Chapter 8: Operator Display Windows

This chapter examines the configuration and use of the display windows available in WinFrog.

- I/O Devices
- Graphics
- Profile
- Vehicle Text
- Acoustics
- Anchor Handling
- Anchor Information
- Alarms
- Attitude
- Auditor
- Bird's Eye
- Calculations
- Controlled Remote
- Distance Counter
- Dynamic Tracking
- GPS QA/QC
- Helmsman
- Level Bubble
- Numerics
- Smart Remote Control
- Time Synchronization
- Tracking Offsets
- Cable Model Large Window
- Cable Model Small Window

Any of these windows can be displayed in the WinFrog work area by simply choosing them from the **View** menu.

Note: some options, such as the **Graphics**, **I/O Devices**, **Calculations**, and **Vehicle Text** windows allow for multiple displays of the same type. Each additional window opened is labeled with a number to differentiate it from the original.

The main menu item **Window** lists all of the currently enabled windows with a checkmark next to the "**active**" window. When you click anywhere within the bounds of a window to make it active, it displays in front of all other windows. You can also choose the window's name from the list under **Window** in order to make it active. Any of the windows that are user-configurable must be made active before they can be modified.

Note: because of its importance, the **Vehicle Text** window can be configured to always be on top of other displays. See the **Vehicle Text** window section below for more details.

On non-initial launches of WinFrog, the windows previously used are displayed in the same layout because window configurations are saved in the **WinFrogini.wfg** file each time you exit WinFrog.

Maximizing Available Monitor Space

Since a large number of windows can be displayed simultaneously, all available monitor display space is quickly used. Even with the most basic WinFrog configurations, the monitor becomes filled, requiring you to limit your selections. Preferred selections typically include the **I/O Devices**, **Vehicle Text**, and **Graphics** windows. A split-screen graphics card and second monitor should be added if you intend to display any of the other available views on a regular basis.

To Maximize Available Monitor Space

WinFrog has four functions to help maximize the use of the available screen space:

1 As mentioned above, the main menu item **Window** lists all of the currently enabled windows, with a checkmark located beside the **active** window. Making a window **active** will display it in front of any other window. Using this feature, you can overlap windows and quickly bring the required window to view as desired.

2 The main menu item **Configure > Virtual Screen** provides you the ability to configure additional "virtual screens." Each can be individually configured for content and layout. (More on this feature in the section named **Virtual Screen Configuration** below.)

3 Also under the **Window** option is the **Cascade** feature. This function re-organizes all of the windows so that they are only partially overlapping. This allows for easy selection of all windows.

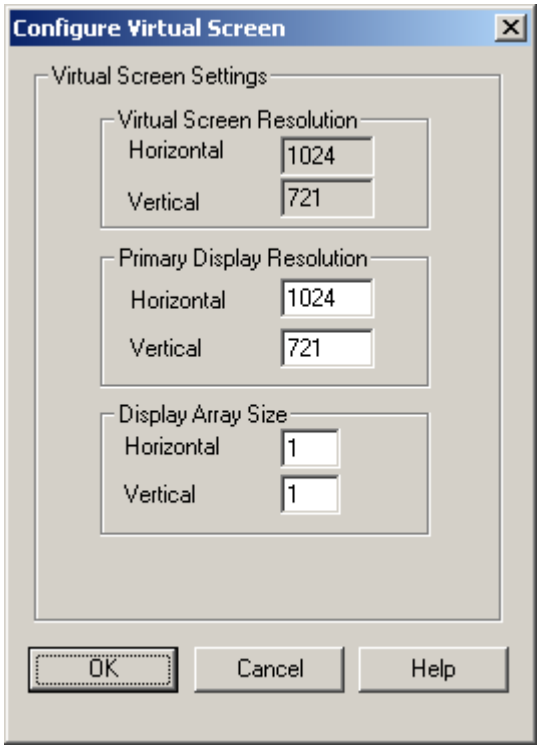
4 In the top right corner of each window are the three standard Windows™ functions: **Minimize, Maximize**, and **Close**. Select the **Minimize** button to shrink the window to display only the **Title bar**. You will be able to see this in the lower left corner of the WinFrog display. (**Note:** a minimized window may be hidden under the **Vehicle Text** window).

Virtual Screen Configuration

As mentioned above, WinFrog's numerous displays are quickly able to cover all available monitor display space. To assist in efficient use of limited space, WinFrog allows you to configure up to 24 "virtual screens" and then choose which display will be viewed. The following sections detail the configuration and selection of virtual screens.

To Configure Virtual Screens

WinFrog's Virtual Screens are configured by selecting the main menu item **Configure > Virtual Screen.** The **Configure Virtual Screen** dialog box displays, as seen below.



Virtual Screen Resolution

Horizontal/Vertical

Displays the monitor's current horizontal and vertical resolution settings. This value is read from the computer's display settings and cannot be altered here.

Primary Display Resolution

Horizontal/Vertical

Enter the horizontal and vertical resolution settings desired for each virtual display. Typically, you would enter the same values as displayed above (Horizontal: 1024, Vertical: 721) in the **Virtual Screen Resolution** entry windows.

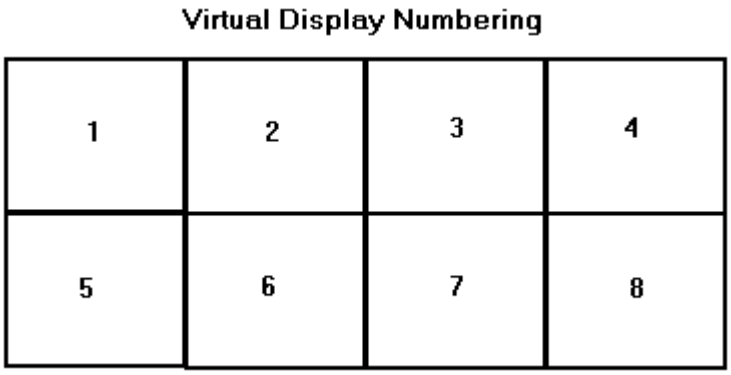
Display Array Size

Horizontal

Enter the number of virtual screen "columns" to be created. The new virtual screens are created to the **right** of **Display Number 1** (see the next figure). For example, the drawing below depicts an entry of 4 in this window.

Vertical

Enter the number of virtual screen "rows" to be created. The new virtual screens are created below the row containing **Display Number 1**. For example, the drawing below depicts an entry of 2 in this window.



A shortcut button, with the number "1" on it, resides on the WinFrog toolbar for the default virtual screen. When you configure additional screens and exit this dialog, shortcut buttons are placed on the toolbar with numbers representing each virtual screen. Click a shortcut button to make that virtual screen the active window. Once the desired display number is selected, you can add or move the various WinFrog display windows to this virtual screen as desired.

I/O Devices Window

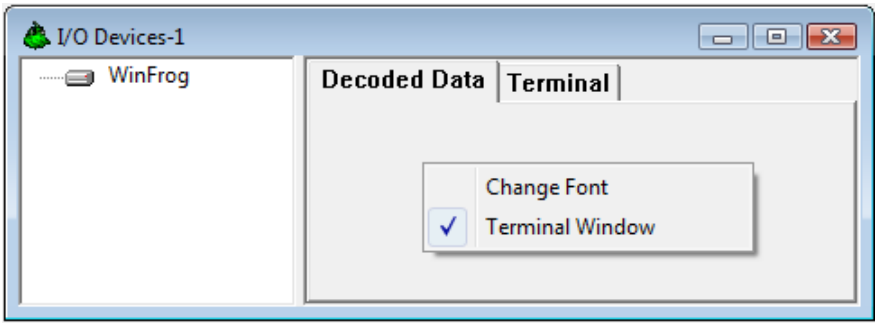
WinFrog's **I/O Devices** window displays real-time data for all peripheral devices configured in WinFrog. This window allows you to view incoming decoded data and outgoing data, edit device interface protocols, and edit operating parameters for each device. Optionally, you can add a terminal tab that displays the raw telegram in ASCII, HEX or binary format. For detailed information concerning configuring peripheral devices in WinFrog, refer to the **Peripheral (I/O) Devices** chapter.

Multiple **I/O Device** windows can be displayed at the same time, enabling you to view data from different devices at the same time.

NOTE: You cannot display the data from the same device in more than one window at a time.

To Display the I/O Devices Window

1 From the **View** menu, choose **Devices**.



The I/O Devices window is divided into two sections: The left side of the window lists all devices that have been added to WinFrog**,** while the right side of the window displays **Decoded Data** and the **Terminal** tab if enabled.

To view the **Decoded Data** or **Terminal** data for a specific device, simply click on that particular device name in the left side of the **I/O Devices** window. The **Decoded Data** or **Terminal** portion of the **I/O Devices** window updates approximately once every half second, displaying data for the chosen device.

The **I/O Devices** window also provides functions that allow you to edit, configure, add, and delete devices.

With the mouse pointer in the **left** side of the **I/O Devices** window, right-click to access the following options:

Edit I/O	Select this option to configure the **input/output (I/O)** parameters for the currently selected device.
Configure Device	Select this option to configure "generic" parameters for the currently selected device, if available.
Timeout Warning	Use this to enable an alarm when data is no longer received from the device. Click the No/Yes to toggle; click the time to open an edit box to change the timeout time.
Add Device	Select this option to open the **Add Devices** dialog box.
Delete Device	Select this option to delete the currently selected device.

With the mouse pointer in the **right** side of the **I/O Devices** window, right-click to access the **Change Font** feature or to enable/disable the **Terminal** tab feature (see graphic above). Select **Change Font** to open a standard Windows™ **Font** configuration dialog box. Select the desired options then click **OK** to return to the **I/O Devices** window. Note: only the **Decoded Data** portion of the **I/O Devices** window uses the selected **Font** options.

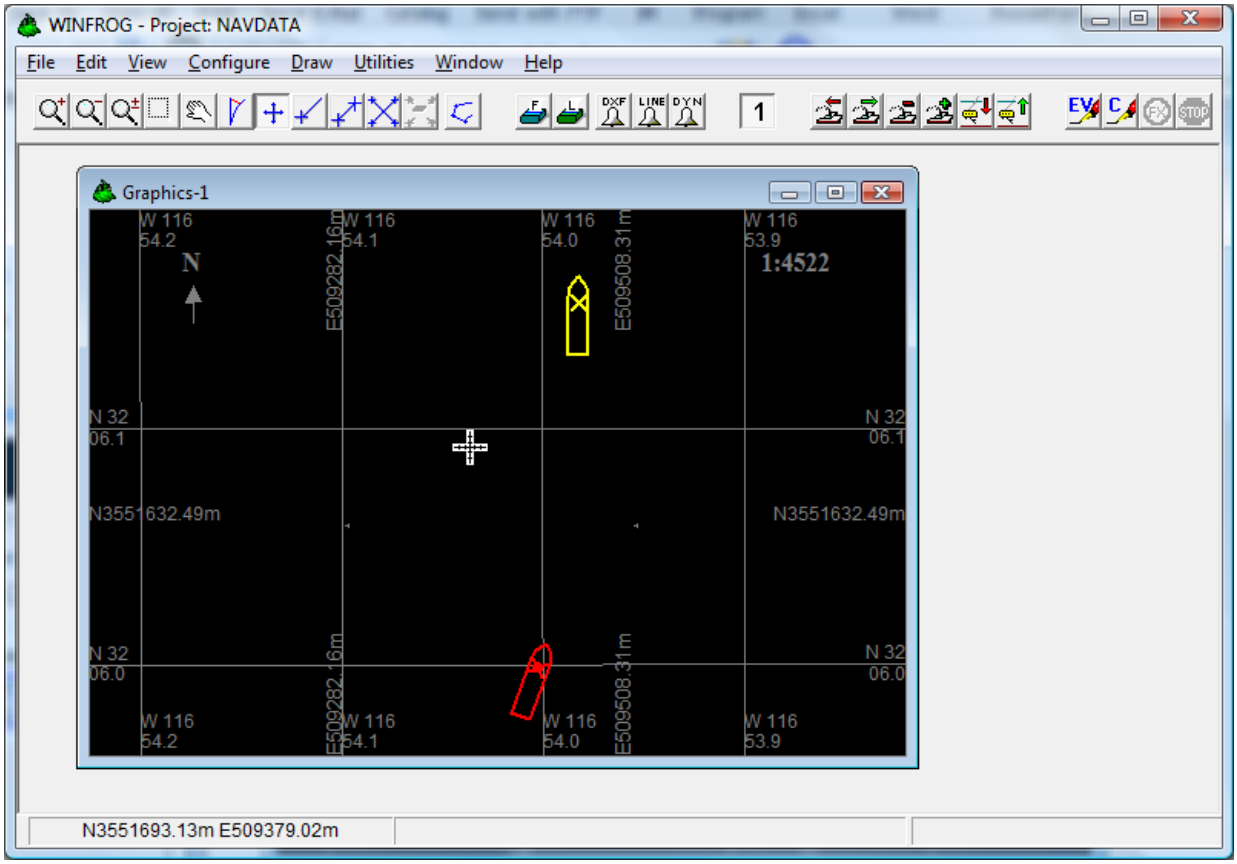
Graphics Window

The **Graphics** window is the main navigational display generated by WinFrog. The **Graphics** window can be configured to display all vehicles, survey lines, waypoints, picture file data, manual events, cable events, data logged using automatic events, transponder locations, and charts. In addition, the **Graphics** window can display latitude and longitude grid lines, Northing and Easting grid lines, a grid with an origin at the center of the **Graphics** window, a North arrow, scale, and chart information.

A feature that is useful for multi-vehicle applications is the ability to display more than one **Graphics** window. Each **Graphics** window can be independently configured to display different information.

To Display a Graphics Window

1 From the **View** menu, choose **Graphics**. WinFrog's default configuration will open the **Graphics** window in the top right corner of the WinFrog workspace.



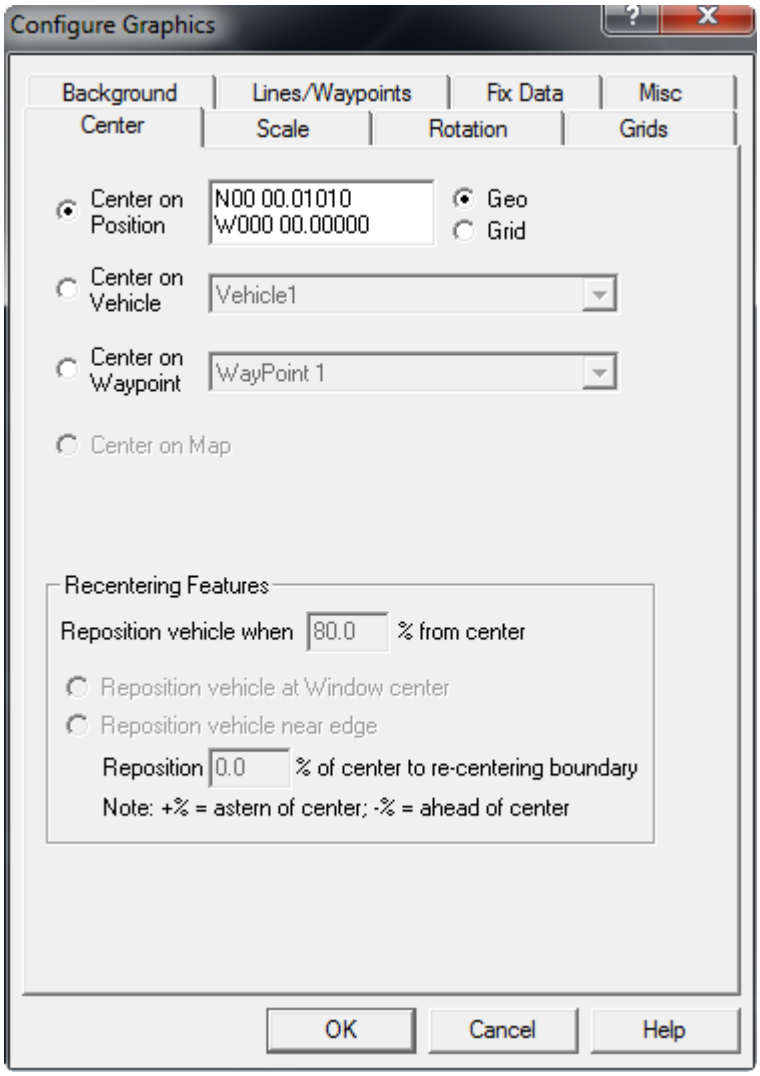
To Configure the Graphics Window

1 If more than one **Graphics** window is currently displayed, you must specify which one will be "active." To do so, either click the title bar of the one to be configured or select the main menu bar item **Window** and select the appropriate **Graphics** window.

2 From the **Configure** menu, choose **Graphics,** or alternatively, move the mouse pointer into the **Graphics** window, right-click and select **Configure Graphics**.

The following parameters are configured using the **Configure Graphics** dialog box:

Center Tab



Center on Position (Geo/Grid)

Select this option to center the **Graphics** window at the coordinates displayed in the box, regardless of the current vehicle position. The coordinates can be either entered in geographic latitude and longitude (if the **Geo** radio button is selected) or in grid Northing and Easting (if the **Grid** radio button is selected).

You can also manually position the center of the **Graphics** window by using the **Mouse Pan** function. To use this function you must first have the **Center on Position** mode selected above. Then, select the **Mouse Pan** icon from the toolbar. Left-click and hold then move the *hand* icon to the desired location. This will re-center the **Graphics** screen to the specified point. You can also pan the Graphics window regardless of which toolbar button is selected by clicking and holding the center mouse button. Note: if the Center on Vehicle mode is selected for the Graphics window you can still pan by either of these methods, but after releasing the mouse button the Graphics window will spring back to center on vehicle. If other modes are selected

(e.g. Center on Waypoint) the centering mode will switch to Center on Position.

Center on Vehicle — Select this option to have WinFrog automatically re-center the **Graphics** screen in reference to the vehicle's current point of reference. If you decide to use either **Mouse Pan** functions while in this mode, when you release the mouse button it will revert back to Center on Vehicle. **Note:** the **Graphics** screen may be constantly refreshing itself if the vehicle is moving and the depicted scale is quite small. This may make viewing of the **Graphics** display difficult.

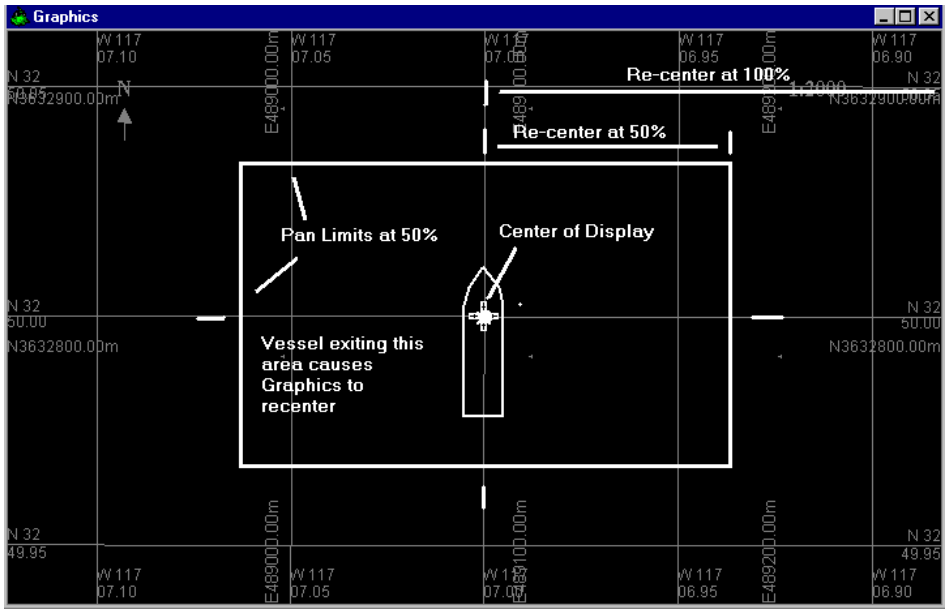
Center on Waypoint — Select this option to have WinFrog automatically re-center the **Graphics** screen in reference to the selected waypoint position. If you decide to use either **Mouse Pan** functions while in this mode, the software will automatically change to Center on Position on the point where you release the mouse button.

Center on Map — Select this option to center on the background map loaded from the Background tab.

Recentering Features — These options are associated with the Center on Vehicle setting and control how the Graphics window redraws relative to the selected vehicle.

Reposition vehicle when % from center — This field allows you to enter a value as a percentage. This is the percentage of the distance between the center and the display edge in which the current vehicle is permitted to travel before the **Graphics** window is refreshed. When the current vehicle reaches the re-center percentage limits of the **Graphics** window edge (in any direction), the **Graphics** window redraws as configured. **Note:** Use this ability sparingly as too small of a percentage will cause WinFrog to refresh the screen too often, dramatically slowing system performance.

The next figure shows the permitted screen area available to the current vehicle in which to travel before a pan is performed to move the vehicle back to the center of the window.



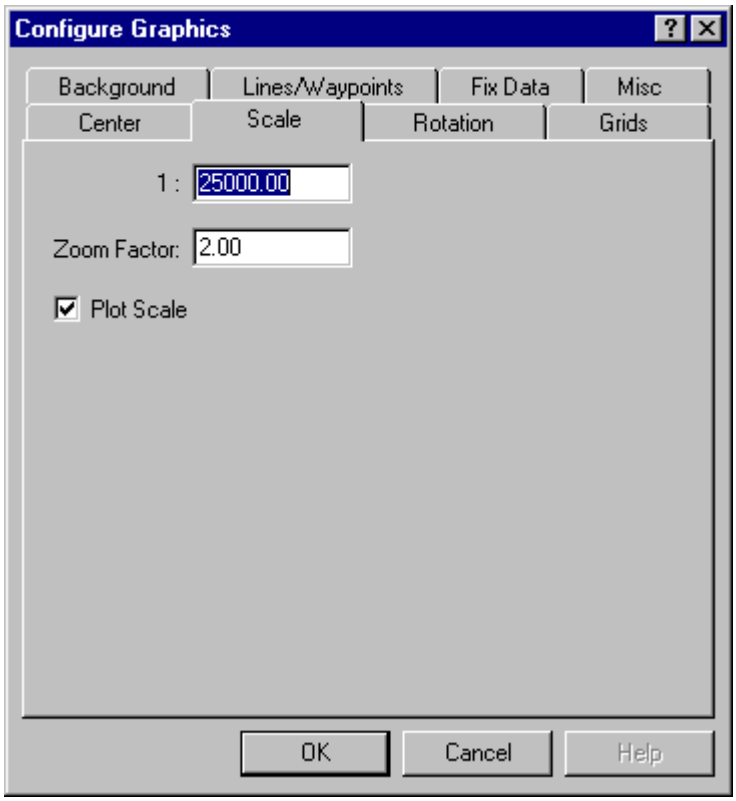
Reposition vehicle at Window center

Select this option if you want the window to redraw with the selected vehicle at the center of the window.

Reposition vehicle near edge

Select this option if you want the window to redraw with the selected vehicle near the edge of the screen. WinFrog calculates a new window center based on the selected vehicle's CMG and a percentage of the distance from the window center to the redraw boundaries relative to the vehicle's CMG. This allows you to configure the window to minimize the redraw frequency when centering on a moving vehicle; or configure the redraw to keep both a towed vehicle and its reference vehicle in the window. A positive percentage places the selected vehicle astern of the window center, i.e. sailing towards the window center on a redraw. A negative percentage places the selected vehicle ahead of the window center, i.e. sailing away from the center.

Scale Tab

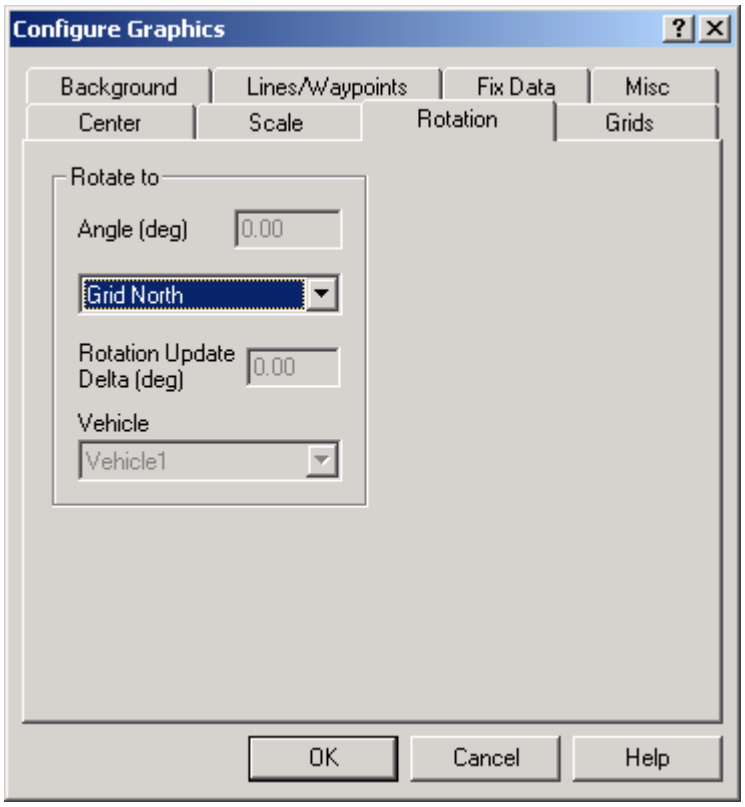


1: field	The value entered here configures the scale at which data are displayed in the **Graphics** window. One unit on the **Graphics** screen equals **X** (user-entered) units in the real world.
Zoom Factor field	The value entered here configures the factor by which the scale of the display is increased when the display is zoomed out or decreased when zoomed in.

You can rapidly change the scale of the **Graphics** screen by selecting the **Zoom In** or **Zoom Out** buttons from the button menu bar.

Plot Scale checkbox	Enable this to display the current **Scale** on the **Graphics** screen.

Rotation Tab



Rotate To Angle field — This option allows you to manually specify the Graphics display Rotation Angle. You must first select Manual from the dropdown box options, then highlight and enter the desired rotation Angle, as measured clockwise from North.

dropdown — Select from the dropdown options to have WinFrog align the **Graphics** window in accordance with one of the following provided options:

Grid North — The grid displays with zero rotation applied i.e. the **North** arrow will be straight "up" in the display.

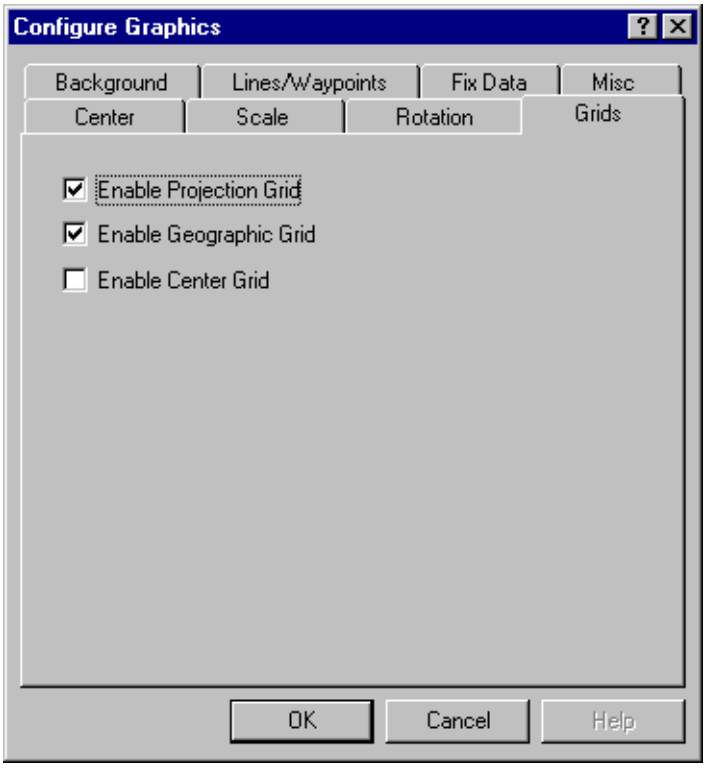
Survey Line — The **Graphics** display is aligned with the **Currently Tracked Segment** of the selected **Survey Line**

The orientation of the **Graphics** window will change as required so that the survey line is aligned from the bottom of the window to the top of the window. When the survey line is tracked in the forward direction, the **Start of Line** is at the bottom of the window. When the survey line is tracked in the reverse direction, the **End of Line** is at the bottom of the window.

Reverse Survey Line	Rotates the **Graphics** display 180 degrees from the current survey line segment direction, as detailed above.
Manual	Rotates the **Graphics** display to an angle of your preference. The value entered refers to degrees as measured clockwise from North.
Centered Vehicle Hdg	Rotates the **Graphics** display to keep the bow of the centered vehicle pointed up. The rotation will automatically update when the heading of the vehicle the Graphics window is centered on changes by an amount equal to or greater than the amount specified in the 'Rotation Update Delta' field. The rotation will only update if the graphics window is centered on a vehicle. When this option is selected the 'center grid' display will no longer rotate with the background display.
Rotation Update Delta field	This field is enabled when the Centered Vehicle Hdg rotation option is selected. This option allows you to set the amount the heading of the centered vehicle must change before the graphics rotation angle is updated.
Vehicle dropdown	If you have chosen Survey Line or Reverse Survey Line in the Rotate To dropdown, you may select the survey line associated with a specific vehicle.

Note: Rotation options are not available when displaying a raster chart with the Blue Marble GeoView Library.

