLES	A directory containing DIPS example files and templates – see Part 3 (Tutorial Manual)
UTILS	A directory containing new utility programs for DIPS – see last chapter of Part 2 (Reference Man)
readme.bat	A DOS batch file for displaying readme.dps
readme.dps	Document file containing up to date information on your current version of DIPS. Please read it.

NOTE: For a "quick tour" of DIPS, see the Quick Start Tutorial at the end of Part 1 – Getting Started. *For more advanced tutorials, see Part 3 – Tutorial Manual.*

Installing DIPS to run from Windows

Once you have installed DIPS on your computer, and if you have the Microsoft Windows program, you may install DIPS so that you can run it from Windows. This is a useful option if you will be making a lot of screen captures of the program output for reports or other documents.

To add DIPS to your Windows library, follow these steps:

- Enter the Windows program.
- Enter the Program Group that you want to add DIPS to.
- Select the **File** option from the Windows Program Manager.
- Indicate that you will be installing a **New** file.
- The New Program Object window will now appear, in which you should select the **Program Item**.
- A Program Item Properties screen will appear next, in which you will enter:

Description	DIPS
Command line	The location of the DIPS program, eg. D:\DIPS\dips.exe. It is advisable to **Browse** for the program name, to ensure that the path is correct.
Working directory	You can leave this entry blank, or if you will always be working with DIPS files in a particular directory, enter the appropriate directory name.
Change Icon	You will receive a message that "No icons exist". Use **Browse** to go to the DIPS directory, and select dips.ico.

The advantage of having DIPS in the Windows library is that screen captures can be taken directly from the program to the clipboard, and from there directly into your Windows based drawing or word processing package. To initiate the capture of a DIPS screen, press the **Alt** and **Print Screen** keys simultaneously. Next press **Alt** and the **Tab** keys together, to send the screen capture to the clipboard. The screen can then be imported into your word processing package directly from the clipboard. The screen capture should appear in correct video orientation, however if you have problems, the screen settings can be changed in the **SET OPTIONS** menu, using the **COLOUR/B&W** option. Further details of this procedure are given in Part 2 – Reference Manual.

Running DIPS

To run the program, type *dips* at the DOS prompt. You should see the start up screen shown in Figure 1.1.

If you wish to run DIPS from a directory other than the installation directory, you must place the DIPS directory in your path:

PATH=C:\DOS;C:\DIPS;

DIPS will automatically detect the graphics card you are using with your computer and use the mode with the highest resolution on your video card. However, a variety of command line options are available if the user wants to force the program to operate in a specific graphics mode. The syntax and command line options for DIPS are:

Syntax: DIPS [options] [filename]

Options:

/A	ADVANCED version of DIPS
/B	BASIC version of DIPS
/C	CGA mode (640 x 200) on EGA/VGA display adapters
/E	EGA mode (640 x 350) colour on VGA display adapter
/H	HERCULES (728 x 348) monochrome adapter
/M	Monochrome emulation for all display adapters
/P	Monochrome emulation for all display adapters
/I	Reverse Monochrome emulation for all display adapters
/R	Reverse Monochrome emulation for all display adapters
/T	ATT card (640 x 400) high resolution monochrome (may not be available)
/1	Super VGA (800 x 600) colour display
/V	VGA mode (640 x 480) colour display

Run DIPS with the /P command line option for black and white screen captures.

You may also choose to include a filename at the DOS prompt when running DIPS. This filename must not include a path and must follow a space after *dips*/[options]. If no filename is given you can use the **FILES** menu in DIPS to load a file.

DIPS Version: Advanced or Basic

DIPS may be run as either the full-featured ADVANCED version, or the trimmed down BASIC version.

To run the ADVANCED or the BASIC version of DIPS, the user has two options. After starting the program, use the **SET OPTIONS -> DIPS VERSION** button to toggle between the two versions (see Part 2 – Reference Manual – for details). Alternatively, use the /A or /B command line options (see above for details) to override the **SET OPTIONS->DIPS VERSION** toggle selection.

The start-up screens for the ADVANCED and BASIC versions are shown in Figures 1.1 and 1.2 respectively. Note the difference in the main menu options. A Quick Start Tutorial using the BASIC version of DIPS can be found at the end of Part 1 – Getting Started.

DIPS Utilities

With DIPS 4.0 several new utility programs are now supplied, including:

- DEDIT — a DIPS file editor
- DIPCAD — a DIPS–AutoCAD mapping utility, to facilitate input of joint traces on plan (horizontal) drawings in AutoCAD
- DATAVIS — a new utility which allows the user to create a contoured stereonet plot of any oriented data set (arbitrary scalar **data** vs. orientation **vis**ualization).

See the last chapter in Part 2 – Reference Manual for a complete description of the DIPS Utilities.

These are briefly described below – for a full description of each, see the last chapter of Part 2 – Reference Manual.

DEDIT

DEDIT is an easy to use data file editor, *specifically designed for the creation and editing of DIPS data files*. The familiar ASCII text editor format should be easy to learn, and if necessary, HELP info is available while running DEDIT.

To run DEDIT, type *dedit* at the DOS prompt, from your main DIPS directory. For more information, see the last chapter of Part 2 (Reference Manual), or run DEDIT and examine the HELP info.

DIPCAD

This utility is designed for mining or surface mapping where the "face" being mapped is horizontal and viewed from above. This is the case in horizontal surface mapping and in underground back mapping where the results are represented on a plan layout of the area being considered. Once the traces are input (back mapping) the utility automatically creates a DIPS file.

For more information, see the last chapter of Part 2 (Reference Manual), or enter the \UTILS\DIPCAD directory and type *dipcad* at the DOS prompt to view a readme file.

