Chapter 18: Basic Ribbit

Introduction

Ribbit is a data processing program written by Fugro Pelagos to provide data processing capabilities primarily for WinFrog data. This software makes the processing of WinFrog data easier, quicker, and safer than using various third party programs. (ASCII XYZ data can also be used in Ribbit, but with limited functionality. More details on this are below in the **Data Input** section).

There are two versions of Ribbit available: **Basic Ribbit** and **Ribbit Cable and Pipeline**. The difference between these programs lies in the addition of a **3D Digital Terrain Model viewer** and the ability to generate **Profile View Data Panels** in the **Cable and Pipeline** version only.

Note: in this document the terms **Ribbit** and **Basic Ribbit** are used interchangeably.

Ribbit is a standalone program designed to run on 32-bit Windows™ platforms. Data storage and memory usage may be maximized during data processing, so a large hard drive and plenty of RAM should be available. The computer's display should also be of a "higher" quality. Although the software will operate on a computer equipped with an 800 by 600 pixel display, it is recommended that a 1024 by 768 pixel display be used. This improves the quality of the various graphical displays found in Ribbit. The software will not operate at a resolution lower than 800 by 600 pixels.

Although Ribbit can be operated simultaneously with WinFrog on the same computer, this is not recommended. Not only will the performance of the programs suffer, conflicts within the operating system may also cause fatal system crashes. However, data processing with Ribbit should not be left until the end of the project either. It is important to verify both data quantity and quality while there is still an opportunity to correct for any shortcomings.

This chapter deals with all aspects of using Ribbit for data processing, in the order that they are found in the program. You may determine that your processing efforts are better undertaken utilizing the various tools in a different order. For example, you may wish to edit each individual data type before any merging or modifications are undertaken (as opposed to the order that these steps are found below). Although Ribbit is flexible in accepting these varied approaches, note that there is no "undo" button available to quickly reverse your actions.

To aid with training, a sample data set is included with the Ribbit installation kit. It is installed in the **Samples** directory, within the **Ribbit** directory. (**i.e., C:\Program Files\Fugro Pelagos\Ribbit\Samples**). This data set allows you to experiment with the software and to explore its features prior to editing "real" data. The data are from a small hydrographic survey conducted in San Diego, California in April 1997, and consist of data from a NMEA-compliant DGPS receiver (Leica MX400) and a NMEA-compliant echosounder (Furuno FCV-582).

As with all Fugro Pelagos software, Ribbit is in a constant state of change and improvement. Select **Help > About Basic Ribbit** to see which version of the program you are operating.

An Overview of Ribbit

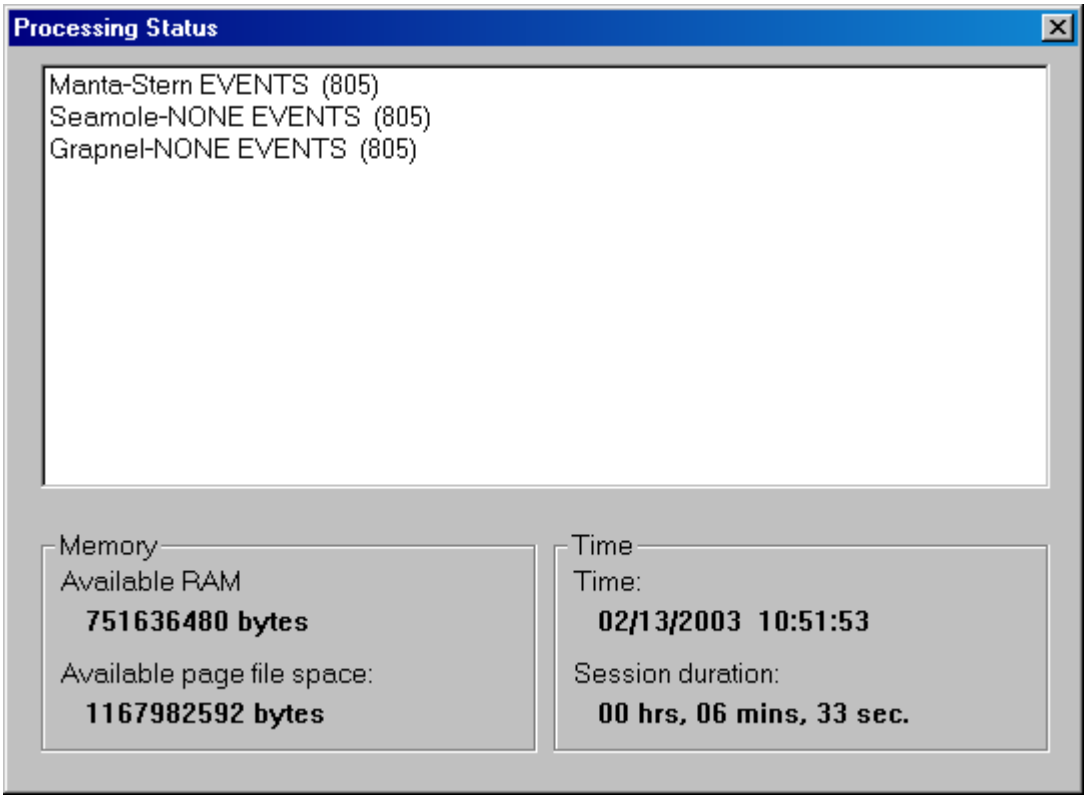
Start Up

The Basic Ribbit program is included with all WinFrog installation disks; this version of the program is provided as "freeware" and subsequently does not require the use of any security devices at startup.

Ribbit is internally configured the same way each time the program is started. This differs from WinFrog, which retains all configuration changes each time the program is stopped, then recalls the configuration the next time the program is started. Each time a Ribbit session is closed, the program deletes (i.e. "forgets") all data input and editing configurations.

Status Window

To view the Status window, select **Tools > Status Window** from the main menu. If the window is already displayed, a checkmark will appear beside this item. To close the Status window, click the X in the top right corner of the window or repeat the steps followed to open it.



The Status window displays the loaded data, memory and time status of the current processing session. The 'loaded data' box lists the WinFrog **data records** currently held in memory and available for processing by the available tools. The specific **data items** contained within these records are not listed.

The current available memory (RAM) and the available page file space are displayed to provide information regarding how close the computer is operating to its memory capacity. Ribbit

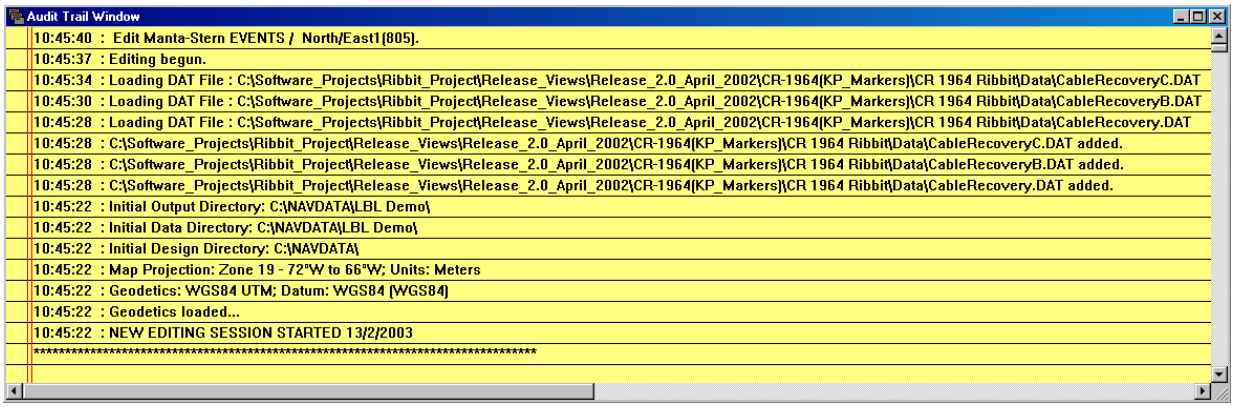
processing module will accept as much data as there is system memory for, but may become sluggish when the amount of available RAM is low and the page file is being used for data storage.

You can decide how much data Ribbit can handle on your computer by watching the status window RAM value. This helps determine when it may be necessary to process data as several separate datasets instead of as one large dataset.

Audit Trail "Notepad"

Ribbit maintains an audit trail of the data loading, processing and editing steps executed for each session. This trail has an associated file and window.

The **Audit Window** displays the audit trail for the current processing session, including time tags, of all events that have taken place. Each time a task is executed, such as loading a data file or performing a correction using the data correction tool, a report of the task is added to the audit trail; if the Audit window is open, it is updated to display it. The events for the current processing session can be scrolled through using the scroll bars located on the bottom and right side of the window.



To view the Audit window, select **Tools > Audit Window** from the main menu. If the window is already displayed, a checkmark will appear beside this item. To close the Audit window, click the X in the top right corner of the window or repeat the steps followed to open it. This window can also be resized and minimized.

The **Audit File** contains the audit trail. This audit file is automatically created when Ribbit is first started. It is placed in the program directory and is called **'audit.trl'**. If the audit file already exists, the audit data from each successive processing session is appended to the file. Because each session is appended to the audit file, the file may become quite large over time. To avoid this you should periodically copy and rename the audit file, and then delete the original. Every entry to the audit trail is written to the audit file.

Menu Items

File, Edit and Search

The File, Edit and Search pull-down menus contain options related to text editing of ASCII files. These options behave in the same way as similar menu items found in standard word processors or in Windows® NotePad and are provided to allow manual editing and inspection of

WinFrog data files. The **File > Open** menu item enables you to select a file from among the common WinFrog file types and to open it into the text editor. Once a file is open it may be edited directly. The **Cut** and **Paste** commands under the **Edit** menu and the **Find** and **Replace** commands under the Search menu may be used to assist in editing. These commands behave in exactly the same manner as the similar commands in the Windows® NotePad program. Data files may be printed using the standard **Print, Print Preview** and **Print Setup** commands. In most cases these menu items represent a relatively minor set of functions that are rarely used during a typical Ribbit processing session.

System Configuration File -- Load

When you select **File > System Config File …** > **Load**, a Standard Windows '*open file*' dialog box is opened, enabling you to pick the cfg file to be loaded into the current Ribbit processing session.

After the operation is complete you are notified with a message indicating the configuration file has been loaded.

This operation will update the existing Ribbit initialization file with the information in the selected configuration file.

System Configuration File – Save

When you select **File > System Config File … > Save**, a Standard Windows 'save *file*' dialog box is opened, enabling you to pick the cfg file to be saved to disk. After the operation is complete you are notified with a message indicating the configuration file has been saved.

This operation will save the existing Ribbit initialization file to the selected configuration file.

Project Directories

When you select **File > Project Directories**, a dialog box is opened enabling you to select the '**Data Directory**' and the '**Output Directory**' for Ribbit to use for processing. Select the '**Browse**' button for each operation to open a Standard Windows 'select folder' dialog box to select the appropriate directory.

Data Input, Tools, and Data Output

These menu items (**Data Input**, **Tools**, and **Data Output)** provide access to all of Ribbit's processing functions.

Ribbit's **Data Input** dropdown menu provides you the ability to input both WinFrog and generic **ASCII XYZ** data types. See the **Data Input** section below for complete details on all of these Ribbit data input tools.

Ribbit's **Tools** dropdown menu provides you with various numerical and graphical data editing functions including; tools for managing the individual data records, merging one data type with another data type, interpolating data based on specified time intervals, applying corrections to the data, filtering the data, and changing the geographic coordinate system to which position data are referenced. See the **Tools** section below for complete details on all of these Ribbit processing tools.

The **Data Output** dropdown menu contains three different output utilities that allow you to create an **ASCII** text file, a **DXF** format plan view map, and a Microsoft Access™ **.mdb** format data file. See the **Data Output** section below for complete details on all of these Ribbit output functions.

Data Input

Ribbit's **Data Input** dropdown menu allows you to input **WinFrog** and **ASCII X,Y,Z** data types. Furthermore, three different WinFrog data formats can be imported: **Automatic Event** data (.**dat**, **.rcv**, **.src**), **Manual Event** data (.**log**), and **Raw** (**.raw**) data. Input of ASCII text also provides the following options: **X,Y,Z** (i.e. **Easting, Northing, Elevation**), **Y,X,Z** or **PC Time, Latitude, Longitude, Elevation**. ASCII data must be in comma or space separated format. You can also load data files in the **MS Access™** (**.mdb**) format. These database files contain **Time**, **Position**, and additional data.

The following sections detail each **Data Input** option.

Raw (.Raw) Files

Most data processing efforts use WinFrog's **raw** (**.raw**) format data files. Since the **.raw** data are truly "raw" in nature (i.e. no filtering or offsets are applied to the data), these files often provide a better "base" starting point for processing than would automatic event data.

Also, because WinFrog can be configured to record **.raw** data from devices as quickly as it is able (as opposed to some specified time or distance interval), these files can also provide a much larger volume of data to work with. See the **Eventing** chapter for details on how to collect .**raw** format data using WinFrog.

In order to fully appreciate the flow of data into and out of a Ribbit processing session, it is important that you become familiar with the WinFrog raw file format.

This format is simply a line-by-line list of all of the data from each individual instrument interfaced to WinFrog, logged record-by-record, and preceded by an identifying device code, the name of the device, and a time-stamp. An example of the format, taken from a WinFrog **.raw** file, is as follows:

303,MX400,861879726.45,65126.00,32.71174000,-117.22566000,2,6,1.4,1.40,-33.30,6.30,262

This is a raw record from a Leica MX400 DGPS receiver. The data are preceded by the **code** 303, which is the code for data output from a GPS receiver. Each type of device has its own preceding code. For example, an echosounder has a WinFrog code of 411, a digital compass or gyro has a code of 410, and so on. See the **WinFrog File Formats** appendix for a detailed description of these files and codes.