Grids Tab

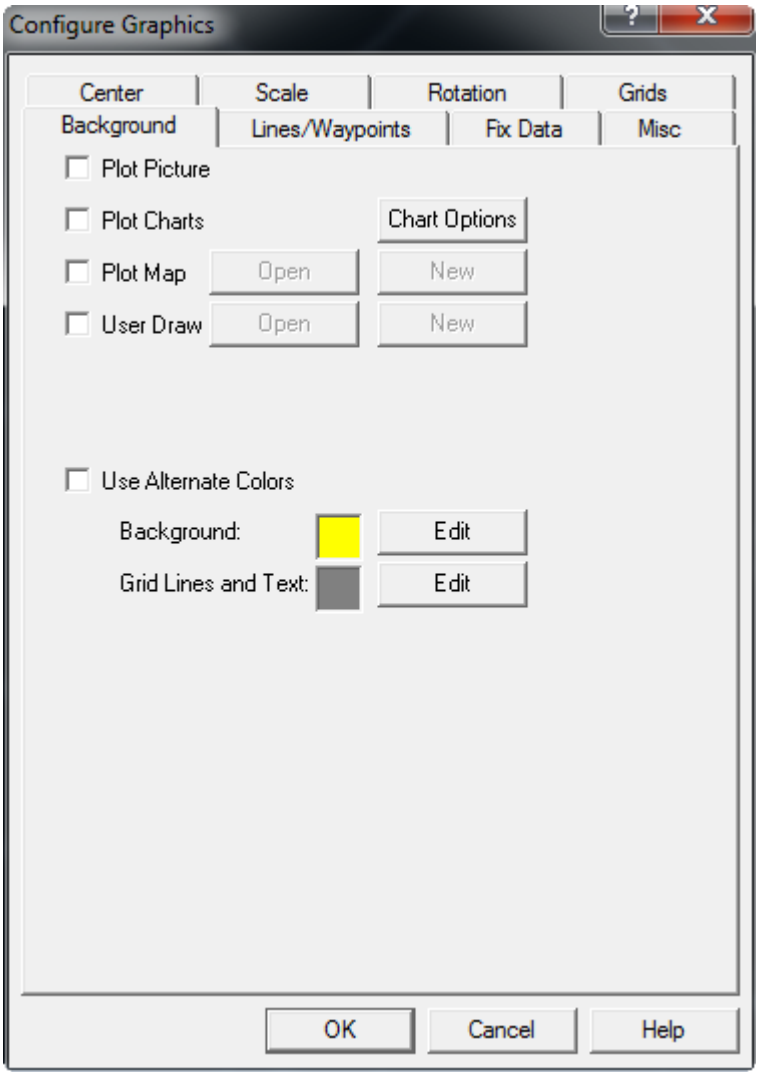


Enable Projection Grid — Select this option to enable the plotting of Northing and Easting grid values at regular intervals in the **Graphics** window. The grid values are also drawn as ticks and crosses to show the location of grid intersections.

Enable Geographic Grid — Select this option to enable the plotting of geographic (latitude and longitude) coordinates labels and lines in the **Graphics** display.

Enable Center Grid — Select this option to enable the plotting of a "cross" centered in the middle of the **Graphics** display. The cross is also annotated at regular intervals showing the distances from the center to the North, South, East, and West limits.

Background Tab



Plot Picture — Select this option to enable the display of the contents of the **Working Picture File.** (See the **Working Picture File** section in the **Working Files** chapter for more details.)

Plot Charts — Select this option to enable the display of a raster chart. See the **Charts** section later in this chapter for more detail on chart configuration.

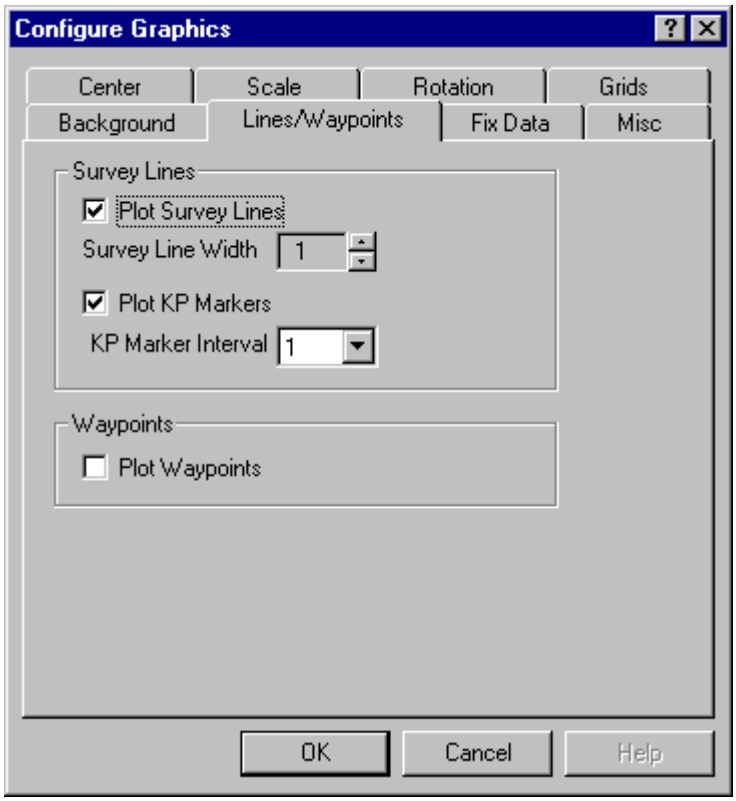
Chart Options button — Explained in the **Charts** section later in this chapter.

Plot Map — Select this option to enable the display of Blue Marble map (BMM) files. See the **Blue Marble Map File Support** section later in this chapter for more information.

User Draw — Select this option to enable the display of a Blue Marble Layer (BML) file on which to draw graphic objects. The options available are to

	open an existing BML file or create a new BML file. See the **User Drawing Support** section later in this chapter for more information.
Use Alternate Colors	Select this option to configure WinFrog to use different colors for the **Background** and **Gridlines and Text** in the **Graphics** window. Use the **Edit** buttons to change the colors as desired. Note that if a background map is displayed using the Blue Marble library, no adjustment is made to avoid masking of features by the chosen background color, if the feature and the background are the same color.
Display MBES Coverage Map	This option is dependent upon the MBES Data Logging module. Select this option to configure WinFrog to display the current multibeam coverage map as the background. For details, see **EM4 - Multibeam Logging and Display**.
Draw Coverage Map Work Area bounds	This option is dependent upon the MBES Data Logging module. Select this option to configure WinFrog to display the polygon that defines the coverage map work area boundary. For details, see **EM4 - Multibeam Logging and Display**.

Lines/Waypoints Tab



Plot Survey Lines — Select this option to display the contents of the **Working (.PTS) Survey Line** file. **Note:** if a vehicle is **tracking** a survey line, the line color will temporarily change from its original color (as defined in the **Working Survey Line File**) to the color of the vehicle.

Survey Line Width — Use the drop down menu to change the width of the survey line as seen in the Graphics and Bird's Eye displays.

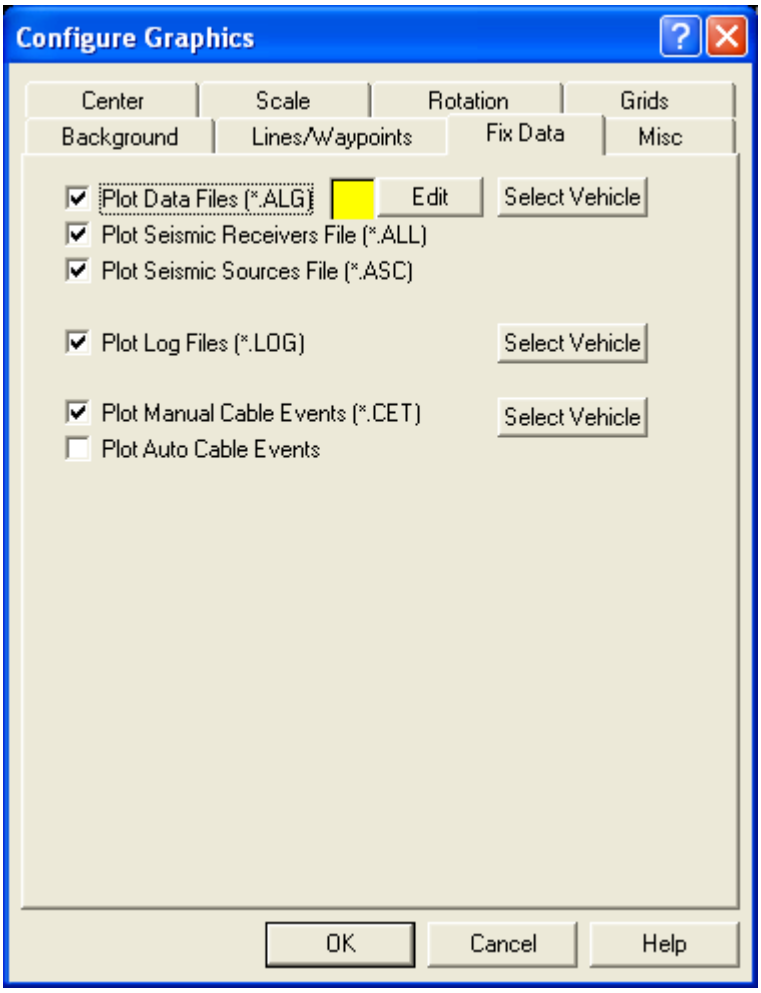
Plot KP Markers — Select this option to enable display of KP Markers (as calculated on the currently tracked survey line) in the Graphics and Bird's Eye displays. Use the drop down menu to change between 0.5 km or 1 km intervals.

Plot Waypoints — Select this option to display the contents of the **Working (.WPT) Waypoint** file. Each individual waypoint can be displayed with a different color and icon, as defined in the **Edit Working Files... Waypoints** > **Waypoint** dialog box. See the **Working Waypoints** section of the **Working Files** chapter.

This customization helps you easily identify different types of waypoints, i.e. navigation hazards, cable events, and alter courses (A/Cs) can each be depicted differently. Similar to

survey lines, a waypoint will change to the vehicle color after it is selected for tracking.

Fix Data Tab

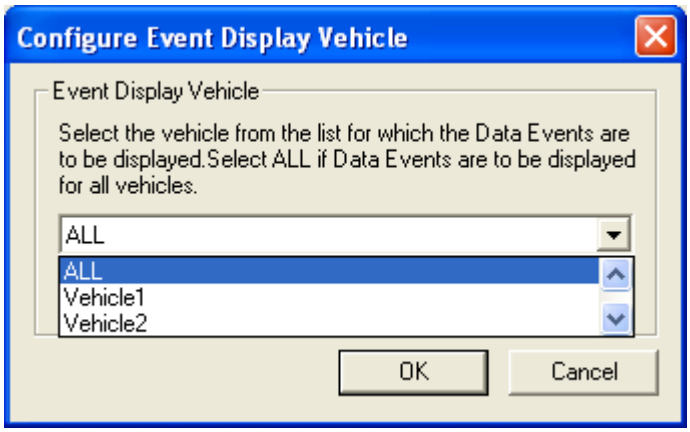


Plot Data Files (*.ALG) — Select this option to enable the plotting of the automatic (**.DAT**) events contained in the **Working (.ALG) Data** file. Each event is plotted as an **X** centered at the event location**.** If the scale is greater than 1:7000, the **X** is annotated with the event number.

Edit — The color used to display the events can be selected. The current selection is displayed. To change the selection, click the **Edit** button.

Select Vehicle — The event data is collected for all vehicles that are configured for either Event Primary or Event Secondary. To limit the display of event data to a specific vehicle, click the **Select Vehicle** button. In the dialog, select either ALL to display event data for all vehicles for which data has been logged, or a specific vehicle. Only

those vehicles that are configured for Event Primary or Event Secondary appear in the list.



Note: you can remove **.DAT** files from the **Working .ALG** file to limit the amount of data displayed on the **Graphics** screen. Likewise, you can add **.DAT** files back to the **Working Data .ALG** file to increase the amount of data shown.

Plot Seismic Receivers File (*.ALL)

Select this option to enable the plotting of the automatic **Receiver** (.**RCV**) events contained in the **Working Seismic Receivers (.ALL)** file. Each event is plotted as an **X** centered at the event location**.** If the scale is greater than 1:7000, the **X** is annotated with the event number. These events are plotted in green and only for the Event Primary vehicle.

Note: you can remove **Receiver** (**.RCV)** files from the **Working Seismic Receiver (.ALL)** file to limit the amount of data displayed on the **Graphics** screen. Likewise, you can add **Receiver (.RCV)** files back to the **Working Seismic Receiver (.ALL)** file to increase the amount of data shown.

Plot Seismic Source File (*.ASC)

Check this option to enable the plotting of the automatic **Seismic** (.**SRC**) events contained in the **Working Seismic Source (.ASC)** file. Each event is plotted as an **X** centered at the event location**.** If the scale is greater than 1:7000, the **X** is annotated with the event number. These events are plotted in blue and only for the Event Primary vehicle.

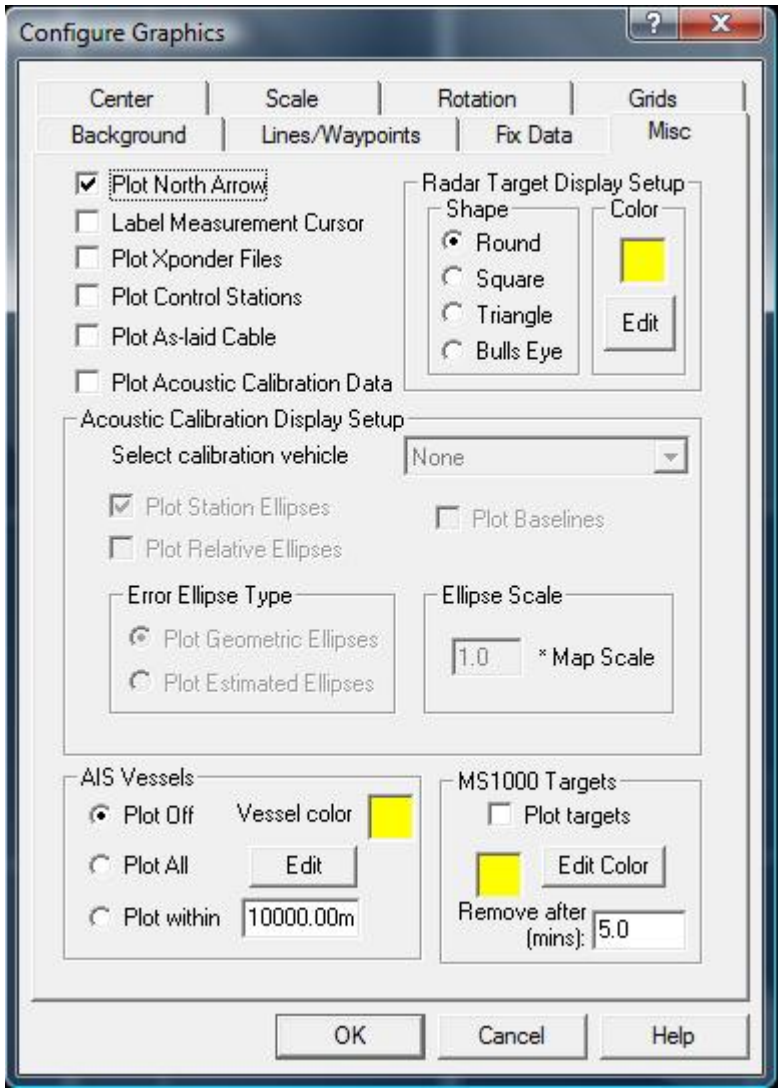
Note: you can remove **Seismic (.SRC)** files from the **Working Seismic Source (.ASC)** file to limit the amount of data displayed on the **Graphics** screen. Likewise, you can add **Source (.SRC)** files back to the **Working Seismic Source (.ASC)** file to increase the amount of data shown.

Plot Log Files (*.LOG)

Select this option to enable the plotting of all **Manual Events** in the **Working Logs (.LOG) File.** Each event is plotted as a **square** centered at the event location**.** If the scale is greater than 1:40000, the **square** is annotated with the event

	number. The event is plotted in the color of the respective vehicle.
Select Vehicle	The event data is collected for all vehicles. To limit the display of event data to a specific vehicle, click the **Select Vehicle** button. In the dialog, select either ALL to display the manual event data for all vehicles, or a specific vehicle.
Plot Manual Cable Events (*.CET)	Select this option to enable the plotting of all **Manual Events** in the **Working (.CET) Cable Events** file. If the scale is greater than 100000, the event is plotted with the respective icon, otherwise it is plotted as an X. If the scale is greater than 1:7000, the icon is annotated with the comment.
Select Vehicle	The event data collected depends on whether or not the Cable Model is active or not. In the case of the Cable Model not being active, the event data is collected for all vehicles. In the case of the Cable Model being active, the event data is logged for the tow and plow vehicles, depending on the configuration. To limit the display of event data to a specific vehicle, click the **Select Vehicle** button. In the dialog, select either ALL to display the manual event data for all vehicles, or a specific vehicle.
Plot Auto Cable Events	Plots all events automatically recorded in the currently open **Cable Database (.MDB)** file. If the scale is greater than 100000, the event is plotted with the respective icon, otherwise it is plotted as an X. If the scale is greater than 1:7000, the icon is annotated with the comment.

Misc Tab



Plot North Arrow — Select this option to plot a North Arrow in the top left-hand corner of the **Graphics** window.

Label Measurement Cursor — Select this option to label all measurement cursor lines with the associated range and bearing information. The information is displayed below the respective line upon completion of the measurement. The information is displayed in geographic or map projection grid terms depending upon the Units\Coordinates configuration setting. The range is displayed in the units selected for Units\General-Distances. The bearing is always based on the direction from the start point (large cross) to the end point (small cross) and is displayed as “ddd.dd°”.

Plot Xponder Files — Select this option to plot all fixed LBL and

	USBL transponders in the **Working Transponders (.XPT)** file as green, unfilled, name-labeled circles. A label is plotted only if the scale is less than 1:7000.
Plot Control Stations	Select this option to plot all **Control Stations** in the **Working Control Stations (.CLS)** file.
Plot As-Laid Cable	Select this option to plot the cable location as determined from the **Working Cable Database (.MDB)** file.

Radar Target Display Setup

If the Rho-Theta device RADAR Targets or NMEA RADAR is present and outputting radar targets they will be plotted on the Graphics window. This group box allows control of the plot. Select the color and shape in which to display all the targets.

Plot Acoustic Calibration Data	Select this option to enable the plotting of the results, baselines observed and error ellipses of an LBL or USBL transponder position calibration directly from the calibration file currently in memory. Select which data to plot from the provided Acoustic Calibration Display Setup options (See Acoustic Display Setup description below). **Note:** A calibration file must be in WinFrog memory in order for it to be displayed.

Acoustic Calibration Display Setup

This section is enabled if the **Plot Acoustic Calibration Data** checkbox is selected. The calibration data to be displayed is taken from the acoustic calibration file currently in memory, whether loaded from file or available directly after logging and processing. Select the features to be displayed using the appropriate dropdown list and checkboxes.

Select Calibration Vehicle	The calibration data is associated with a vehicle. Select the respective vehicle from this dropdown list box. **Note:** Only those vehicles that have either an LBL TRANSCEIVER or USBL HYDROPHONE data item associated with them are listed since these are the only vehicles with which an acoustic calibration file can be associated.
Plot Station Ellipses	The *absolute* error ellipses associated directly with a given station can be plotted by selecting this checkbox.
Plot Relative Ellipses	The *relative* error ellipses associated with a given station pair can be plotted by selecting this checkbox.
Plot Baselines	The baselines observed for the calibration are displayed by selecting this checkbox.

Note: All baselines that were observed are displayed regardless of their current weighting or validity.

Error Ellipse Type — Geometric or estimated error ellipses can be displayed based on the radio button setting. For more information on these types of ellipse, please refer to the **USBL & LBL Calibrations** chapter, specifically the **Viewing the LBL Solution Statistics** section.

Ellipse Scale — The ellipse scale field allows you to enter the display scale to be used for displaying the error ellipse. This can be different from the map scale. This allows the error ellipses to be drawn large enough to be viewable in the **Graphics** window. The number in the field is multiplied by the current graphics scale factor to determine the scale at which the error ellipse is drawn.

AIS Vessels

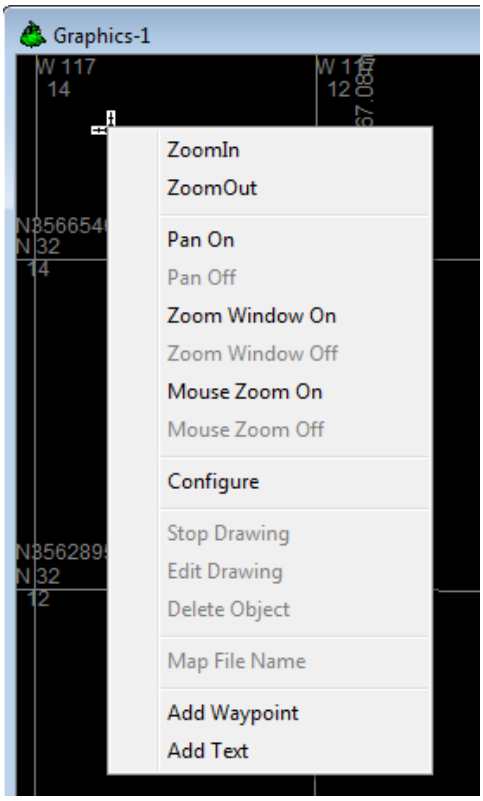
This group allows you to display vessels whose positions are being received using an AIS device. You must setup the NMEA AIS device driver. Select to display none, all, or only those within the indicated distance from the vehicle to which the AIS data item is attached. These vehicles are all the same shape and size. When the mouse hovers over one (focus must be for the graphics window and the regular cursor selected) the name and MMSI will be displayed in the bottom tool bar.

MS1000 Targets

This group allows the display of targets received by WinFrog using the ROV device named MS1000. This data can be displayed both at the master WinFrog that has the device and on an unlicensed (Smart Remote) WinFrog. A small triangle with the target number (1 to 9) in the selected color will be displayed for the length of time indicated. Up to nine targets may be displayed. Any target will be erased when a new target with the same number is received.

Graphics Window Pop-up Menu

A pop-up menu is available to provide quick links to several related features. Right-clicking in the Graphics window accesses the menu as seen below.



Zoom In Clicking this has the same effect as clicking the Zoom In button in the tool bar; it causes the Graphics window to zoom in by the factor set in the Configure Graphics dialog's Scale tab.

Zoom Out Clicking this has the same effect as clicking the Zoom Out button in the tool bar; it causes the Graphics window to zoom out by the factor set in the Configure Graphics dialog's Scale tab.

Pan On This item is enabled if the cursor type is currently not Pan. Selecting this changes the cursor to Pan. It has the same effect as clicking the Pan button in the tool bar.

Pan Off This item is enabled if the cursor type is currently Pan. Selecting this changes the cursor to Display Position. It has the same effect as clicking the Display Position button in the tool bar.

Zoom Window On This item is enabled if the cursor type is currently not Rectangle Zoom. Selecting this changes the cursor to Rectangle Zoom. It has the same effect as clicking the Rectangle Zoom button in the tool bar.

Zoom Window Off This item is enabled if the cursor type is currently Rectangle Zoom. Selecting this changes the cursor to Display Position. It has the same effect as clicking the Display Position button in the tool bar.

Mouse Zoom On This item is enabled if the cursor type is currently not Mouse Zoom. Selecting this changes the cursor to Mouse Zoom. It has the same effect as clicking the Mouse Zoom button in the tool bar.

Mouse Zoom Off This item is enabled if the cursor type is currently Mouse Zoom. Selecting this changes the cursor to Display Position. It has the same effect as clicking the Display Position button in the tool bar.

Configure Clicking this item opens the Configure Graphics dialog.

Stop Drawing This item is enabled if the User Draw option is enabled (see Configure Graphics dialog, Background tab) and a drawing feature is active. Selecting has the same effect as clicking the Stop Draw button in the tool bar.

Edit Drawing This item is enabled if the User Draw option is enabled and an object has been selected using the

	Select Object button in the tool bar. Selecting this allows you to configure respective features of the selected object, e.g. color.
Delete Drawing	This item is enabled if the User Draw option is enabled and an object has been selected using the Select Object button in the tool bar. Selecting this allows you to delete the selected object.
Map File Name	This item is enabled if the Plot Map option is enabled. Selecting displays the file name of the map currently being displayed.
Add Waypoint	Selecting this item allows you to add a waypoint at the location of the last left mouse click in a Graphics window. If selected, the Waypoint dialog is displayed.
Add Text	Selecting this item allows you to add text at the location of the last left mouse click in a Graphics window. If selected, the Configure Text dialog is displayed.

Cursor Features

The cursor can be used to access information pertaining to acoustic calibration data, view and edit waypoints, obtain some vehicle information, and zoom in and out directly.

Acoustic Calibration Data Access
If the Graphics window is configured to display acoustic calibration data (see **Plot Acoustic Calibration Data** in the **Misc Tab** above) and the cursor is placed over a calibration station, the cursor changes to a target cursor (). Right-clicking while the target cursor is displayed results in a pop-up menu with the item **Show Statistics**. Clicking on this item results in a message box to be displayed giving the calibration information for the station, including statistics and error ellipse information. Alternatively, double-clicking while the cursor is a target cursor will result in the display of the same message box.

Waypoint Information Access
If the Graphics window is configured to display waypoints (see **Plot Waypoints** in the **Lines/Waypoints Tab** above) and the cursor is placed over a waypoint, the cursor changes to a target cursor (). Double-clicking (left) when the target cursor is displayed results in the **Waypoint** dialog being displayed allowing the viewing and editing of the waypoint data. Editing the waypoint settings and exiting the Waypoint dialog with OK will result in the immediate updating of the Working Waypoint file.

Note: If a waypoint and a calibration station are co-located, the acoustic calibration data feature takes precedence.
Note: The target cursor is only activated if the Graphics window has the focus. To set the focus, click in the window.

Vehicle Information Access
If the mouse arrow cursor (**Display Position** mode) is placed over the CRP of a vehicle the cursor changes to a target cursor (). Double-clicking (left) when the target cursor is displayed results in the display of some basic information on the vehicle – name, color, current reference offset, etc.

Zoom In and Out
The Graphics window can be zoomed in or out by selecting the Mouse Zoom cursor from the tool bar () or the pop-up menu, clicking and holding the left mouse button down and dragging the cursor in the Graphics window. Dragging the cursor up will result in the window zooming in, dragging the cursor down will result in the window zooming out.

Note: The zoom action is dependent on the vertical cursor movement, not the horizontal. The ratio of the vertical movement to the horizontal must be greater than 1:1 for any zooming to occur.

Charts

WinFrog can be configured to display either **raster** or **vector** format charts in the **Graphics** and **Bird's Eye** displays.

See the instructions in the following section for information on displaying**.RML, .HDR** and .**BSB** format raster charts.

WinFrog now uses the **Blue Marble GeoView Library** to display other types of vector and raster files. The supported vector file types are DXF, DWG, SHP, MIF, DGN, and BML. The supported raster file types are JPG, BMP, TIF and GEOTIFF. See the **Blue Marble Map File Support** section later in this chapter for information on displaying Blue Marble Map (BMM) files that contain the supported file types.

Displaying a Raster Chart in WinFrog

The following instructions apply to**.RML, .HDR** and .**BSB** format raster charts. It is recommended that the charts be installed onto a local hard drive.

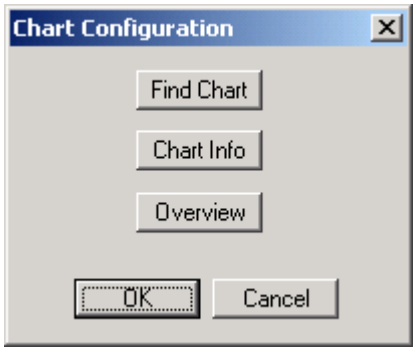
To Display a Raster Chart

1 From the **Configure** menu, choose **Graphics**.

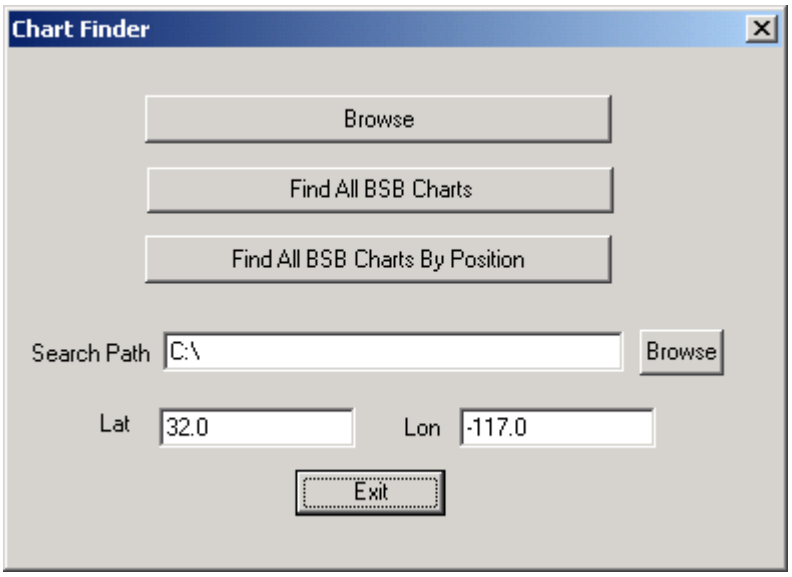
2 On the **Background** tab of the **Configure Graphics** dialog box, select the **Plot Charts** checkbox.