DATAVIS

*Arbitrary **DATA** (Scalar Value Versus Orientation) **VIS**ualization.*

This option allows the user to create a plot of any oriented data set. That is, if a grid of data is created where some value is specified at regular orientation intervals (eg. normal stress, permeability, seismic velocity, etc. as a function of orientation in space) this value can be contoured on a stereonet. DATAVIS requires the user to calculate or specify the values at fixed orientation points.

Two example DATAVIS utilities have been supplied (JOIFREQ and JOISLIP), along with their computer source code (C), to illustrate the creation of your own DATAVIS utility.

To view a readme file, enter the \UTILS\JOIFREQ or \UTILS\JOISLIP directories, and type *datavis* at the DOS prompt. Or refer to the last chapter of Part 2 (Reference Manual).

DIPS Screen Layout

When the DIPS program is first started, the screen shown in Figure 1.1 will appear. This screen shows the options available in the ADVANCED version of the program. If you have changed the **DIPS VERSION** to the BASIC option, then the screen shown in Figure 1.2 will appear.

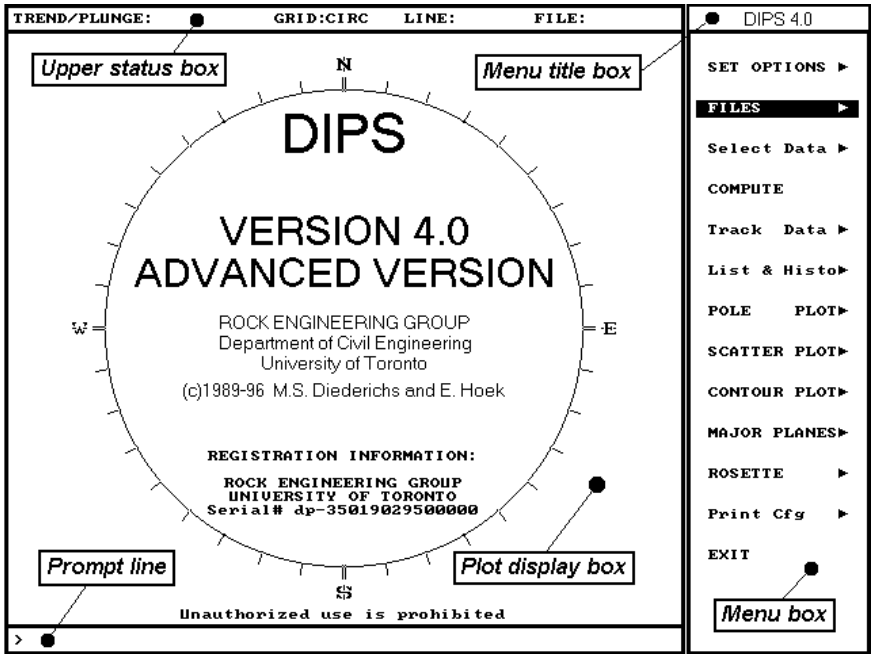


Figure 1.1: The start up screen for the ADVANCED version of DIPS.

The DIPS screen can be broken up into different display fields, as indicated in Figure 1.1. These are described below.

Upper Status Box

The Upper Status Box contains several pieces of information. To the left is the LOCATOR prompt which becomes active when using the **LOCATE POLES** or **SET WINDOWS** options in the four **PLOT** menus. When using these options, the co-ordinates corresponding to the cursor position are displayed here. GRID and LINE are flags to indicate the status of the grid and line features in **LOCATE POLES** and **SET WINDOWS** – see Part 2 (Reference Manual) for more information. On the right hand side of this box, the active FILE name is displayed.

Menu Title Box

The Menu Title Box contains the TITLE of the current menu in which you are working – in this case the DIPS main menu.

Menu Box

The options for each menu are contained in the Menu Box – the main menu is shown in Figure 1.1. Selecting any of the 'buttons' by moving the cursor to the appropriate button and pressing *Enter* or the *left mouse button*, will activate the option or take you to the submenu that it represents. This area is also used in the **FILES** menu to display filenames, and by the **Select Data** and **Track Data** options to display data column information. In these three cases this area acts like a menu and allows you to select items from a list with the cursor. Other options such as **LOCATE POLES**, **SET WINDOWS** and the various **LEGENDS** use this area for display of information.

Plot Display Box

The Plot Display Box is used for all graphical presentation of data (stereo plots and histograms), for text listing of data, and for the display of various other types of information. *Interactive graphical manipulation through the use of the cursor occurs in this area*.

Prompt Line

The Prompt Line is used for any text or numerical input required throughout the program and also contains important instructions and helpful hints as you move through the options in DIPS. When in doubt about an option, *read the prompt line*.