The next field contains the **name** of the device selected when it was first added. In this example, it is MX400. See the **Adding a Device** section in the **Peripheral Devices** chapter for details.

Following the name is the **time-tag**, which is a single number referred to as **PC time**. **PC time** is a common method of representing time in data files and represents the number of seconds elapsed since 00:00:00.0, January 1, 1970.

These first three fields of the raw data record are common to all devices.

The remaining fields in the raw file record are specific to the type of device creating the record. For example, the 303 record includes fields for **GPS Time of Week**, **Latitude**, **Longitude**, **Status**, **Number of Satellites**, **HDOP**, **Altitude**, etc.

Each individual line of data in a file is referred to as a **data record,** or **record.** Each **record** can contain several **fields**, where a single value within a field is referred to as a **data item**.

The WinFrog File Formats appendix contains specific details on the contents of every raw data record produced and recorded by WinFrog.

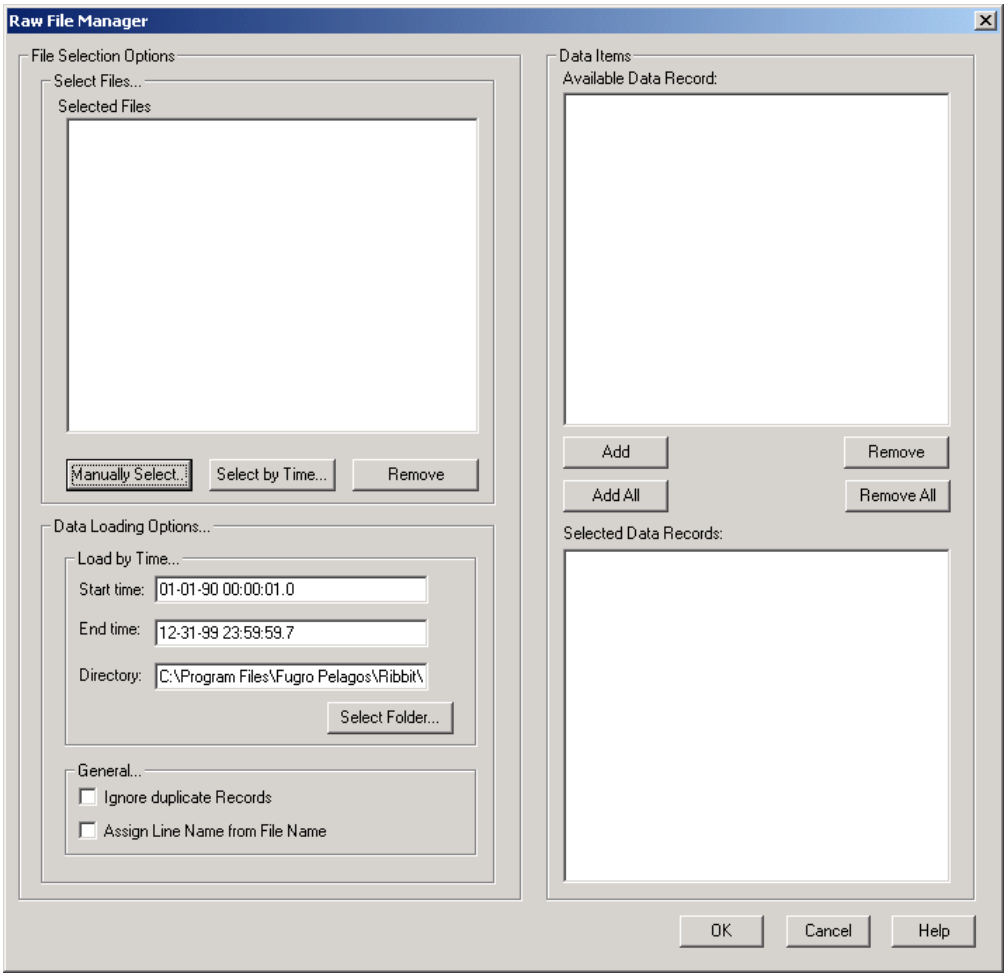
Loading Raw (.Raw) Data Files

As briefly mentioned above, the various options found under the main menu item **Data Input** are used to load files into Ribbit.

To Load WinFrog Raw (.raw) Files

1 Choose the **Select RAW data files...** option from the **Data Input** dropdown.

This action opens the **Raw File Manager** as seen in the next figure.



The **Raw File Manager** provides two methods for loading **.raw** files into the current data processing session: **Manually Select** and **Select by Time**. As the name suggests, **Manually Select** allows you to select **.raw** files manually, i.e. "by hand" and **Select by Time** is used to select **.raw** files by specifying a time window.

To Manually Select .Raw Files

1 In the **Raw File Manager** window, click the **Manually Select** button.

2 Navigate to the directory containing the files.

Note: see WinFrog's main menu item **File> Select Working Directories** to see where the **.raw** data files were recorded. WinFrog's default configuration places **.raw** data files in the **C:\ Navdata** directory.

3 Select the desired **.raw** files.

Use the keyboard's **Shift** or **Ctrl** keys to select multiple **.raw** files simultaneously.

4 Click **Open**.

5 Ribbit "reads" the selected .**raw** files and lists all of the different **Data Records** found in these files. Select the desired **Available Data Records** from the upper right-hand list.

6 Click **Add** to move the selected items to the **Working Data Records** list. Alternatively, double-click on the desired item in the Available Data Record list to move that item to the Working Data Records list; or click the **Add All** button to move all items in the Available Data Record list to the Working Data Records list.

If you change your mind and want to remove a Data Record from the Working Data Records list, you may do any of the following:

- highlight the item(s) in the list and click the **Remove** button to remove those selected items;
- double-click on the item in the list to remove that one item; or
- click the **Remove All** button to remove all the data records from the list.

7 Click **OK**. Ribbit now closes this window and displays "**Loading Data**.... " while it loads the **Data Records** into the temporary memory. Note that the **Audit Trail** lists the selected **.raw** files and **Data Records**. The **Status Window** also displays all loaded **Data Records**.

To Select .Raw Files by Time

1 In the **Raw File Manager** window, enter a **Start time** and **End time** in the **Data Loading Options** section.

Note: the time must be entered in the **mm-dd-yy hh:mm:ss.s** format.

2 Click the **Select Folder** button and navigate to the directory containing the files. Click **OK**. Alternatively, enter the folder path and name in the **Directory** field.

Note: see WinFrog's main menu item **File> Select Working Directories** to see where the **.raw** data files were recorded. WinFrog's default configuration places **.raw** data files in the **C:\ Navdata** directory.

3 Once the data loading options are specified, click the **Select by Time** button.

Only those **.raw** data files created between the designated start and end times (and residing in the current directory) are loaded into the **Raw File Manager**. Once the desired **.raw** files have been loaded into the **Raw File Manager**, the upper right list of **Available Data Records** will contain all of the data records available from the selected files. The next step is to select which **Data Records** are to be loaded into the current processing section.

4 Select the desired **Available Data Records** from the upper right-hand list.

5 Click **Add** to move the selected items to the **Working Data Records** list. Alternatively, double-click on the desired item in the Available Data Record list to move that item to the Working Data Records list; or click the **Add All** button to move all items in the Available Data Record list to the Working Data Records list.

If you change your mind and want to remove a Data Record from the Working Data Records list, you may do any of the following:

- highlight the item(s) in the list and click the **Remove** button to remove those selected items;
- double-click on the item in the list to remove that one item; or
- click the **Remove All** button to remove all the data records from the list.

6 Click **OK**.

Ribbit now closes this window and displays "**Loading Data**..." while it loads the **Data Records** into the temporary memory. **Note:** the **Audit Trail** lists the selected **.raw** files and **Data Records**. The **Status Window** also displays all loaded **Data Records**.

Data (.Dat, .Rcv, .Src) Files

WinFrog's Data files refer to those files generated when **Automatic Eventing** is enabled, and include the **.dat, .rcv**, and **.src Record Types**. Each of these three **Record Types** can be loaded by using the **Select .DAT Data Files** utility. Ribbit places these three different **Record Types** into the same category because the files are identical in structure and content.

WinFrog's **Automatic Event** data differs from **.raw** WinFrog data in that they do not represent data from any particular instrument, but rather represent the instantaneous state of navigation of a particular vehicle at the moment of the event. WinFrog events are discrete snapshots of the overall state of the vehicle, recorded at either specified distances along a survey line or at specified time intervals.

See the **Eventing** chapter for more details on data collection and data files.

To Load .Dat, .Rcv and .Src Data Files

1 From the **Data Input** menu, choose **Select DAT data files ...**.

2 From the **Files of Type** dropdown menu, select the desired file type.

3 Navigate to the directory containing the desired file(s).

By default, WinFrog will place all of these data file types in the **C:\ Navdata** directory. See WinFrog's main menu item **File >Select Working Files** to ascertain where these files are located.

4 Click **Open**.

Ribbit lists the loaded files in the **Audit Trail Notepad** and the **Status** window.

Manual Event (.Log) Files

WinFrog **Manual Event** files refer to those files containing data recorded manually at a specific point in time as defined by the user. **Manual Events** are stored in the Working **.log** file.

To Load Manual Event (.Log) Files

1 From the **Data Input** menu, choose **Select .LOG event files ...**.

2 Navigate to the directory containing the desired file(s). By default, WinFrog will place all of these data file types in the **C:\ Navdata** directory. See WinFrog's main menu item **File >Select Working Files** to ascertain where the **.log** files are located.

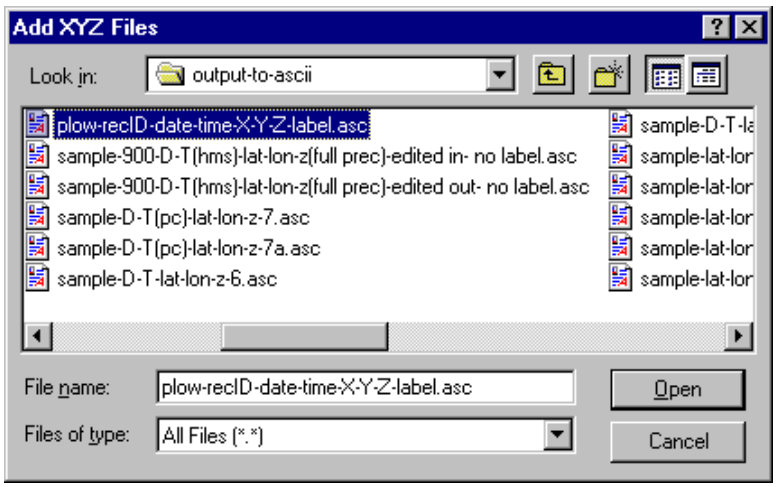
4 Click **Open**.

Ribbit lists the loaded files in the **Audit Trail Notepad** and the **Status** window.

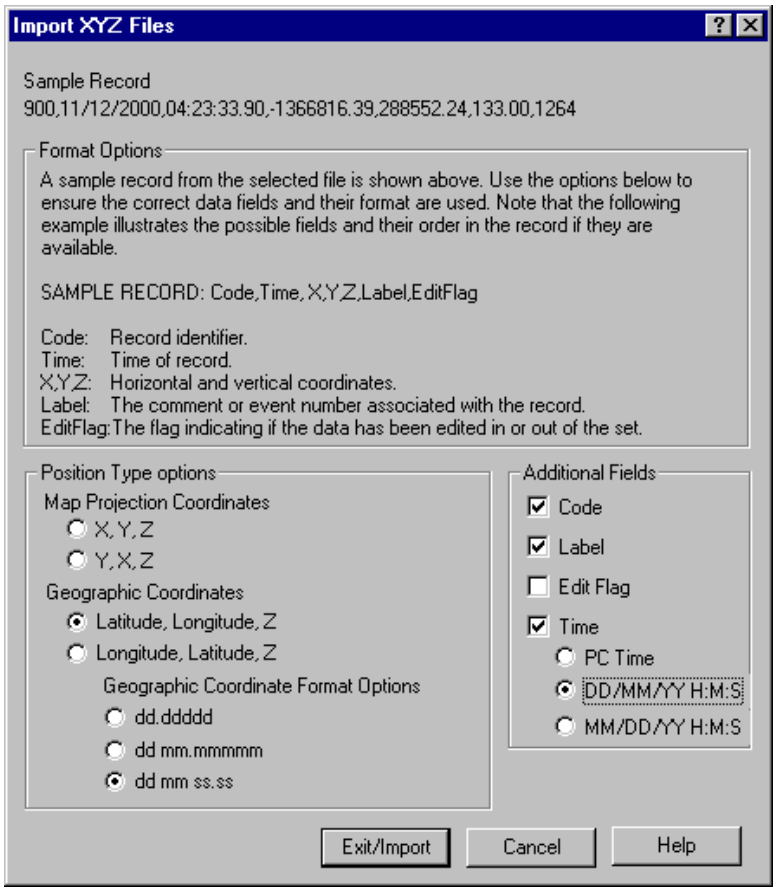
XYZ Data

XYZ Point files are files that can contain any number of fields which have XYZ or Lat,Lon, Z datafields.