3a If this is the first time you are displaying a chart, the **First Time Chart Selection** dialog box will appear. Click the **Browse for Chart** button and locate the desired chart file. Click **OK**.

3b If you have already displayed a chart and want to choose a different chart file, click the **Chart Options** button (on the **Background** tab of the **Configure Graphics** dialog box) to display the **Chart Configuration** dialog.



4 Click the **Find Chart** button. The **Chart Finder** dialog displays.



5 The **Chart Finder** dialog box provides three options for selecting **.BSB** charts.

Option 1: Click the **Browse** button to manually find the desired file.

Option 2: Enter the **Search Path** in the provided entry window and select the **Find All BSB Charts** button. This will initiate an automatic search of the defined computer directories for the desired file.

Option 3: Enter a **Search Path** and the required **Latitude** and **Longitude** values in the provided entry windows, then select the **Find All BSB Charts By Position** button. This initiates an automatic search for a **.BSB** file that covers the specified coordinates.

6 Once the desired file is located, highlight the file name, and click **Open**.

Note: some **.BSB** files can refer to more than one chart. If more than one file is associated with the selected **.BSB** file, the **Select Chart** dialog box appears. Select the desired chart (by name) and click the **OK** button. WinFrog will briefly display a **Creating Chart** dialog box then automatically return to the **Chart Configuration** dialog box. Click **OK** to close the **Chart Configuration** dialog box and return to the **Configure Graphics** dialog box.

See the next section for more information on viewing the selected chart. For more details on the other options found in the **Chart Configuration** dialog box, see the **Raster Chart Options in the Chart Configuration Dialog Box** section.

Raster Chart Viewing Tips/Hints

There are certain conditions that must be met before a raster chart can be seen in the **Graphics** display.

1 Obviously, the correct chart must be selected. It is preferable that the selected chart be located on the computer's hard drive rather than on a CD drive or some networked location.

2 If the chart is not visible, ensure that the **Graphics Display** is centered within the limits of the chart. See the section on **Chart Configuration** below for more details.

3 There is a limit to the scale at which raster charts can be viewed in the **Graphics Display**. This scale limit changes according to the **size** of the **Graphics Display** window. Above a certain scale, raster charts may not be visible. You may have to re-size the **Graphics Display** or change the scale to a smaller numerical value in order to view the chart.

4 All other selected **Graphics Display** elements display on top of the chart background. Some details may be invisible if the chart is of the same color as the selected option.

5 It is assumed that the chart datum is the same as configured in WinFrog's **Geodetics.** WinFrog will not adjust or convert the chart's coordinates if WinFrog's **Geodetics** are changed. This is a very important detail. The use of charts that are referenced to a different geodetic datum can cause very large positional errors. (See the **Chart Information** paragraph immediately below for details on determining the datum of a NOAA raster chart.)

Note: When loading a BSB file that is rotated at a non-zero rotation angle, and viewing it at small scales, some clipping of the edge of the chart may be apparent in the Graphics window when you pan across the window. This is to allow efficient drawing of the chart.

Raster Chart Options in the Chart Configuration Dialog Box

The **Chart Configuration** dialog box (as seen below) contains two options that can provide you with valuable information about the currently loaded raster chart: **Chart Info** and **Overview**. (See the section above named **To Display a Raster Chart** for details on accessing the **Chart Configuration** dialog box.)

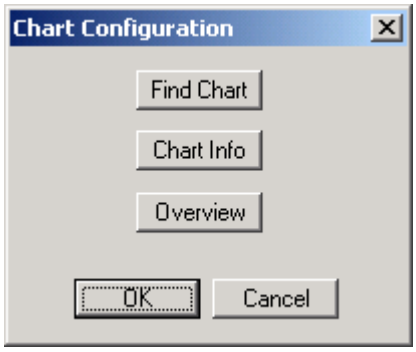
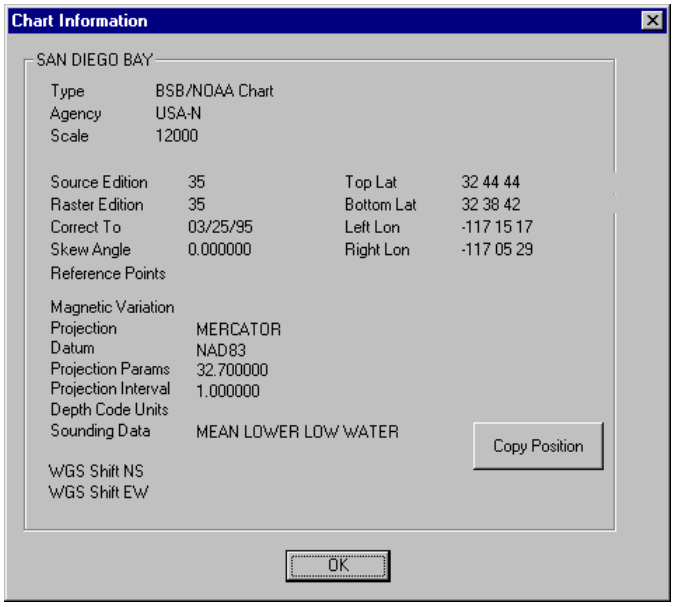


Chart Info button — Displays the **Chart Information** dialog box. An example of the information provided for BSB/NOAA Raster charts is shown below.



The **Chart Information** dialog box displays a variety of important details about the loaded NOAA Raster chart including the **Geodetic Datum** that the chart refers to, as well as to which **Sounding Data** the displayed **depths** refer.

This dialog box also provides you with the geographical coordinates of the **Limits** of the chart. This information can assist you in "finding" the chart in the **Graphics** display.

Select the **Copy Position** button to have WinFrog calculate the chart's center coordinates and copy them to the computer's clipboard memory.

To Center the Graphics Display at the Middle of the Chart

1. Choose **Configure > Graphics** from the main menu.
2. On the **Center** tab, select the **Center on Position** radio button.
3. Highlight the coordinates and, with the mouse pointer still within the coordinate entry window, right-click.
4. Select **Paste**.

Note: the coordinates now change to the calculated chart center.

5 Click OK to close the Configure Graphics dialog box and enact the changes.

More options on the **Chart Configuration** dialog box:

Overview button	Click this button to display the extents of the loaded chart in a size-reduced **Overview** window. Click anywhere within the chart limits to see that position's geographical coordinates. **Note:** this option is only available when using **BSB/NOAA** charts. Click **OK** to close this window and return to the **Chart Configuration** dialog box.
Find Chart button	Select this option to load a new chart. **Note:** this feature is detailed earlier in this chapter in the section named **To Display a Raster Chart**.

Troubleshooting Chart Problems

Chart does not display, even when the vehicle's position is within the boundaries of the chart and the Graphics Display Scale is the same as the natural scale of the chart.

Ensure that WinFrog's **Geodetics** have been properly configured for the current position. Check the **Geographical** and **Projection Grid** lines in the **Graphics Display** and ensure that, with zero degrees display rotation, the lines run straight vertically and horizontally. If these lines are not straight, it is possible that the geodetics are configured incorrectly.

During WinFrog installation, the message "Chart.dll cannot be registered" is displayed.

Ensure that you are logged on to **WINNT** with **administrative** privileges while installing WinFrog.

Unable to open RMI PCX charts.

Ensure the correct directory is entered for the **Chart working directory**.

WinFrog runs very slowly when the charting option is selected.

Charting requires at least 32 megabytes of RAM under NT. For tight memory use, the RMI PCX charts may provide a performance improvement.

Blue Marble Map File Support

WinFrog can be configured to display a **Blue Marble Map (BMM)** file comprised of different layers of **raster** and **vector** maps.

The following raster file types are supported:

- JPEG - Joint Photographic Experts Group (. JPG)
- Supports JFIF compliant files. TIFF - Tagged Image File Format (. TIF)
  - Supports TIFF Specification 5.0 files.
  - Supported Compression Types: no compression, packbits, Modified Huffman encoding, CCITT Group 3 1D, CCITT Group 3 2D, and CCITT Group 4
  - Supported color formats: monochrome, 256 color, grayscale, and 24 bit
- Windows Bitmap (. BMP, .DIB)
  - Supports 1, 4, 8, 24 bit images in Windows or OS/2 format files. Run Length encoded files are not currently supported.

The following vector file types are supported:

- AutoCAD DXF (. DXF) Release 14 and earlier
- AutoCAD DWG (. DWG) Release 14 and earlier
- ESRI Shape File (. SHP)
- MapInfo Vector (. MIF)
- Microstation (Bentley Systems) DGN (. DGN) files.
- Blue Marble Layer (. BML)

In practical terms, the use of multiple layers of raster and vector files as background layers should be cautioned. This BMM file setup may result in performance degradation in updating the Graphics display in real time. For instructions on creating a BMM file, see the Map Wizard section in the Utilities chapter. A shortened version of the same wizard is available through the **Configure Graphics** dialog. See the *To Create a new Blue Marble Map File* section below.

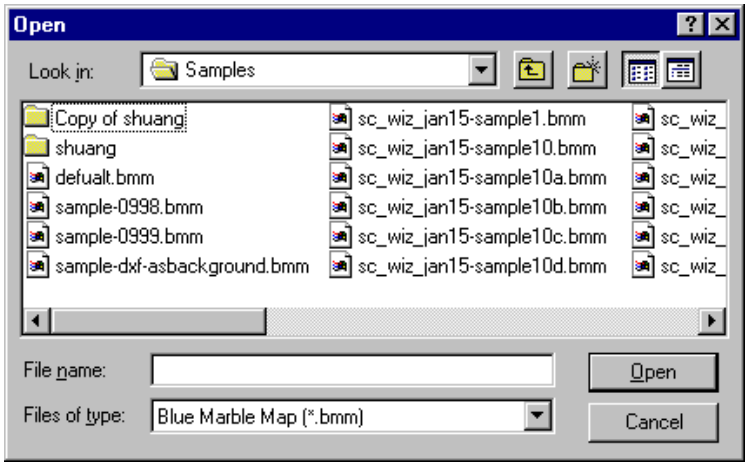
To Display a Blue Marble Map File

1 From the **Configure** menu, choose **Graphics**.

2 On the **Background** tab of the **Configure Graphics** dialog box, select the **Plot Map** checkbox to enable the display of Blue Marble Map (BMM) files.

3 Click the **Open** button to open a BMM file to display as a background image in the Graphics window. A BMM file must first be created using the Map Wizard as described in **Chapter 11 – Utilities**.

4 Select the BMM file to open from the File Open dialog.

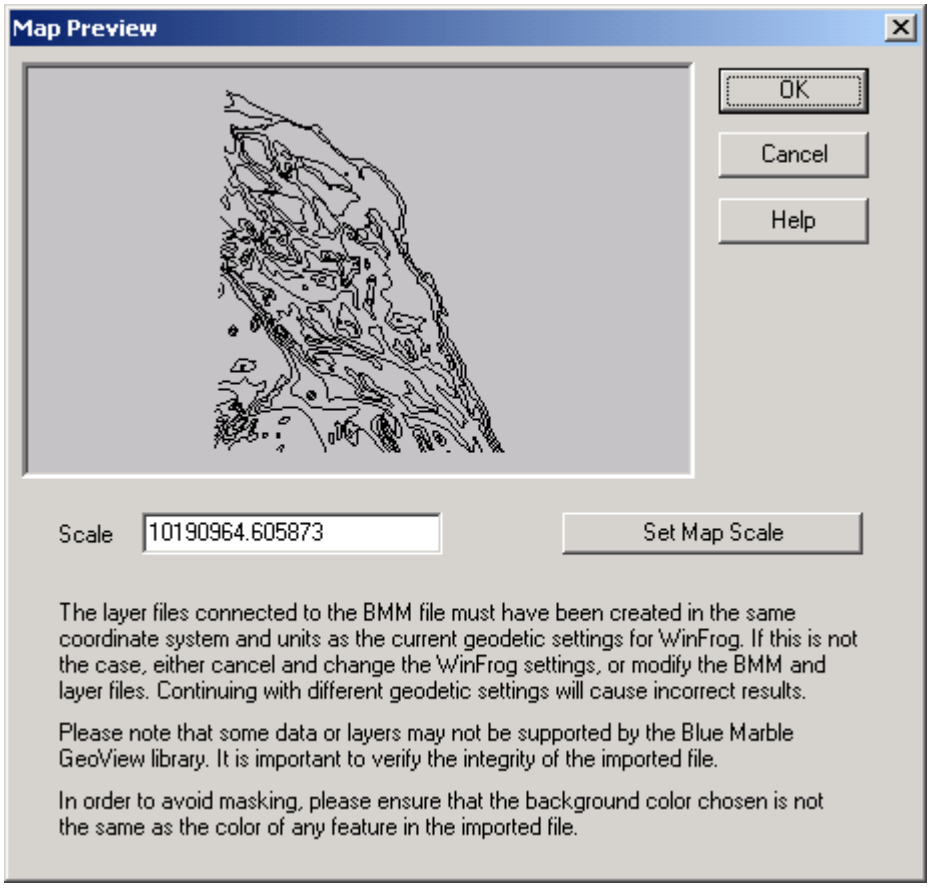


5 A **Map Preview** dialog opens with an overview display of the BMM file. Please ensure that the BMM file and layer files that are attached to it were created in the same coordinate system and units as the settings in WinFrog. If this is not the case and the coordinate systems or units are not the same, click the **Cancel** button and select another BMM file or change the WinFrog geodetics configuration. Refer to **Chapter 3 – Geodetics & Units** for information on changing WinFrog geodetics. Note that if the systems differ and you open the file, the results will be unpredictable and any resulting image will be inaccurate.

Depending on the file format used, some layers and feature types may not be fully supported by the Blue Marble library. It is important to verify the integrity and completeness of the imported file. Also, care must be taken with the chosen background color. If features are the same color as the background color, they will be masked and will not be visible.

Upon previewing, if you find it is necessary to change the scale of the map view, enter a new scale and click the **Set Map Scale** button.

Click **OK** if you are at the desired map view scale.



6 Click **OK** on the **Configure Graphics** dialog box to use this BMM file as a background map.

When a BMM file is displayed in the Graphics window you can verify the name of the BMM file being displayed. This is done through the Graphics window pop-up menu. Right-click in the Graphics window to access the **Map File Name** option to view the name and path of the currently displayed file.

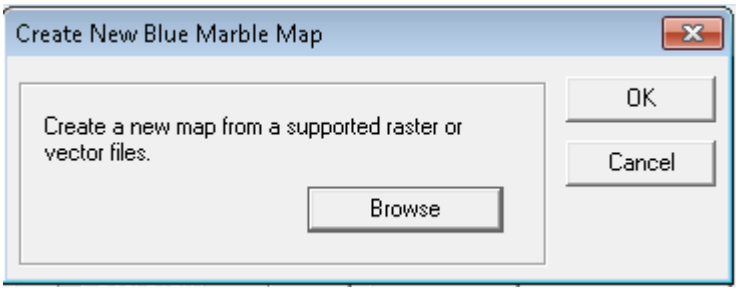
To Create a New Blue Marble Map File

Follow the steps below to quickly create a Blue Marble Map for one supported file.

1 From the **Configure** menu, choose **Graphics**.

2 On the **Background** tab of the **Configure Graphics** dialog box, select the **Plot Map** checkbox.

3 Click the **New** button. This will open the following dialog.



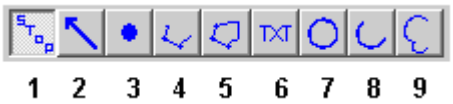
Use the Browse button to select a supported file. Click OK to create a new Blue Marble Map using the input file and to display it as the background map.

User Drawing Support

WinFrog offers the ability to draw graphic objects on the background in the Graphics window. The graphic objects can be drawn on: (1) an existing BMM file background, (2) an existing Blue Marble Layer (BML) file, or (3) a new, empty background. The following sections provide instructions for drawing objects in each of these scenarios.

User-drawn objects can be saved as a Blue Marble Layer (BML) file for use as a background layer in the Graphics window, or appended to an existing BML file. See **To Save Graphic Objects to a Blue Marble Layer File**.

The drawing options can be accessed in two ways: through the **Draw** menu, or through the drawing shortcut buttons on the toolbar. The toolbar buttons are:



1 Stop Drawing
2 Select Object
3 Draw Point
4 Draw Polyline
5 Draw Polygon
6 Draw Text
7 Draw Circle
8 Draw Arc
9 Draw Polyarc

Once object are drawn, certain attributes, such as line color, can be edited. See **To Edit User-Drawn Graphic Objects** later in this chapter.

To Draw Graphic Objects When a Blue Marble Map (BMM) File is Displayed

1 Display a BMM file. For steps on how to display a BMM file in WinFrog, see the **Blue Marble Map File Support** section above.

2 Select the appropriate toolbar button or **Draw** menu option for the graphic object you which to draw.

3 Position the mouse pointer on the Graphics window and click. The graphic object will be

added at this position. For a Point object, a point symbol will be added at this location. For the Polyline, Polygon, Circle, Arc and Polyarc objects, the vertex of the specified object will be added. For the Text object, you will be prompted to enter the text for the specified location.

4 Repeat step 3 for each vertex in the Polyline, Polygon, Circle, Arc and Polyarc objects.

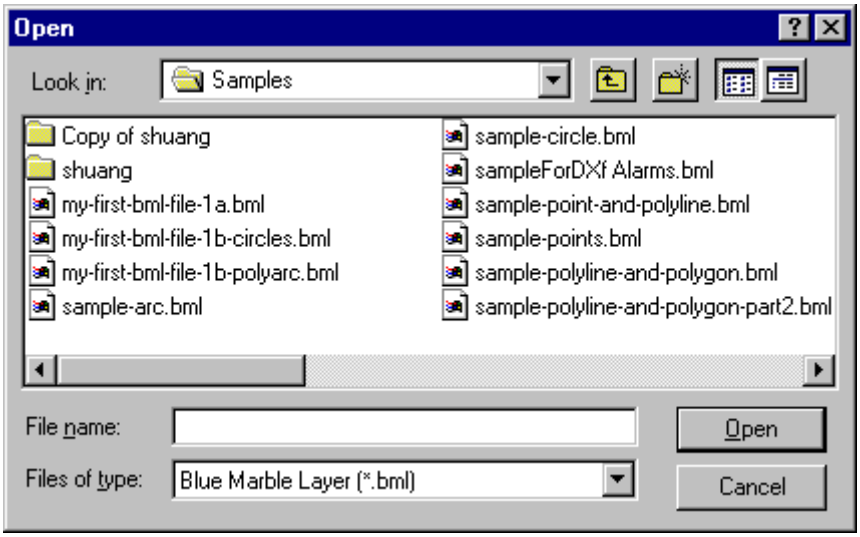
5 Once the object is drawn, select **Draw > Stop Drawing**, or click the Stop Drawing toolbar button, or right-click and select **Stop Drawing** from the pop-up menu.

To Draw Graphic Objects on an Existing Blue Marble Layer File (BML)

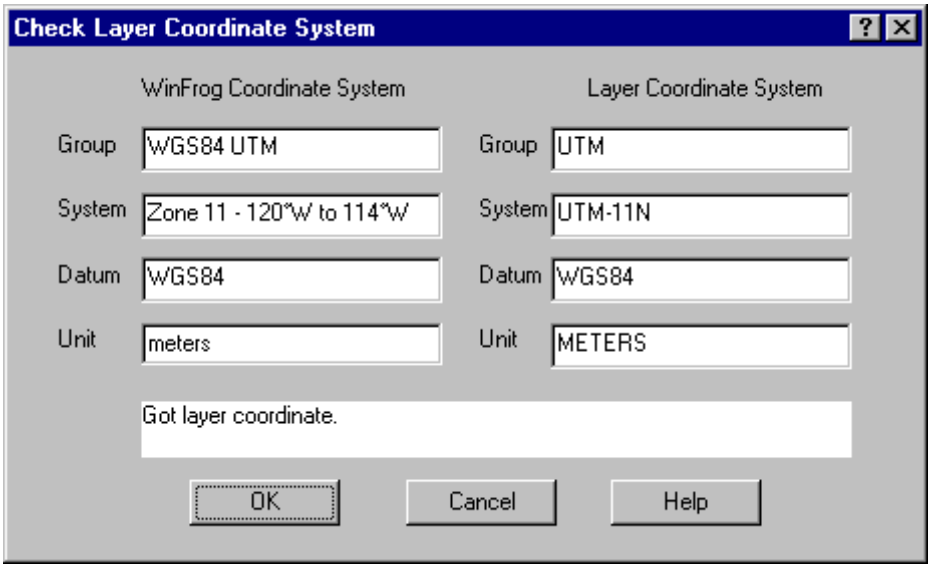
1 From the **Configure** menu, choose **Graphics**.

2 On the **Background** tab of the **Configure Graphics** dialog box, select the **User Draw** checkbox to enable the **Open** and **New** buttons.

3 Click the **Open** button to open a BML file to display as a background layer in the Graphics window.



4 A **Check Layer Coordinate System** dialog opens with the WinFrog and BML Map file coordinate systems and units displayed. Click **OK** to proceed to the next step or **Cancel** if the displayed geodetics and units do not match. If the two geodetic systems differ, either select another BML file or change the WinFrog geodetic configuration. Refer to the Geodetics & Units chapter for information on changing the WinFrog geodetics.



5 A **Layer Preview** dialog opens with an overview display of the BML file. Click **OK** to display this file in the Graphics window or click **Cancel** to cancel this operation. Once the file is displayed in the Graphics window, you can follow the steps in the above section to draw graphic objects on this background.

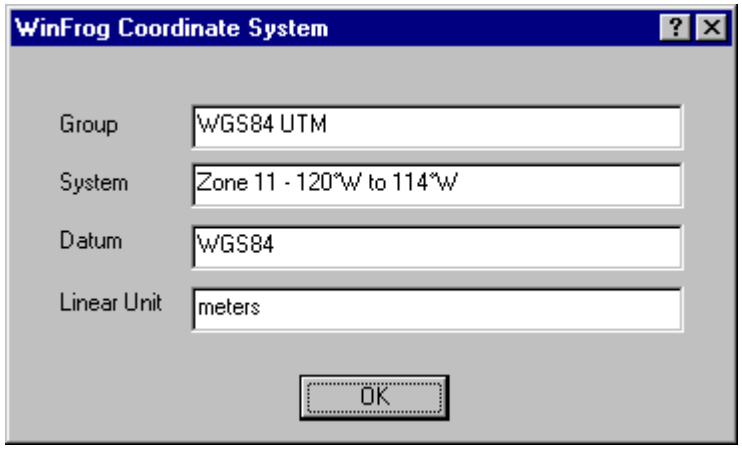
To Draw Graphic Objects on an Empty Background

1 From the **Configure** menu, choose **Graphics**.

2 On the **Background** tab of the **Configure Graphics** dialog box, select the **User Draw** checkbox to enable the **Open** and **New** buttons.

3 Click the **New** button to create a new background image in the Graphics window.

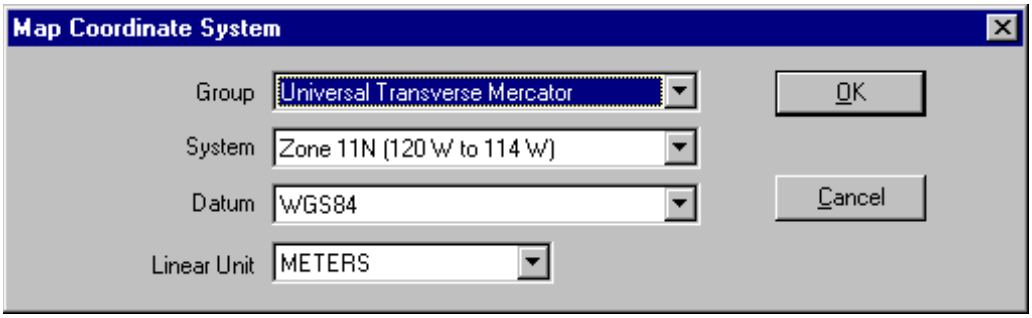
4 A **WinFrog Coordinate System** dialog box displays with the current WinFrog geodetics selected. (See **Chapter 3 – Geodetics & Units** for information on setting geodetics.) This is dialog is informative only – you cannot change the settings. Click **OK** to proceed to the next step.



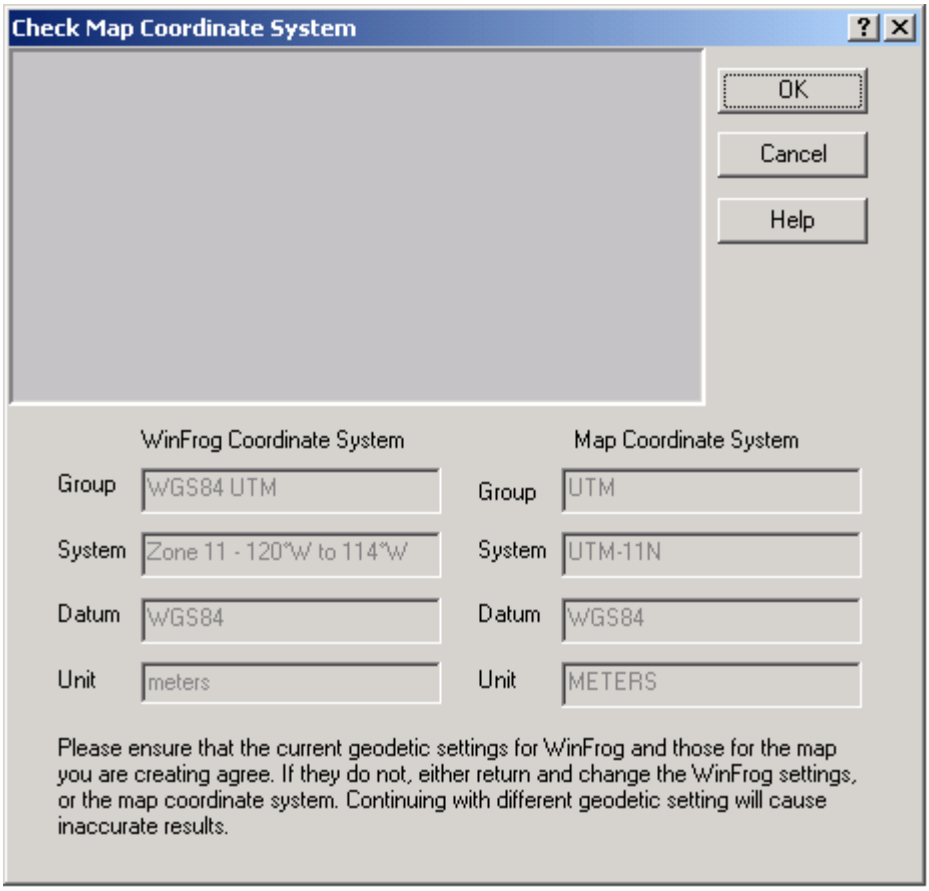
5 A **Map Coordinate System** dialog opens to configure the BML map file coordinate system. Set the BML file geodetics to the WinFrog geodetics from the previous step – this

is very important, as incorrect settings will cause inaccurate results. Click **OK** to proceed to the next step or **Cancel** to cancel the operation.

Note: The BML file Geodetics should be set for the hemisphere that the active survey is being performed. In this example, use 11N for operations in the Northern Hemisphere and 11S for operations in the Southern Hemisphere for the UTM zone.



6 A **Check Map Coordinate System** dialog opens with an overview display of the newly created BML file in the top portion of this dialog and the WinFrog and BML Map file coordinate systems and units displayed in the bottom. Click **OK** to proceed if the coordinate systems and units match, or click **Cancel** to cancel this operation.



7 Click **OK** on the **Configure Graphics** dialog box. You can now draw graphic objects on this newly created background.

To Save Graphic Objects to a Blue Marble Layer File

1 When finished drawing the graphic objects you wish to create, select **Draw > Save**.

2 The **Save User Drawing** dialog box displays. Select the **Save** radio button.

3 A **Save As File** dialog box displays. Specify the name and location where the BML file will be saved.

4 The **Map Coordinate System** dialog box displays. Confirm that the Map Coordinate System geodetics are the same as the WinFrog geodetics. Click **OK** to create the BML file.

Creating and saving a BML file in this manner saves the file as an independent BML file, with the **.bml** file extension. Any BML files created can be displayed as a standalone background layer in the Graphics window or added as a layer into a new or existing BMM file.

Note: Saving graphic objects into an existing BML file will overwrite the file and you will lose all previously saved objects. See the instructions in the following section for appending objects to an existing BML file.

To Append Graphic Objects to a Blue Marble Layer (BML) File

1 When finished drawing the graphic objects you wish to create, select **Draw > Save**.

2 The **Save User Drawing** dialog box displays. Select the **Append** radio button.

3 An **Open File** dialog box displays to select an existing BML file to which to append the additional graphic objects.

To Edit User-Drawn Graphic Objects

Certain attributes of user-drawn graphic objects can be edited, based on the type of object.

1 Click the **Select Object**  button on the toolbar and then click on the object you wish to edit. The object color changes to show that it is selected.

2 Right-click in the Graphics window and select **Edit Drawing** from the pop-up menu. A dialog will display with editing options based on the object selected.