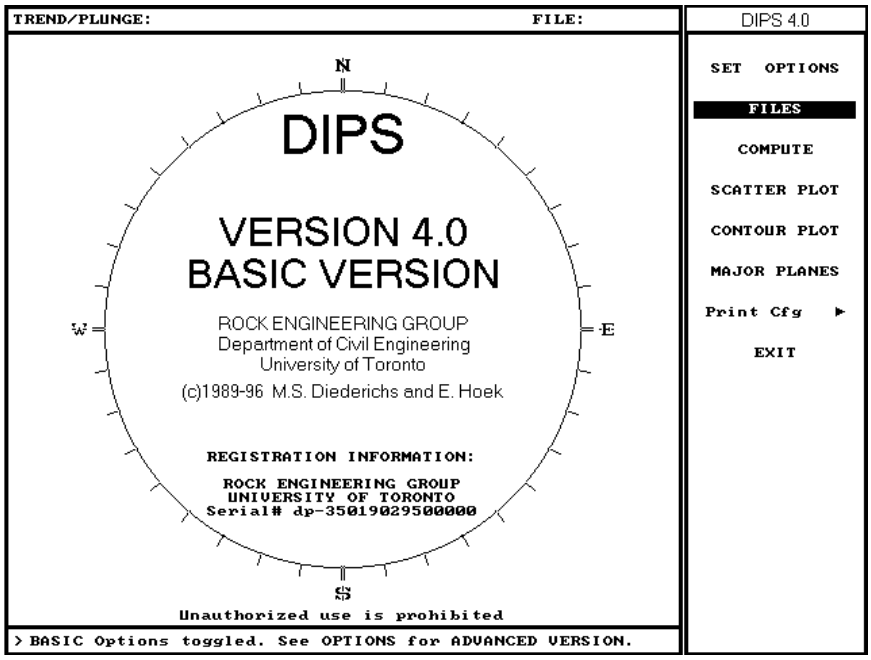


Figure 1.2: The start up screen for the BASIC version of DIPS.

Using the Menu System

DIPS uses a sidebar tree structured menuing system for user interaction. Select an option by moving the highlighted menu bar with the keyboard arrow keys or by sliding the mouse up and down until you are highlighting the option you wish to select. Now either press the *Enter* key or the *Left mouse button* to select the option.

*Use the **Home** and **End** keys, or the **right mouse button** to quickly toggle between the first and last options in a menu.*

The *Home* and *End* keys will take the menu bar to the top and bottom of a menu respectively. The *Right mouse button* will also take you immediately to either top or bottom of a menu. In addition, each sidebar menu is actually a closed loop, so that the first item in a menu can be directly accessed from the last item, and vice versa.

Selecting the **RETURN** option in each menu will return you to the previous menu. The *Esc* key and in some cases pressing both mouse buttons simultaneously will have the same effect. ***<Alt X>*** can be used to exit the program (without saving) at any stage.

*After executing a particular option you may notice that **the cursor will jump to another option in the menu**. This is to indicate the most common but not necessarily mandatory next step.*

The menu options in **CAPITAL LETTERS** are the most commonly used options. Those in **Lower Case** are less common or are more complex.

After executing a particular option you may notice that the cursor will jump to another option in the menu. This is to indicate the most common but not necessarily mandatory next step.

Moving the Cursor

At times you will be required to select or enter points within the drawing region using a selection box (cursor). Move the cursor with the mouse if you have one. Normally, the *Left mouse button* will 'select' and the *Right mouse button* will 'escape' or 'abort' from the activity in progress.

You may also use the arrow keys to move the cursor. Hold down the *Left shift* key while using the arrow keys for larger cursor jumps. Hold down the *Right shift* key to move the cursor pixel by pixel. Usually the *Enter* key is used to 'select' an option and the *Esc* key is used to 'escape' from the option in use.

More about the Mouse

*The **mouse buttons** can be used to quickly respond to prompt line questions.*

In addition to using the mouse to move and select in the Menu Box and Plot Display areas, the mouse may also be used to respond to questions posed from the Prompt Line. If one, two or three possible responses are permitted to a given question in the prompt line, the *Left*, *Right* and *Both mouse buttons* may be used in place of the *first*, *second* and *third* keyboard responses respectively. If there is a fourth possible response, the keyboard must be used for the fourth option. If the question requires an arbitrary alphabetic or numerical response, the keyboard must also be used.

Hot Keys

Two hot key combinations are available in DIPS:

Hot key

*Use the **<Alt X>** keyboard combination to exit the program immediately from any menu.*

<Alt X>	Exit DIPS immediately, from any menu, without saving.
<Ctrl P> or <Ctrl O>	Dump the screen to a printer, or PCX file. User specifies either **<*Ctrl P*>** or **<*Ctrl O*>** as the active hot key combination, in **Print Cfg** menu.

Super VGA Support

The VESA Super VGA mode 800x600, 16 colors is supported. To run the program in this mode, you may use the /1 command line parameter (i.e., dips /1), or set the environment variable SVGA to a value of 1 by placing the following line in your autoexec.bat file:

```
SET SVGA=1
```

If the program hangs in this mode, you might require a VESA driver for your display adapter to be loaded first.

Printer Support

DIPS provides an option which allows for capturing the screen to various printers, or to PCX format files. To capture a screen you must first configure the program for your printer, using the **Print Cfg** option in the main menu of DIPS. When this option is selected, a menu is displayed which allows the user to select various printer types, as well as print options.

Screen captures used in DIPS have been tested in CGA, EGA, VGA, and Super VGA 800x600 graphics modes. The following options can be toggled through their various selections and are available to the user when the **Print Cfg** option is selected:

Printer Type – This option allows the user to select the type of printer they will be using. The printers supported by DIPS are:

HP Laserjet	HP Paintjet	HP Deskjet
HP Laserjet III	HP Paintjet XL	HP Deskjet 1200C
HP Laserjet IV	HP Paintjet XL 300	Epson 9 and 24 Pin Printers

Reverse White – This option allows the user to select whether *white text* is printed as *white* or *black*. (All *images* are printed with a white background.)

Shading – This option allows users with black and white printers to print colors as shaded patterns.

Hot Key – This option allows the user to toggle between two ***hot key*** combinations, ***<Ctrl P>*** and ***<Ctrl O>.*** Pressing the ***hot key*** combination initiates the printing process to the designated printer or PCX file. When you press the hot key combination to print the screen, you will hear two "beeps" to indicate the beginning and the end of the printing process.

