Introduction

GEOPAK is a comprehensive software package for all of your survey processing needs: from raw field data to a finished drawing all within the MicroStation environment. GEOPAK performs traverse entry / edit / reduction, coordinate geometry and mapping without having to leave MicroStation.

VDOT's implementation of GEOPAK will focus mainly on coordinate geometry and digital terrain modeling for post processing of field data.

Using GEOPAK will help ensure consistency and accuracy of survey data from initial field collection all the way to construction staking.

1.1 File Names

GEOPAK uses and/or creates files during the design process. The files are detailed in the table below.

job###.gpk	This binary file is created when the user starts a coordinate geometry (COGO) session for the first time or through Project Manager and may be appended to during the design process. All coordinate geometry elements are stored in this file. Multiple users can access this file at the same time, and only one file should be created for each project. The "###" is the only variable in this name. It represents a job number (up to 3 alphanumeric characters) unique to a project and is defined by the user upon creation.
fname###.ioc **Example: align999.ijd**	ASCII input file for loading data during a COGO session. "###" represents the job number and "oc" is the operator code (users initials).
fname###.ooc **Example: align999.ojd**	ASCII output file created by GEOPAK during a COGO session. Variables are the same as defined above.
fname.dat	A binary file that contains string and point information to be used for digital terrain model construction.
fname.tin	A binary file containing triangular surfaces also known as the digital terrain model (DTM).
project.prj	Binary file resulting from the creation of a new project.

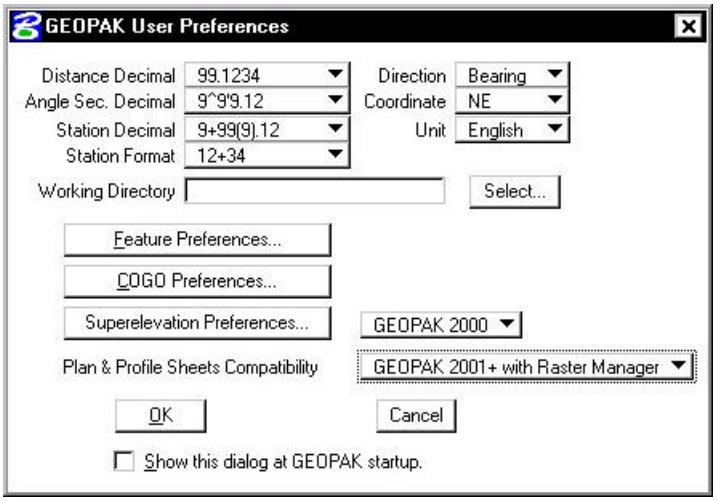
1.2 Accessing GEOPAK

GEOPAK is started upon entering a MicroStation File. To verify that GEOPAK is active, scan the MicroStation menu bar where the Applications menu appears. Simply pull down **Applications > GEOPAK SURVEY**. When each GEOPAK tool is selected, the corresponding dialog will appear. In addition, several dialogs may be opened simultaneously.

To close a dialog, simply click the X in the upper right corner of the dialog. In addition, the Coordinate Geometry dialog and Design and Computation Manager may be closed by selecting the **File > Exit** option. Other various dialogs have a **Cancel** button, which exits the dialog. Exiting the MicroStation file automatically closes all GEOPAK dialogs.

1.3 User Preferences

When a user begins Geopak for the first time or after Geopak has been reloaded, there are certain **User Preferences** the user needs to set. The **User Preferences** dialog can be accessed from **Applications > Geopak SURVEY > User Preferences**. The following dialog appears.

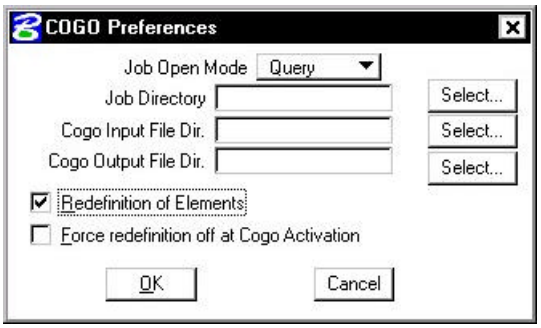


Most of the settings in this dialog are defined when the project is set up.

The **Working Directory** identifies where the data files for a particular project can be found. This is to say that GEOPAK will look here by default, for any files needed to read or write to by any application. If a user does not want to specify a directory, the field may be left blank, and Geopak uses the directory wherein the open MicroStation file is located.

By pressing the **COGO Preferences** button, the following dialog is invoked.

Everything about this dialog refers to COGO and the COGO database (.gpk).



Job Open Mode

This determines the file creation constraints imposed on creating new coordinate geometry database file. Coordinate geometry data is stored into a file named job** .gpk where ** is the user-specified job number for a given project. Each time the Coordinate Geometry window is invoked for a job number that does not correspond with a job**.gpk file in the current or specified working directory, GEOPAK creates a new job**.gpk file contingent on the constraints imposed by the Job Open Mode parameter.