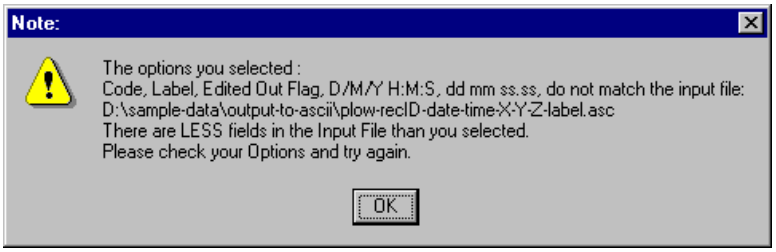
A dialog box is displayed when you select **Data Input > Select XYZ Point Files**. This dialog box is a standard Windows '**Add Files**' box which allows you to select the drive, directory and filename. All filenames are displayed. Double-click a filename or click a filename and click **Open** to add the file to the current Ribbit processing session . This dialog box is as follows:



The next step is to choose the appropriate options that match the input file. The options supported are Code, Label, Edit Flag, Time and various forms of XYZ or LatLonZ. An example is indicated below:



Selecting too **many** options for the selected input file will result in a message box like the following sample.



Selecting too **few** options for the selected input file will result in a message box like the following sample.

While XYZ files are loading, you are presented with a message like the one below.

Loading Tide Files

Ribbit is capable of loading and utilizing tide data from three different sources; Micronautics, Inc.'s World Tide program, the U.S. National Oceanographic and Atmospheric Administration (NOAA), and "generic" ASCII files.

World Tide files are identified by their **.tab** extension, while **NOAA**'s files use the **.tid** extension. The "generic" user-defined **ASCII** text format files can have any extension type.

Note: before any tide data are loaded into Ribbit, it is critical to confirm what units of measure (i.e. meters or feet) and time reference (i.e. local or UTC) are used in the tide file. It is also critical to confirm the same information for the water depth data to which the tides will be applied.

ASCII Files

This method allows you to use tide files made up of simply ASCII text **time** and **tide** data. This data can be in various formats, as specified below in the **ASCII Tide Input** dialog box.

To Load an ASCII Tide File

1 From the **Data Input** menu, choose **Tide Files ....> ASCII tide format**.

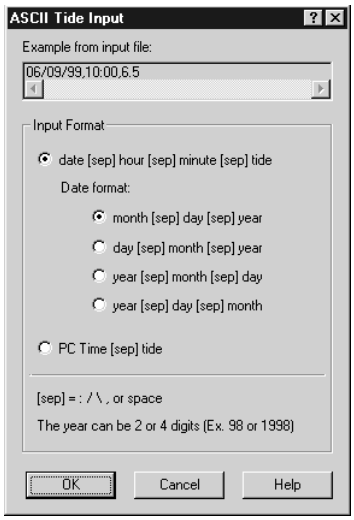
2 Navigate to the directory containing the desired file.

3 Select the desired file.

(As mentioned above, any file extension will be accepted).

4 Click **Open**.

The **ASCII Tide Input** dialog box opens, as seen in the next figure.



The **Example from input file** window displays the contents of the first line in the selected file.

5 Configure the **Input format** using the example as a guide.

6 Click **OK** to load the tide data and close this window.

World Tide (.Tab) Files

The World Tide program is used to generate predicted tides for any time period at thousands of locations covering the entire globe.

To Load a World Tide (.Tab) File

1 From the **Data Input** menu, choose **Tide Files ....> WorldTide 'TAB' file**.

2 Navigate to the directory containing the desired World Tide (.**tab**) file.

3 Select the desired **.tab** file.

4 Click **Open**.

NOAA Tide Files

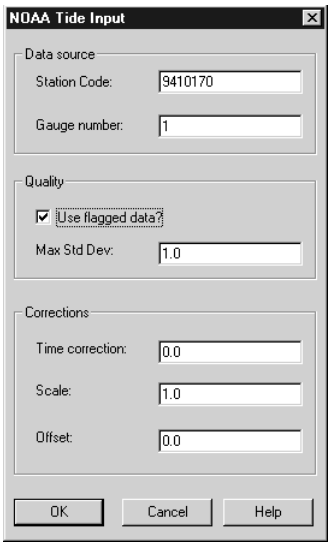
The U.S. NOAA organization generates actual and predicted tide information for any time period at hundreds of locations covering the coastal United States. These **NOAA (.tid)** files can be downloaded from the NOAA web site.

To Load a NOAA (.Tid) Tide File

1 From the **Data Input** menu, choose **Tide Files ....> NOAA tide format**.

2 Navigate to the directory containing the desired **NOAA** (**.tid**) file.

3 Select the desired **.tid** files.



4 Configure the following parameters of the **NOAA Tide Input** dialog box:

Data Source

Station Code — Enter the code for the tide station.

Gauge number — The number of the gauge (typically 1).

Quality

Use Flagged data? — Tide data are time stamped similar to the way .raw data are time stamped. If anything abnormal occurs at a specific time stamp that might make the data suspect, that data are flagged. You can choose to use the flagged data or not.

Max Std Dev: — When data are flagged, they are assigned a standard deviation that statistically describes how far the data may deviate from the truth. If you decide to use flagged data, you can enter a standard deviation threshold so that suspect data are not used.

Corrections

Time correction: — Alters the time of the data when it is loaded.

Scale: — Scales the data by a constant value when loaded.

Offset: — Adds a constant value to the data when loaded.

5 Click **OK** to load the data.

Note: if it appears that the data are not loaded, check to ensure that the **Station Code and Gauge Number** are correct.

MS Access (.Mdb) Data

Microsoft's **Access™** is a program used in various database applications, including Fugro Pelagos, Inc.'s **WinFrog** and **Cable Route Design Database** (**CRDD**) software systems. The files generated and used by MS Access™ are identified by a **.mdb** extension.

To Load an MS Access (.Mdb) File

1 From the **Data Input** menu, choose **Input From MS Access Database.**

2 Navigate to the directory containing the desired **.mdb** file.

3 Select the desired **.mdb** file.

4 Click **Open** to close this window and load the file.

Clear Data

Clicking on this menu item when data is loaded in Ribbit will prompt you with the following dialog box:

Select **OK** to clear all data from memory or **Cancel** to perform other Ribbit actions.

Tools

The **Tools** menu is used to access functions that allow you to manipulate the **Data Records** and **Data Items** presently loaded in Ribbit. All changes made to the loaded data records or items are recorded in the **Audit Trail Notepad** window.

Note: as previously mentioned, at no point are the contents of the original data files overwritten to reflect the modifications made using any of Ribbit's tools.

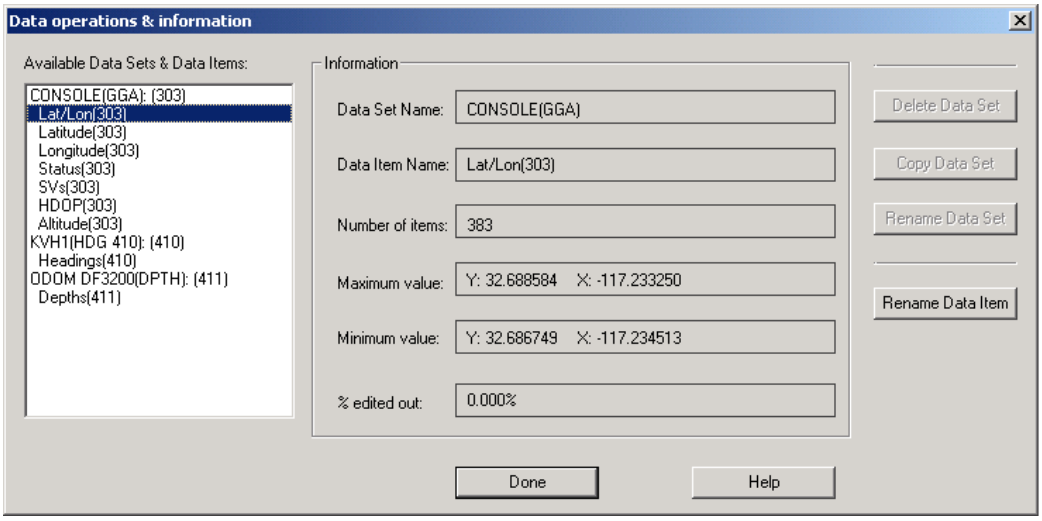
Data Operations

This tool allows you to determine the number of **Data Items** contained in each **Data Record**, as well as ascertain the **Minimum** and **Maximum** values of these **Data Items**. It also provides you with a value that summarizes the percentage of **Data items** that have been flagged as **Edited Out**. The **Data Operations** tool also allows you to **rename** loaded **Data Items** and **delete**, **rename**, and **copy** loaded **Data Records**.

To Perform Data Operations

1 From the **Tools** menu, choose **Data Operations**.

The **Data operations and information** window appears as seen in the next figure.



Available Data Sets and Data Items

This window lists all **Data Sets** and **Data Items** loaded in the current processing session. Click on any data set or data item to display its information.

Information

Details the specifics for any data set or data item in the **Available Data Sets and Data Items** list. The following information is displayed:

- Data Set Name
- Data Item Name
- Number of Items
- Maximum Value
- Minimum Value
- % Edited Out

Delete Data Set

This function allows you to delete any loaded **Data Set**.

To delete a **Data Set**, first click on the desired **Data Set** (found in the **Available Data Sets and Data Items** list), then select **Delete Data Set**. A **Confirmation required** message appears at this point. Select **Yes** to delete the selected **Data Set**.

Copy Data Set

This function allows you to copy any loaded **Data Set**.

To copy a **Data Set**, first click on the desired **Data Set** (found in the **Available Data Sets and Data Items** list), then select **Copy Data Set**. The **Copy Data Set** dialog box appears. Enter a name for the new **Data Set**, then select **OK**.

Rename Data Set

This function allows you to rename any loaded **Data Set**. This is required when more than one **Data Set** of the same type has been added, as Ribbit is unable to differentiate between **Data**

	Sets with identical names. To rename a **Data Set**, first click on the desired **Data Set** (found in the **Available Data Sets and Data Items** list), then select **Rename Data Set**. The **Rename Data Set** dialog box appears. Enter the new name for the **Data Set**, then select **OK**.
Rename Data Item	This function allows you to rename any loaded **Data Item**. This is required when more than one **Data Item** of the same type has been added, as Ribbit is unable to differentiate between **Data Items** with identical names. To rename a **Data Item**, first click on the desired **Data Item** (found in the **Available Data Sets and Data Items** list), then select **Rename Data Item**. The **Rename Data Item** dialog box appears. Enter the new name for the **Data Item**, then select **OK**. **Note:** do not change the **record number type**. Ribbit requires this information to identify what type of data item it is.

Merging / Deskewing

The **Data Merging and Deskewing Tool** is used to interpolate values from one **Data Item** to the time stamps of another **Data Item**. This merging operation is used to unify multiple, separate **Data Items** into a single new **Data Item**.

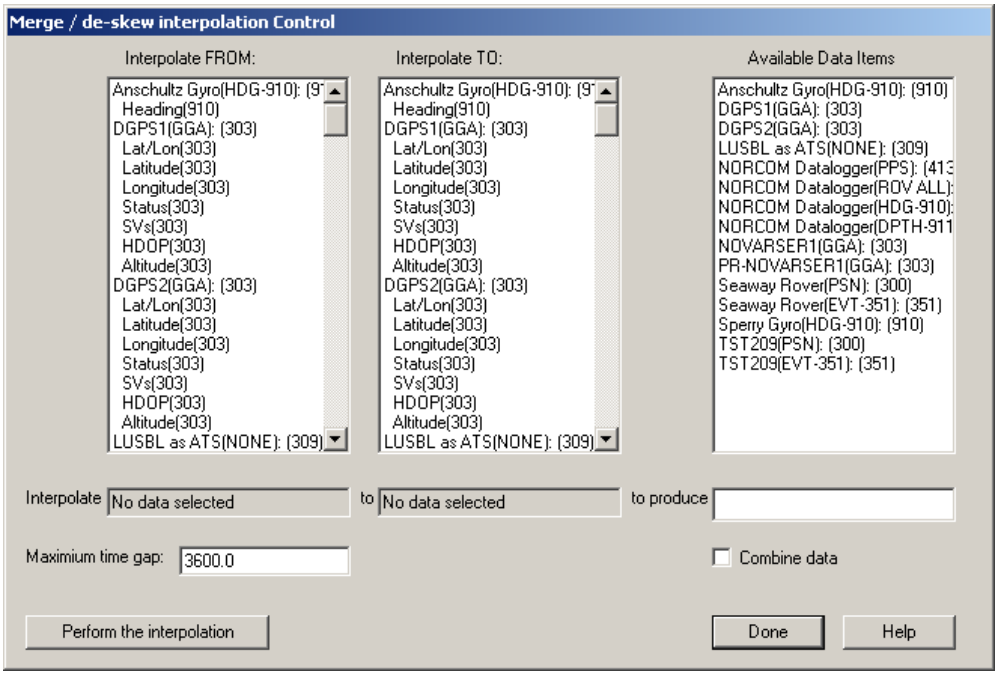
All data merging performed in Ribbit is based on a linear interpolation over time. Depending on which **Data Item** is merged "**to**", the data density of the new **Data Item** can increase, decrease, or remain the same. For instance, merging a raw **Depth Data Item to** a raw **Position Data Item** will typically reduce the number of depth measurements that will be used for subsequent processing. This is due to the fact that **Echosounders** typically output numerous depths per second (depending on water depth), whereas **Positioning Device**s typically are not capable of data output at more than once a second. Merging in this "direction" will result in a new **Data Item** containing the same number of records as contained in the **Positioning Data Item** (i.e. Ribbit will interpolate a depth value for the time stamps of each position).