Editing options for graphic objects:

Polyline, Polygon, Circle, Arc and Polyarc	Color
Text	Text and text color
Point	Color, size and icon **Note:** When editing the size of the Point object, a negative value indicates that the size is in pixels and the object size remains fixed when the map scale is changed; a positive value indicates that the size is in map units and the object size will change scale with the map when you zoom in or out; a size of zero (the default value) indicates that the bitmap is shown at its normal size.

3 Make your editing selections and click **OK** to exit.

Objects can also be deleted from the Graphics window pop-up menu. Select an object, right-click and choose **Delete Object**.

Displaying a C-Map Vector Chart in WinFrog

When you first install WinFrog, there are two installation options, **Typical** and **Custom**. Choosing a **Custom** installation provides you with the option to configure WinFrog to display **C-Map** files. You MUST choose this option in order to display C-Map files. If you did not initially install WinFrog using the **Custom** installation options, **WinFrog** must be **removed** and then **reinstalled**.

Note: **C-MAP** charts are purchased directly from **C-MAP**.

Note: WinFrog only supports **C-MAP CM-93 Edition 2**.

By default, **C-MAP** charts use a **Mercator** map projection to convert the geographical coordinates to grid coordinates. If a project requires it, the charts can be displayed using different geodetic parameters. See the section titled **To Use WinFrog's Map Projection** below.

Note: **RML, HDR** and **BSB** format raster charts **cannot** be displayed when the **C-MAP** display option is selected. **WinFrog** must be **removed** and then **reinstalled** in order to display these types of **Raster** charts. Other chart file types supported by the **Blue Marble GeoView Library** (JPG, BMP, TIF and GEOTIFF raster files and DXF, DWG, SHP, MIF, DGN, and BML vector files) **can** be displayed (as a layer in a BMM file) when the C-Map display option is selected.

To Display a C-Map Vector Chart

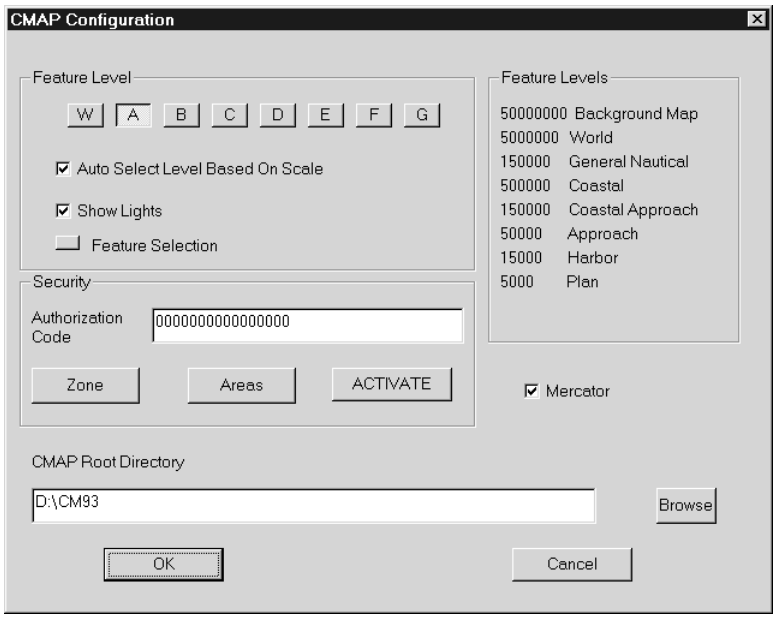
1 Insert the **C-Map** CD containing the region to be displayed.

2 Launch **WinFrog**.

3 From the **Configure** menu, choose **Graphics** to bring up the **Configure Graphics** dialog.

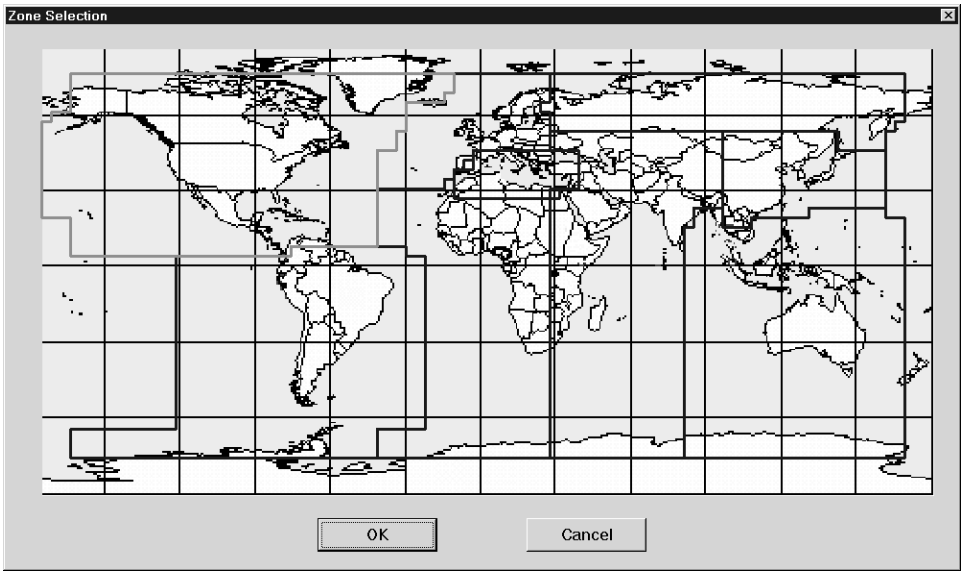
4 Select the **Background** tab.

5 Select the **Plot Charts** checkbox, then click the **Chart Options** button to display the **C-MAP Configuration** dialog as seen below.

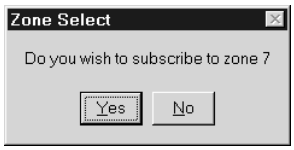


6 In the **CMAP Root Directory** field (at the bottom of the **CMAP** dialog box), make sure the drive letter corresponds to the CD ROM drive containing the **CMAP** CD.

7 Click the **Zone** button to bring up the **Zone Selection** dialog box, as seen below.



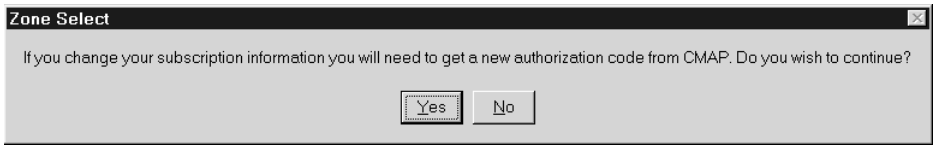
8 Select a **zone** by double-clicking within its boundaries.



The **Zone Select** dialog box opens, asking you to confirm the selection.

9 Click **Yes** or click **No** and repeat **Step 6**.

10 Click **OK**. Another **Zone Select** dialog box opens.



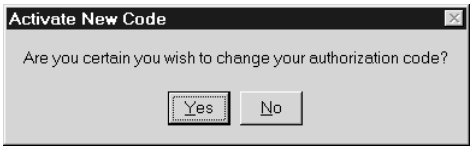
11 Click **Yes** or click **No** and repeat **Step 6**.

The **User Code** dialog box opens, displaying the following message: "**Your User Code is X. Contact C-MAP with this user code to receive an authorization code.**"

12 Click **OK**.

13 Once the **Authorization Code** is obtained, enter it in the **Authorization Code** entry field.

14 Click the **ACTIVATE** button.



15 Click **Yes** to confirm the change.

16 Click **OK** to close the **CMAP Configuration** dialog box.

17 Click **OK** to close the **Configure Graphics** dialog box and display the **C-Map vector** chart.

C-Map Vector Chart Feature Levels

C-Map Vector chart parameters can be modified via the **CMAP Configuration** dialog box.

When the **Auto Select Level Base on Scale** box is checked in the **CMAP Configuration** dialog box, the **precision** of the map displayed is related to the value entered by you in the **Scale 1:** entry field at the top of the **Configure Graphics** dialog box.

Scale	Feature Level	ID	Precision Values
>5,000,000	Background Map	W	not available
5,000,000	World Map	A	1500m
1,500,000	General Nautical	B	450m
500,000	Coastal	C	150m
150,000	Coastal Approach	D	45m
50,000	Approach	E	15m
15,000	Harbor	F	4.5m
5,000	Plan	G	1.5m

The letter **ID** in the **Feature Level** area of the **CMAP Configuration** dialog box shows the feature level displayed in the **Graphics** window. If there is no chart available with the feature level corresponding to the user-entered scale, the **Graphics** window displays in white.

To Bypass the Default Precision Value Associated with an Entered Scale

1 Uncheck the **Auto Select Level Base on Scale** box in the **CMAP Configuration** dialog box in order to display a desired feature level despite the entered scale.

Note: a high precision feature level displayed at a high scale can adversely affect performance while a low feature level displayed at a low scale can result in a loss of precision.

To Use WinFrog's Map Projection

By default, these charts are displayed using a Mercator map projection. You can choose to display the charts using the parameters configured in WinFrog's **Geodetics** dialog box instead.

1 In WinFrog, select the main menu item **Configure > Geodetics**, then configure the geodetic parameters, as required. See the **Configuring Geodetics and Units** chapter for more information on selecting the **Working Geodetics** in WinFrog.

2 In the **CMAP Configuration** dialog box, un-check **Mercator**.

Note: **CMAP** display performance is greater when the **Mercator** box is checked.

Visible Illuminations

Light sources shine a light toward the sea. However, obstacles can block the beam of light in certain directions. **Vector** maps can indicate where a vessel would be able to see a beacon of light shining from a lighthouse or other light sources.

To Indicate Illumination

1 Check the **Show Lights** box in the **Feature Level** area of the **CMAP Configuration** dialog box.

Profile Window

The **Profile** window displays a user-defined view of the water column and can include such information as **survey lines** and **waypoints** as well as all WinFrog **vehicles**. In addition, if a DTM is loaded, the profile created where the Profile Window cross section intersects the DTM can be displayed.

Note: The use of a DTM to display a profile requires the MBES Logging module.

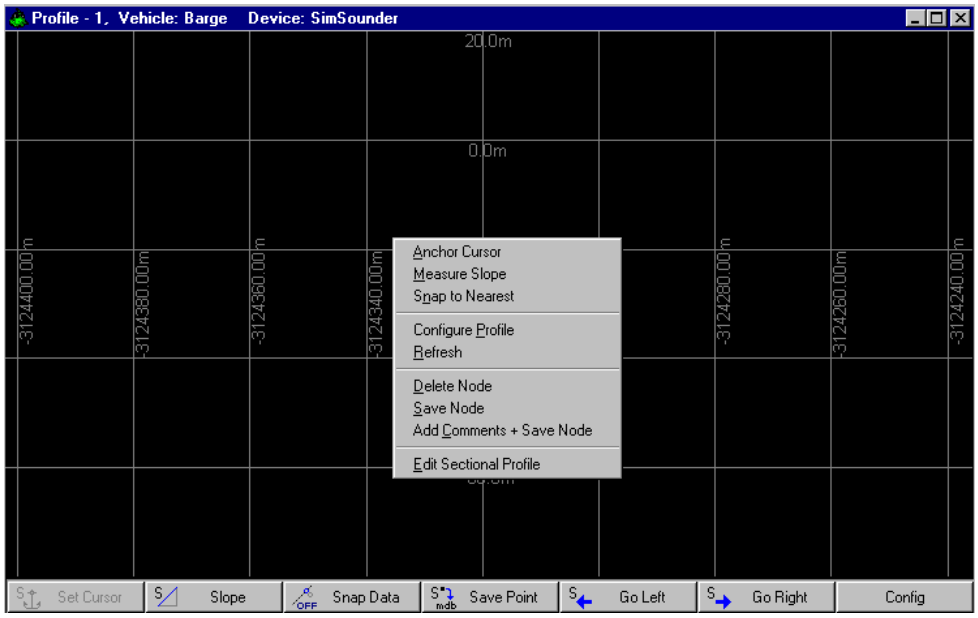
The inclusion of the above mentioned data in the **Profile** window is dependent upon the location of the various data relative to the configured location as well as the orientation of the **Profile** window. The following sections detail the configuration of the **Profile** window. See the **Working Files** chapter for more information on configuring three-dimensional survey line and waypoint data.

To Display the Profile Window

1 From the **View** menu, choose **Profile**. Multiple **Profile** windows can be displayed simultaneously, each with their own unique configuration. Each **Profile** window can be moved or have its size altered by "grabbing" the edge of the window and moving it as desired.

There are a variety of **Profile** window operation and configuration options presented when the mouse pointer is moved into the limits of the **Profile** window and the right mouse button is clicked. Most of these options are also presented in the **Profile** window **Toolbar** found at the bottom of the **Profile** window.

For typical, real world operations you would first configure the **Profile** window.



To Configure the Profile Window

There are three ways to access the **Configure Profile** dialog box.

1 Select **Configure** > **Profile**.

2 Move the mouse pointer within the limits of the **Profile** window, right-click and select **Configure Profile**.

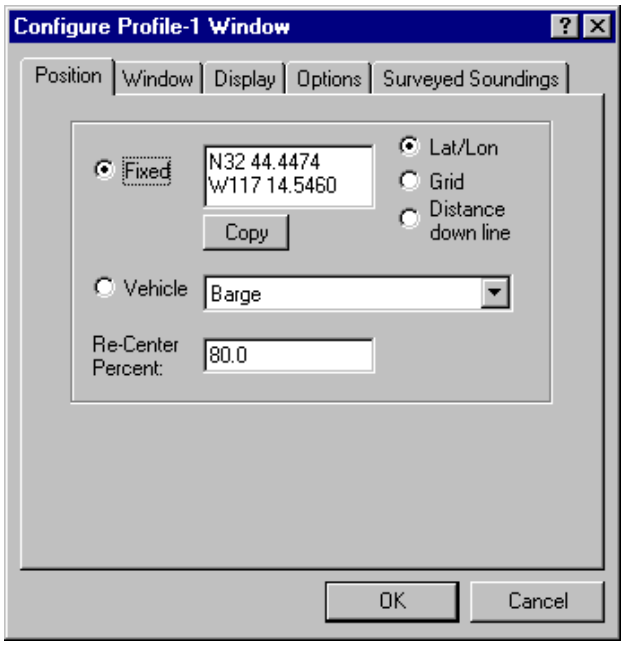
3 Select the **Config** button in the lower right corner of the **Profile** window on the toolbar.

Regardless of the method used, the result is the presentation of the **Configure Profile Window** dialog box.

The **Configure Profile** window is comprised of five different configuration categories that are accessed by selecting the appropriate tab. Each of these configuration options is detailed below.

Position Tab

The **Position** tab allows you to specify the way that the **Profile** window is centered horizontally.



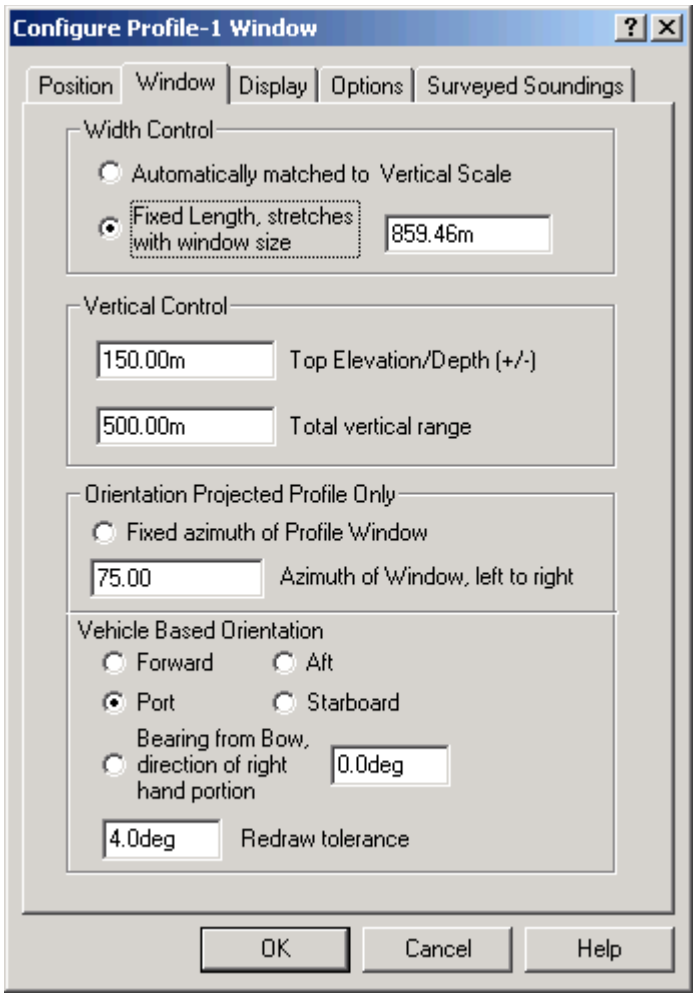
Fixed radio button — Select this option to horizontally center the **Profile** window at the coordinates displayed in the box, regardless of the current vehicle position. The coordinates can be either entered in geographic latitude and longitude (if the **Geo** radio button is selected) or in grid Northing and Easting (if the **Grid** radio button is selected).

Vehicle radio button/ dropdown box — Select this radio button, then (from the dropdown box) choose the vehicle to which the **Profile** window display will be horizontally centered.

Re-Center Percent field — Enter a value in percent. This is the percentage of the distance between the center and the side edge of the display in which the current vehicle is permitted to travel before the **Profile** window is refreshed. When the current vehicle comes within the re-center percentage limits of the **Profile** window edge, the **Profile** window pans to return the current vehicle to the center (horizontally) of the **Profile** window.

Window Tab

The **Window** option allows you to control the **Horizontal Scale**, **Vertical Scale**, and **Orientation** of the data in the **Profile** window.



Width Control

Automatically matched to Vertical Scale

If selected, WinFrog automatically varies the length (width) of the **Profile** window to match the **Vertical Scale**.

Fixed Length, stretches with window size

If selected, allows you to manually define the length (width) of the Profile window. It is recommended that this option is selected to ensure the adequate horizontal information is visible, despite the fact that the display will not be to scale.

Vertical Control

Top Elevation/Depth

Enter a value to define the top of the water column displayed in the **Profile** window. This value designates where the top of the **Profile** window begins in relation to the surface of the water. The value **0** starts at the surface. A

negative value starts below the surface. It is suggested that a value of approximately 20 meters is entered to ensure that surface vehicles will be visible in the **Profile** window.

Total Vertical Range — Defines the total amount of the water column displayed in the **Profile** window, as measured down from the **Top Elevation** entry made above. This range is always entered as a positive value.

Orientation

You can only select a profile orientation for the projected type of profile; see the Display tab. The orientation may be fixed, i.e. with respect to north or may be related to a vehicle.

Fixed azimuth of Profile Window — Select this radio button to fix the profile's orientation with respect to north.

Azimuth of Window left to right — Enter the **Azimuth (horizontal bearing)** of the **Profile** display as it appears in the **Graphics** window.

To determine the **Azimuth**, visualize that you are looking straight down from high above the ocean surface and the **Profile** location. From this perspective, the **Profile** will appear simply as a thin straight line, the length as defined in the **Width Control** entry above.

To define the **Azimuth** of the **Profile** line you must first decide from which side you wish to view the **Profile** (i.e. decide which end of the **Profile** will be to your viewing **left** and which side will be to your viewing **right** as you look **horizontally** at the mid-point of the **Profile**). The **Orientation** value entered here is the bearing of the line created by joining the left edge of the display to the right side of the display.

Typically, to view a **Survey Line** in profile view without scale distortion, the **Orientation** value will be the bearing of the **Survey Line** segment (or 180 degrees different, depending on how the **Survey Line** coordinates were entered).

Note: if **Continuous Profile along selected line** is chosen from the **Display** section (detailed in the section below), the **Orientation** entry window will display **Along whole line,** and not allow any numerical data entry.

Vehicle Based orientations:

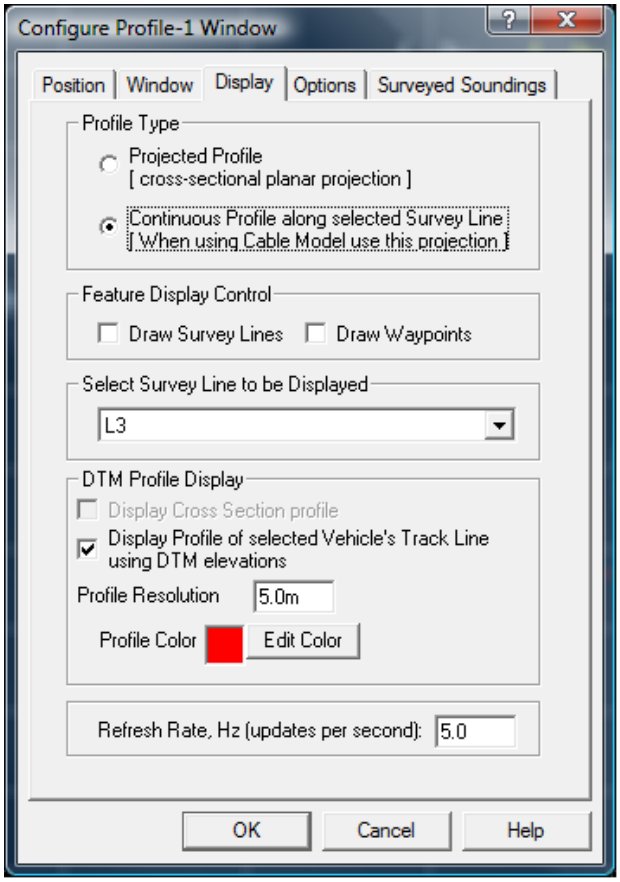
Forward — The profile will be perpendicular to the vehicle's heading and as if the viewer was facing forward, towards the bow, from the center of the vehicle. Thus the right hand side of the profile will be to the starboard side of the vehicle.

Aft — Similar to above, the profile will be perpendicular to the vessels heading, but as if the viewer is facing aft. Thus the right hand side of the profile will be to the port side of the vehicle.

Port	The profile will be parallel to the vehicle's heading and as if the viewer was facing port, from the center of the vehicle. Thus the right hand side of the profile will be to the forward part of the vehicle.
Starboard	Similar to port, the profile will be parallel to the vehicle's heading and as if the viewer was facing starboard, from the center of the vehicle. Thus the right hand side of the profile will be to the aft part of the vehicle.
Bearing from bow…	Instead of using cardinal points above, you may select an angle from the bow that you want the profile to lay at. The right hand portion of the profile is in the direction of the entered angle.
Redraw Tolerance	Since vehicle based orientations will change as the vehicle heading changes, a tolerance has been added to prevent continual redraws. Once begun, the vehicle heading must change by the amount entered before a redraw will occur.

Display Tab

The **Display** option provides you with the ability to configure various **Profile Display** features.



Profile Type

Projected Profile — Select this option to allow manual configuration of the **Window Tab** options, as detailed immediately above. This type of profile is a cross section. The extent of the cross section is displayed in the Graphics window.

Continuous Profile along selected line — Select this option to have WinFrog automatically control the **Profile orientation** to suit the currently selected survey line, as detailed below. This type of profile is a center line profile of the line assigned to the vehicle selected on the first tab. A vehicle must be selected on the first tab. This profile is always drawn from the start of line on the left.

Feature Display Control

Draw Lines / Draw Waypoints — Select the appropriate checkbox to draw lines and/or waypoints. These options enable the display of all contents of the appropriate **Working** file.

Select Survey Line to be Displayed

dropdown box — This selection is applied only when the **Profile Type** is **Continuous Profile along selected line.** This option allows for the **Profile** display of an alternate **Survey Line**, perhaps one that contains more **downline** elevation information, such as slope changes for example.

If the real-time **Cable Model** is **not** running, this option defines the line for the Profile window. If the real-time **Cable Model** is running, the Profile window is defined by the survey line being **tracked** by the first surface layer vehicle.

DTM Profile Display

This group is only enabled if a DTM (multibeam coverage map) has been loaded. It will enable the drawing of the profile of either the cross section or vehicle track line where it intersects the DTM.

Display Cross Section Profile — If the Projected Profile has been enabled you can display the profile of this cross section where it intersects the DTM. The cross section line is displayed in cyan in the Graphics window.

Display Profile of selected Vehicle's Track Line — This will allow you to draw the selected vehicle's track line profile where it intersects the DTM. A vehicle must be selected on the first tab

and it must have an assigned survey line. The profile is drawn in terms of along line distance, from left to right, across the Profile window.

Profile Resolution — This is the resolution (distance between points) to use to interrogate the DTM to construct the profile. It shouldn't be any less then the cell size; the minimum interval is 0.25m.

Profile Color — This is the color that the profile will be drawn in. Click the Edit Color button to change it.

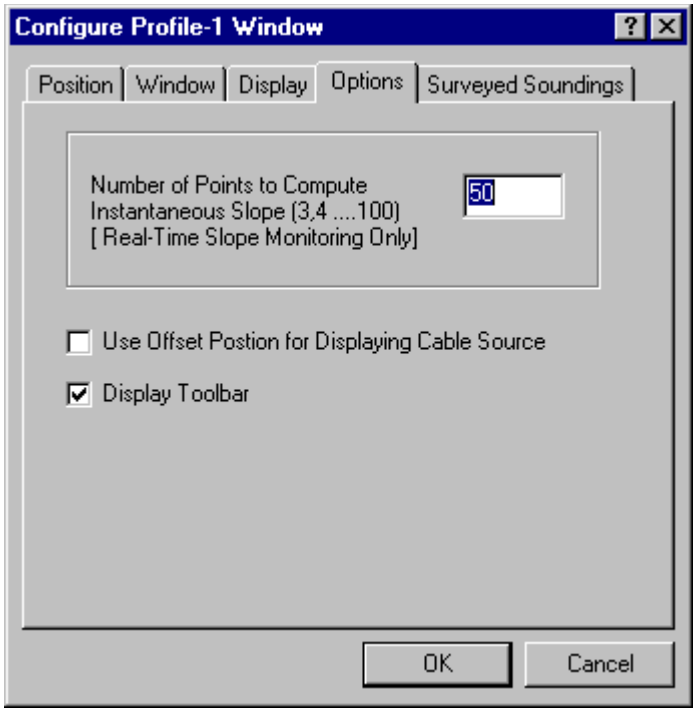
General

Refresh Rate (Hz) — Enter a value that configures the rate at which WinFrog will refresh the **Profile** window display. The default value of 5.0 Hz should be adequate for most applications.

Note: Do not enter too small a value, as the constant regeneration of the **Profile** window will slow the program.

Options Tab

The **Option** dialog box provides you with the ability to control three **Profile** window options, as detailed below.



Number of Points to Compute Instantaneous Slope — Enter a value (between 2 and 100) that defines the number of real-time echosounder observations

(soundings) that will be used to determine the slope of the seabed. This value is applied only if **Real-Time Slope Monitoring** is enabled.

Use Offset Position for Displaying Cable Source

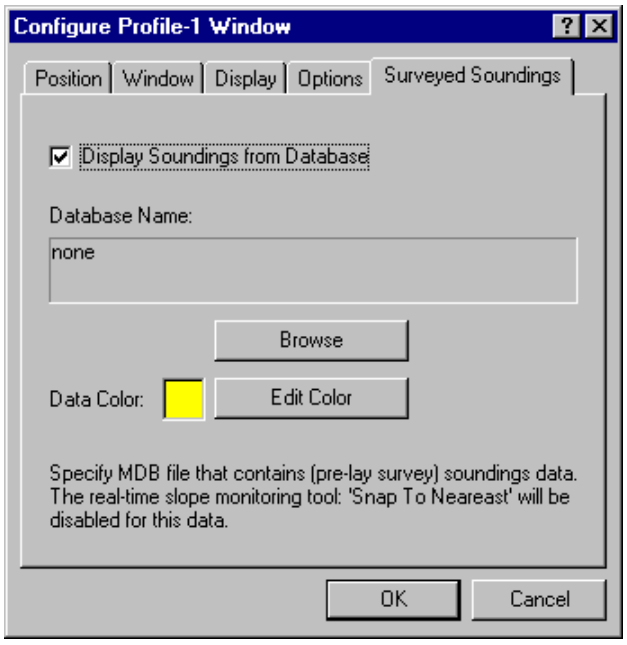
Select this option to enable a shift in the position that the echosounder data are plotted to the vessel's **Tracked Offset** position (i.e. the **Stern,** for example), as opposed to the vessel's **CRP** position. This visual adjustment to the real-time sounding data makes no notable difference to calculations in deeper water depths.

Display Toolbar

Select this option to enable the display of various **Profile** window **slope measurement** and **display movement** tools in the bottom of the **Profile** window. These toolbar options are detailed in the section below named **Profile Window Toolbar**.

Surveyed Soundings Tab

The **Surveyed Soundings** dialog box allows you to configure the display of **Pre-lay Sounding data** from a previously recorded **Database** (**.mdb**) file, as detailed below.



Display Soundings from Database

Select this option to enable the display of sounding data contained in a **.mdb** format file.

Browse

Select this button to navigate to the appropriate directory and select the desired **.mdb** file.