Create - Automatically creates a new coordinate geometry database.

No Create - This mode does not permit creation of a new coordinate geometry database and provides a warning.

Query - With this mode, the user is queried when a job number is requested that does not correspond with a job**.gpk file in the current directory. Once queried, the designer may proceed with the database creation or cancel it.

Directories

Job Directory

The job directory will force the creation of the coordinate geometry database (.gpk) somewhere other than the project working directory. This may be desirable simply for file maintenance, to keep the gpk separate from all the other project data files.

COGO Input File Dir.

COGO Output File Dir.

Normally, input and output files are stored in the project directory, in which case, these fields would be blank. However, there are times when they are located in other directories, which can be keyed into these fields. In lieu of typing, pressing any of the Select buttons invokes the Select Directory Manager, wherein the desired directory may be specified.

Redefinition of Elements

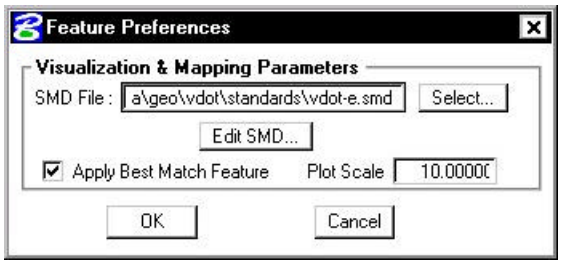
When the toggle button is active, existing elements in the Coordinate Geometry component can be redefined. For example, point number 8523 that was previously defined to coordinate values can be set to new coordinate values when this toggle is active. Otherwise, the Coordinate Geometry component would not store the new coordinate values with point number 8523 and a warning message "Element already exists" is displayed on the screen. This serves as a protection to the integrity of the coordinate geometry database. The same functionality can be achieved by the Redefine toggle in the Coordinate Geometry window.

Force Redefinition Off at COGO Activation

When this toggle is activated, and coordinate geometry is invoked, the Redefine button is not active, so that no redefinition of elements is permitted. However, at any time during the session, the Redefine toggle may be activated.

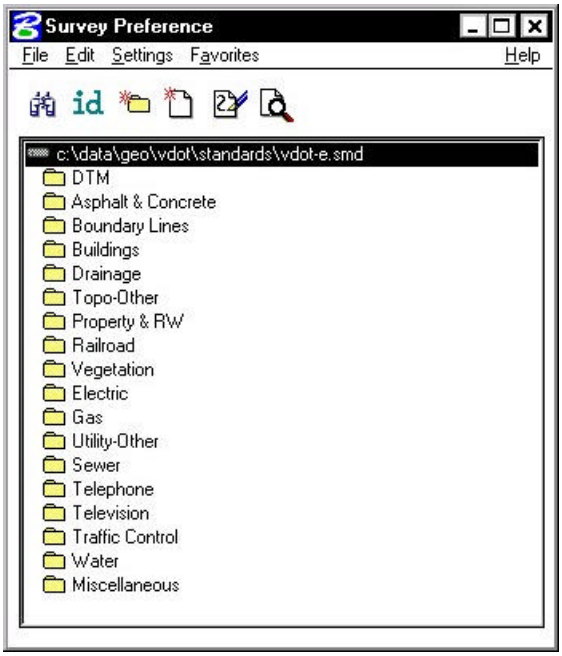
1.4 Feature Preferences

From the main user preference dialog access can be gained to the GEOPAK survey manager database or .smd file. The SMD file is where feature preferences are set so that the field-collected features are mapped according to desired symbology. By pressing the **Feature Preferences** the following dialog is invoked.



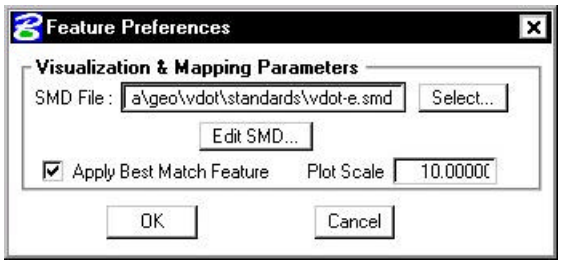
The SMD File keyin allows for the selection of the desired database.

From this dialog, if the **Edit SMD** button is selected, access is granted to the database via the dialog below.



From this dialog interface, a complete database can be configured to the desired symbology for individual features. This database contributes to consistency agency wide when field data is mapped into a MicroStation file.

The other two options from the **Feature Preferences** dialog, **Apply Best Match Feature** and **Plot Scale**, allow the user to not only to vary scales of the features when mapped but also to control how the software matches field codes to those found in the database itself.



When the **Apply Best Match Feature** toggle is activated, the program, when processing the data, will search the database for a candidate feature code that most closely matches the code as entered in the field. This can be used to your benefit when collecting multiple, like features.