On the other hand, you can merge a **Position Data Item** to a **Depth Data Item** to get a **Position** to match each **Depth** measurement. In this case Ribbit is creating extra positions to match each depth measurement time stamp.

Ribbit will interpolate between chronologically successive **Data Items** that are separated by less than the time set in the **Maximum time gap** box (entered in seconds). This helps eliminate interpolation errors that occur when interpolating over large time periods.

To Merge Data Items

1 From the **Tools** menu, choose **Merging/deskewing**. The **Merge/de-skew interpolation Control** dialog box opens.



2 Double-click the desired **Data Record** or **Data Item** in the **Interpolate FROM** list. The selection now appears in the **Interpolate** field at the bottom of the **Interpolate FROM** list.

Note: selecting a **Data Record** will result in Ribbit merging all **Data Items** in that **Data Record**. It is preferred to merge single **Data Items**.

3 Double-click the desired **Data Record** or **Data Item** in the **Interpolate TO** list.

The selection now appears in the **Interpolate** field at the bottom of the **Interpolate TO** list.

Note: selecting a **Data Record** will result in Ribbit merging all **Data Items** in that **Data Record**. It is preferred to merge single **Data Items**.

4 Type a unique name in the **to produce** field at the bottom of the **Available Data Items** list.

5 Enter a **Maximum time gap** value (in seconds) in the provided window.

Note: checking the **Combine Data** checkbox will cause the selected data to be combined with no interpolation.

6 Click **Perform the Interpolation**. Notice that the new **Data Item** now appears in the **Available Data Items** list. The name is as specified above, while the record number is created by Ribbit.

7 Click **Done** to close this window and return to the main Ribbit display.

Interpolation

The **Interpolation** tool allows you to create new data values via the linear interpolation of the time stamps of existing data. The interpolation is similar to the **Merging/Deskewing** tool in that the interpolation is based on time. However, it interpolates within a specific data record instead of from one record to another.

The **Data fill-in interpolation** dialog box provides two methods of record interpolation:

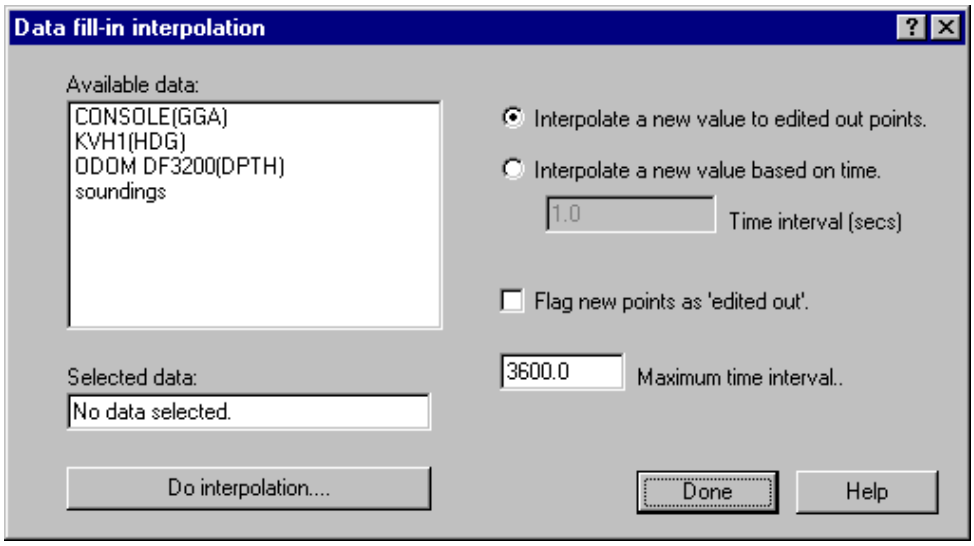
1 **Interpolate a new value to edited out points** initiates the creation of a new data value for each **Edited Out** data point, based on the nearest valid data points before and after the **Edited Out** data point being interpolated. This feature effectively generates new "good" data based on the time stamp of a "bad" data point.

2 **Interpolate a new value based on time** initiates the interpolation of a new value to a user-specified **Time interval**. For example, if raw GPS data was collected every 10 seconds, but positioning data is required every 5 seconds, this tool would be used to generate the new data points. As with the method mentioned above, data interpolation is based on time.

Data created using either interpolation technique can be flagged as **Edited Out** using the check-box selection. This allows you to identify the data as "non-original" data. A **Maximum time-interval** for interpolation can also be set.

To Interpolate Data

1 From the **Tools** menu, choose **Interpolation**. The **Data fill-in interpolation** dialog box appears as seen below.



2 From the **Available data** list, double click the desired **Data Record**. The item will appear in the **Selected data** window below.

3 Select one of the two options mentioned above. If **Interpolate a new value based on time** is selected, enter a **Time interval** value in seconds.

4 If desired, enable the **Flag new points as 'edited out'** option. (Typically this is selected).

5 Enter a **Maximum Time interval** (in seconds).

6 Click on the **Do Interpolation...** button.

7 Click **Done** to return to the main Ribbit window.

Apply Corrections

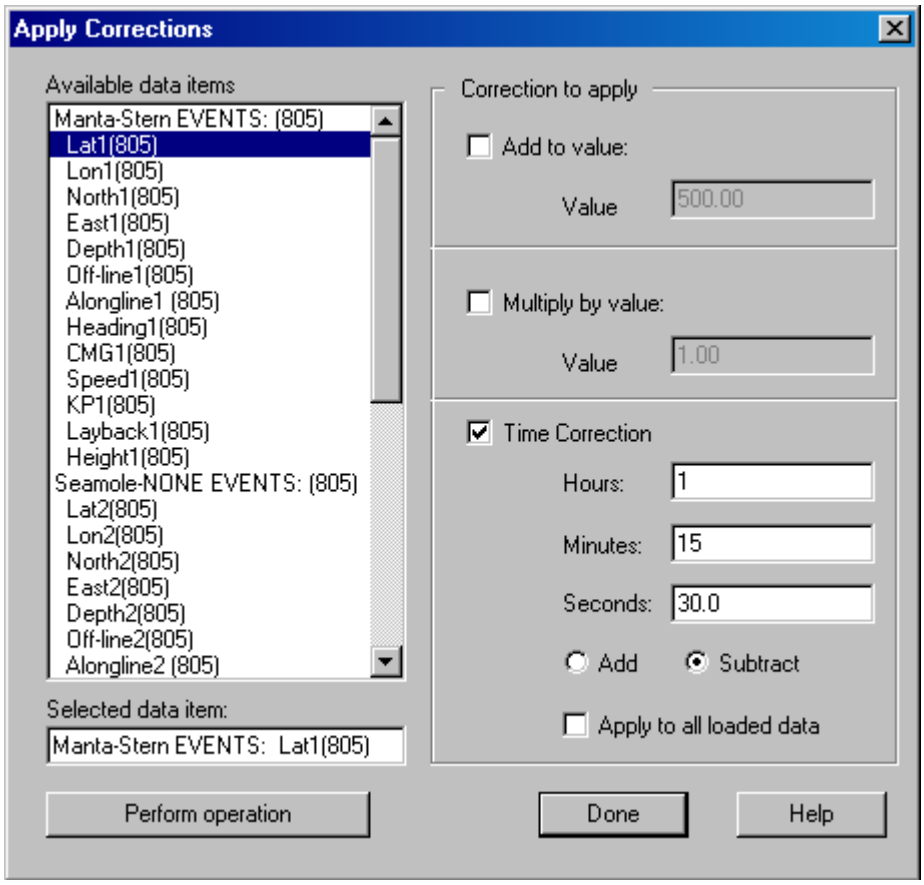
The ability to apply corrections to loaded **Data Items** is one of the most commonly used features in Basic Ribbit. Three different forms of corrections can be applied:

- the addition of a constant value to selected data
- the multiplication of selected data by a constant value
- the addition or subtraction of hours/minutes/seconds from the time-tag of selected data

It is recommended that you undertake these operations independently to ensure that the corrections are applied in the desired order.

To Apply a Correction to a Data Item

1 From the **Tools** menu, choose **Apply Corrections**.



2 From the **Available data items** list, double-click on the desired Data Item.

3 In the **Correction to apply** area, check the desired box.

4 Enter the desired correction value(s). Note that any combination of corrections can be applied in a single process. It is therefore important to note the order that the corrections are applied is first **Add**, second **Multiply** and lastly the **Time Correction**. The exception to this is if the **Apply to all loaded data** option is selected, in which case only the **Time Correction** is applied.

To subtract a constant from the selected Data Item, select **Add to value** and type in a negative value.

To divide the selected Data Item, enter a value of 1/constant.

5 If **Time Correction** is selected, select either the **Add** or **Subtract** radio button.

6 Click **Perform Operation**.

Filtering & Thinning

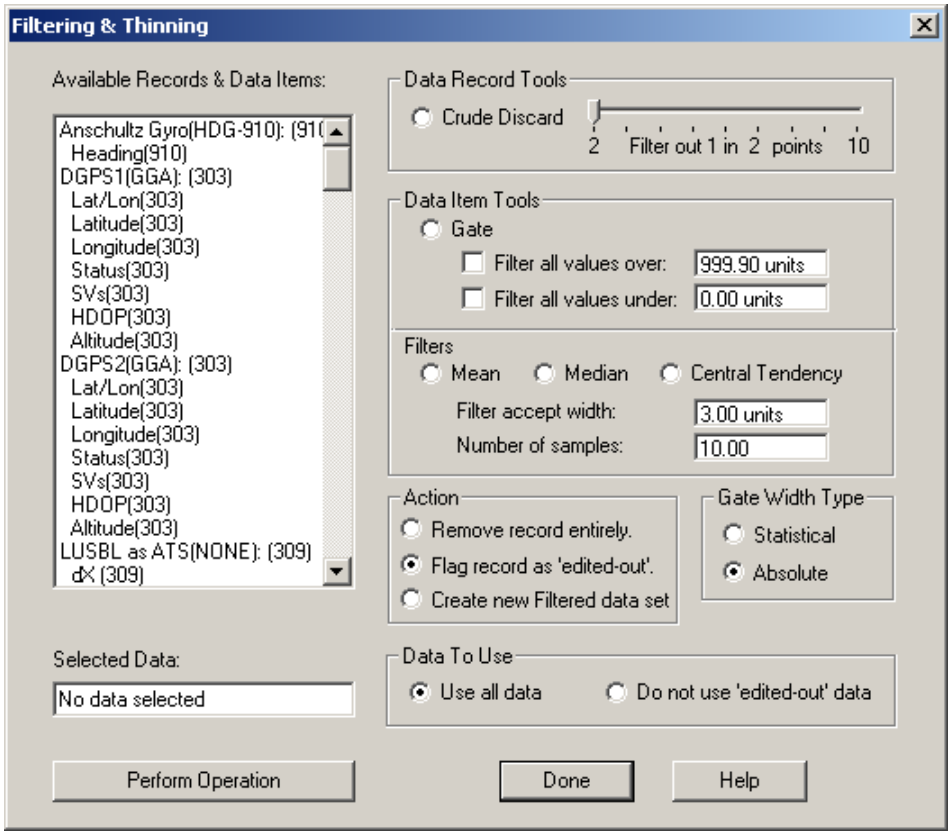
The **Filtering & Thinning** tool is primarily used to reduce (thin) the volume of data from a selected Data Item. This thinning is accomplished by gating out noisy data and removing outliers based on statistical modeling. The points that are filtered or discarded can be **removed entirely** or alternatively flagged as "**edited out**," allowing you to reinstate ("edit in") individual points later, if desired. When executing the Filters option, a third option for the filter results, **Create new Filtered data set,** is available. When this option is selected, the filter is applied, but as the filter moves through the data set, instead of the results of the filtered subset being used to test a given data point to determine if it lies within the specified tolerances, the filtered data point is added to a new data set, resulting in a new data set of filtered points.

Note: the "**Action**" (**Remove record entirely** or **Flag as 'edited out')** and **Data To Use** selections must be made before any tools found in this window are utilized. The **Action** selection defines whether the data points selected by the filtering and thinning tools will be deleted or simply flagged as "edited out." The **Data To Use** selection allows you to include (or exclude) data that have previously been deemed "edited out."

To Thin Out a Data Item

1 From the **Tools** menu, choose **Filtering & Thinning**.

The **Crude Discard** selection provides you with the ability to define the quantity of data to be removed or edited out.



2 From the **Available Records and Data Items:** list, double-click the desired Data Item.

The name of that particular Data Item now appears in the **Selected Data** field at the bottom of the **Available Records and Data Items:** list.

3 In the **Data Record Tools** area, click the **Crude Discard** radio button.

4 Move the mouse pointer to be precisely on top of the slide bar, then (while holding down the left mouse button) move the bar to set a value between **2** and **10.** This value indicates the amount of data to be removed (i.e. 2 indicates that 1 in 2 points in the selected Data Item will be removed or flagged as "edited out").

5 In the **Action** area, select either the **Remove record entirely** or **Flag record as** '**edited-out**' radio button.

6 In the **Data to Use** area, select either the **Use all data** or **Do not use** '**edited-out**' **data** radio button.

7 Click **Perform Operation**.

To Filter a Data Item

1 From the **Tools** menu, choose **Filtering & Thinning**. The **Data Item Tools** section of the **Filtering and Thinning** window provides you with four mathematical methods that can be applied to remove or edit out data from the selected Data Item.

- Gate Filter
- Mean Filter

- Median Filter
- Central Tendency

Gate Filter

The **Gate Filter** is used to filter out all data that is over or under user-defined limits.