Orientation – This option allows you to toggle between two orientations, *landscape* and *portrait*. The portrait option prints the screen in a traditional vertical page format. The landscape option prints the screen aligned with the long axis of the page (ie. at 90° to the portrait option).

Printer Port – This option allow you to toggle between three printer ports, LPT1, LPT2, and LPT3, in order to select which port the image is to be sent to.

Beeps

When you press the hot key combination to print the screen, you will hear two "beeps" — to indicate the beginning and the end of the printing process.

When sending the image to a printer, the second "beep" may take some time, as the information is transferred from the computer to the printer.

When capturing an image to a PCX file, the second beep should immediately follow the first.

Width, Left Margin and Top Margin – These three options allow you to vary the width of the image and the spacing of the margins of the screen to be printed. Note that the width *always* refers to the width aligned to the short direction of the paper, in both the landscape and portrait orientations.

Crop Image – This useful option allows cropping and printing of any portion of the screen, by activating a window at the time the printing process is started (ie. after pressing the hot key combination). Use the mouse or the keyboard arrow keys to locate the upper left and lower right corners of the window. Enter a window corner and toggle to the opposite corner by using the *left mouse button* or *Enter* on the keyboard – this can be repeated any number of times if the location is not satisfactory. When the location of the box has been determined, hit *Esc* or the *right mouse button* to start printing the cropped image. **HINT:** The box location can be adjusted very precisely by holding down the *right shift key*, and using the *keyboard arrow keys* – this will move the edges of the box in very small (single pixel) increments.

***HINT:** The box location can be adjusted very precisely by holding down the* right shift key*, and using the* keyboard arrow keys*, to move the edges of the box in single pixel increments.*

Dump to PCX File – This option allows you to save the screen image to a file in PCX format instead of sending it to a printer. This is useful for importing graphics images into word processor documents or drawing programs.. To save an image to a file, toggle the Dump to PCX File option ON. Use the REVERSE option to capture the PCX image with a white background. To capture the image to a PCX file, press the hot key combination as you would to send the image to a printer. The file will be saved with the following preset filename format : screen?.pcx. The ? will be a number that starts at 1 and increments by 1 depending on how many PCX files already exist in the current directory – i.e. screen1.pcx, screen2.pcx, screen3.pcx etc. In some cases, programs reading in PCX files dumped with a white background, will display the background as grey. To ensure a white background, read the PCX file into a package such as Pizazz Plus for Windows, and **Save As** PCX Black & White.

*To capture an image to a PCX file, press the **hot key** combination as you would to send the image to a printer.*

*Use the **REVERSE** option to capture the PCX image with a white background.*

Hints about the Manual

- Text in **BOLD** (eg. **SET OPTIONS** or **Track Data**) in most cases indicates a sidebar menu item.
- *Italic* text is used for emphasis, and also to indicate an action to be carried out by the user (eg. press *Enter* or *F7*).
- Text enclosed by a box eg.:

> You are using the ADVANCED VERSION of DIPS. Change (Y or N)?

indicates a prompt line message, found at the bottom of the DIPS screen.

Quick Start Tutorial

This "quick start" tutorial illustrates the essential features of DIPS, using the BASIC version of the program, by working through the series of steps that must be followed to calculate and present the major planes for the data file: **example.dip.**

*This "quick start" tutorial uses the file **example.dip** and the BASIC version of the DIPS program.*

This file can be found in your main DIPS directory, and also in the \EXAMPLES subdirectory.

In this tutorial, some knowledge of stereographic projection is assumed. Detailed information about each of the options available in DIPS is provided in the reference section (Part 2) of this manual.

The DIPS program is initiated by typing the name of the program, *dips*, at the DOS prompt. The program will automatically sense the configuration of the computer and adjust to the graphics card in use. Further details of the DIPS graphics display options, which can be accessed in the command line, are discussed earlier in Part 1 – Getting Started.

The first time that you run the DIPS program, the ADVANCED version will appear on the screen. If you wish to change to the BASIC version, enter the **SET OPTIONS** menu, and toggle the **DIPS VERSION** button.

Hints about the Quick Start Tutorial

- Follow instructions such as:

  Select: FILES ➔ LOAD DATA FILE

  to navigate the sidebar menu selections.

- Text enclosed by a box eg.:

```
> You are using the ADVANCED VERSION of DIPS. Change
(Y or N)?  Press Y
```

  indicates a prompt line message, found at the bottom of the DIPS screen. The ***italic*** text at the end of the prompt line indicates a user response. The word ***Press*** indicates that pressing the indicated letter or number will immediately carry out the action. The word ***Enter*** indicates that an alphanumeric character or string is to be typed in and entered by pressing the *Enter* key. If no ***italic*** message is indicated at the end of the prompt line, this indicates that the prompt line is displayed for information purposes, and no response is necessary.

- Text in **BOLD** (eg. **MAJOR PLANES** or **SET WINDOWS**) indicates a sidebar menu item.

Running the BASIC Version of DIPS

Alternatively, use the

dips \b

command line option to run the BASIC version of DIPS

If you have not already done so, run the program by typing *dips* at the DOS prompt. If you are running DIPS for the first time, you should be running the ADVANCED version of the program. To switch to the BASIC version of DIPS, select the first item in the main menu, **SET OPTIONS**, and then the first item from the **OPTIONS** menu, **DIPS VERSION**.

Select: SET OPTIONS

Select: SET OPTIONS ➔ DIPS VERSION

```
> You are using the ADVANCED VERSION of DIPS. Change
(Y or N)?  Press Y
```

The BASIC version screen will appear.

```
> You are using the BASIC VERSION of DIPS. Change (Y
or N)?  Press N
```

This will accept the BASIC version and return you to the **OPTIONS** menu. Select **RETURN** or hit *Esc* to return to the main menu.