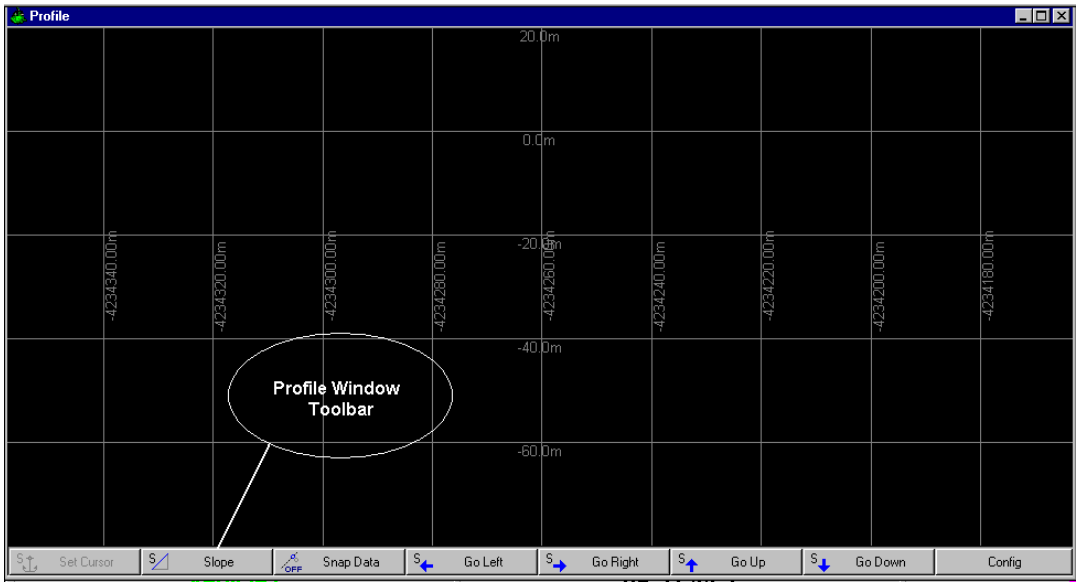
Edit Color

Select this button to change the color in which the loaded database soundings are plotted in the **Profile** window.

The Import Bathymetry utility (**Utilities > Import Bathymetry**) converts ASCII x,y,z bathymetry data into a WinFrog formatted soundings database file that can be displayed in the Profile window. To learn more about this utility refer to chapter 11: Utilities.

Profile Window Toolbar

At the bottom of the **Profile** window is a toolbar that provides you with shortcuts to seven different **Profile** window configuration and measurement functions. Several of these functions can also be accessed by right-clicking when the mouse pointer is located within the limits of the **Profile** window display. The following sections detail each of the toolbar items, in the order that they are found at the bottom of the **Profile** window.



Set Cursor

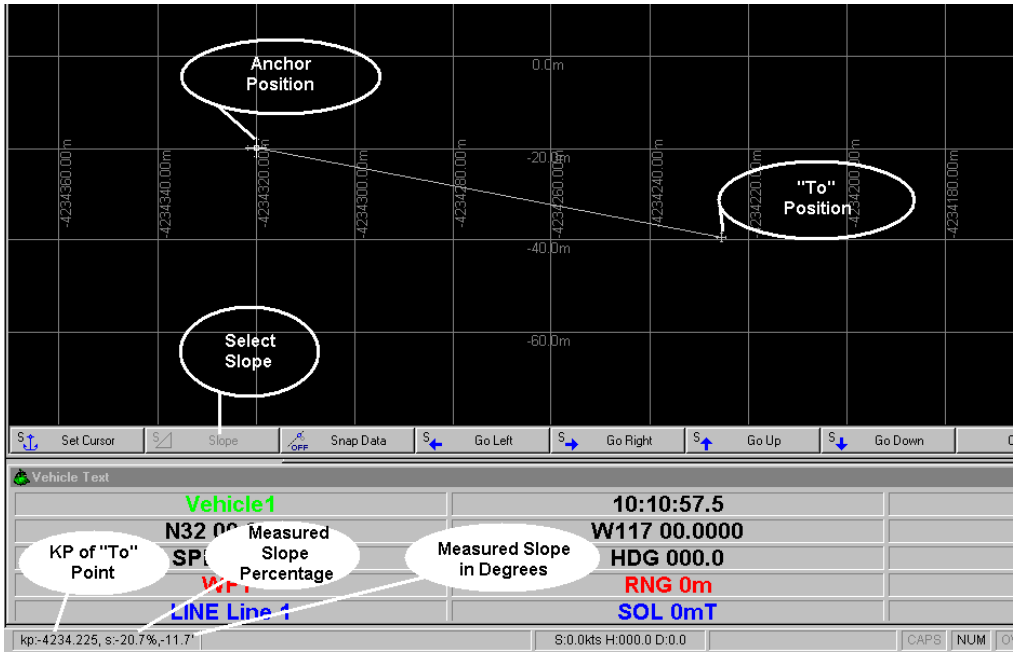
Selecting this button enables you to define the point **from** which slope measurements will be made, i.e. where the slope will be anchored. This function is the same as the **Anchor Cursor** feature found in the "right-click menu" accessed while your cursor is in the **Profile** window.

To set the cursor, select this button ("graying" out the button text), then move the mouse pointer to the desired location in the **Profile** window and click. A "cross' will appear in the **Profile** window at the specified location.

Slope

Select this button to define the point **to** which slope measurements will be made, i.e. from where the slope was anchored (see above) to this new location. This function is the same as the **Measure Slope** feature found in the "right-click menu" accessed while your cursor is in the **Profile** window.

To measure slope, select this button ("graying" out the button text), then move the mouse pointer to the desired location in the **Profile** window and click the left mouse button. A line will now appear, connecting the previously set "anchor" position to this new point. WinFrog displays a variety of information related to this measurement in the bottom left corner of the display area below the **Vehicle Text** window.



As shown above, WinFrog calculates and displays the **To Point** KP value, the slope measured in degrees, and the measured slope percentage.

Snap Data

Select this button to instruct WinFrog to "snap" to an existing plotted sounding **to** which slope measurements will be made. This selection precludes the manual definition of a "To" point as defined above.

Go Left

Select this button to instruct WinFrog to move the viewer's perspective of the **Profile** window to the left, i.e. moves the contents incrementally to the right.

Go Right

Select this button to instruct WinFrog to move the viewer's perspective to the right, i.e. moves the **Profile** window contents incrementally to the left.

Go Up

Select this button to instruct WinFrog to move the viewer's perspective "up", thus moving the **Profile** window contents incrementally "down."

Go Down

Select this button to instruct WinFrog to move the viewer's perspective "down", thus moving the **Profile** window contents incrementally "up."

Config

Select this button to access the **Configure Profile** window dialog box, as detailed at the start of the **Profile Window** section.

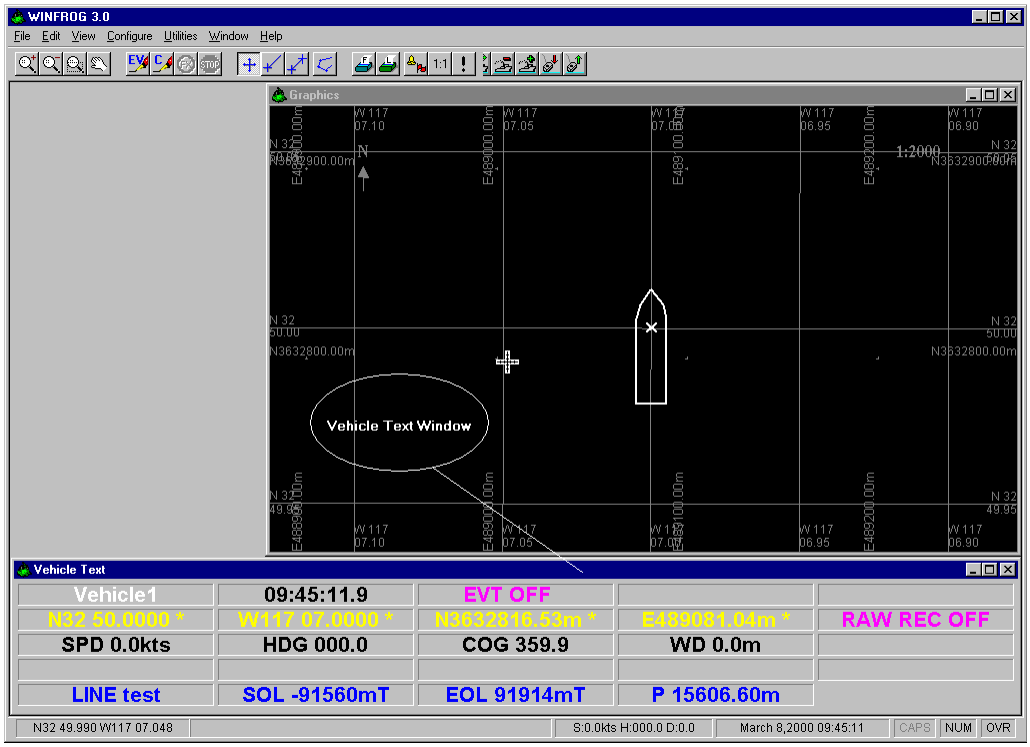
Vehicle Text Window

The **Vehicle Text** window displays real-time information for all vehicles in text form. This information can include the vehicle's **Name**, **Position**, **Heading**, and **Speed,** as well as a host of other data. You can display more than one **Vehicle Text** window at a time, with each **Vehicle Text** window configured differently than the others.

As well as displaying navigation data, the **Vehicle Text** window provides quick access to several commonly used WinFrog setup and configuration menus, including **Automatic Event Configuration, Vehicle Offset, Vehicle Device Configuration, Line Tracking**, **Vehicle Presentation,** and **Waypoint Tracking**. The event configuration item will only be present if the vehicle displayed in the Vehicle text window is the primary event vehicle.

To View the Vehicle Text Window

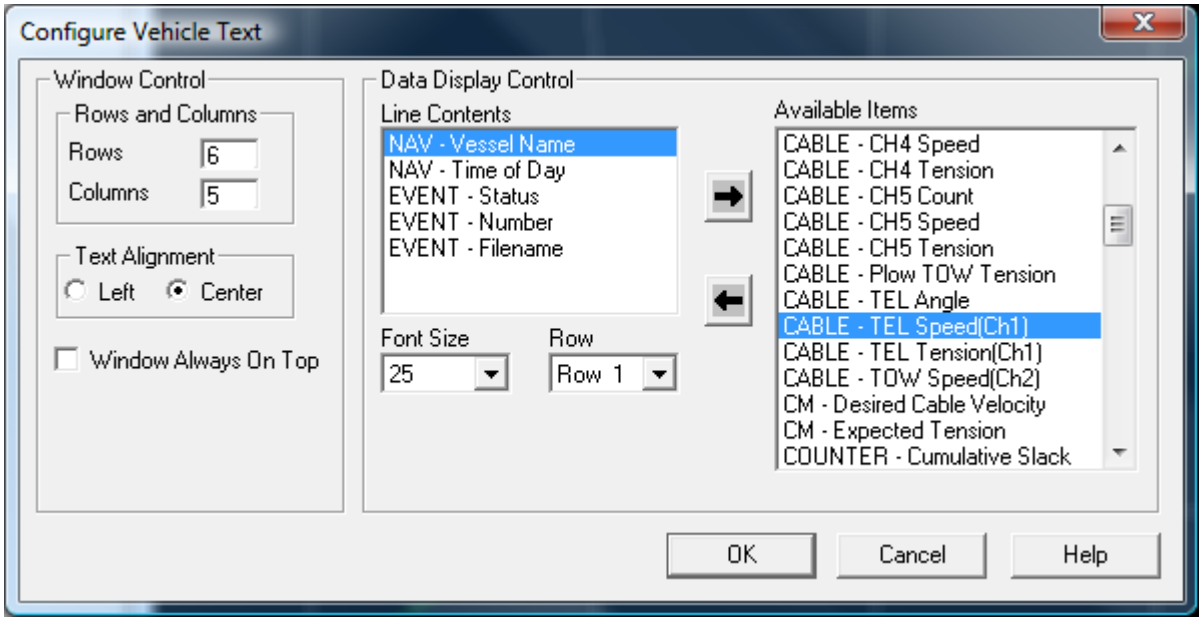
1 From the **View** menu, choose **Vehicle Text**. The **Vehicle Text** window opens at the bottom of the WinFrog work area, as seen below.



WinFrog carries a default configuration of the **Vehicle Text** window contents for the initial start up. The data displayed in this window (and the location of data items in the window) is configurable as detailed below. All modifications to the Vehicle Text window are saved in the **WinFrogini.wfg** file when the program is exited correctly.

To Configure the Vehicle Text Window

1 Select the main menu item **Configure > Vehicle Text** or move the mouse pointer into the **Vehicle Text** window and right-click then select **Configure Vehicle Text** from the presented menu options.



This window allows you to select which data items are displayed in the **Rows** and **Columns** of the **Vehicle Text** window, as well as the Font Size and Alignment of the selected data text.

Note: Row 1 refers to the top **row** of the **Vehicle Text** window.

Window Control

Rows/Columns — Enter the number of rows and columns (1 to 5) that you want to display in the **Vehicle Text** window.

Text Alignment

Left/Center radio buttons — Select the desired alignment option.

Window Always on Top — Select this option to ensure that the **Vehicle Text** window always displays on top of any overlapping windows. This ensures that the more important information found in the **Vehicle Text** window is always visible.

Data Display Control

Row dropdown — Use the dropdown menu to select the **row** that you want to modify.

Line Contents box — Lists the items currently displayed in the selected **row** of the **Vehicle Text** window.

To add items to this list, first ensure that the desired row is selected. Next, select the desired item listed in the **Available Items** box and click the **left** arrow. This adds the selection to the **Line Contents** box and removes it from the **Available Items** list.

To remove contents from the **Line Contents**

box, select the desired item and click the **right** arrow. This removes the item from the **Line Contents** box and adds it (in alphabetical order) to the **Available Items** list. Each item can be listed only once in the **Vehicle Text** window.

Note: some items may appear as blank boxes in the **Vehicle Text** window until valid data exists for that field. For example, by default, **Row 4** is configured to display waypoint tracking data (**Wpt Name**, **Wpt Range**, **Wpt Bearing**). If no waypoint is being tracked, these three data items will remain blank.

Font Size — Select the size of the font used to display items in the row number shown in the **Row** dropdown list.

Available Items

The items available for display in the **Vehicle Text** window are listed. When selected by using the left arrow they are removed from this list and appear in the Line Contents list for the selected row.

Note: If a plow device is providing tension at the plow, this tension is the item **CABLE Plow TOW Tension** if it is also providing tension at the ship (either as part of the telegram or from a selected counter device) the tension at the ship is **CABLE - TEL Tension (Ch1)**.

To Remove a Vehicle's Data from Display in the Vehicle Text Window

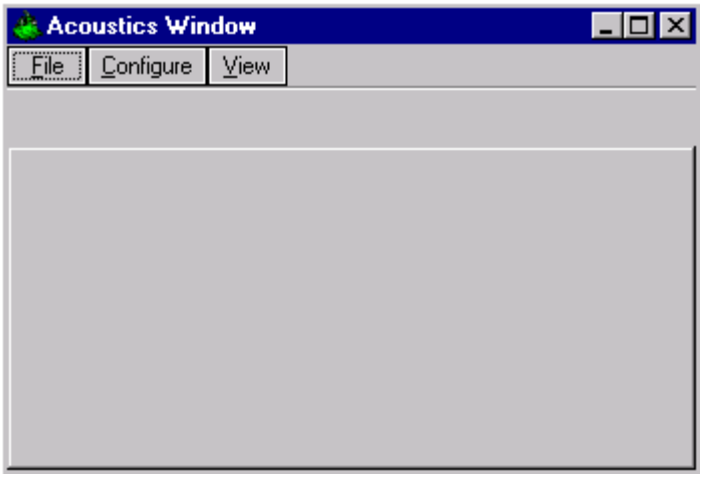
1 Select the main menu item **Configure > Vehicles > Vehicle Presentation > Vehicle Window Data > Off**.

Acoustics Window

The **Acoustics Window** provides you with the means to configure and monitor all aspects of the WinFrog acoustic operation. This window supports multiple sub-windows that provide these features for different parts of the acoustic operation.

To Display the Acoustics Window

1 From the **View** menu, choose **Acoustics**



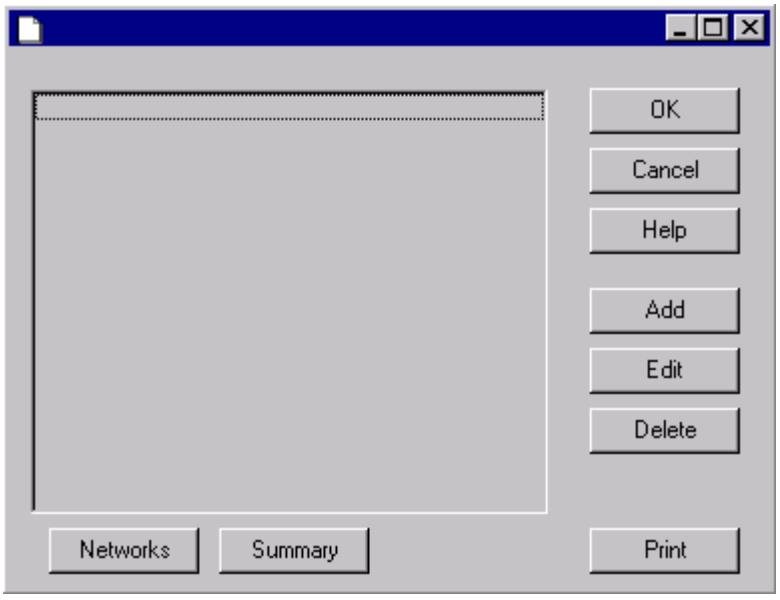
This window provides access to the configuration options and sub-windows from the three menu buttons located at the top of the window.

Working Files Options

You are able to work with **transponder** and **velocities** files directly from the **Acoustics Window** using the **File** menu item. This is a more efficient process than using the WinFrog main menu **File** item.

New

Click the **File** item, select **New** and you are able to select either **Xponders** or **Velocity**. Choosing either one moves you directly to the new Xponders or Velocities window.



Proceed from this point as described in the **Working Files** chapter for Xponder and Velocity files.

Set To Working

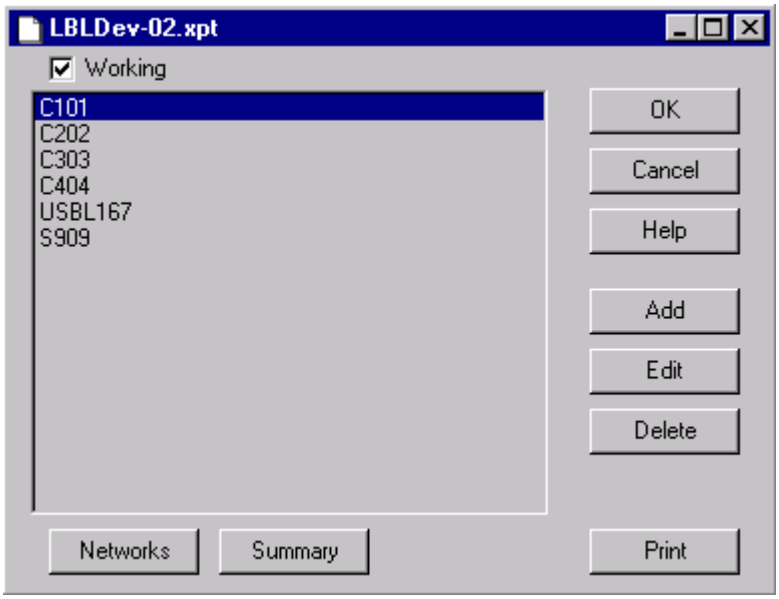
This option allows you to directly set a selected Xponders or Velocities file to be the Working version.

Click the **File** item, select **Set to Working** and then select either **Xponders** or **Velocity**. Choosing either one moves you directly to the browse dialog showing only the appropriate file types. Select the desired file and click **OK**. The selected file is automatically set to be the Working copy.

Note: If there is currently a **Working Xponders** file, you are alerted to this and the operation is aborted. If this occurs, you must open the current Working Xponders file and un-check the Working checkbox and exit with OK. Now a new Working Xponders file can be set. This check is not currently implemented for the **Working Velocities** file.

Edit

This option allows you to directly access the current **Working Xponders** or **Velocities** files for editing. Click the **File** item, select **New** and you are able to select either **Xponders** or **Velocity**. Choosing either one moves you directly to the Xponders or Velocities window.



Proceed from this point as described in the **Working Files** chapter for Xponder and Velocity files.

Direct Configure Options

From the **Configure** menu item, you are able to select the vehicle with which to associate the acoustic calibration features and configure and control the acoustic calibration.

Select Vehicle for Calibration

This option allows you to select the vehicle with which the window will associate all acoustic calibration control and monitoring.

Click the **Configure** item, select **Select Vehicle for Calibration** and you are able to select

from a pop up list of all vehicles with either an **LBL TRANSCEIVER** or **USBL HYDROPHONE** data type attached to it. Select the appropriate vehicle.

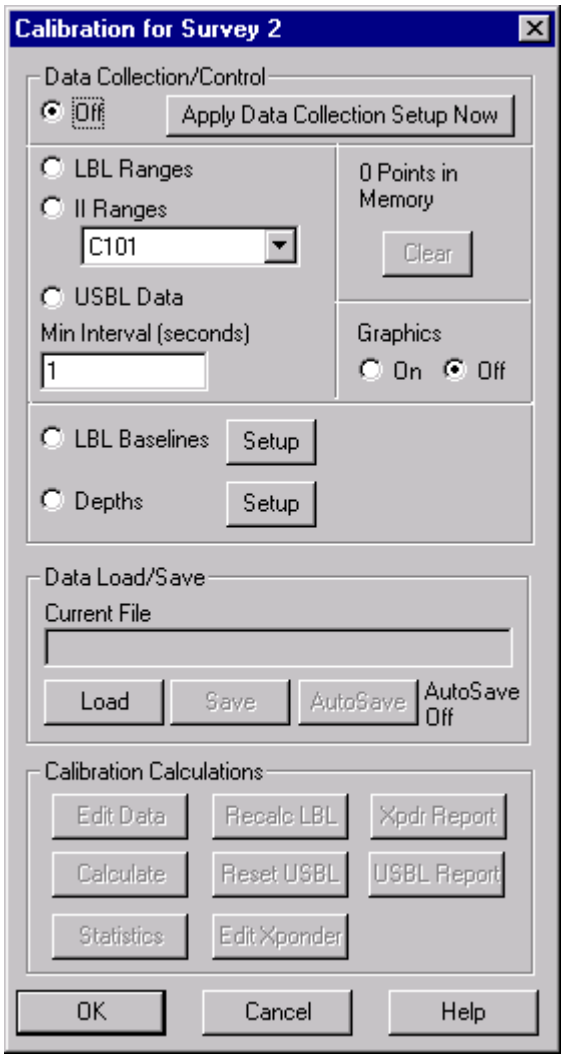
In subsequent repeats of the aforementioned steps, the selected vehicle is displayed with a checkmark beside its name.

Note: This setting is not saved when the Acoustics Window is closed.

Calibration

This option provides direct access to the **Calibration** dialog for the selected vehicle. If a calibration vehicle has not been selected, you are so informed and the **Calibration** dialog is not accessed.

Click the **Configure** item, select **Calibration**.



Proceed from this point as described in the **Acoustic Calibration** chapter.

Viewing Windows

The **Acoustics Window** allows you to access several windows that provide the means to

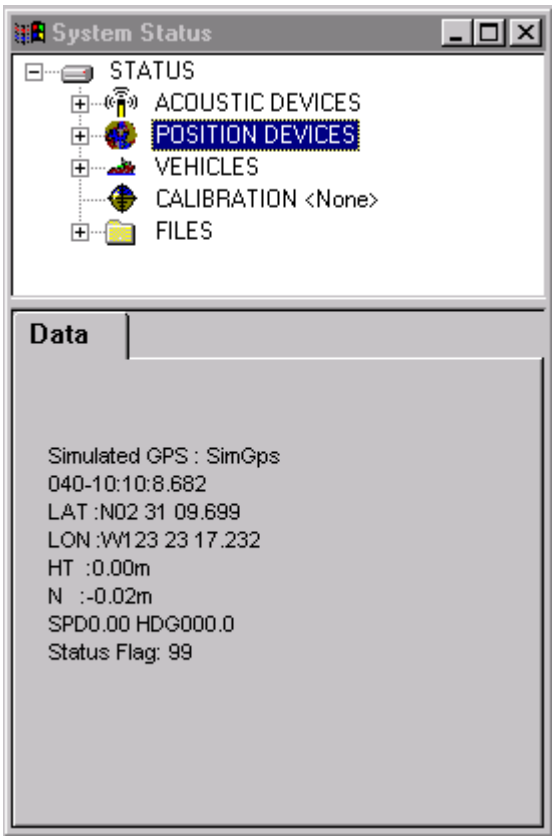
monitor the WinFrog system and operation as it pertains to acoustics. Some of these support direct access to the configuration of the WinFrog components they are monitoring.

These windows are accessed from the **View** menu item. The following sections detail each available window.

System Status

This window presents a summary of the WinFrog system as it relates to acoustic operations. The information is constantly updated and reflects the current respective configurations and information.

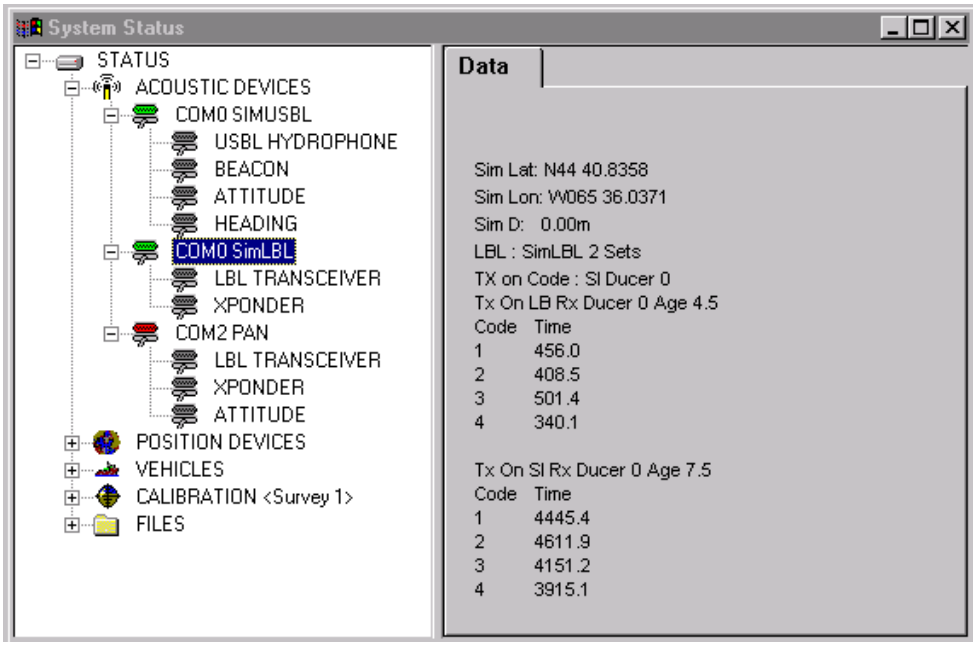
Click the **View** item and select **System Status**.



This split window presents the configuration of WinFrog in a tree format in one panel and data in the other panel. The split can be configured to vertical or horizontal via a pop-up menu using the right mouse button in the tree section. The font used in the data section can be modified via a pop-up menu using the right mouse button in the data section.

The tree nodes include icons to indicate an appropriate status.

ACOUSTIC DEVICES Node



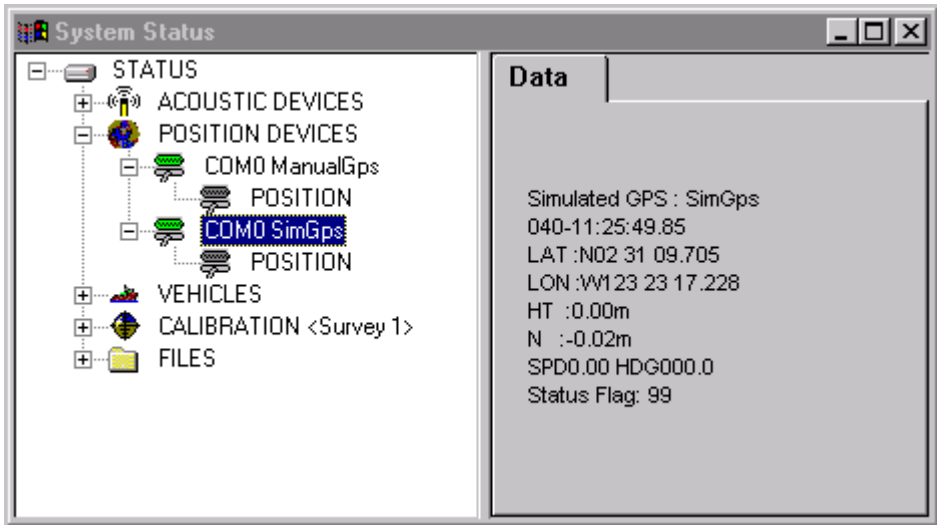
This node lists all the LBL and USBL acoustic devices that have been added to WinFrog. The devices are listed with an icon indicating the status of the serial port. Each device node can be expanded to list the data types associated with it.

Select a device and click the right mouse button to open a pop-up menu that presents direct access to the selected devices configuration.

Note: Devices can not be added to WinFrog from this window.

For more details, see the **I/O Devices Window** section in this chapter.