To Apply a Gate Filter to a Data Item

1 From the **Tools** menu, choose **Filtering & Thinning**.

2 From the **Available Records and Data Items:** list, double-click the desired Data Item. That particular item now appears in the **Selected Data** field at the bottom of the **Available Records and Data Items:** list.

3 In the **Data Items Tools** area, click the **Gate** radio button.

4 Check the **Filter all values** over box and/or the **Filter all values under** box.

5 Enter the appropriate gating value(s). Ribbit assumes this value to be in the same units as the selected Data Item.

6 Click **Perform Operation**.

Mean Filter

Data Items can also be filtered using the Mean Filter. In mathematical terms a mean value is the average value of all included points. The Mean Filter requires the entry of a **Filter accept width** and **Number of samples** values.

The **Number of samples** is the total number of observations that are used to determine the mean value. If an even value is entered (as per the default of 10), Ribbit will calculate the mean of 10 accepted points total (5 accepted points found before and 5 points after the point in question). If an odd value is entered for the number of samples, the **following** points will include the "extra" point. The point in question is not used in the mean calculation.

Ribbit then takes the calculated mean value and adds and subtracts the value found in the **Filter accept width** to determine an upper and lower acceptance value. The point in question is then compared to these acceptance values. If the point falls outside the acceptance value window, it is either removed entirely or flagged as edited out.

Alternatively, if the **Create new Filtered data set** option has been selected, the results of the filter algorithm will be added to the new data set.

To Apply a Mean Filter to a Data Item

1 From the **Tools** menu, choose **Filtering & Thinning**.

2 From the **Available Records and Data Items:** list, double-click the desired Data Item. That particular item now appears in the **Selected Data** field at the bottom of the **Available Records and Data Items:** list.

3 In the **Filters** area, click the **Mean** radio button.

4 Enter values for **Filter accept width:** and **Number of samples**.

5 Click **Perform Operation**.

Median Filter

Data Items can also be filtered using the **Median Filter**. In mathematical terms, a median value is a value that has an equal number of observations below and an equal number of observations above it in the sample data set. The **Median Filter** requires the entry of a **Filter accept width** and **Number of samples** values.

The **Number of samples** is the total number of observations that are used to determine the median value. If an even value is entered (as per the default of 10), Ribbit will calculate the median of 10 accepted points total (5 accepted points found before and 5 points after the point in question). If an odd value is entered for the number of samples, the **following** points will include the "extra" point. The point in question is not used in the median calculation.

Ribbit then takes the calculated median value and adds and subtracts the value found in the **Filter accept width** to determine an upper and lower acceptance value. The point in question is then compared to these acceptance values. If the point falls outside the acceptance value window, it is either removed entirely or flagged as edited out.

Alternatively, if the **Create new Filtered data set** option has been selected, the results of the filter algorithm will be added to the new data set.

To Apply a Median Filter to a Data Item

1 From the **Tools** menu, choose **Filtering & Thinning**.

2 From the **Available Records and Data Items:** list, double-click the desired Data Item. That particular Data Item now appears in the **Selected Data:** field at the bottom of the **Available Records and Data Items:** list.

3 In the **Filters** area, click the **Median** radio button.

4 Enter values for **Filter accept width:** and **Number of samples:**

5 Click **Perform Operation**.

Central Tendency Filter

Data Items can also be filtered using the **Central Tendency Filter**. In mathematical terms, a central tendency value is the value found at the center of a line that is best fit through the sample data set. The **Central Tendancy Filter** requires the entry of a **Filter accept width** and **Number of samples** values.

The **Number of samples** is the total number of observations that are used to determine the central tendency value. If an even value is entered (as per the default of 10), Ribbit will calculate the central tendency of 10 accepted points total (5 accepted points found before and 5 points after the point in question). If an odd value is entered for the number of samples, the **following** points will include the "extra" point. The point in question is not used in the central tendency calculation.

Ribbit then takes the calculated central tendency value and adds and subtracts the value found in the **Filter accept width** to determine an upper and lower acceptance value. **Note:** with this particular filter, the **Filter accept width** value can be defined in the **Gate Width Type** section to be in **Absolute** Data Item units or **Statistical** units of Sigma (one standard deviation).

The point in question is then compared to these acceptance values. If the point falls outside the acceptance value window, it is either removed entirely or flagged as edited out.

Alternatively, if the **Create new Filtered data set** option has been selected, the results of the filter algorithm will be added to the new data set.

To Apply a Central Tendency Filter

1. From the **Tools** menu, choose **Filtering & Thinning**.
2. From the **Available Records and Data Items:** list, double-click the desired Data Item. That particular Data Item now appears in the **Selected Data:** field at the bottom of the **Available Records and Data Items:** list.
3. In the **Filters** area, click the **Central Tendency** radio button.
4. Enter values for **Filter accept width** and **Number of samples.** As mentioned above, use the **Gate Width Type** radio buttons to change the **Filter accept width** from Data Item units to statistical units of Sigma.
5. Click **Perform Operation**.

Configure/Transform Geodetics

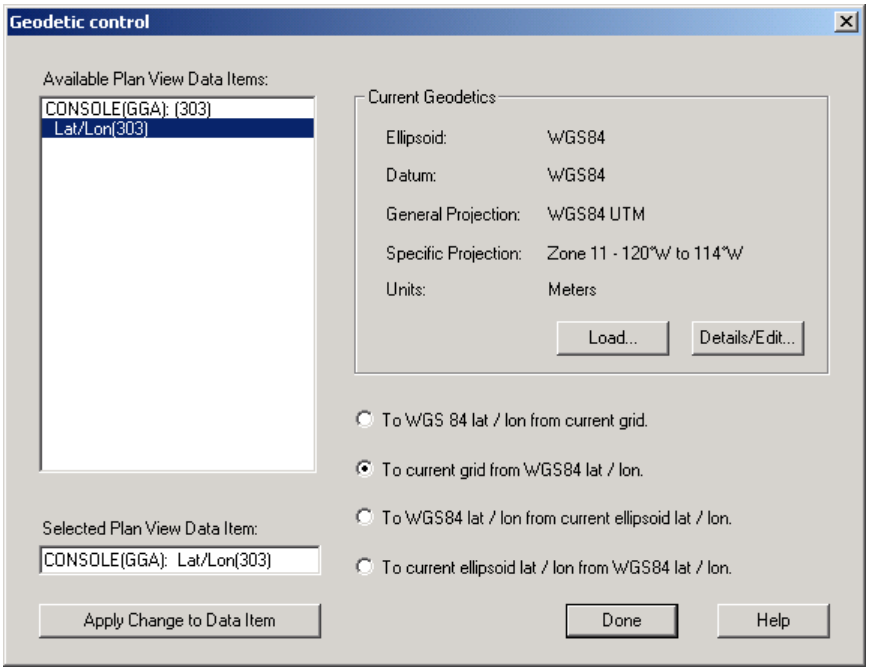
The **Configure/Transform Geodetics** tool allows you to convert the geodetic parameters (reference ellipsoid, datum shifts and map projection) of a loaded positional Data Item. There are four conversions that can be undertaken using this tool.

1. Positional **Data Items** recorded as WGS84 referenced lat/long coordinates can be converted to lat/long referenced to another datum or to map projection Northing/Easting coordinates.
2. Positional **Data Items** recorded as non-WGS84 referenced lat/long coordinates or map projection Northing/Easting coordinates can be converted to WGS 84 lat/long coordinates.

   Note: errors made in the specification of geodetic constants will be carried throughout an entire survey and can have disastrous results. Therefore, it is imperative that you understand the implications of modifying the geodetic constants and ensure that all values are set correctly.

To Change a Data Item's Geodetics

1. From the **Tools** menu, choose **Configure/Transform Geodetics**.



2 Review and change, if necessary, the current geodetics. There are two options to do this:

a. Click the **Load** button to access the WinFrog cfg or ini file from which you can directly load the geodetic and map projection parameters, or

b. Click the **Details/Edit** button to open the **Geodetics** dialog box in which you can specify both the map projection constants and the working ellipsoid and datum.

3 Once the current geodetics have been selected you can convert any available plan view data item to/from the WGS84 coordinate system. From the **Available Plan View Data Items** list, double-click the desired item.

This places the selected item into the **Selected Plan View Data Item** field.

4 Click the desired radio button.

Note: if you are converting from one non-WGS84 coordinate system to another non-WGS84 coordinate system, you must first convert the data set to WGS84 and then convert from WGS84 to the other working system.

5 Click the **Apply Change to Data Item** button.

6 Click **Done**.

Apply Offsets

Basic Ribbit's **Apply Offsets** tool allows you to horizontally offset the coordinates contained in any loaded positional Data Item. This is necessary when events have been recorded in the field without having the correct **Tracking Offset** enabled or perhaps incorrect offsets were entered in WinFrog's **Offsets** window.

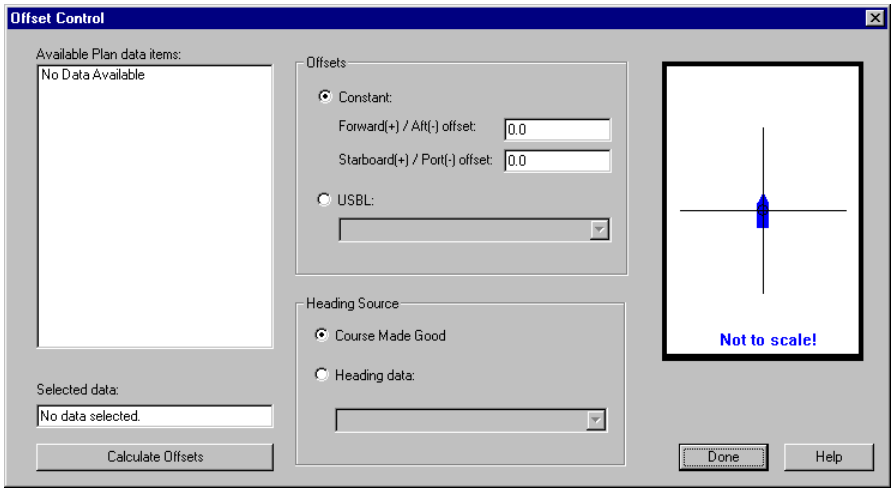
The most common use of this tool is to offset raw GPS antenna positions to the location of the

vessel's echosounder. Without this offset calculation, the depths will be incorrectly related to the GPS antenna position.

It is critical that any offset that is applied must use a gyro device **Data Item** for heading information. The use of **Course Made Good** "headings" is only relevant if the vessel is truly progressing in the same direction that the vessel is pointed.

To Apply a Horizontal Offset to a Positional Data Item

1 From the **Tools** menu, choose **Apply Offsets**.



2 Double-click the desired Data Item from the **Available Plan data items:** list. (Only those data items containing horizontal positioning data are presented).

This places that data item in the **Selected data:** field.

3 Enter the desired offset values into their appropriate boxes, along with the appropriate mathematical sign: forward (+) or aft (-), starboard (+) or port (-).

The **Graphics** window displays the direction of the entered offsets before they are applied (**Note:** this is **not** to scale). This display helps eliminate errors caused by entering in the wrong sign for offsets.

4 In the **Heading Source** area, click either the **Course-Made-Good** radio button or the **Heading data:** radio button.

Course-Made-Good is calculated using consecutive positional measurements, whereas **Heading data:** comes from raw heading observations recorded in the field. The dropdown menu displays a complete list of all available **Heading Data items**.

5 Click **Calculate Offsets**.

Overplot Removal

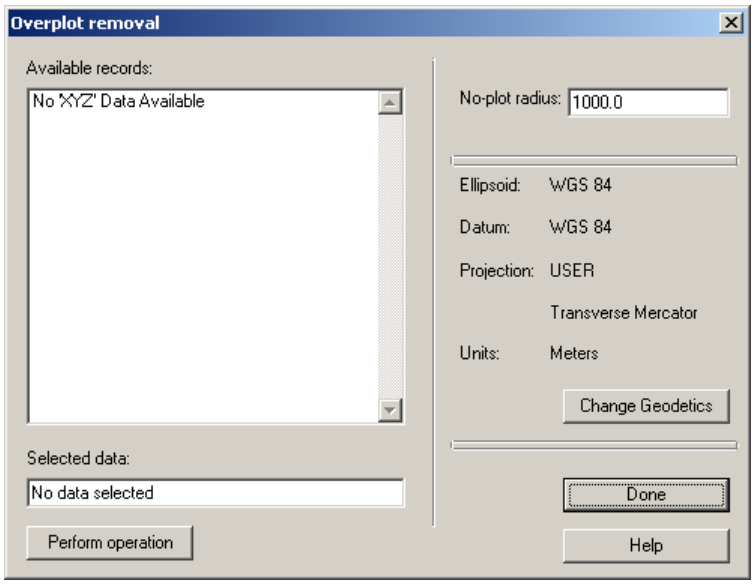
The **Overplot Removal** tool is used for creating hydrographic sounding charts in which only a specific result is required, namely only the shallowest depths. It performs a shoal-biased thinning of the soundings data. This means that the data will be thinned to leave only one item within a specified radius, with this record being the minimum (i.e. shallowest) sounding.

Because the **Overplot removal** tool filters a **Z** dimension based on its horizontal **X**/**Y** coordinates, it is necessary to first convert one or two dimension Data Items to a three dimension Data Item using the **Interpolation** tool. (i.e. interpolate a Depth Data Item (one dimension) to a Position Data Item (two dimensions) to generate an **X/Y/Z** (three dimensions) Data Item.