Select: SET OPTIONS ➔ RETURN

You are now in the main menu of the BASIC version of DIPS. See Figure 1.2 (earlier in Part 1 – Getting Started) for an illustration of this start up screen.

Note: you may also run the BASIC version of DIPS by using the \b command line option (ie. type dips\b instead of dips at the DOS prompt).

Set Options

For the quick start tutorial, the **SET OPTIONS** settings will be left at their defaults (ie. **PROJECTION** = EQUAL ANGLE , **CONVENTION** = POLE VECTOR etc.) however we will toggle the **DISTRIBUTION** to SCHMIDT.

Select: SET OPTIONS ➔ DISTRIBUTION

```
> Contour distribution type is FISHER: change(Y or N)?
Press Y
```

```
> Contour distribution type is SCHMIDT: change(Y or
N)?  Press N to accept the Schmidt distribution
```

For further information about the **SET OPTIONS** menu, see the second chapter of Part 2 (Reference Manual).

Loading a File

To load a DIPS file, select **FILES** from the main menu, and **LOAD DATA FILE** from the **FILES** menu.

Select: FILES

The prompt line will show the current directory (eg.):

```
> cur.dir=D:\DIPS40
```

Select: FILES ➔ LOAD DATA FILE

A list of files available in the current directory will now appear in the menu box. For convenience, the **example.dip** file is available from your main DIPS directory (when you installed the program). This can be seen in Figure 1.3. Use the cursor to highlight the file name (use the *mouse* or *keyboard arrow keys*), and select the **example.dip** file.

Select:

FILES ➔ LOAD DATA FILE

*Use the cursor to click on the **example.dip** file.*

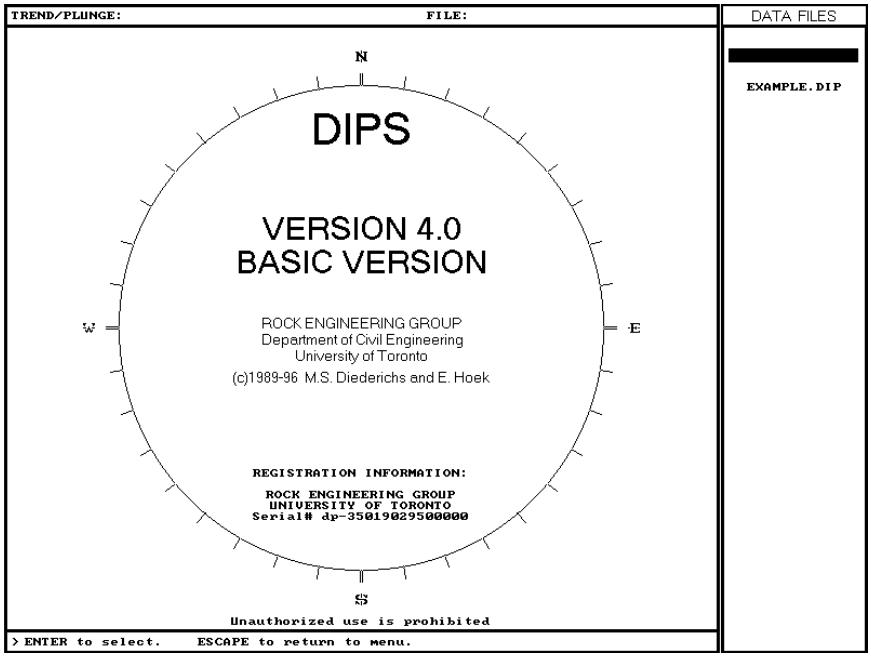


Figure 1.3: The list of files available in the current directory, in this case only the *example.dip* file .

After you have selected the file, a list of the file contents will be displayed on the screen as shown in Figure 1.4, and the cursor will jump to the **COMPUTE** button.

Compute

Before you select the **COMPUTE** option, check the summary of the file contents displayed on the screen. If everything appears correct, select the **COMPUTE** option.

Select: COMPUTE

Check the summary of the file contents on the screen.

*Select **COMPUTE.***

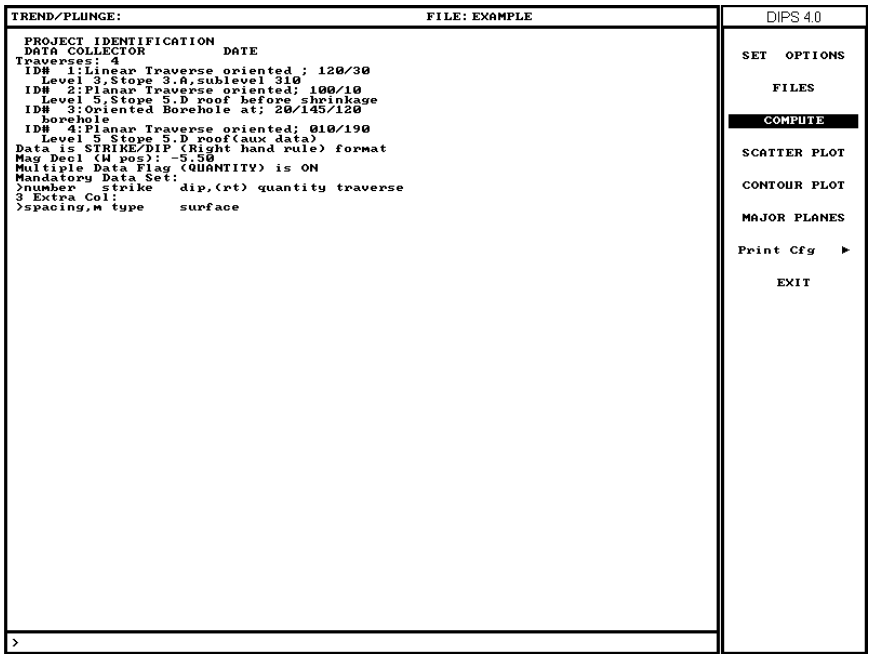


Figure 1.4: Summary of file contents displayed after loading file.

