

Structural orientation files: creation, modification and storage using a BBC microcomputer

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Abstract—Field orientation and universal-stage data are easily stored as computer data files. A stereographic projection package has been developed to create and modify such data files and allow their use in conjunction with plotting and contouring routines. The first of these programs, the filing system, is discussed.

THE FILING SYSTEM

THE FILING system is one of a suite of programs that can manipulate structural orientation data in various forms. The remaining programs use the data to produce equal area plots, contoured plots and rose diagrams. The main aim of the filing program is to produce an efficient disk filing system which generates a useful format for the data. In reality there are two filing systems, one dealing with universal stage data, the other with field orientation data.

The directory

The use of the directory command is paramount to the successful operation of the package. Within the filing programs it classifies the type of data. The disk filing system (DFS) uses directories to group associated files and re-directs operating system commands. Creation of files with the same name is possible by assigning them to different directories. When using directories the file-name is prefixed by a symbol representing that directory. Plotting, universal stage, contouring, filing and the main menu programs are assigned the symbols 'P', 'U', 'C', 'F' and 'M', respectively.

Data files are classified into three types; contour, stereographic and universal stage, with directory symbols 'C', 'P' and 'U'. When using the stereographic filing program, data is created under the 'P' directory. Any data files prefixed with the letter 'P' are transferred to the default directory and are unlocked, thus indicating to the user the section of data files which may be modified. Other files remain locked and inaccessible. This facility of the DFS, used within the programs, is very valuable because it prevents access to data files which have a different purpose from those of the relevant plotting programs.

Datafile structure

Datafile structure is an important aspect of any filing system. Within the package random access data files are

used. These tend to be larger than sequential files but are easier to update and rectify any major errors when the structure is fully understood. Table 1 shows the structure of the various files.

MODIFICATION OF DATA FILES

When data has been stored it is possible to use the modification routine. Within this routine data is read from disk and displayed on the screen; alterations to dip direction, dip and the location name can then be made.

Editing data files

Data are read in batches of 144 pairs, and displayed within a single screen window (9 data pairs × 16 lines). All modification takes place on the data disk; the screen may be updated from the disk at any time through the editing process using a re-display option. A (CTRL-S) option increments the file pointer and allows further values to be accessed and displayed on the screen if they exist.

Alteration of data is carried out by means of cursor keys, tab statements and user defined characters. The cursor keys are re-defined as variables and are used to locate the data pair on disk. In conjunction with the tab statement they provide user defined markers around the data as a visual check.

Table 1. Structure of the stereographic and universal stage data files. Values refer to bytes

	Stereographic files	Universal stage files
Location name	42	42
Total No. of data items present	5	5
The average dip direction and dip of the data set	12	—
A value representing the file length	5	5
Data set (each dip direction and dip) (plotting conditions)	10	10
	—	4

MERGING AND UPDATING FILES

One of the main problems in merging and updating data is the "Can't extend" error message. A data file bracketed between two others, cannot be extended because of insufficient space on disk. There are two ways by which this may be overcome. The first is to confine one file to one disk and the second is to create a file of fixed length which will contain a maximum number of points. Within this filing system, the latter option is used. The user inputs a value representing the maximum number of points expected to reside in the file. This provides flexibility and allows files to be merged. Merging is accomplished so that one data file is extended by the length of a second file, in a similar manner to updating a file. It is important, therefore, to allow sufficient space for extension, since merging cannot be achieved if the combined data lengths are greater than the declared file length. This method is superior to creating fixed file lengths of, for example 2K, which can hold only 1000 points.

THE CONTOUR DATA FILES

The contour data files are created from stereographic and universal stage files and differ in that they are fixed in length and require no modification.

Each integer within the file, of which there are 257, is linked to an xy co-ordinate which represents the counting grid. The values, therefore, refer to the number of points falling within the 1% area surrounding the xy

Table 2. Relationship of the programs to the three types of data. The symbol (—) represents compatibility

Data files	Stereographic	Universal	Contour
Programs			
Stereographic filing	—	—	—
U-stage filing	—	—	—
Contour stereographic filing	*	— to create	*
Contour U-stage filing	—	* to create	*
Stereographic plotting	—	—	—
U-stage plotting	—	—	—
Rose diagrams	*	—	—
Contoured plotting	—	—	*

pair. Additionally, the files contain the type of data; e.g. poles, plunges, etc., and the location name of the parent file.

RELATIONSHIP OF THE DATA FILES TO THE PLOTTING PROGRAMS

Once data has been created it can only be used in the relevant plotting programs. Table 2 demonstrates this relationship.

Any of the above programs can be selected from within a main menu program. When the respective program has finished, control is returned to the menu program.

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