Furthermore, the resulting three dimensional data record must be in **grid** Northing/ Easting coordinates. You must use the **Geodetics** tool to convert the geographic **lat/lon** coordinates to **grid** coordinates before the overplot removal tool can be used. Also, note that this operation can be time consuming for large sets of data.

To Apply Overplot Removal to a Three Dimensional Data Item

1 From the **Tools** menu, choose **Overplot Removal**.



2 Double-click the desired Data Record as found in the **Available records:** list.

This places the record in the **Selected data:** field below the **Available records:** list.

3 Enter a value in the **No-plot radius:** field.

Note: the units of the entered **radius** refers to the units displayed in the **Geodetics** area of the **Overplot removal** dialog box.

4 Click **Perform operation** to execute the overplot removal.

This results in a new Data Record named **Reduced**. This data set contains only the shoal-biased soundings.

Interactive Data Editor

The **Interactive Data Editor** allows you to graphically view and edit individual Data Items loaded into the current processing session.

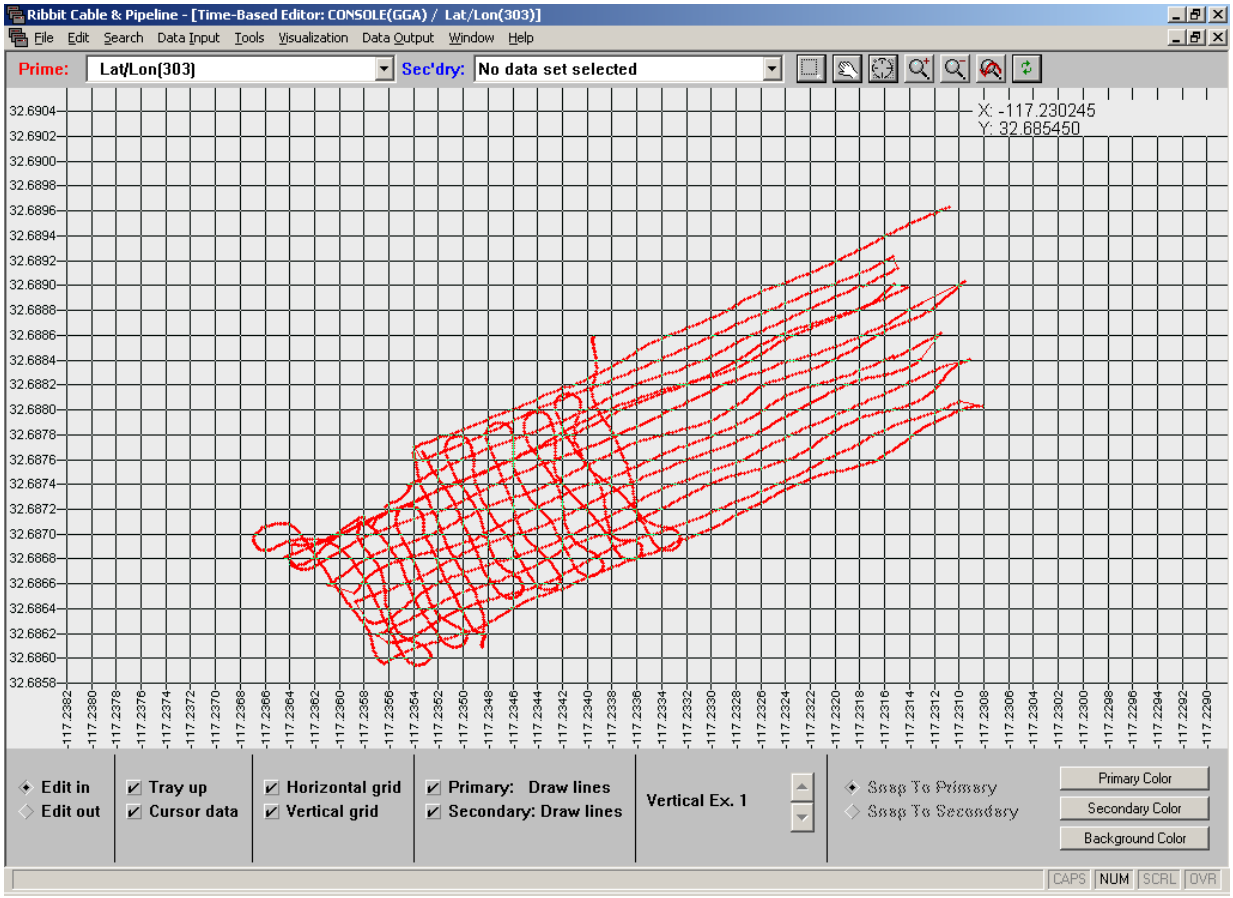
You can view up to two Data Items simultaneously; The first Data Item viewed is called the

Primary Data Item and the second is called the **Secondary** Data Item. The Primary and Secondary Data Items must be from the same category. For example, **Plan data** and **Profile data** cannot be viewed at the same time. Plan Data Items are plotted by their Northing/Easting values, while Profile Data Items are plotted in the Y-axis relative to time along the X-axis. Since Profile Data Items can be edited in this way, this editor is also referred to as the **Time-Based** editor.

The **Edit out** feature allows for the removal of user selected data from the current processing session, while the **Edit in** feature can be used to re-instate "edited out" data.

To Edit a Data Item using the Interactive Data Editor

1 From the **Tools** menu, choose **Interactive Data Editor**.



2 Select the desired Data Item from the **Primary** dropdown menu.

Ribbit graphically displays the selected Data Item data. Ribbit automatically centers the data and optimally scales the data to fit within the limits of the display space.

3 If a second Data Item is to be viewed, select the desired Data Item from the **Secondary** dropdown menu.

Ribbit does not automatically adjust the data scales for the second Data Item. Therefore, it might not be visible without adjusting the graphic controls. The graphic controls, located in the upper right panel of the **Time-Based Editor,** provide you with the ability to zoom in on

a specified area with the **Rectangle Zoom** tool, **Pan**, **Snap to Data**, **Zoom-In** and **Zoom-Out**, and return to a previous scale and center display setting with the **Zoom Previous** tool.

4 If the **Edit Out** box is checked, individual data points can be "edited out" by drawing a box around the particular point(s) with the cursor. (Hold down the left mouse button while drawing the box).

A data point that has been flagged as "edited out" is displayed in gray regardless of which Primary or Secondary Data Color has been selected.

Note: only Primary Data Points can be edited. Also, remember that any points flagged as "edited out" are not used in any subsequent processing or final output results.

5 If points have been mistakenly edited out, they can be edited back into the processing session by checking the **Edit In** box and then once again drawing a box around the point(s) with the cursor. This returns the point to its original color and re-includes the point in all subsequent processing.

6 The upper right-hand corner of the **Time-Based editor** displays **Time and Values** and information specific to one Data Item, referenced to the cursor position. This feature is enabled or by checking the **Cursor Data** box at the bottom of the **Time-Based editor.**

7 You can force Ribbit to have the lower tool "tray" remain visible along the bottom panel of the **Time-Based editor** by checking the **Tray Up** box at the bottom of the **Time-Based editor.**

8 The **Vertical Exaggeration** function can be used to shows more detail in items that have small vertical variances with respect to horizontal axis. The **Vertical Exaggeration** is changed by clicking the **Up** or **Down** arrows.

9 Horizontal and vertical grid lines can be turned off or on in the display. Display the grid lines by checking the **Vertical grid** box and the **Horizontal grid** box.

10 Select the **Primary Data Color** and **Secondary Data Color** buttons to change the color of the selected Data Item. The display's background color can be changed by clicking the **Background Color** button and selecting the desired color.

Note: using a display with a resolution of less than 1024 by 768 pixels may limit the availability of some of the features discussed above.

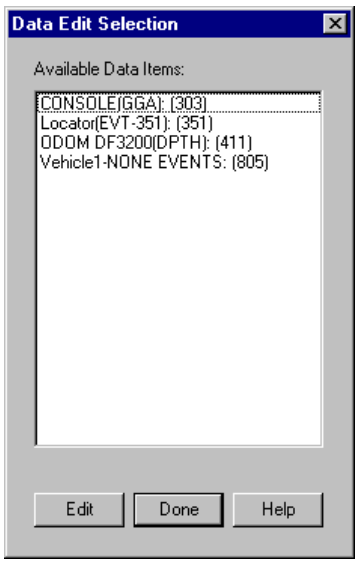
11 Click the **X** in the top right corner of the **Time-Based Editor** window (**NOT** the corner of the entire Ribbit window) to close the **Interactive Data Editor**.

Spreadsheet Editor

As the name implies, the **Spreadsheet Editor** allows you to edit the contents of any loaded Data Record through the use of a spreadsheet-style text editor. This editing tool allows you to not only change the status of a data string, but to also change the value of any Data Item contained in the selected Data Record.

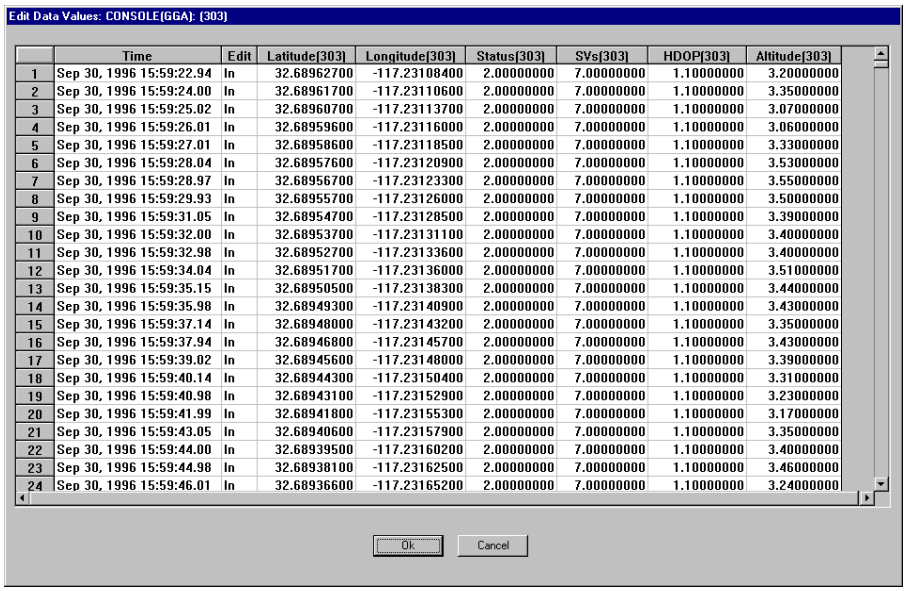
To Edit a Data Item Using the Spreadsheet Editor

1 From the **Tools** menu, choose **Spreadsheet**. The **Data Edit Selection** window appears as seen below.



2 Select the desired Data Record from the **Available Data Items** list.

3 Click on the **Edit** button. The **Edit Data Items** spreadsheet dialog box opens.



	Time	Edit	Latitude(303)	Longitude(303)	Status(303)	SVs(303)	HDOP(303)	Altitude(303)
1	Sep 30, 1996 15:59:22.94	In	32.68962700	-117.23108400	2.00000000	7.00000000	1.10000000	3.20000000
2	Sep 30, 1996 15:59:24.00	In	32.68961700	-117.23110600	2.00000000	7.00000000	1.10000000	3.35000000
3	Sep 30, 1996 15:59:25.02	In	32.68960700	-117.23113700	2.00000000	7.00000000	1.10000000	3.07000000
4	Sep 30, 1996 15:59:26.01	In	32.68959600	-117.23116000	2.00000000	7.00000000	1.10000000	3.06000000
5	Sep 30, 1996 15:59:27.01	In	32.68958600	-117.23118500	2.00000000	7.00000000	1.10000000	3.33000000
6	Sep 30, 1996 15:59:28.04	In	32.68957600	-117.23120900	2.00000000	7.00000000	1.10000000	3.53000000
7	Sep 30, 1996 15:59:28.97	In	32.68956700	-117.23123300	2.00000000	7.00000000	1.10000000	3.55000000
8	Sep 30, 1996 15:59:29.93	In	32.68955700	-117.23126000	2.00000000	7.00000000	1.10000000	3.50000000
9	Sep 30, 1996 15:59:31.05	In	32.68954700	-117.23128500	2.00000000	7.00000000	1.10000000	3.39000000
10	Sep 30, 1996 15:59:32.00	In	32.68953700	-117.23131100	2.00000000	7.00000000	1.10000000	3.40000000
11	Sep 30, 1996 15:59:32.98	In	32.68952700	-117.23133600	2.00000000	7.00000000	1.10000000	3.40000000
12	Sep 30, 1996 15:59:34.04	In	32.68951700	-117.23136000	2.00000000	7.00000000	1.10000000	3.51000000
13	Sep 30, 1996 15:59:35.15	In	32.68950500	-117.23138300	2.00000000	7.00000000	1.10000000	3.44000000
14	Sep 30, 1996 15:59:35.98	In	32.68949300	-117.23140900	2.00000000	7.00000000	1.10000000	3.43000000
15	Sep 30, 1996 15:59:37.14	In	32.68948000	-117.23143200	2.00000000	7.00000000	1.10000000	3.35000000
16	Sep 30, 1996 15:59:37.94	In	32.68946800	-117.23145700	2.00000000	7.00000000	1.10000000	3.43000000
17	Sep 30, 1996 15:59:39.02	In	32.68945600	-117.23148000	2.00000000	7.00000000	1.10000000	3.39000000
18	Sep 30, 1996 15:59:40.14	In	32.68944300	-117.23150400	2.00000000	7.00000000	1.10000000	3.31000000
19	Sep 30, 1996 15:59:40.98	In	32.68943100	-117.23152900	2.00000000	7.00000000	1.10000000	3.23000000
20	Sep 30, 1996 15:59:41.99	In	32.68941800	-117.23155300	2.00000000	7.00000000	1.10000000	3.17000000
21	Sep 30, 1996 15:59:43.05	In	32.68940600	-117.23157900	2.00000000	7.00000000	1.10000000	3.35000000
22	Sep 30, 1996 15:59:44.00	In	32.68939500	-117.23160200	2.00000000	7.00000000	1.10000000	3.40000000
23	Sep 30, 1996 15:59:44.98	In	32.68938100	-117.23162500	2.00000000	7.00000000	1.10000000	3.46000000
24	Sep 30, 1996 15:59:46.01	In	32.68936600	-117.23165200	2.00000000	7.00000000	1.10000000	3.24000000

4 Use the slide bar found at the right side of the display to view additional data strings. If you click on any data field in the spreadsheet editor, you can also use the keyboard's **Page Down** button to view additional data.