POSITION DEVICES Node

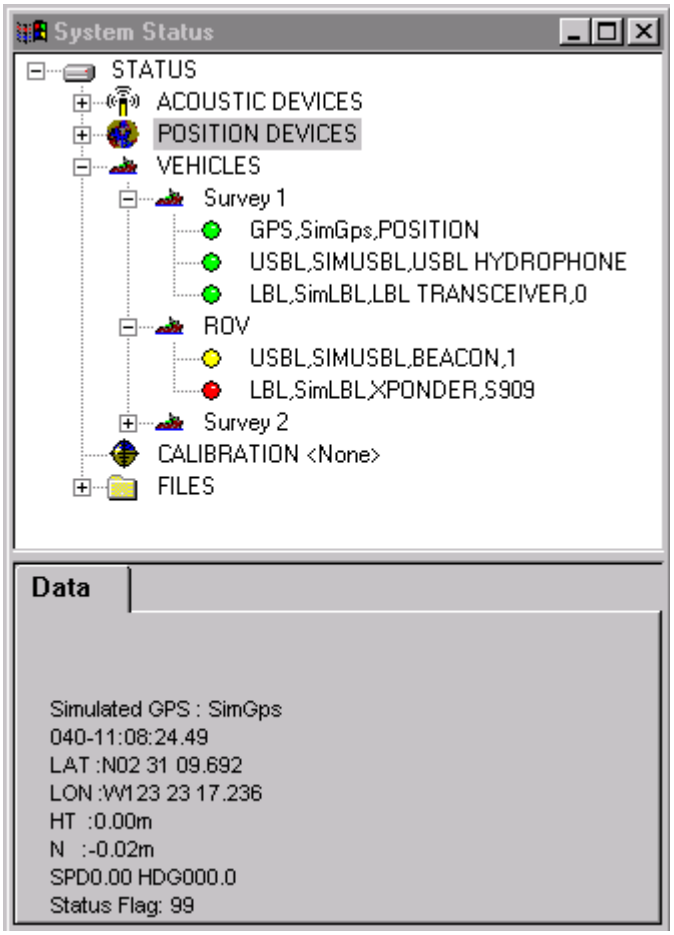


This node lists all the position type devices (GPS) that have been added to WinFrog. The devices are listed with an icon indicating the status of the serial port. Each device node can be expanded to list the data types associated with it.

Select a device and click the right mouse button to open a pop-up menu that presents direct access to the selected devices configuration.

For more details, see the **I/O Devices Window** section in this chapter.

VEHICLES Node



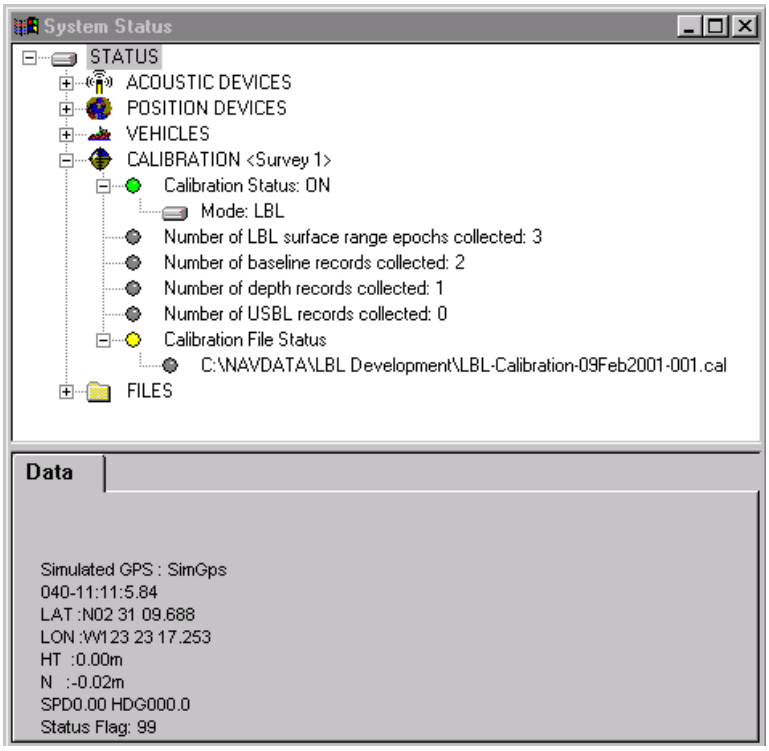
This node lists all the WinFrog vehicles that have an acoustic data type attached to them. These nodes can be expanded to list the POSITION, LBL and USBL data types attached to the respective vehicle. Note that only these data types are listed.

The data type nodes include an LED indicating the status of that data type's position calculations. A yellow LED indicates that the status is unknown or the position calculation was successful but the result was gated. A red LED indicates that the position calculation failed. This failure may be due to insufficient data. A green LED indicates that the position calculation was successful and accepted.

Select a data type and click the right mouse button to open a pop-up menu that presents direct access to the selected data type configuration.

For details on configuring the data types, see the **Vehicle Data Source**, **LBL Operation** and **USBL Operation** chapters.

CALIBRATION Node



This node summarizes the calibration status for the vehicle selected for the calibration for the window (see **Select Vehicle for Calibration**). The primary node caption includes the name of the vehicle selected or None if one has not been selected.

The node can be expanded to provide details on the calibration. For details on the information displayed here, see the **Acoustic Calibration** chapter.

Calibration Status

This node shows the current status of the calibration data collection, both with an LED (green, collection is on, red, collection is off) but also with an **ON** and **OFF** statement. In addition, this node can be expanded to show the current collection mode.

Mode This states the current calibration data collection mode, either LBL, II, USBL, Baselines or Depths. In addition, it includes the status if the collection is Paused or Aborting.

Number of LBL surface range epochs collected

This lists the total number of surface position and LBL range data records in the current calibration data set.

Number of baseline records collected

This lists the total number of baseline observation records in the current calibration data set.

Number of depth records collected

This lists the total number of depth observation records in the current calibration data set.

Number of USBL records collected

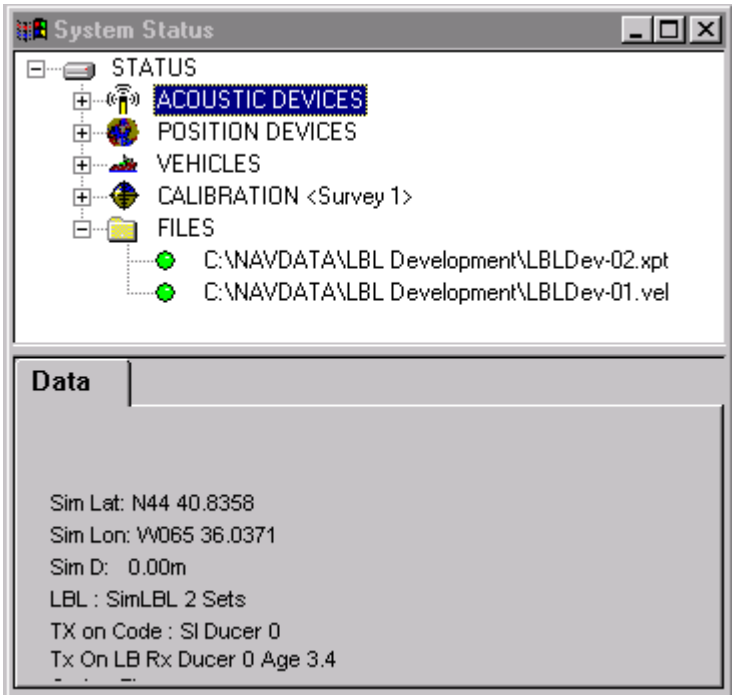
This lists the total number of surface position and USBL range data records in the current calibration data set.

Calibration File Status

This node shows the current status of the calibration data file with respect to actually being saved to disk. The node LED is red if the file has not been saved once. It is yellow if the file has been saved at least once but there is new data in the data set and the file should be saved again soon. The LED is green if the file has been saved and is current, that it, there are no new data points.

Name This lists the name of the current calibration data set file.

FILES Node



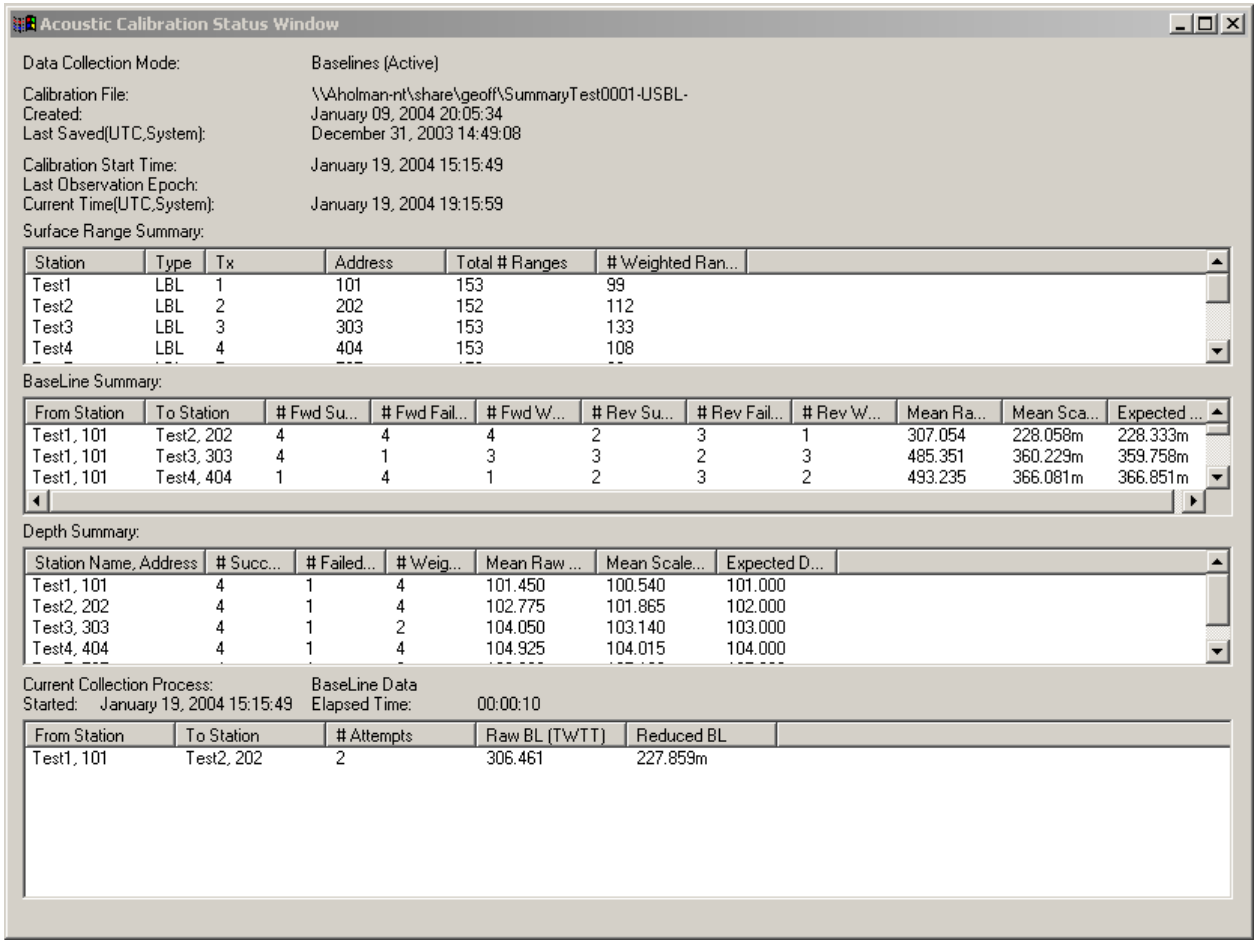
This node expands to summarize the associated **Working Xponders** and **Working Velocities** file status.

The names of the current **Working Xponders** and **Working Velocities** files are listed with a green LED associated with each indicating that the file is loaded and set to Working. In either case, if a Working file is not present, the LED flashes between yellow and red and the message **>>>LOAD AN XPONDER FILE<<<** or **>>>LOAD A VELOCITY FILE<<<** is shown in place of the file name.

Calibration Status

This window presents a summary of the current calibration data set for the selected calibration vehicle, whether loaded from a file, or currently being collected or any combination of these. The window is constantly updated and represents the current status of the calibration data set.

Click the **View** item and select **Calibration Status**.



The information is presented in a header followed by four list windows.

Header

This section summarizes the overall calibration data information.

Data Collection Mode

This displays the current data collection mode and it status. The possible modes are as follows:

LBL Standard Surface Range
LBL II Surface Range
USBL Surface Range
Baselines
Transponder Depths

In the case of the first three, the only status is **(Active)**, in the case of the last two the status could be **(Active)** or **(Paused)**.

Calibration File	This gives the path and name of the file used for the current calibration data set.
Created	This is the date and time the file was created (WinFrog clock).
Last Saved	This is the time the file was last saved (computer clock).
Calibration Start Time	This is the time the calibration was started (WinFrog clock).
Last Observation Epoch	This is the time the timestamp of the last data epoch (WinFrog clock).
Current Time	This is the current time (computer clock).

Surface Range Summary

This list window summarizes the surface based observations. This includes both surface position and LBL range data records and surface position and USBL range data records. They are listed by type, name and address/beacon code.

Station Name	The stations that have been ranged to as part of the calibration data set.
Type	The data type, either **LBL**, **USBL (XYZ)** or **USBL (TWTT).**
Tx	The LBL transmit channel or the USBL beacon ID.
Address	The LBL address or the USBL beacon ID.
Total # Ranges	The cumulative total of the ranges for the associated station.

# Weighted Ranges	The cumulative total of the ranges for the associated station that are weighted in the solution.

Baseline Summary

This list window summarizes all the observed baseline station pairs. Any pair is only listed once in the list and includes the forward and reverse observations. For a given pair, the From station is assigned to the station of the pair that is detected first in the calibration data set station information list.

From Station	The From station in the baseline pair by name and transponder address.
To Station	The To station in the baseline pair by name and transponder address.
# Fwd Successful	The total number of successful forward baseline observations.
# Fwd Failed	The total number of failed forward baseline observations.
# Fwd Weighted	The total number of forward baseline observations weighted in the solution.
# Rev Successful	The total number of successful reverse baseline observations.
# Rev Failed	The total number of failed reverse baseline observations.
# Rev Weighted	The total number of reverse baseline observations weighted in the solution.
Mean Raw BL	The mean of all the weighted raw baseline observations.
Mean Scaled BL	The mean of all the weighted scaled baseline observations.
Expected BL	The expected baseline distance.

Depth Summary

This list window summarizes all the depth observations.

Station Name, Address	The stations that have had depth observations made to them.
# Successful Depths	Thenumber of successful depth observations.
# Failed Depths	The number of failed depth observations.

# Weighted Depths	The number of weighted depth observations.
Mean Raw Depth	The mean of all the weighted raw depth observations. Note that this is the raw depth observation and therefore in the case of a digiquartz sensor, will be the frequency count, not an actual depth.
Mean Scaled Elevation	The mean of all the weighted depth observations reduced to a station elevation.
Expected Elevation	The respective station elevation as a reference for the observations.

Current Collection Process Summary

This list window summarizes the current collection process. The associated header states the current process type, start time and elapsed time.

The list window itself provides the columns that relate to the respective current process.

LBL Ranging

Station Name	This column lists the station name and address of the occupying transponder.
Data Time	This column gives the epoch of the current observation.
Observed Range (TWTT)	This column gives the current raw range, that is, the two-way-travel-time in milliseconds.
Red. Range	This column gives the current reduced range.

USBL Ranging

Station Name	This column lists the term USBL and the beacon code.
Data Time	This column gives the epoch of the observation.
Obs. X	This column gives the current raw observed X value of the USBL data.
Obs. Y	This column gives the current raw observed Y value of the USBL data.

Obs. Z	This column gives the current raw observed Z value of the USBL data, except that the sign convention has been changed to represent the local ship based coordinate reference frame in that this Z term is a negative.

Baseline Data

From Station	This column lists the From station in the baseline pair by name and transponder address.
To Station	This column lists the To station in the baseline pair by name and transponder address.
#Obs collected	This is the number of forward and reverse baseline observations collected.

Depths

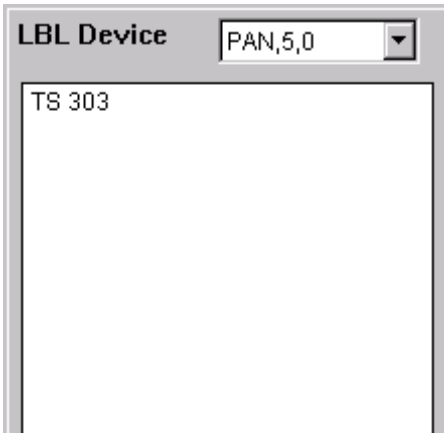
Station	This column lists the station by name and transponder address.
#Obs collected	This is the number of depth observations collected.
Raw Obs	This column lists the current raw depth observation. Note that this is the raw depth observation and therefore in the case of a digiquartz sensor, will be the frequency count, not an actual depth.
Reduced Elevation	This column lists current depth observation reduced to a station elevation.

Terminal

This window enables you to communicate directly with a selected LBL acoustic device using a **Terminal Window**.

To view, click the **View** item and select **Terminal**. While open, this item is displayed in the View menu with a checkmark.

To close, click the **View** item and select **Terminal**.



From the drop down list of available LBL acoustic devices, select the one to communicate with.

Click the mouse in the terminal section of the window. Enter the command to send to the device and hit **Enter**. While waiting for the response, the terminal section is set to read only. When the response is received it is displayed in the terminal section and this section becomes active again.

If a response is not received after 30 seconds, the terminal section is updated to display a TIME OUT message and re-activated.

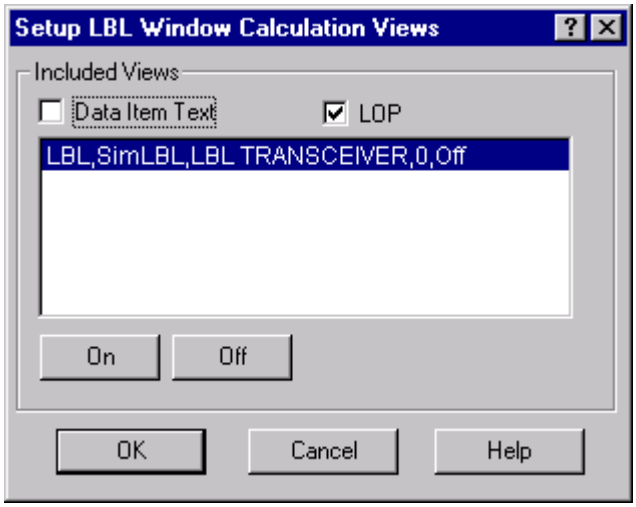
If the appropriate devices are not available, an appropriate message is displayed in the terminal section.

Calculations

This window provides similar functionality to the **Calculations Window** (see section earlier in this chapter) modified to reflect the needs for monitoring the acoustic operations.

To view, click the **View** item and select **Calculations**.

To configure, select the vehicle from the dropdown list of vehicles (this list contains only those vehicles with acoustic data types attached to them). Then click the **Setup** button to access the configuration dialog.

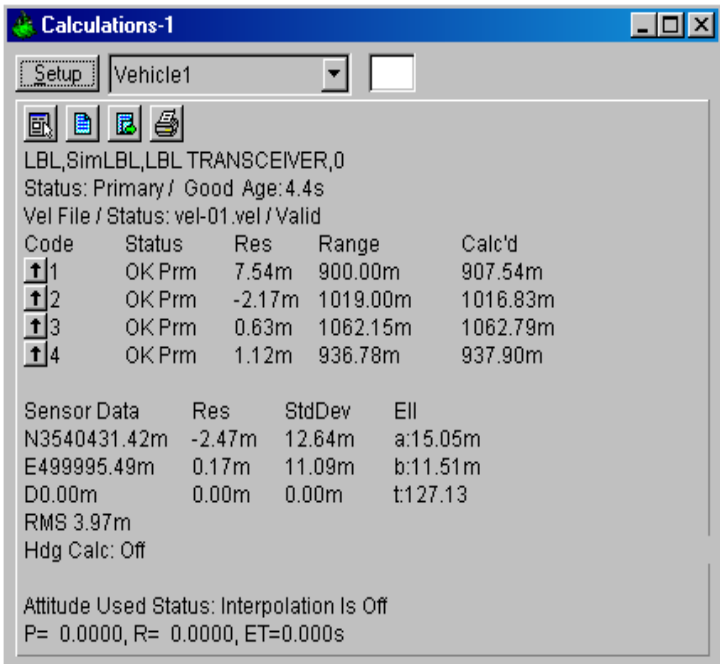


Only acoustic related data types are listed. The presentation options are **Data Item Text** and **LOP**.

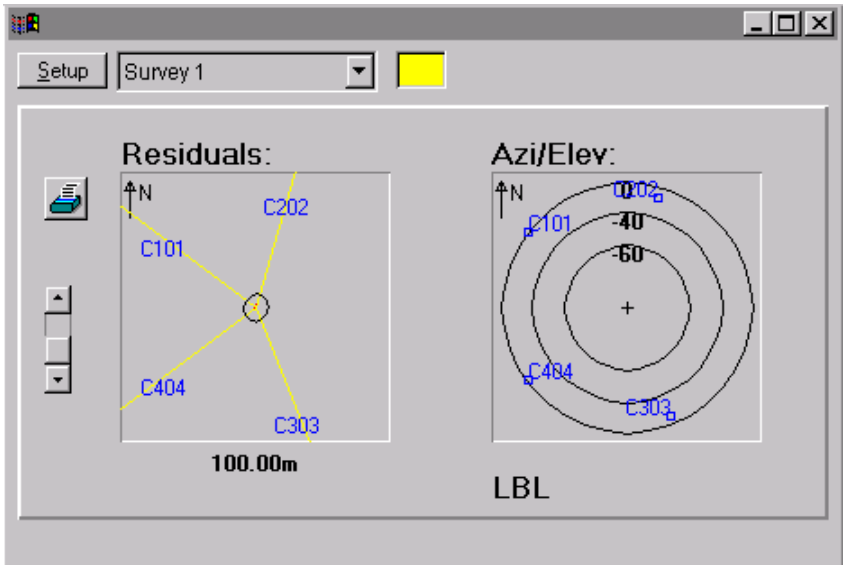
To enable the display of a data type for viewing, select the desired data type and click the **On** button. To disable, repeat this process but click the **Off** button.

Then select one or both display options and click **OK**.

The following figure is an example of an **LBL TRANSCEIVER** data type using the **Data Item Text** option.



The following figure is an example of an **LBL TRANSCEIVER** data type using the **LOP** option.

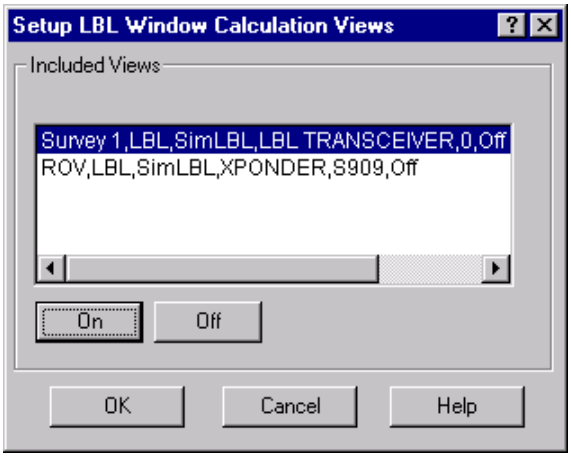


For more details on the windows presented, refer to the **LBL Operations** and **USBL Operations** chapters.

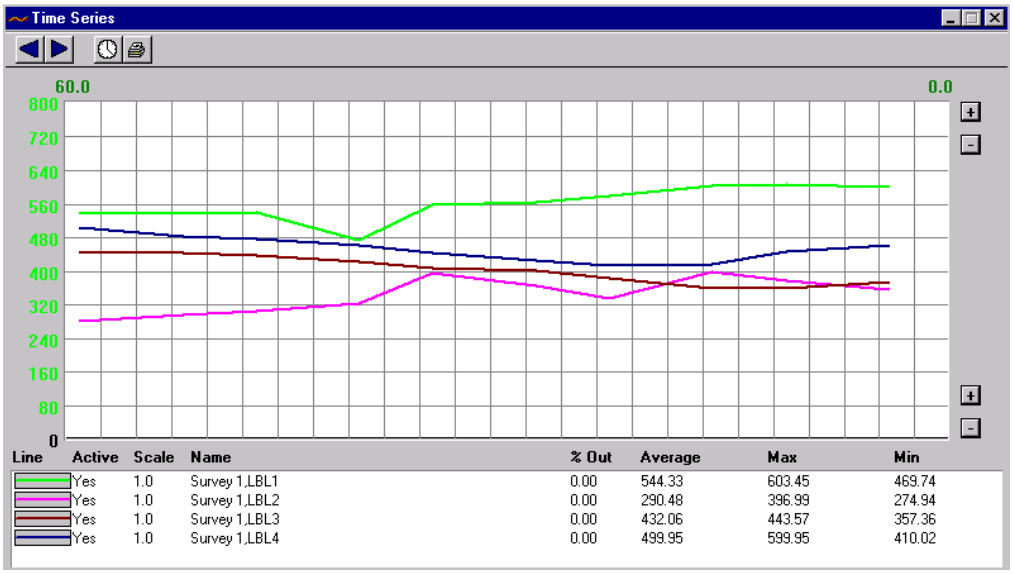
Time Series

This window provides a time series view of the data associated with the acoustic data types.

To view, click the **View** item and select **Time Series**. Immediately, the configuration dialog pops up.



All data types available for viewing using the time series window are listed in the list box. They are given by vehicle name, device type, device name and data type name. Select one and click the **On** button. If you wish to view more than one, select another and click the **On** button again. Note that the window will become cluttered and difficult to interpret if too many data types are displayed. Click **OK** to exit this dialog and view the time series window.

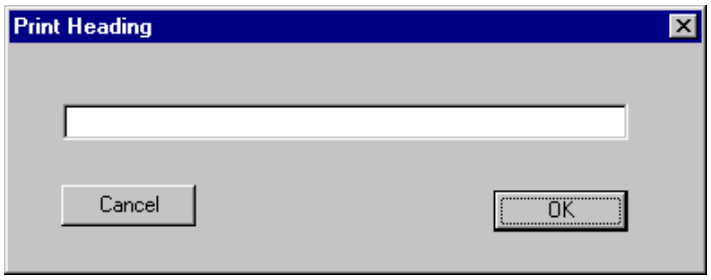


The window provides a comprehensive time series display of the pertinent data and includes a legend and button control for changing the viewing window.

The left and right arrows in the tool bar control the length of the time series. The +/- buttons on the right side of the window control the respective top and bottom limits of the time series.

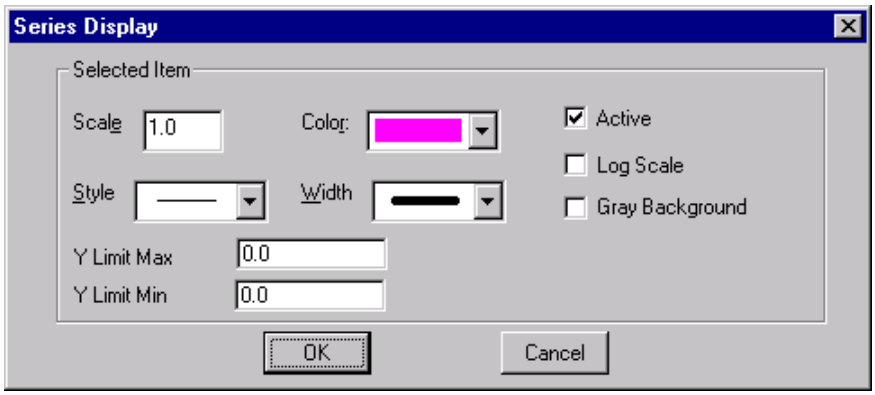
Clicking the **Clock** button in the tool bar toggles between freezing and unfreezing the time series plot.

Clicking the **Printer** button in the tool bar generates a printout of the time series window. When this is clicked, you are prompted for a heading for the printout.



This is followed by the typical Windows printer setup dialog box.

To configure the individual data plot lines, double click on the respective data in the legend to access the configuration dialog.



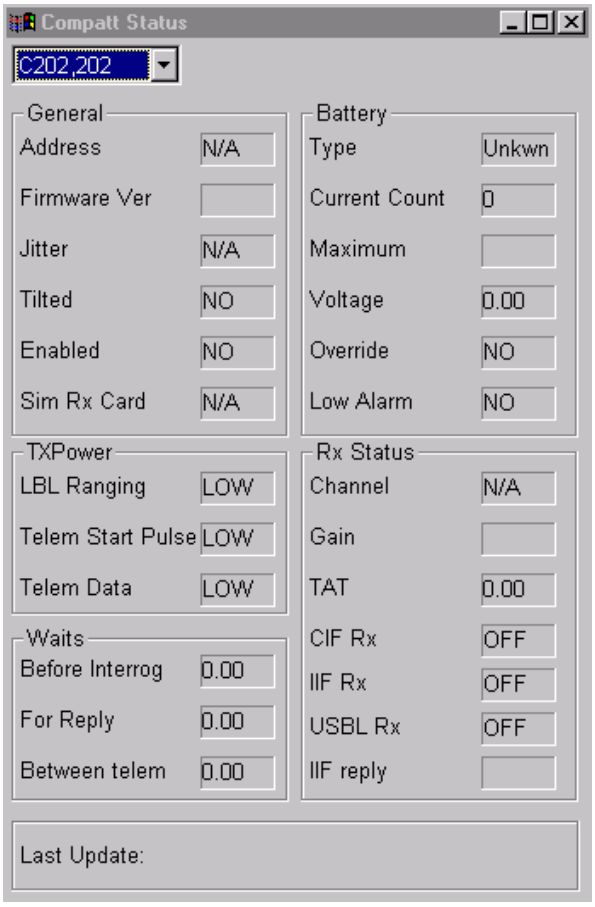
From this dialog, the line color and width can be selected. The plot for the respective data can also be enabled or disabled by checking or un-checking the **Active** checkbox. In addition, the background can be toggled between gray and white by checking or un-checking the **Gray Background** checkbox.