The progress of the computation is displayed in the prompt line, however, depending on your file size and computer speed, the display may flash by too quickly to read.

After **COMPUTE** has been executed, the cursor will automatically jump to the **SCATTER PLOT** button.

Create a Scatter Plot

Select the **SCATTER PLOT** button to automatically generate a scatter plot of the data, as shown in Figure 1.5. The legend at the right of the screen is displayed by selecting the **SCATTER LEGEND** button from the **SCATTER PLOT** menu.

Select: SCATTER PLOT

Select: SCATTER PLOT ➔ SCATTER LEGEND

Select:

SCATTER PLOT ➔ SCATTER LEGEND.

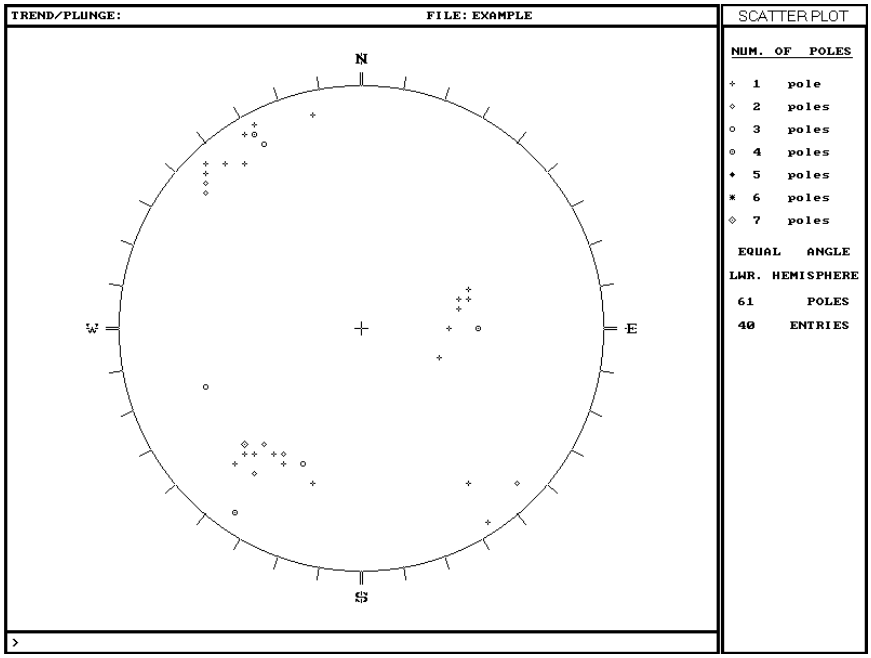


Figure 1.5: The scatter plot of the data contained in example.dip

Hit any key to return to the **SCATTER PLOT** menu. Select **RETURN** or hit *Esc* to return to the main menu.

Select: SCATTER PLOT ➔ RETURN

Create a Contour Plot

Select the **CONTOUR PLOT** button to automatically generate a contour plot of the data, as shown in Figure 1.6. The legend at the right of the screen, and the titles at top and bottom, were added by selecting the **SCREEN DUMP** button from the **CONTOUR PLOT** menu.

Select: CONTOUR PLOT

Select: CONTOUR PLOT ➔ SCREEN DUMP

The titles displayed by **SCREEN DUMP** are the first two data lines of the DIPS data file. Note that the legend provided by **SCREEN DUMP** is the same as displayed by the **CONTOUR LEGEND** option.

Return to the main menu.

Select:

CONTOUR PLOT ➔ SCREEN DUMP.

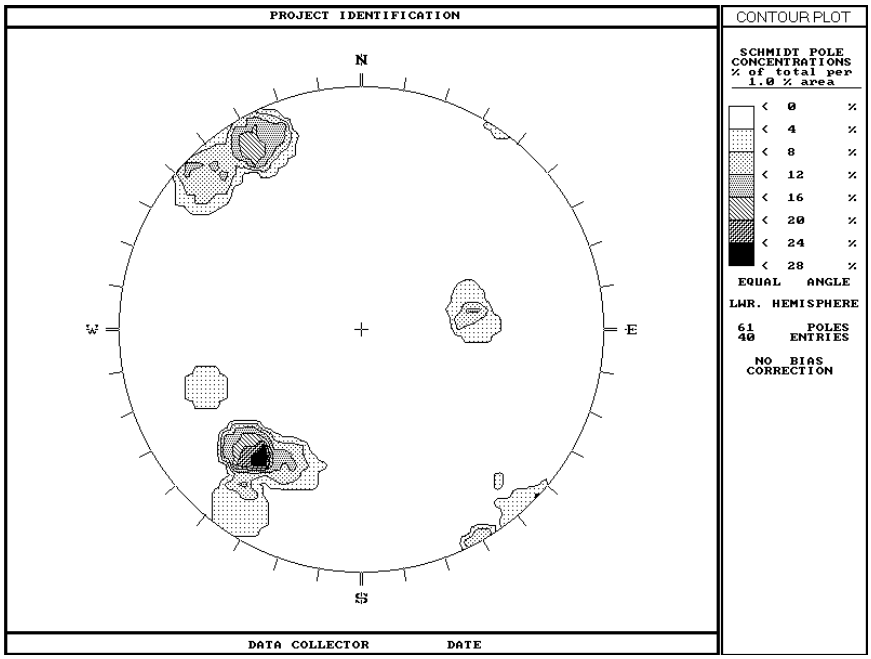


Figure 1.6: The contour plot of the data. The capture-ready screen was generated using the **SCREEN DUMP** option.