Use the slide bar found at the bottom of the display to view additional Data Items contained in each of data string.

5 To change the status of a data string , i.e., to be included (in) or "edited out" (out), click on the desired string's **Edit** value, then use the dropdown window to select the appropriate option.

6 To change the value of a particular Data Item, double-click on the desired Data Item's value, then use the keyboard's left and right arrow buttons to move to the appropriate digit.

Now, simply enter the new value(s) as desired. **Note:** all Data Item values, except **Time**, can be modified.

7 Once all editing is complete, click on the **OK** button to return to the **Data Edit Select** dialog box.

8 Click on the **OK** button if you are finished editing.

Data Output

Basic Ribbit can output data in **ASCII** text, **.DXF** graphics, and **MS Access™ .MDB** data base formats. The **Data Output** menu provides access to each of these utilities.

Note: if the ASCII text or .DXF graphics Data Output formats are selected, only those Data Items with an "edited in" status will be included in the final output product. MS Access™ .MDB data base files retain all Data Item information, including status.

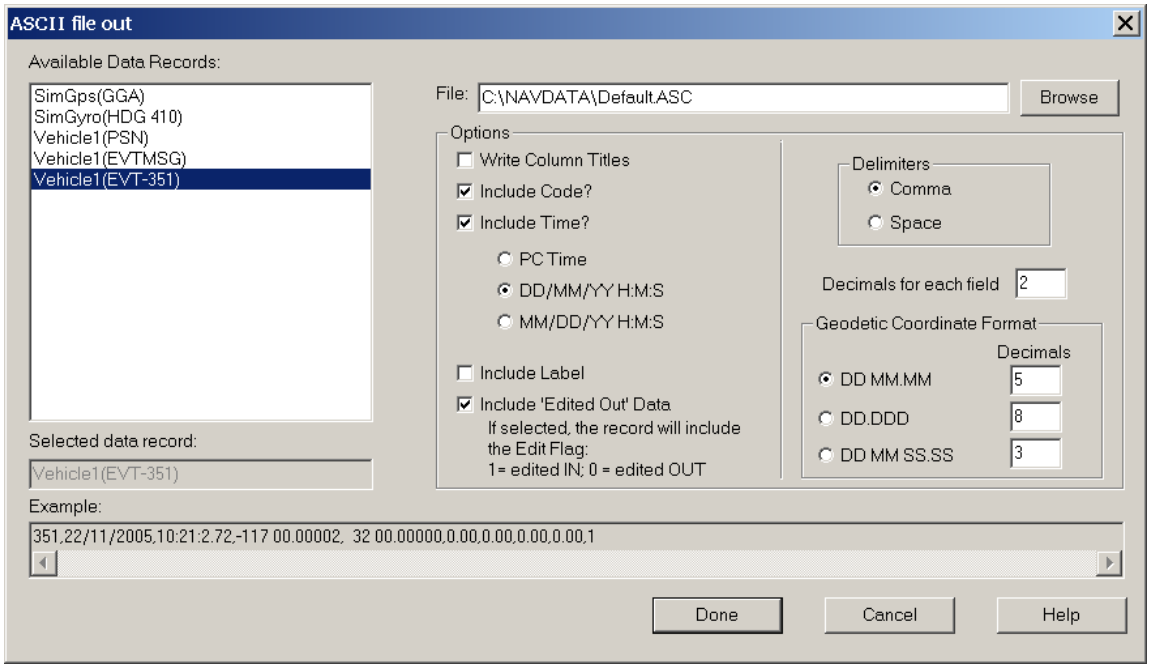
ASCII File Output

ASCII files, also known as flat text files, are simple text files that can be read by any text editor (such as Word™, NotePad™, Wordpad™), spreadsheet editor (such as Excel™ or Lotus™,) and even some mapping software systems (such as AutoCAD's Quicksurf™).

Note: only individual Data Records may be exported using the **Output to ASCII** feature. If you wish to export a combination of Data Items, you must first interpolate one to the other using the **Interpolation** tool. Alternatively, individual ASCII files can be combined using text or spreadsheet editors.

To Output Data as ASCII Text

1 From the **Data Output** menu, choose **Output to ASCII file**.



2 From the items in the **Available Data Records:** list, select the desired Data Record to output into ASCII format.

The selected data record appears in the **Selected data record:** field. An example of how that record will be formatted when it is output in ASCII format appears in the **Example:** field. This example represents a single line of data as it will be written to the ASCII file. This enables a quick check of the format prior to actually writing the file. Changes made to any of the **Options** available in the **ASCII file out** dialog box are instantly reflected in the **Example:** field.

3 Check the desired options in the **Options** area.

Select **Write Column Titles** to write out a line of column titles before the data records. This is done before each set of records of each dataset and can be useful for interpreting data when the raw record documentation is not at hand.

Select **Include Code** to include the three digit record identifier or code. Remember that each data record has a unique code to identify it from other records.

Select **Include Time** to include the time recorded for every data item in that record. Some data may have interpolated time values. The time can be in either PC Time (in seconds from 00:00 on January 1, 1970), in regular Day/Month/Year Hours:Minutes:Seconds format or in Month/Day/Year Hours:Minutes:Seconds

Select **Include Label** to include the label for every data item in that record. This information can be useful to identify each record by number.

Select **Include 'Edited Out' Data** to include an edited out value for each record. This value will be '1' for edited data records and '0' for unedited data records.

4 In the **Delimiters** area of the **Options** dialog box, check the **‘,’ Separator** radio button to create comma separated data fields or check the **‘ ’ Separator** radio button to create space separated data fields.

5 Specify the number of decimals used to output the data to the file in the **Decimals for each field** edit box. All data except time, and geodetic coordinate values (latitude and longitude) are governed by this entry.

6 For any latitude and longitude values in the output data, you can specify how they are written in one of three formats, namely DD MM.MM (degrees and decimal minutes), DD.DDD (decimal degrees) or DD MM SS.SSS (degrees, minutes and seconds). For each choice you may also specify the number of decimals output. The resolution of output grid coordinates is governed by the **Decimals for each field** control above.

7 Click the **Browse** button to navigate to the desired location where the new file will be created and to define the name of the new file.

Note: by default an **.asc** file extension will be added to the entered file name. This can be changed to any desired extension if required.

8 Click **OK** at the bottom of the **ASCII file out** dialog box to generate the new file.

DXF File Output

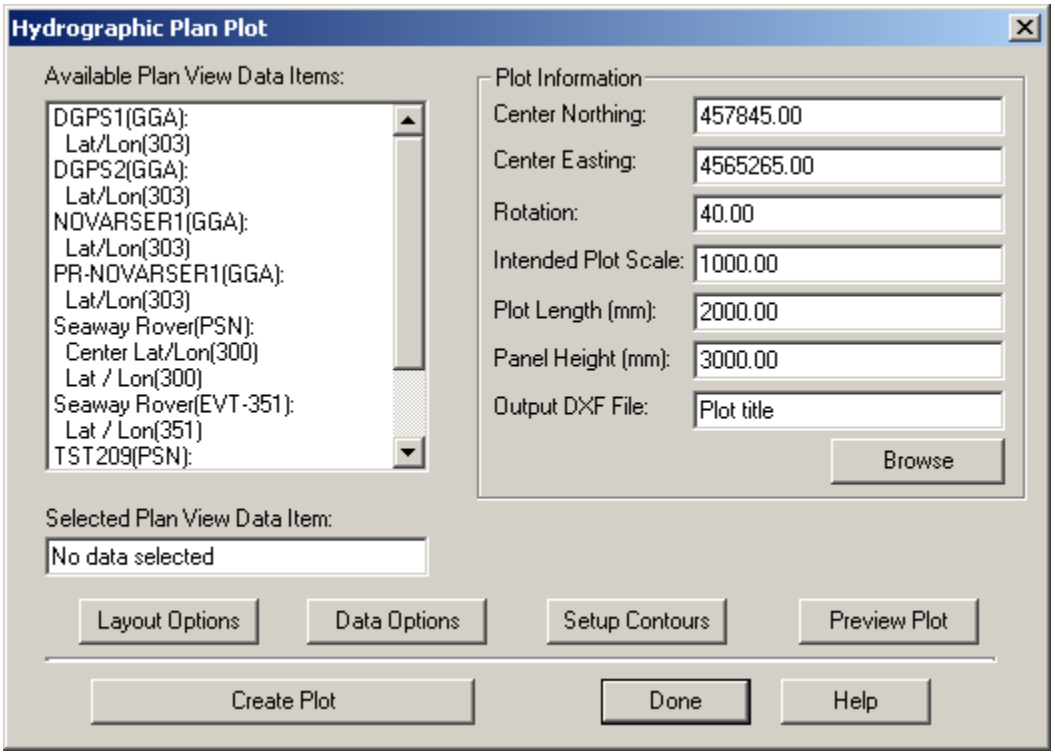
This **Data Output** option is used to generate plan view charts in the popular **.DXF** format. As implied by the name, (an abbreviation for **D**rawing E**x**change **F**ormat), the DXF file format is used to exchange graphical data between various CAD software packages including AutoCAD™, PageMaker™, CorelDraw™, ArcView™, and MapInfo™. These systems can then be used to modify the contents of the DXF chart. DXF drawings can also be input into a Microsoft Word™ document if equipped with the appropriate filter.

Note: all items depicted in the DXF charts created by Ribbit are in real world map projection coordinates.

The DXF charts created by Ribbit consist of multiple layers, with each layer containing a separate component of the drawing.

To Create a DXF Chart

1 From the **Data Output** menu, choose **Output to DXF file**. The **Hydrographic Plan Plot** dialog box is displayed, as seen below.



2 Select the appropriate Data Item from the **Available Plan View Data Items** list. Only those Data Items containing positional data (i.e. Lat/Long or Northing/Easting coordinates) are presented for selection.

Double-click on the desired Data Item to select it. The **Selected Plan View Data Item** window will display the name of the Data Item chosen.

Note: if you select a Data Item that contains Latitude /Longitude coordinates, you must ensure that the **Configure Geodetics Tool** is configured correctly in terms of Datum and Zone before the DXF chart is created.

3 The **Plot Information** area options must be defined for each chart created. These parameters define the size, rotation, and real world location of the chart.

Center Northing: and **Center Easting**: Enter the map projection grid coordinates of the center of the chart. As mentioned above, the coordinates cannot be specified in units of latitude/longitude.

Rotation: Enter a value to define the amount of rotation that will be applied to the chart's border. As previously mentioned, the data and grids depicted in the chart are always in real world map projection coordinates, and so are never rotated from their original locations. The rotation is entered in degrees as measured clockwise from North.

Intended Plot Scale: Enter an integer value to define the scale factor used in the chart. Entering a value of 1000, for

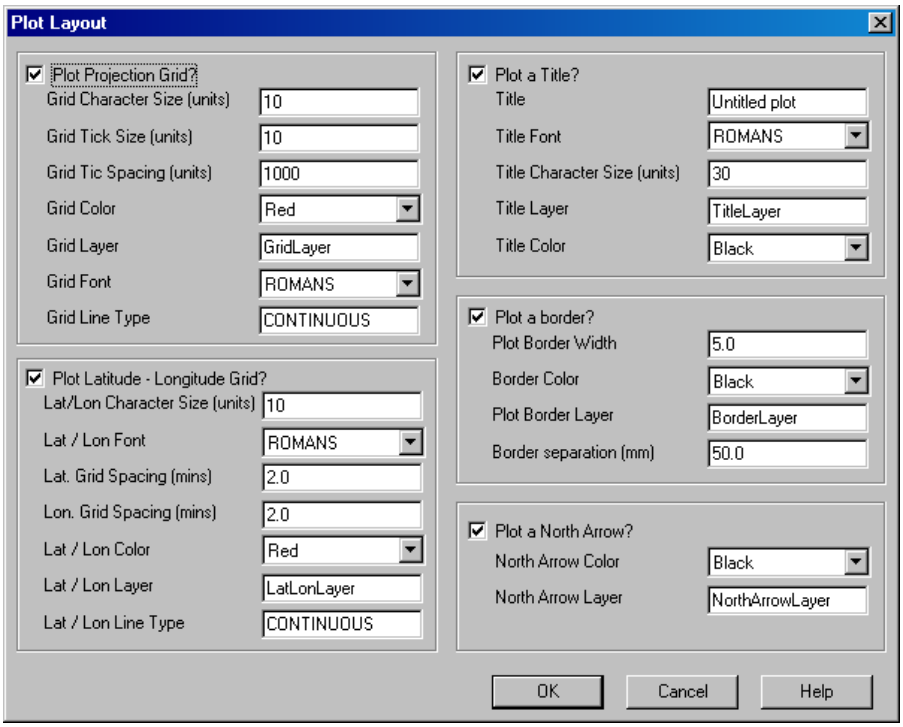
example, tells Ribbit that 1 unit on the chart will represent 1000 units in the real world. This value is used to calculate the size of the border and text items.