To reconfigure the data type selected for display, go to **View** and select **Time Series**. The configuration dialog pops up. Re-configure as required.

Extended Status

This window provides a view of the extended status of Sonardyne transponders.

To view, click the **View** item and select **Extended Status**.



A dropdown list box at the top left of the window presents a list of the transponders available for viewing in this window. When selected, the extended status information is displayed in the appropriate read only boxes.

For details on the information presented in this window, see **Working Xponders** in the **Working Files** chapter.

Anchor Handling Window

The **Anchor Handling** window displays navigation and anchor handling data for use in anchor placement tasks. This window generically refers to the vehicle that is attached to the anchors as a "**Barge.**" It allows you to monitor and record all anchor handling operations including picking up anchors off of a **Barge**, navigating toward a defined **Target** location, and dropping the anchor's **On-Bottom** coordinates. The **Barge** vehicle, **Tug** vehicles, and **Anchors** can be selected from dropdown menus in the **Anchor Handling** window. It is also possible to view multiple **Anchor Handling** windows, if required.

The Anchor Handling window has two sections. The top, or Barge, section supports the selection and manipulation of those vehicles configured as Barges. The bottom, or Anchor Vehicle, section supports the selection and manipulation of those vehicles designated as anchor vehicles. The window can be configured to display from 1 to 5 anchor vehicles (default is 3).

The Anchor Handling window can be re-sized and the font used to display the anchor vehicle information is scaled with the window size. This feature, combined with the option to specify how many anchor vehicles to display, enables the manipulation of the window for optimum viewing at a distance.

You must configure the **Barge** vehicle and its **Anchors** before this window can be used. Any WinFrog vehicle that has been configured as **Fairlead Possible** is considered to be a **Barge**. Onboard anchor positions (i.e. **Fairlead** positions) are configured under the vehicle's **Fairlead** option. **Fairleads** are defined as the physical location on the barge where the anchor lines lead to the **Anchors**.

To Configure a Vehicle as a Barge Vehicle

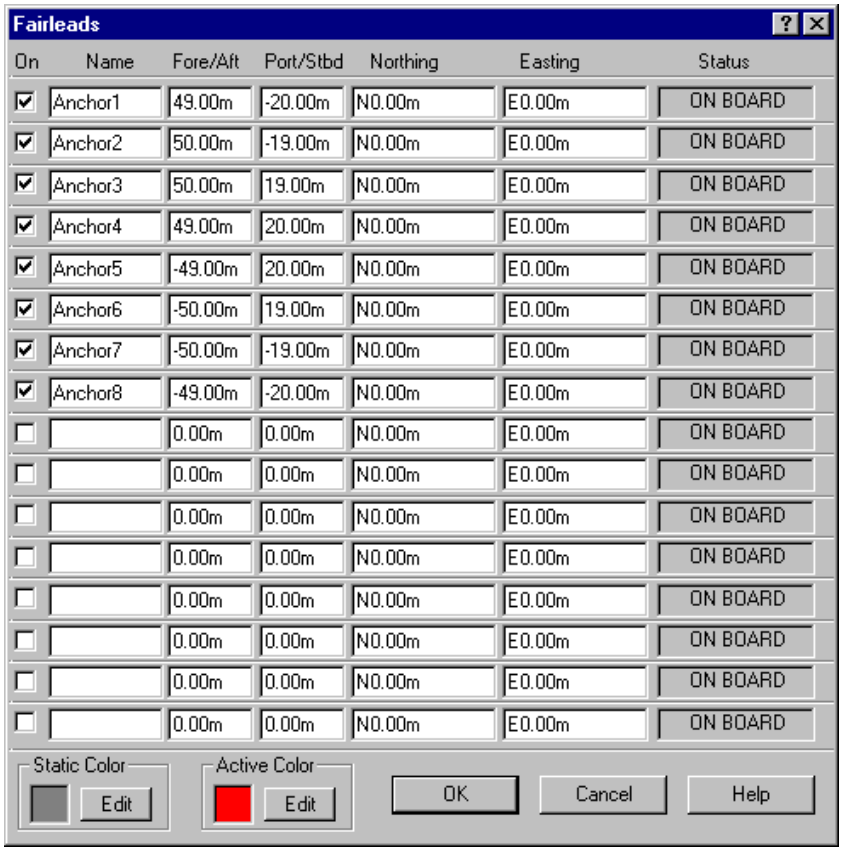
1 Select the main menu item **Configure > Vehicles.**

2 Highlight the barge vehicle (i.e. the vehicle that has the anchors onboard) and select the **Vehicle Presentation** option.

3 In the **Anchor Fairleads** category, select **Possible** then click **OK** to return to the **Configure Vehicles** dialog box.

4 Now, with the same vehicle name still highlighted, select the **Setup Fairleads/Anchors** option.

The **Fairleads** dialog box is used to configure up to **16 Fairleads** (i.e. the **onboard** positions of up to **16** anchors), as seen in the next figure.



5 Enter a **Name** and the **Offsets,** as measured from the vehicle's CRP, for each anchor.

6 Check the **On** box to enable plotting of that anchor on the **Graphics** screen.

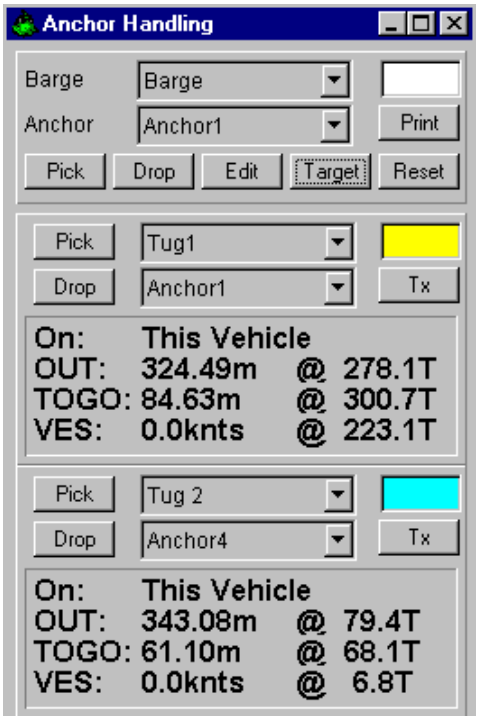
Note: do not enter any values into the **Northing**, **Easting**, or **Status** windows. These windows will update as the anchors are picked up by other vehicles or as they are dropped on the bottom.

Select the appropriate **Edit** button at the bottom of the **Fairlead** dialog box to change the colors of the **Fairleads** in the **Graphics** screen. The **Static Color** is for when the anchor is not being handled (i.e. onboard the barge or on the bottom). The **Active Color** is used when the anchor has been picked up.

Once all Fairleads are configured as desired, select **OK** to close the **Fairleads** window and return to the **Configure Vehicle** window.

To Display and Configure the Anchor Handling Window

1 Choose the main menu item **View > Anchor Handling**.



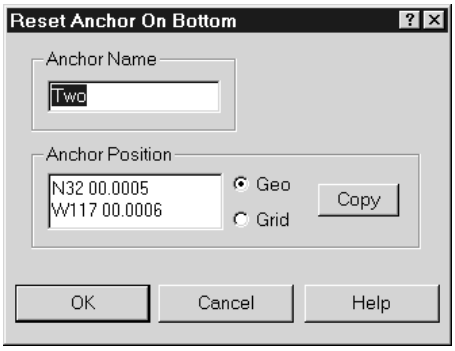
Top Area - Barge Vehicle Buttons

Barge dropdown	lists all of the vehicles that have been configured as **Anchor Fairleads Possible**. Typically, only one vehicle should be designated **Fairleads Possible**.
Anchor dropdown	lists all anchors that have been configured on the vehicle selected in the **Barge** menu above (**Configure > Vehicles > Fairleads**).
Color box	shows the color of the selected **barge** vehicle.
Print button	prints a summary of anchor locations; can be directed to the printer and/or an .rtf file.
Pick button	changes the selected **Anchor Status** to **On Board** the selected barge vehicle at its configured fairlead location (i.e. the barge picks up the anchor).
Drop button	changes the selected **Anchor Status** to **On Bottom** and updates the **Anchor Target** position to the anchor's current position (i.e. the anchor has been dropped to the bottom directly from the barge, rather than being first handled by a **Tug** vehicle).
Target button	When selected, causes a blue square, labeled as per the selected anchor, to appear at the drop

target coordinates. To remove the blue target square from the **Graphics** screen, choose the appropriate anchor and select **Target** again.

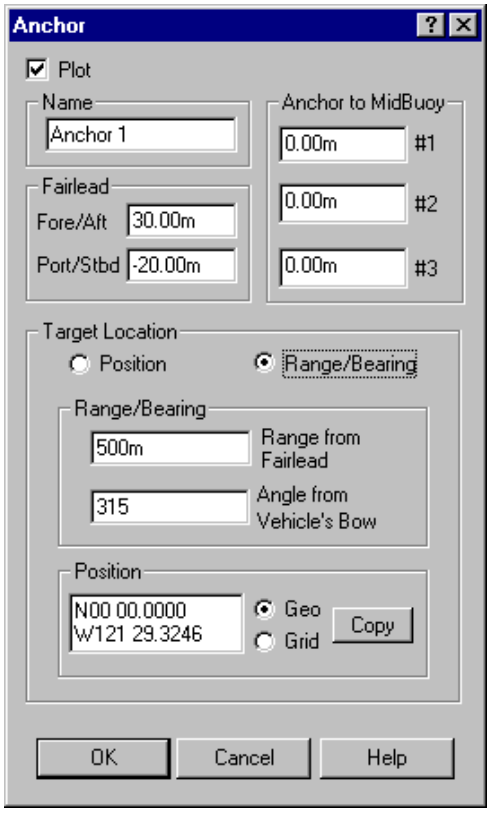
Reset button

Opens the **Reset Anchor on Bottom** dialog box to allow you to relocate the anchor on the bottom, if it has moved. The position that shows in the **Reset Anchor on Bottom** dialog box is the last known bottom position for the anchor. Enter a new position as desired.



Edit button

Select this button to open the **Anchor** dialog box, as seen below. This window allows you to edit the selected anchor's (i.e. Fairlead's) previously entered **Name** and onboard **Location** and also define a **Target** position.



Anchor dialog box

Plot checkbox — Select this option to enable plotting of this anchor in the **Graphics** display.

Name

Entry field — Highlight this window and change the **Name** of the selected anchor as required.

Fairlead

Fore/Aft and Port/Stbd — Highlight the **Fore/Af**t or **Port/Stbd** entry field and change the previously configured **Anchor/Fairlead** location.

Anchor to MidBuoy

Entry fields — **MidBuoys** are buoys placed along an anchor cable to lift the cable off of the bottom. Midbuoys are used when the anchor line is knowingly placed across an existing pipeline or cable to prevent damage to the existing structure. Highlight the appropriate window and enter the desired **Anchor to Fairlead** distance.

Target Location

Position and Range/Bearing — You can enter anchor **Target Location** information as either a **Position** (grid or geographical coordinates) or as a **Range/Bearing** relative to the barge's location and heading.

If **Position** is selected, you can enter the coordinates manually or click the **Copy** button to copy the coordinates from WinFrog's temporary clipboard memory. (For example, if you click on the **Graphics** screen with the **Display Position** option enabled, the coordinates are written to the "clipboard.")

If **Range/Bearing** is selected, you must enter a **Range** (distance) from the (onboard) fairlead position and the **angle** from the **Vehicle's Bow**. **Note:** this is a relative angle measured **clockwise from the vehicle's bow**, **not** an absolute bearing from North.

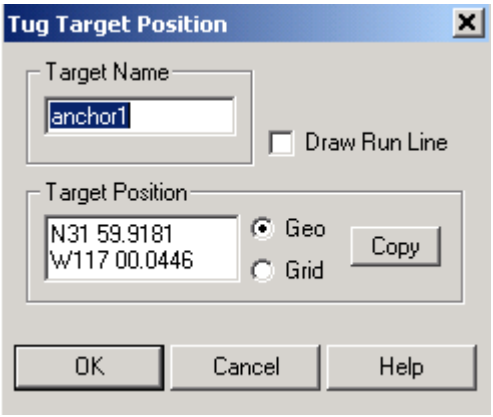
Note: if the target position is altered with the anchor on the bottom, the anchor's position is overwritten by the new target position. Any changes made within this dialog box are entered directly into the **Fairleads** dialog box. (See the **To Configure Fairleads and Anchors** section of the **Vehicles** chapter.)

Bottom Areas - Anchor Handling Vehicles

The areas repeated immediately below the barge vehicle buttons are for the display of **Anchor Handling Vehicle** (i.e. "tugs") data. The buttons and dropdown menus are repeated in each area so that the specified number of vehicles/anchors can be tracked and viewed at the same time.

If required, multiple **Anchor Handling** windows can be opened and configured accordingly in order to view all anchor vehicles.

Upper Untitled dropdown	lists all of the **Anchor Handling Vehicles** ("Tugs")- i.e. those vehicles that have been configured **Not Anchor Fairleads Possible**. (**Configure > Vehicles > Vehicle Presentation**).
Lower Untitled dropdown	lists all of the anchors (fairleads) that have been configured on the barge vehicle.
Color box	shows the color of the selected **Anchor Handling Vehicle** (i.e. Tug).
Pick button	Click this button to tell WinFrog that this vehicle has picked up the anchor displayed just below. (It will be picked up at the **Tracked Offset** on this vehicle). This results in several changes: The **On:** line, just below, will indicate that the anchor is now on this vehicle. The **Graphics** display will draw a line from the original onboard (barge) location to the (tug) vehicle's present location. WinFrog changes the selected anchor **Status** to **On Board** the selected anchor handling vehicle at its tracked offset. This also generates an event that is written to the **Working Logs (.LOG)** file and output to the printer. See the Eventing chapter for more details on the **Working Logs** file.
Drop button	changes the selected anchor's **Status** to **On Bottom** and updates the anchor's **Target** position to the anchor's current position and turns off the anchor run line drawing and tracking. This also generates an event that is written to the **Working Logs** file and output to the printer.
Tx button	opens the **Tug Target Position** dialog box to enable you to transmit the **Target** position to a Tug Vehicle and to draw and track an **Anchor Run Line** (see section below). This obviously requires a telemetry system to be in place and operational.



On:	displays the anchor state, i.e. whether it is on a vehicle or **On Bottom**.
OUT:	displays the **distance** and **bearing** from the **fairlead** location on the barge to its present location.
TOGO:	displays the **distance** and **bearing** from the present anchor location to its target location.
VES:	displays the tug's present **speed** and **heading**. Again, this requires telemetry hardware to be in place to provide the barge with the tug's positioning information.

Anchor Events

When the **Pick** and **Drop** buttons are clicked, WinFrog generates an event. This event is automatically logged to the current **Manual Log** file. In addition, the event can be printed to the printer. You can control whether or not the events are printed in real-time. The default when a window is opened is to print the events. This setting is saved to and loaded from the .ini and .cfg files.

To Configure the Anchor Event Printing

1. Move the cursor to a point in the Anchor window where it is not over one of the buttons or data entry fields and then right-click.
2. The first option in the resulting pop-up menu is **Print Event**. Click this item to toggle the setting on and off. If it is on, the item is listed with a check mark beside it.

Anchor Run Lines

The **Draw Run Line** checkbox in the **Tug Target Position** dialog box allows you to draw and track run lines between the fairlead and the target anchor positions.

This option allows you to display locally and transmit to controlled and smart remotes, a run line from the fairleads to the target anchor positions. Because multiple anchors may be ran at the same time, the users at the master and at the smart remotes (i.e., winch operators) may want to view run lines for more than one Fairlead/Anchor. The users at the controlled remotes would likely only be concerned about the run line for their particular anchor.

The anchor run lines are survey lines and set as the tracked line for the corresponding vehicle in the Graphics windows, and as line data in the Vehicle Text window.

The checkbox allows you to turn on/off the drawing of the anchor run line at the corresponding controlled remote. Only the run line pertaining to the specified tug should be drawn at the corresponding controlled remote. When the run line is drawn the run line tracking is on, and when the drawing turns off the run line tracking is off too.

The **Drop** button in **Bottom Area – Anchor Handling Vehicles** changes the selected anchor's **Status** to **On Bottom** and turns off the anchor run line drawing and tracking.

Note: When using the anchor run line feature with a Controlled Remote, it is possible that if the communication link with the Remote is lost after the run line is transmitted, and the anchor is picked and/or dropped before the link is re-established, the line tracking in the Vehicle Text window and the run line in the Graphics window will not be removed when pick and drop are subsequently performed. To remedy this, either re-send the run line (or send another one) after the link is re-established, or turn off line tracking for the Remote vehicle by accessing the Setup Line Tracking dialog from the Vehicle Text window.

Anchor Handling Window Configuration

To Configure the Number of Anchor Vehicles to Display

1 Move the cursor to a point in the Anchor window where it is not over one of the buttons or data entry fields and then right-click.

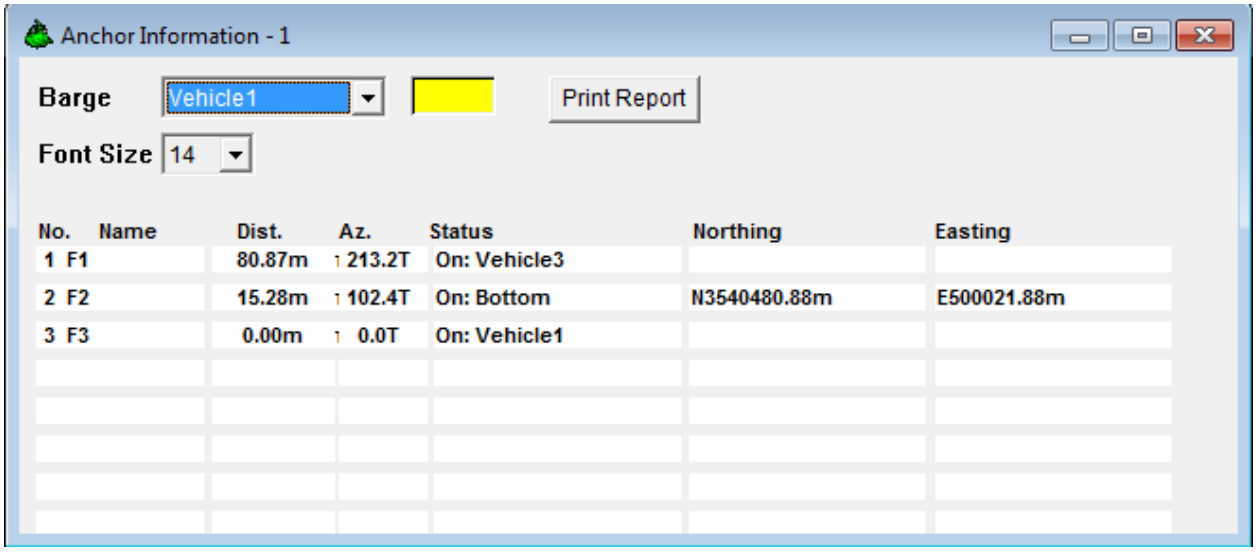
2 The pop-up menu lists **Display *n* Anchor Vehicle** where n is 1 to 5. The current setting is indicated with a check mark. Select the item that corresponds to the desired number of anchor vehicles to display in the window.

Anchor Information Window

The **Anchor Information** window displays status information of each of the anchors/fairleads setup in the Anchor Handling window. This window generically refers to the vehicle that is attached to the anchors as a "**Barge**." It allows you to monitor the status of each anchor during anchor operations. The coordinates are only displayed when the anchor is on bottom. The distance and azimuth is from the fairlead to the anchor; these are 0 if the anchor is on the barge.

Printing can be to a file and/or to the Windows default printer.

See the **Anchor Handling** section for details on anchor operations.



Alarms Window

WinFrog's **Alarm** feature provides you with the ability to configure alarms to respond to almost any real-time condition. The **Alarms** window displays the real-time (instantaneous) conditions of the various alarms with the use of standard "status colors"; **green** indicating a **good** status, **yellow** for **caution**, and **red** for **full alarm**. **Note:** the **Alarm** window remains blank until you configure the required alarms. This section details both the configuration and display of alarms.

To Display the Alarms Window

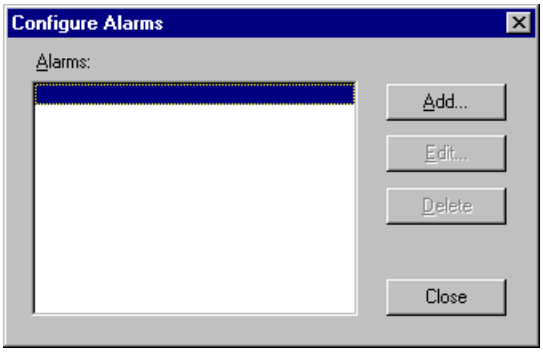
1 From the **View** menu, choose **Alarms.**

An empty **Alarms** window displays. The **Alarm** window can be changed in size or moved by "grabbing" the display window edges (or title bar) with the mouse pointer and moving it as desired.

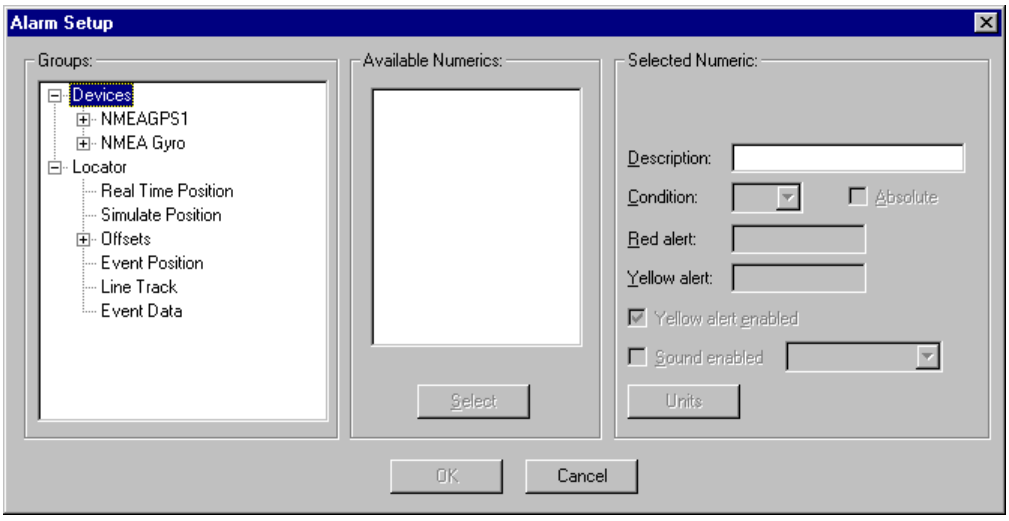
To Configure Alarms

1 Select the main menu item **Configure > Alarms.**

An empty **Configure Alarms** window appears, as seen below.



2 Click on the **Add** button to bring up the **Alarm Setup** window, as seen below.



Click on the "+" symbol beside a **Device** or **Vehicle Name** to expand the list of items that can be added to the **Alarm** list. All items which can be selected for a particular **Vehicle** or **Device** are listed in the **Available Numerics** portion of the **Alarm Setup** window.

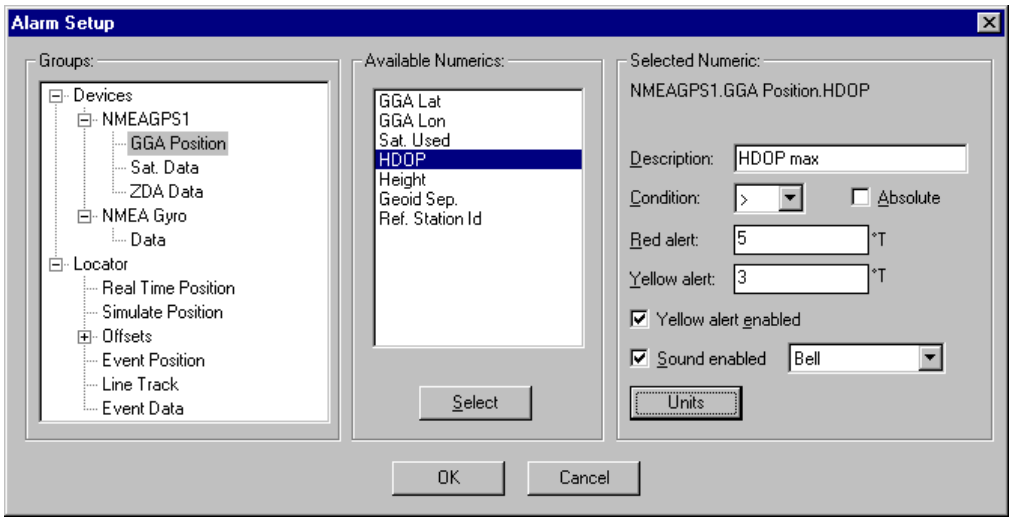
NOTE: In the case of a device, if it supports multiple instances of the same data type, these are displayed with a common name followed by a counter digit. This counter starts at 0. For example, a USBL device generally supports tracking of up to 10 beacons. When the USBL device is expanded, the ten possible beacons are listed as **Bcn. *n*** where the *n* increments from 0 to 9. The counter does not reflect the beacon code, but the index of that beacon with respect to the device.

3a Double-click on the desired item in the **Available Numerics** window to select it and have it displayed in the **Selected Numeric** portion of the window.

Or

3b Highlight the desired item and click on the **Select** button.

In the display seen below, the **GGA Position HDOP** value has been selected.



4 Type in a description for the device in the **Description** entry window.

5 Select the appropriate condition from the **Condition** dropdown box.

Note: ensure that the correct units are being used for the alarm. Select the **Units** button in the bottom of the **Selected Numeric** portion of the **Alarm Setup** window to change units as required.

6 Enter the appropriate **Red Alert** and **Yellow Alert** values.

7 Enable the **Yellow Alert** (optional).

8 Enable the **Sound Alert** and choose the desired option from the dropdown menu (optional).

9 Repeat steps **3** through **8** to configure additional alarms**.** Select **OK** to return to the **Configure Alarms** window once all desired alarms are added.

10 Select the **Edit...** button to change a configured alarm, if required.

11 Select **Close** from the **Configure Alarms** dialog box to close the window and save the changes.

The **Alarms** display window now shows the configured alarms and the current status of each.

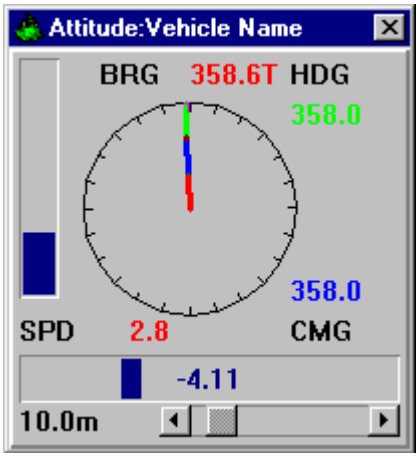
Attitude Window

The **Attitude** window graphically displays a variety of navigation information relating to the **current** vehicle. (The **current** vehicle is the one that is displayed in the **Vehicle Text** window). The information displayed in the **Attitude** window can also be simultaneously displayed in text form in the **Vehicle Text** window. However, in time critical operations, the information can be seen much easier and quicker using the **Attitude** window.

Note: only one **Attitude** window can be displayed at a time and the window size is not configurable.

To Display the Attitude Window

1 From the **View** menu, choose **Attitude.**



The following information is found in the **Attitude** window, clockwise from the top.

BRG	displays (in red) the **bearing** of the survey line segment currently being tracked by the **current** vehicle. If a survey line is not being tracked, **BRG** represents the bearing to a tracked waypoint. If neither are being tracked, **BRG** will show the last **BRG** value used. The **BRG** value is also graphically represented in **red** on the "compass" in the center of the display.
HDG	displays (in green) the **heading** of the **current** vehicle. The **HDG** value is also graphically represented in **green** on the "compass" in the center of the display.
CMG	displays (in blue) the **C**ourse **M**ade **G**ood of the **current** vehicle. The **CMG** is the inverse bearing between the last two filtered positions. The **CMG** is also graphically represented in **blue** on the "compass" in the center of the display.
SPD	On the left side of the **Attitude** window is the **Speed (SPD) Indicator** bar. As the **current vehicle's** speed increases, the blue bar will grow to reflect the increase in speed, ranging from **0** to **10** knots.
Slide bar	Along the bottom of the **Attitude** window, the blue **Cross Track Error Indicator** bar moves from side to side as the vehicle crosses the **currently tracked** survey line segment. If the vehicle is to the **Port** of the currently tracked survey line segment, the "tab" is to the left of center. The numbers in this section of the **Attitude** window also indicate whether the vehicle is to the left or right of the currently tracked survey line segment. A **negative** offset value means the vehicle is to the **Port** of the line segment (in terms of the direction that the line coordinates were entered and the direction that the line is being tracked). Use the adjustable bar at the bottom of the window to change the **Scale** of the **Cross Track Indicator**. The value shown in the bottom left corner is **one half** of the **entire** width of the **Cross Track Indicator**.