The above plot was generated using the SCHMIDT distribution, however the FISHER distribution could also have been used, by toggling the **DISTRIBUTION** option in the **SET OPTIONS** menu.

Calculate Mean Orientations using Set Windows

The **SET WINDOWS** option of **CONTOUR PLOT** is used to calculate mean poles and their corresponding planes, for clusters of data on the stereonet.

Select:

CONTOUR PLOT ➔ SET WINDOWS

Move the cursor to the first corner of the window. Press Enter or the left mouse button to establish the first corner. ***Note that the windows are always formed in a clockwise direction.***

Select: CONTOUR PLOT ➔ SET WINDOWS

To create a window, follow the directions in the prompt line. The first prompt will read:

```
> SELECT first corner of window using cursor
```

Move the cursor (which will appear in the lower left corner of the screen) to a desired location. Since the windows are generated in a clockwise direction, begin by selecting a 'counter-clockwise' corner, relative to the group of data you wish to select with the window. Press *Enter* or the *left mouse button* to establish the first corner. The next prompt (visible in Figure 1.7 below) will read:

```
> MOVE CURSOR clockwise to complete window
```

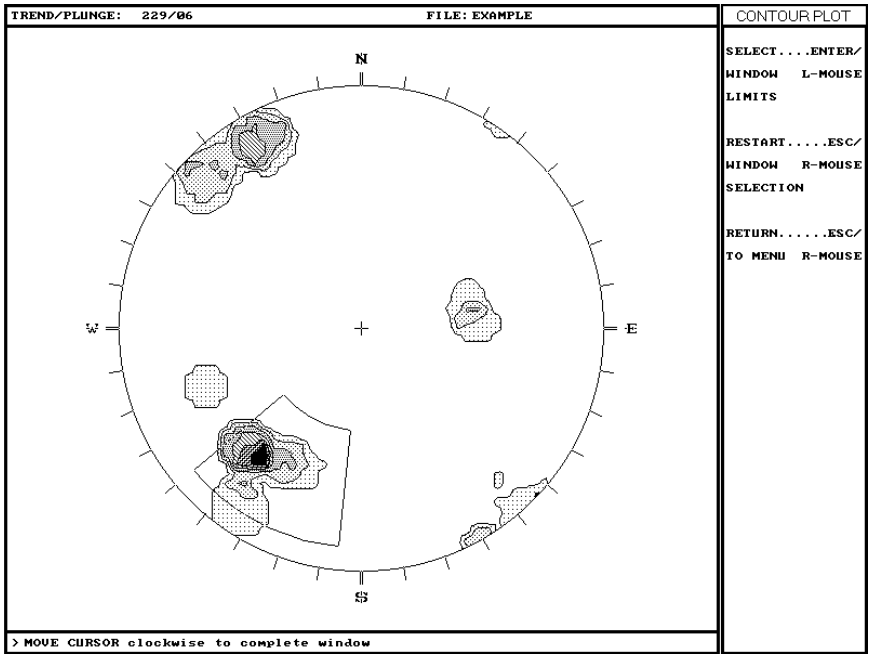


Figure 1.7: Moving the cursor to establish the second corner of the window in the **SET WINDOWS** option.

Once the desired window is established, press *Enter* or the *left mouse button*, and DIPS will calculate the orientation of the mean pole for this data and automatically plot the mean pole and corresponding plane on the stereonet, as shown in Figure 1.8. The last prompt will show:

```
> ## poles from ## entries in set number ##
```

In the BASIC version of DIPS, the 'set number' is generated automatically (1,2,3, etc.) with each window (in the ADVANCED version, the user inputs the set number) .

- Note that, since the data cluster is near the perimeter, the window in Figure 1.8 wraps around the opposite side of the stereonet – this wrap around is done automatically by DIPS if the cursor crosses the perimeter of the stereonet. (Recall that orientations in the upper hemisphere are represented by their opposite vectors in the lower hemisphere.)

- Also note that if you position the cursor on the *center* of the net initially, the window will be perfectly circular. This facilitates the selection of data groups near the center of the stereonet.

- If you place the cursor *outside* the net, and press *Enter*, you can manually input the starting orientation in the prompt line.

- If you get confused with the windowing procedure and 'lose control' of the window at any point, simply press *Esc* or the *right mouse button* to reset the cursor and try again.

After a small amount of practice, the positioning of a window on the stereonet will become simple, even if it seems awkward at first due to the clockwise convention, the automatic wrap around, etc.

Set the other corner of the window by pressing Enter or the left mouse button when the cursor is in the correct position. DIPS will then calculate the orientation of the mean pole for this data.

The BASIC version of DIPS will immediately plot the mean pole and corresponding plane on the stereonet.