Plot Length (mm): and **Plot Height (mm):** — Enter the chart's horizontal length and vertical length dimensions. These values are entered in millimeters, and together with the scale determine the area that is represented in the created chart.

Output DXF File: — Enter the name and location of the .DXF file to be created.

Browse button — Opens a navigation dialog box where a new file can be created or an existing file located.

3 Click the **Layout Options** button. The **Plot Layout** dialog box appears as seen below.



The **Plot Layout** dialog box allows you to define if and how two grids, a title, a border, and a North arrow will be plotted in the **.DXF** chart.

4 Configure the various **Plot Layout** options as desired.

Note: if a dimension entry is requested in "units," this refers to real world units as opposed to plotted units; it may require some calculation to derive the real world values. For example, if a grid annotation is to be plotted at a size of 10 mm, with a chart scale of 1:1000, the "units" entry would be 10, as determined by multiplying both values by a factor of 0.01.

Plot Projection Grid? — Check this option to generate a series of projection grid Northing and Easting "crosses"

on the .DXF chart. You must define the size of the annotations (**Grid Character Size** in grid units), the size of the grid "ticks" (**Grid Tick Size** in grid units), and the spacing of the grid "ticks" (**Grid Tick Spacing** in grid units).

You can also change the color of the grid and annotation (**Grid Color**), the name of the layer to which this information will be written (**Grid Layer**), the AutoCAD™ text font (**Grid Font**), and the type of AutoCAD™ line that will be plotted (**Grid Line type**).

Plot Latitude - Longitude Grid? — Check this option to generate a series of latitude and longitude lines on the .DXF chart. The options presented for this feature are the same as those for the Projection grid with one key difference; the **Latitude** and **Longitude Grid Spacing** are specified in minutes of arc rather than real world units. For calculation purposes, 1 minute of arc is approximately 1852 meters in length.

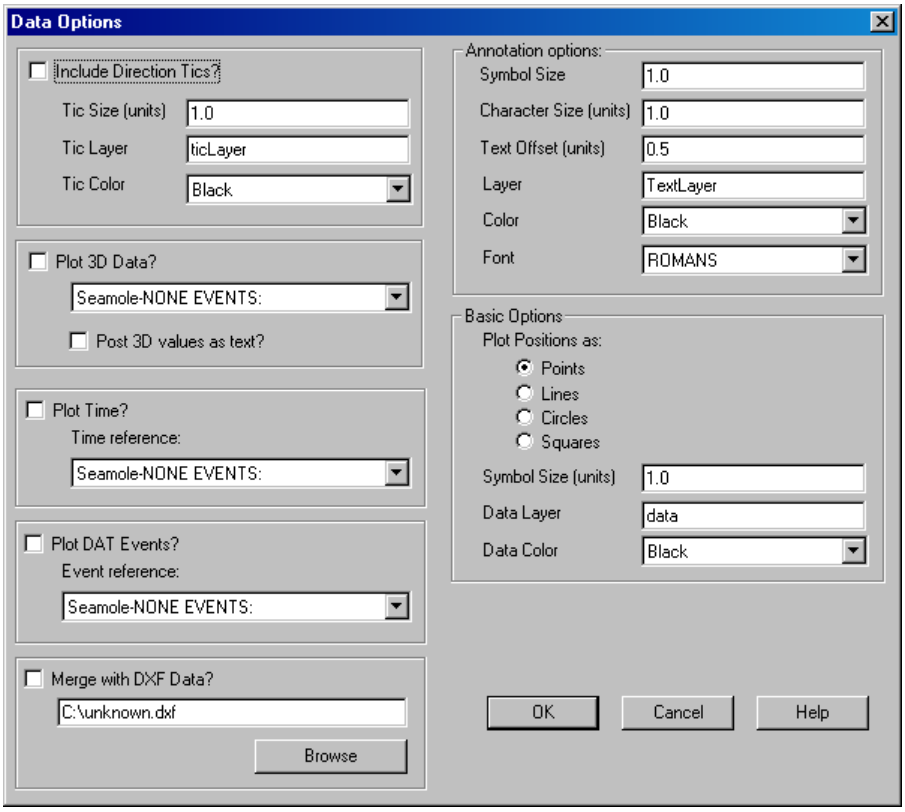
Plot a Title? — Check this option to plot the title entered in the provided window (**Title**). You can also define the **Title Font**, **Title Character Size** (in real world units), the name of the AutoCAD™ layer on which the title is to be placed (**Title Layer**), and the color of the title text (**Title Color**).

Plot a border? — Check this option to plot a border around the drawing. You can also define the border width (**Plot Border Width** in real world units), the color of the border (**Border Color**), the name of the AutoCAD™ layer on which the border will be placed (**Plot Border Layer**), and the separation between the plot border and the overall drawing limits (**Border separation in mm**).

Plot a North Arrow? — Check this option to plot a **North Arrow**. You can define the color of the arrow (**North Arrow Color**) and the name of the AutoCAD™ layer on which the north arrow is to be plotted (**North Arrow Layer**). The location and size of the North arrow are automatically determined by Ribbit based on the size and scale of the drawing.

5 Click **OK** to save these settings and return to the main **Hydrographic Plan Plot** dialog box.

6 Click the **Data Options** button. The **Data Options** dialog box appears as seen below.



The **Data Options** dialog box controls what data will be included in the .**DXF** chart and how the data are presented.

Include Direction Tics? — Check this option to enable the drawing of a line from each data point in the direction equal to the vessel's Course Over Ground at that moment. You can define the length of the line (**Tic Size** in real world units), the name of the drawing layer to which the tics will be written (**Tic Layer**), and the color of the tics (**Tic Color**).

Plot 3D Data? — Check this option to enable the plotting of a third dimension Data Item at each positional data point,

i.e. a point in the DXF file will have X, Y, and Z values rather than just X and Y plan coordinates. The "Z" Data Item is selected using the provided dropdown menu.

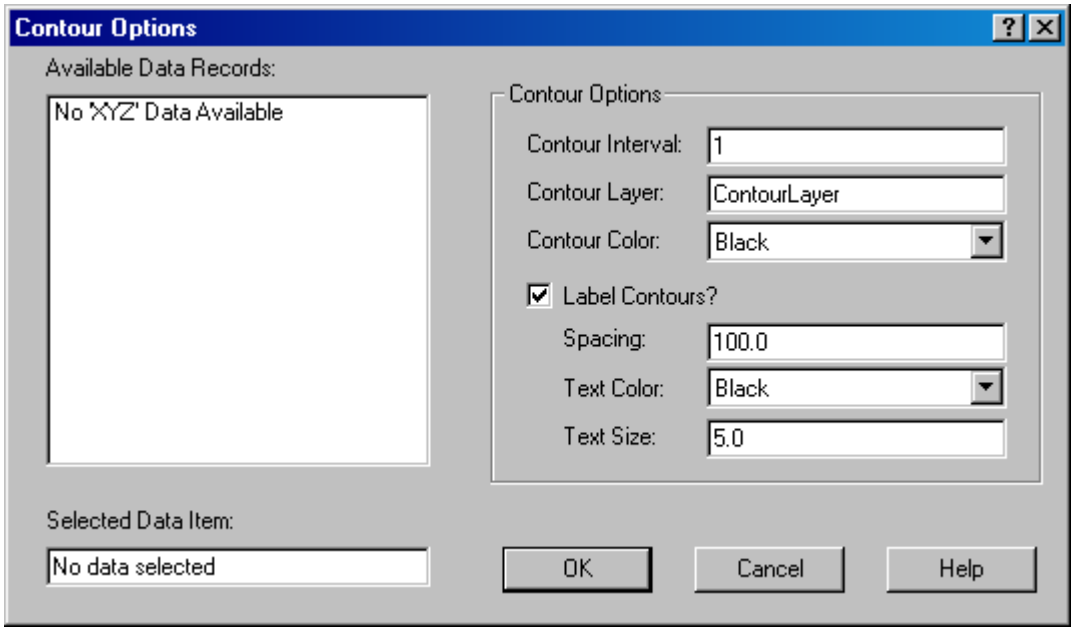
Post 3D Values as text? — Check this option to have Ribbit plot the value of the 3rd dimension (i.e. "Z") Data Item value beside the data point. You must also select **Plot 3D Data?** above. See **Annotation options** below to define how the values will be appear on the chart**.**

Plot Time? — Check this option to have Ribbit annotate each data point with the time that that particular event was recorded. Use the **Time reference**:

	dropdown menu to select the Data Item that will provide the time reference.
Plot DAT Events?	Check this option to enable the plotting of automatically generated event data (i.e. those events generated by WinFrog based on user-specified time or distance downline intervals). Use the **Event reference** dropdown menu to select the desired Data Item.
Merge with DXF Data?	Check this option to enable the plotting of an existing .DXF file in the newly created .DXF Chart. Only those features in the selected existing DXF file that are within the borders of the new DXF chart will be added to the file being created, i.e., the existing .DXF file will be cropped to the area being plotted. Use the **Browse** button to navigate to the desired .DXF file.
Annotation Options:	This portion of the **Data Options** window provides you with the ability to customize various annotation configuration options, including; the size of the symbol that will be plotted to represent that event (**Symbol Size** in real world units), the annotation's character size (**Character Size** in real world units), the offset of the annotation from the data point (**Text Offset** in real world units), the name of the layer that the Data Options will be written to (**Layer**), the color of the various Data Options (**Color**), and font of the annotation (**Font**).
Basic Options	This portion of the **Data Options** dialog box allows you to control the way that the positional data will be plotted on the .DXF chart. Select the appropriate radio button to have Ribbit plot the data points as **Points, Lines, Circles,** or **Squares**. The **Symbol Size** box allows you to define the size of the selected symbol; the entry here (in real world units) defines a **line's** length, a **circle's** radius or a **square's** side length. The name of the layer the points will be added to and the color of the data can also be modified.

7 Click **OK** to save these settings and return to the **Hydrographic Plan Plot** dialog box.

8 Click the **Setup Contours** button. The **Contour Options** dialog box appears as seen below.



The **Contour Options** dialog box is used to configure the plotting of contours in the plan view .DXF chart. Contours are lines drawn joining points of common elevation, hence only three-dimensional (i.e. "X/Y/Z") Data Records can be used. See the section above on **Merging/Deskewing** to create three dimensional X/Y/Z data.

9 Double-click the desired **Data Record** in the **Available Data Records** list. The **Data Item** name now appears in the **Selected Data Item:** field.

10 Configure the **Contour Options** as required.

Contour Interval:	Enter the contour interval in real world units.
Contour Layer:	Enter the name of the layer the contours will be drawn to.
Contour Color:	Select the color the contours will be drawn in.
Label Contours?	If the contours are to be annotated, select this checkbox.
Spacing	Enter the interval (spacing) of the contours between annotations (e.g. 100 would mean annotate the even 100 contours).
Text Color	Select the color the contour annotations will be drawn in.
Text Size	Enter the size of the annotation text in real world units.

11 Click **OK** to save these settings and return to the **Hydrographic Plan Plot** dialog box.

At this point you should preview the .DXF chart to ensure that all of your configuration entries were made correctly.

12 Click **Preview Plot**. Ribbit will generate a chart based on the various configuration selections mentioned above.

13 Click **Done** to return to the **Hydrographic Plan Plot** dialog box.

14 If the chart appearance is suitable, click **Create Plot** button to create the .DXF chart file in the pre-defined location. If the chart requires further modifications, simply re-configure the appropriate dialog boxes as detailed above.

15 Click **Done** to return to the main Ribbit window.

DXF File Output Font Options

When the **DXF File Output** option is used, Ribbit provides dropdown lists for you to select fonts from for annotation of the data and background information. The default font options are ARIAL, COURIER and ROMANS. However, these are augmented with the use of the **ribbit_DXF_fonts.txt** file. This is a simple ASCII text file that is installed into the Ribbit directory during the installation process. It contains a list of basic fonts that AutoCAD® supports. Every time you access the primary configuration dialogs for the DXF Output File option, Ribbit looks for this file and if it is available, reads it and creates a list of available fonts that are then presented whenever a font is required as part of the DXF File Output parameters.

It is possible to edit this file and add fonts that you would like to have included in the font list. The file can be edited and saved using any ASCII text editor such as Windows Notepad. Each font is added on its own line in the file.

It is important to note the following:

- The original copy of this file contains fonts that have been determined as being supported by a basic AutoCAD® installation.
- The file is not generated by scanning the storage media for font files.
- The presence of a font in this file does not guarantee that it will be supported by subsequent processing/displaying packages.

MS Access™ .MDB File Output

.MDB files are database files created and utilized by Microsoft's Access™ program. As the .MDB file format is one of the file types that Ribbit can input, creating an .MDB file during a processing session provides you with a single usable backup file of all currently loaded data. This could potentially save time in future editing sessions.

Note: Ribbit writes all data to the .MDB file, regardless of status (i.e. even those Data Items with an "edited out" status will be recorded to file.)

To Output Data to a .MDB File

1 From the **Data Output** menu, choose **Output to MS Access Database**. A standard Windows™ "Save as" dialog box opens.

2 Navigate to the appropriate directory and enter the desired file name. Ribbit will add the .mdb extension automatically.

3 Click the **Save** button to initiate the creation of this file and return to the main Ribbit window.