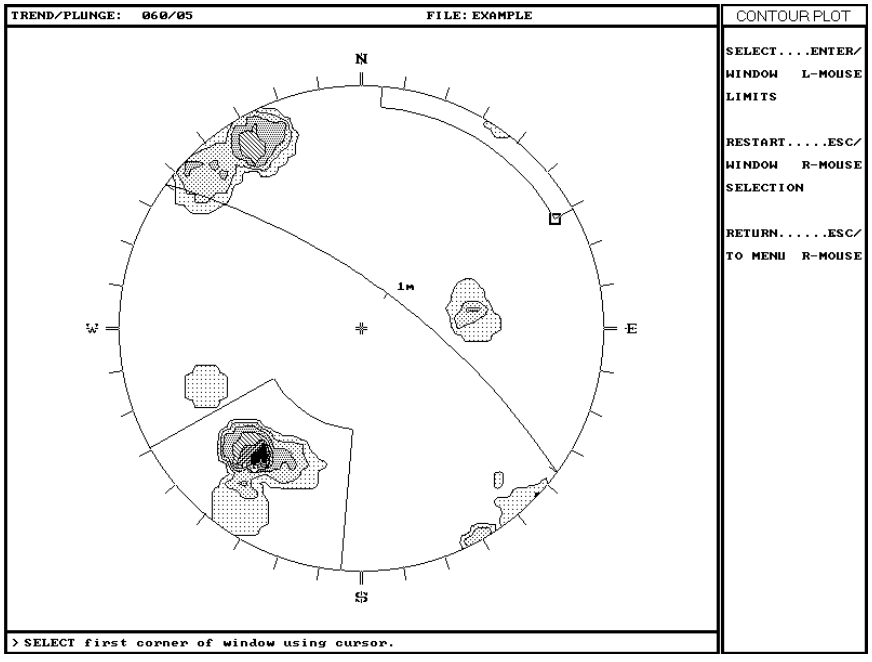


Figure 1.8: Second corner of window has been entered. Mean orientation for data contained in the window is automatically plotted.

After one window has been entered, the first prompt will reappear (see Figure 1.8), allowing the process to be repeated. *Carry out the same procedure for the two other major concentrations of data shown on the contour plot*.

Press *Esc* or the *right mouse button* to leave the **SET WINDOWS** mode and return to the **CONTOUR PLOT** menu. Select **RETURN** or hit *Esc* to return to the main menu.

Select: CONTOUR PLOT ➔ RETURN

Plot Major Planes

After the mean vectors and planes have been calculated as described above, it is possible to plot the major planes without all of the stereonet data. Select the **MAJOR PLANES** option from the main menu.

Select: MAJOR PLANES

Select: MAJOR PLANES ➔ SCREEN DUMP

Select:

MAJOR PLANES

*to plot the mean orientations alone. Toggle the **PLANES LEGEND** or the **SCREEN DUMP** option to generate a list of planes in the menu box.*

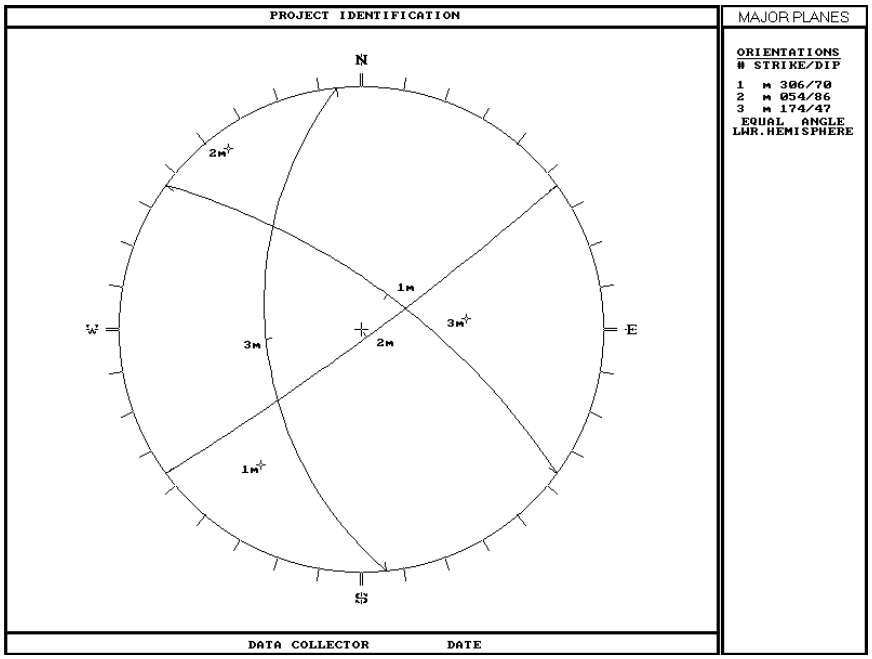


Figure 1.9: A plot of the major planes calculated using the **SET WINDOWS** option.

Note the 'm' beside each label signifies that the poles and planes represent unweighted ***mean*** orientations, created using **SET WINDOWS**. No letter indicates that the **LOCATE POLES** option was used to enter an individual pole/plane, ie. it does not represent an average orientation.

Save Planes for use in UNWEDGE

You can now use the **SAVE PLANES** option in the **MAJOR PLANES** menu to save the planes for use in the UNWEDGE* program. The planes and/or windows are saved in a user named file with a **.dwp** extension, which stands for **d**ips **w**indows and **p**lanes.

Select: MAJOR PLANES ➔ SAVE PLANES

```
> Filename to save windows and planes =  Type in a
filename, without the .dwp extension
```

If you have entered a valid filename, you will then see the prompt:

```
> Selected planes, window limits and means saved to
filename.dwp
```

Note that in the ADVANCED version of DIPS, this option is accessed via the **FILES** menu.

* **WEDGE** stability for **UN**derground excavations, also available from the Rock Engineering Group at U of T.

Exiting DIPS

RETURN to the main menu, select **EXIT**, and answer *Y* at the prompt to exit from DIPS.

```
> Are you sure you want to EXIT (Y or N)?  Press Y
```

Alternatively, the hot key combination <***Alt X***> may be used to quickly exit the program from any menu.