Auditor Window

WinFrog's **Auditor** Window allows you to keep track of all significant operations that have occurred in the current WinFrog session. **Note:** the term "significant operations" is used to refer only to those items that have some affect on the overall configuration of the program. These are noted in the **Auditor** display. For example, operations such as enabling or disabling displays, zooming in or out, or enabling or disabling waypoint or survey line tracking are not considered significant and are **not** noted in the **Auditor** display window.

Items that are included in the **Auditor** window include any changes to the **Working Geodetics**, **Working Files**, or **Working Units**.

To Display the Auditor Window

1 From the **View** menu, choose **Auditor.**

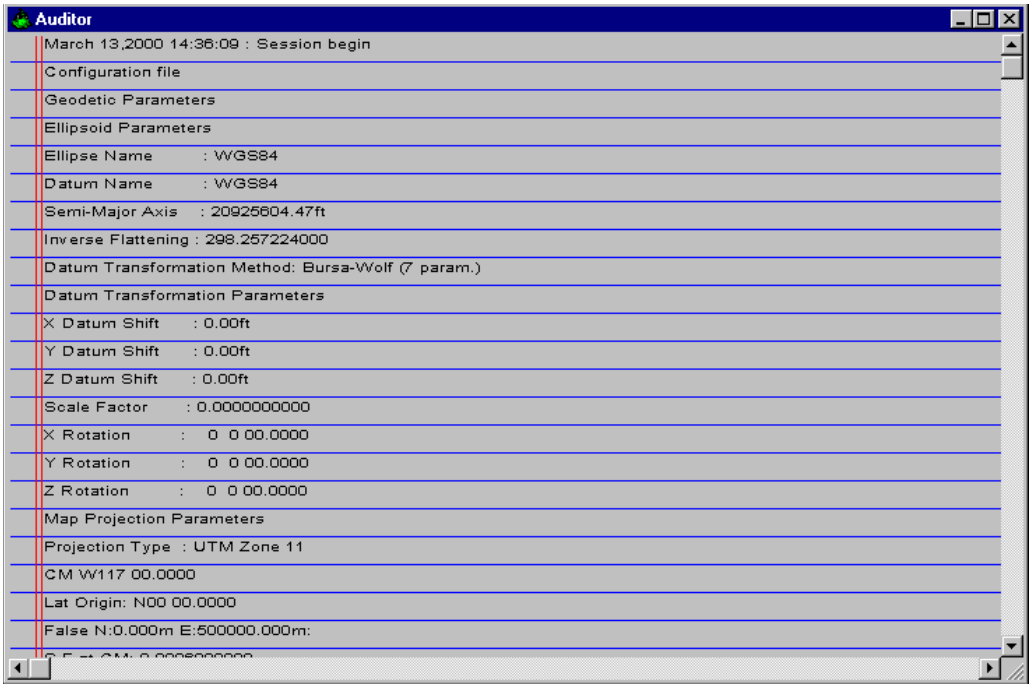
An empty **Auditor** window appears. The **Auditor** window can be changed in size or moved to a new location by "grabbing" the display window edges (or title bar) with the mouse pointer and moving the mouse as desired.

If the **Auditor** window was enabled when WinFrog was last shutdown, you can simply re-open it rather than display a new window.

To Re-Open the Auditor Window

1 Select the main menu item **Window**, then select **Auditor**.

The **Auditor** window will now appear in the size and location that it was last configured, with the significant items displayed, as per the example seen below.



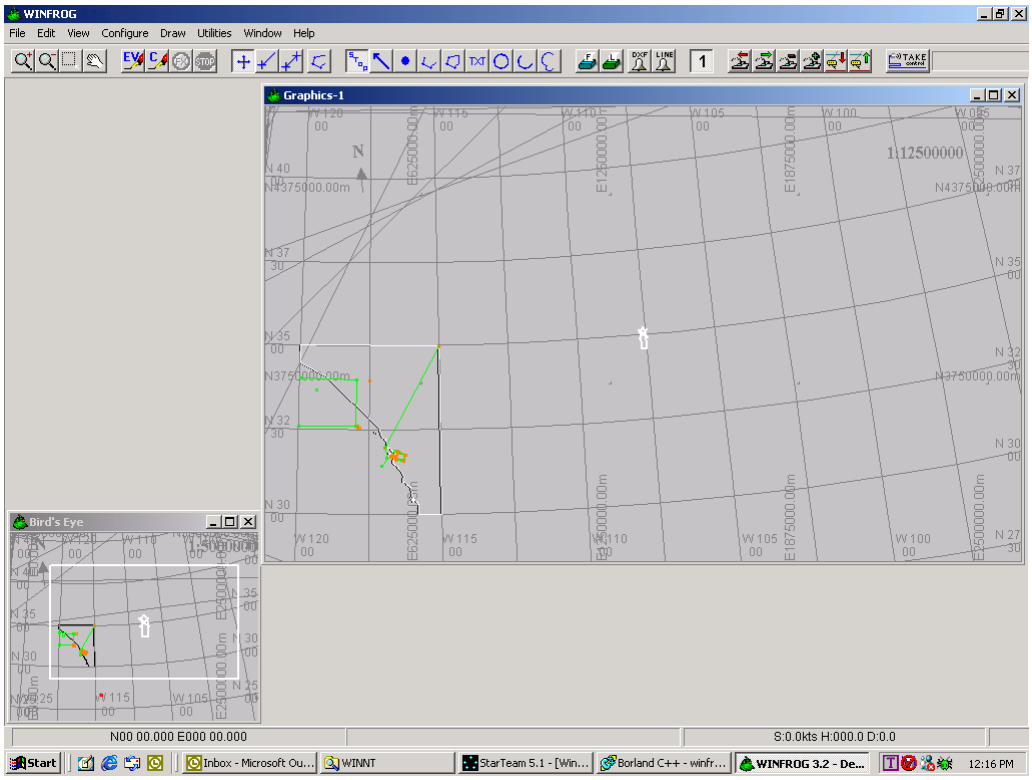
Bird's Eye Window

The **Bird's Eye** window provides all of the same display options and functionality available in the **Graphics** display**.** In addition to these features, the **Bird's Eye** display also plots a "box" that depicts the location and limits of the **Graphics** window. This box always remains correct in scale, even as the **Bird's Eye** and **Graphics** display scales are changed. Although WinFrog can display several **Graphics** windows, only one **Bird's Eye** window can be displayed. The **Bird's Eye** window is configured in the same way as the **Graphics** window.

To Display the Bird's Eye Window

1 From the **View** menu, choose **Bird's Eye**.

By default, the **Bird's Eye** display is located in the lower left corner of the WinFrog display space. The location and size of the **Bird's Eye** display can be changed by simply clicking and dragging the edges of the display box.



A white box is drawn on the **Bird's Eye** window to represent the area currently displayed in the related **Graphics** window. **Note:** the white box may not be visible if the **Bird's Eye** window is zoomed in very close or is centered on a different point from the **Graphics** window.

To Configure the Bird's Eye Window

1a With the **Bird's Eye** window selected, choose the main menu item **Configure > Bird's Eye.**

Or

1b Move the mouse pointer into the **Bird's Eye** display box limits, right-click and select the **Configure** option.

The display parameters that can be configured for the **Bird's Eye** window are identical to, but independent of, those for the **Graphics** window. This allows you to display the same (or different) information as the **Graphics** window.

Refer to the **Configure Graphics** window section earlier in this chapter for information describing the various configuration options for the **Bird's Eye** window.

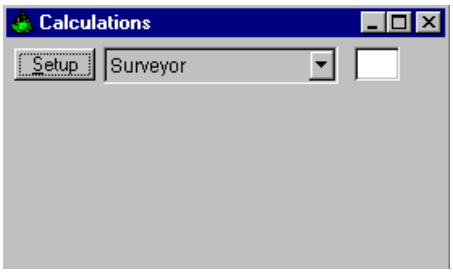
Calculations Window

The **Calculations** window displays real-time **Data**, **Statistics**, and **Quality Control** information for any device that has been added to a WinFrog vehicle. Several **Calculations** windows can be displayed at once, giving you the capability to simultaneously display information for several vehicles and devices.

Note: each **Calculations** Window can display data for any number of devices, but for organizational purposes it is recommended that you open a new **Calculations** window for each device.

To Display a Calculations Window

1 From the **View** menu, choose **Calculations**.

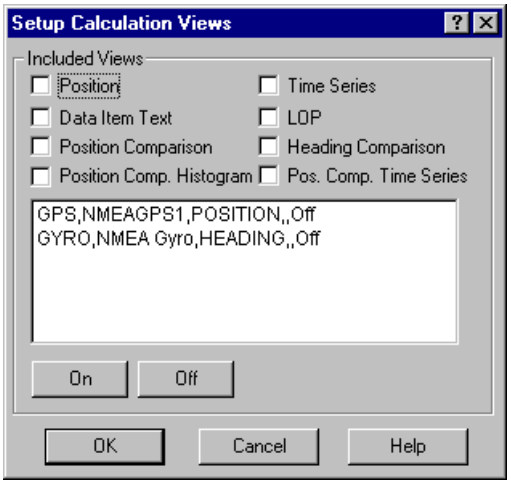


To Configure the Calculations Window

1 If there is more than one **Calculations** window currently displayed, click the title bar of the one to be configured to make it the **active** window.

2 Select the appropriate vehicle from the dropdown menu list.

3 Click the **Setup** button to bring up the **Setup Calculation Views** window, as seen in the next figure.



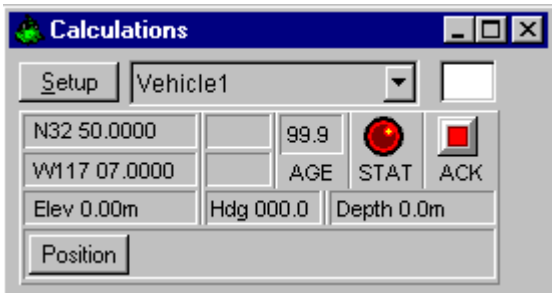
All of the devices that have been added to that vehicle's position are displayed in the white window area.

4 Choose the device for which you wish to see data displayed.

5 Click the **On** button.

6 Check the desired box in the **Included Views** area at the top of the **Setup Calculation Views** dialog box. Each of these options will enable a different data display in the **Calculations** window, as defined below.

Position box	Displays **Position** data in the top of the **Calculations** window, as seen below. (This option is the only one that does not require any devices to be turned on in the **Calculations** window as described in Steps 3 and 4 above).



The selected vehicle's current **Latitude**, **Longitude**, **Elevation**, **Heading**, and **Water Depth** are updated every program cycle.

AGE box	displays the age of the WinFrog position.
STAT button	is a visual cue that indicates the status of the filtered position. A **green** cue indicates the position is **good**, a **yellow** cue indicates the position is **degraded** (the position calculation has failed for more than 15 seconds), and a **red** cue indicates the position is **invalid** (the position calculation has failed for more than 30 seconds). If the

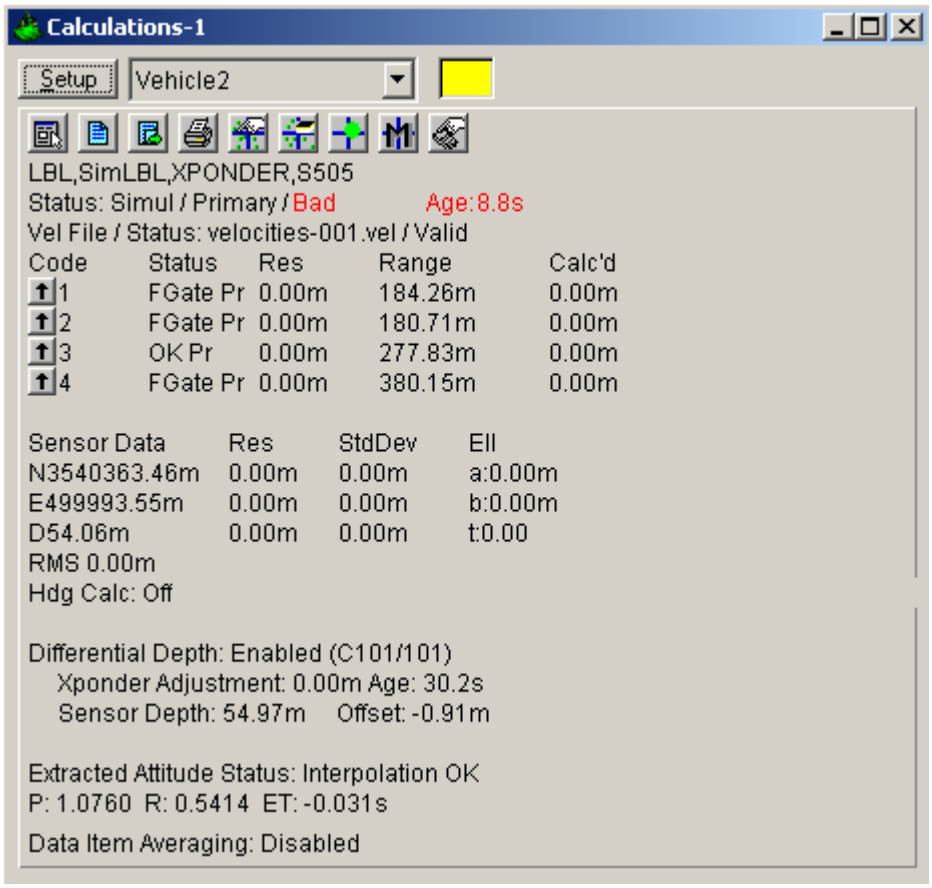
	cue turns red, an alarm sounds, which can be silenced by clicking the **ACK** button.
ACK button	used to silence the status alarm
Position button	(located below the **Elev.** information) This button is a shortcut to the selected vehicle's **Configure Vehicle-Devices** window. This provides you quick access to edit any devices that have been added to the vehicle's position calculations.
Data Item Text box	Select this option to display the latest data from all devices that have been turned **On** in the **Setup Calculation Views** dialog box. Typically, this option is just used to display information for GPS device(s), particularly for **GPS Pseudorange Calculations** and **Multi-Ref** solution data. Three buttons are displayed in a device's **Data Item Text** window, directly above the device information, four if the selected data item supports the fix print option. The functions of each button from the left are as follows: The first button provides a shortcut to the configuration menu for that particular device, as used by that vehicle. The second button is not used. The third button is used to toggle through different information pages for that device, if available. The fourth button prints a fix report for the epoch displayed when the button is clicked. You are then prompted for print options – print directly to the printer and/or print to an rtf file. If the data item being displayed also supports the Data Item Averaging option, there are additional buttons associated with this feature to the right of the print button. See **Data Item Averaging** below.
Position Comparison box	Select this option to display the coordinates of all **Primary** and **Secondary** positioning devices as well as real-time comparisons between their positions. **Survey Line** and **Waypoint** tracking data averaged over time can also be displayed. This comparison is user-configured and can be written to file for subsequent viewing and QC analysis.

Data Item Averaging

The Data Item Averaging feature provides the means to collect data for a specific data item for the purpose of determining a mean over a given number of epochs complete

with the respective standard deviations for the sample set. This feature is accessed via the Data Item display (see **Data Item Text** box above).

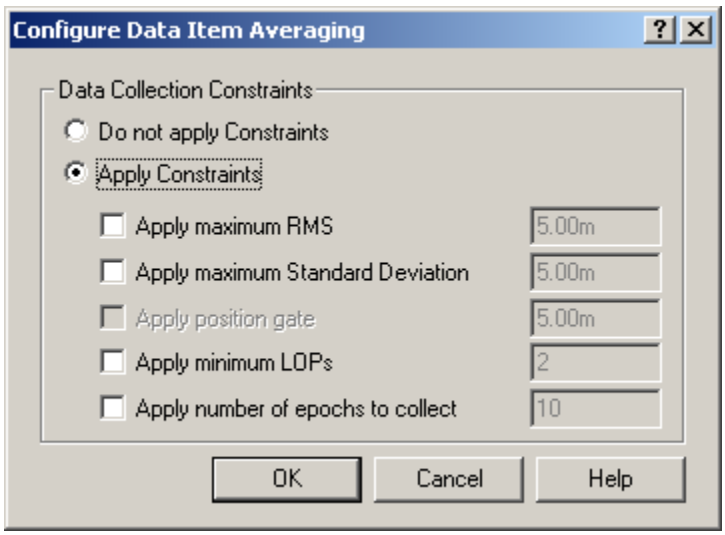
Note: Not all data items support this option. If a data item supports this option the respective buttons are available in the Data Item window.



The LBL XPONDER data item supports this feature and is shown in the above figure.

1 Configure the automatic data collection.

The collection of the data can be done automatically or manually. If it is to be done automatically, you can configure parameters for the collection. To configure these, click  to access the following dialog.



i. If you do not wish to apply any constraints to the data collection, select **Do not apply Constraints**. All data is collected with the exception of that which fails the specific data item constraints (e.g. if an LBL adjustment fails). In the case of LBL positioning, if the position determination fails, the data is not captured even if no constraints are applied via this configuration.

ii. If you do wish to apply constraints to the data collection, select **Apply Constraints**. If this is selected, the constraint options become available.

   a. **Apply maximum RMS**. Select this option if only those epochs whose solution RMS is less than a specific tolerance are to be collected. Enter this tolerance.

   b. **Apply maximum Standard Deviation**. Select this option if only those epochs whose solution standard deviation(s) is less than a specific tolerance are to be collected. Enter this tolerance.

   c. **Apply minimum LOPs**. Select this option if only those epochs that use at minimum a specified number of LOPs are to be collected. Enter this number.

   d. **Apply number of epochs to collect**. Select this option if you want WinFrog to automatically stop collecting data when a specified number of epochs are collected. Enter this number.

iii. Click **OK** to apply the constraints. Note that this configuration is saved to the INI and CFG files for the respective data item. If the Calculation Window is closed and then re-opened and the data item is re-selected for display, the previous configuration is still present.

2 Clear the data from memory.

Once data has been collected (or loaded from a file) WinFrog maintains it in memory. If you wish to start a new data item averaging session, you will need to clear the data from memory. To do this, click the  button.

3 Start the data collection.

To start automatic data collection, click the  button. The data collection process will immediately start, starting with the current epoch, which is checked and saved if it meets the constraints or regardless if the constraints are not being applied. The button will change to  .

4 Stop the data collection.

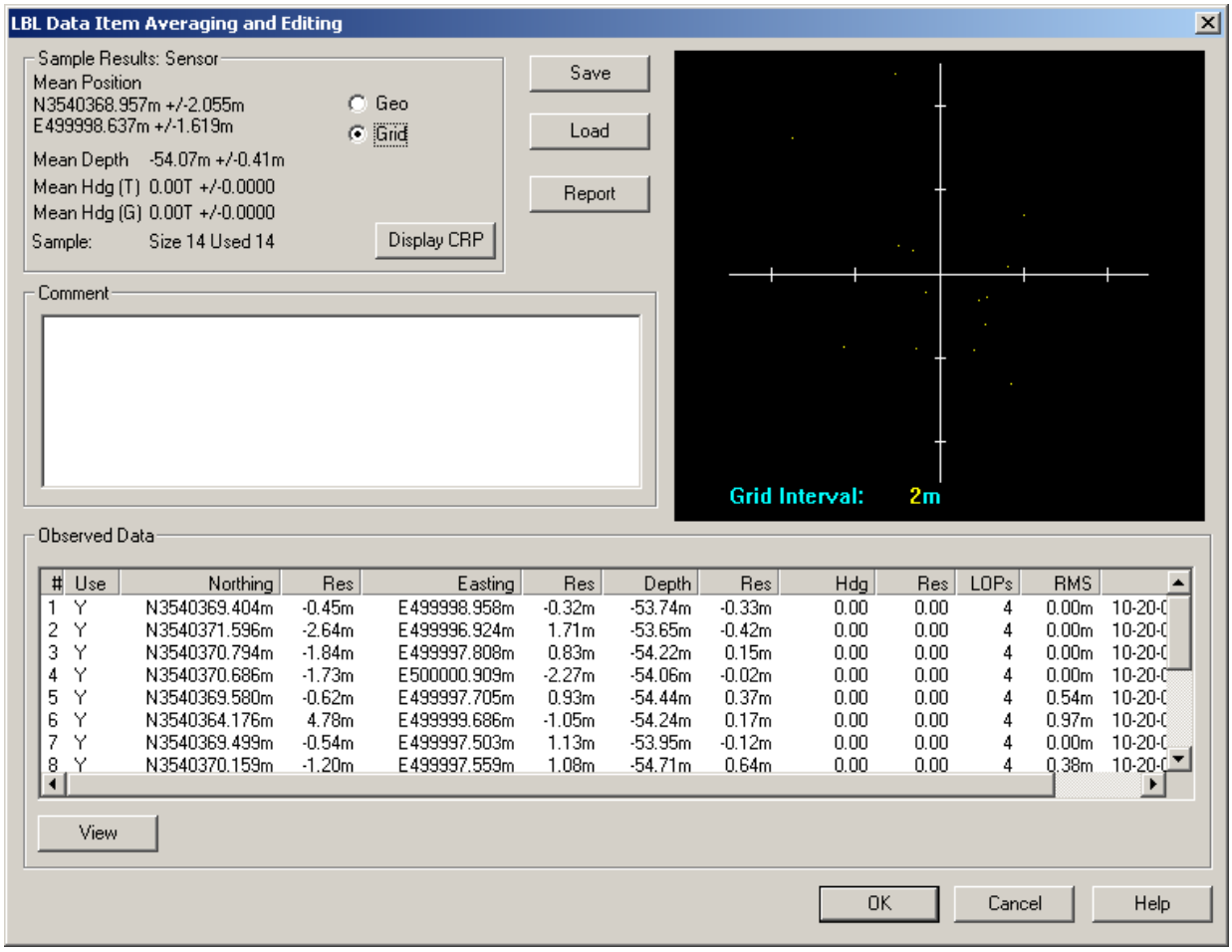
To stop the automatic data collection, click the  button. The data collection process will immediately stop and the button will change to  .

5 To manually capture data.

A data epoch can be captured at any time, even if the data logging is active and the current epoch was rejected due to the data item averaging data collection constraints. To capture the current epoch without consideration of the data collection constraints, click the  button.

6 To process the data.

To review the data currently in memory or load data from a file, click the  button. Note that this button is only active when the automatic data collection is not. Clicking this button presents the respective processing dialog. The following is the dialog for the LBL acoustic data items XPONDER and LBL TRANSCEIVER.



i. View the results

The mean position and depth along with the mean True and Grid heading for the vehicle are displayed in the **Sample Results** panel, with the respective standard deviations for the sample set. The position can be viewed in geographic or map projection grid by selecting the appropriate **Geo** or **Grid** radio button. The position and depth display defaults to the respective sensor. The associated CRP position and depth can be displayed by clicking the **Display CRP** button and back to the sensor by clicking the **Display Sensor** button. Note that the CRP position is derived from the sensor data and is not the filtered vehicle CRP position.

The size of the sample and the number of the set that are used for the mean determinations is also shown.

ii. Enter a comment

A comment to be associated with this data set can be entered in the **Comment** field. It is printed and saved/loaded to/from the data file. If one is already present for the respective data set, it is displayed and available for editing.

iii. View the epoch summary.

The summary of data epochs captured is displayed in the **Observed data** list window.

iv. Toggle an epoch to be used or not used

All data captured defaults to be used. To toggle any epoch's current setting, double-click the epoch number field. Upon a change in any epoch's use/don't use setting, the mean is re-determined and displayed.

v. View an epoch

To view the data for any epoch, click on the desired epoch's number and click the **View** button. The data is presented as it would be in the Calculation Window, Data Item view, with some exceptions.

- Age information is not shown. Instead the associated time is shown.
- The button used in the Calculation Window to toggle between different presentations of the data is replaced with a **Page** button.
- The use status of the data in the determination is displayed and can be toggled by clicking the **Toggle On/Off** button.

vi. Save the data

To save data currently in memory, click the **Save** button, navigate to the appropriate location and select or enter a file name to save to.

vii. Load data

To load data into memory, click the **Load** button, navigate to the appropriate location and select a file to load. When data is loaded, any data currently in memory is lost.

Note: If you load data into memory, you can append to it simply by re-starting the data collection or clicking the manual data collection button. To do this, make sure you leave this dialog by clicking OK after loading data.

Note: You can only load data for the same data item type as the data item window is set for.

viii. Scatter Plot

The panel in the top right of the dialog presents a scatter plot of the sensor position data.

ix. Print data

To print the results of the mean data determination, click the **Report** button and select to print to the printer or file using RTF format. The print out provides a summary of the data collection, the results for both the sensor and CRP positions complete with the respective sample set standard deviations and the comment. Each individual epoch is also printed.

7 Monitor data item averaging

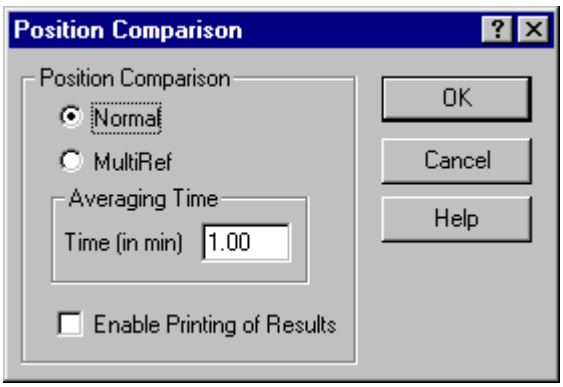
The status of the data item averaging is displayed at the bottom of the respective data item window.

There are several states:

Disabled	Automatic data collection is off and there is no data in memory.
Active Count: n	Automatic data collection is enabled, **n** is the number of epochs currently in memory.
Paused Count: n	Automatic data collection is off but there is data in memory, **n** is the number of epochs currently in memory.
Completed	Automatic data collection was active with the number of epochs to collect option active. This number has been reached.

To Perform a Position Comparison

1. Select the **Position Comparison** checkbox in the **Setup Calculation Views** dialog.
2. Turn **On** the **Primary** and **Secondary** devices.
3. Select **OK** to return to the **Calculations** window.
4. Select the **Edit** button.



There are two **Position Comparison** options available: **Normal** and **MultiRef**.

Normal	displays the comparison information between the **Primary** and **Secondary** positioning devices.
MultiRef	displays the comparison information between the weighted mean **multi-reference** position and the individual (single reference station) solutions.

An **Averaging Time** must be entered for either of these options.

5 Choose **Normal** or **MultiRef** and enter and **Averaging Time**.

When you return to the **Calculations** window, your **Averaging Time** input displays as **Time Remaining** and counts down to zero. The comparison, which will automatically repeat itself, can also be manually controlled by using the **Start** and **Stop** buttons. These data are not recorded to any files.

Position Comparison Display

The first line of the **Position Comparison** section of the **Calculations** window lists the **Primary Positioning Device** with its user-assigned name.

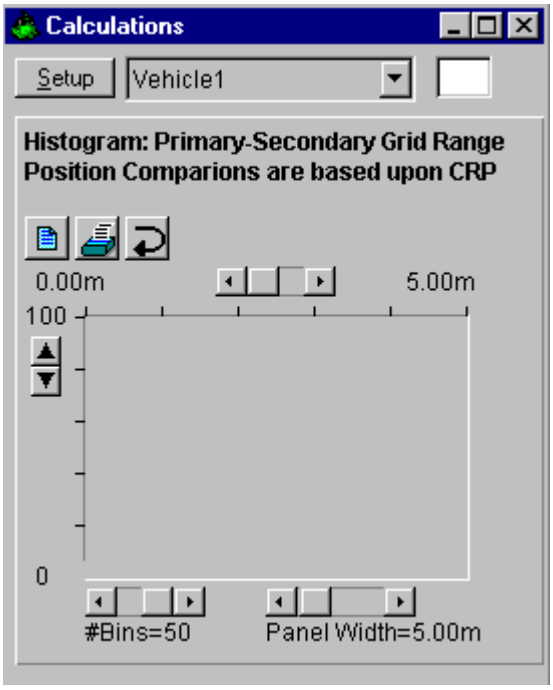
The second line displays that device's position in grid Northing and Easting.

The third and fourth lines display the same information for the **Secondary Positioning Device**.

The fifth line displays the instantaneous differences in the Northings and Eastings between the two devices.

Below that information is the **Average Position Comparison**. By default, the average is based on a one-minute time period. If there is another **Secondary** positioning device, the same information appears for it as it does for the first secondary. The bottom line displays the time remaining (in minutes) for the **Comparison Average**.

Position Comp. Histogram Select this option to enable a **Calculations** window display that plots a real-time histogram of the **Position Comparison** between the **Primary** and **Secondary Positioning** devices. **Note:** this window does not require any devices to be turned **On** in the **Calculation** window's **Config** option.



To Configure a Position Comparison Histogram

1 Click and move the sliding bar above the display window to set the **Center of the Plot**. (This is the absolute value of combined Northing and Easting errors).

2 Click on the radio buttons on the left of the display window to set the overall **Height** of the display to see changes in data more clearly

3 Select and slide the bar at the bottom left corner of the window to set the **Number of Bins** that are displayed.

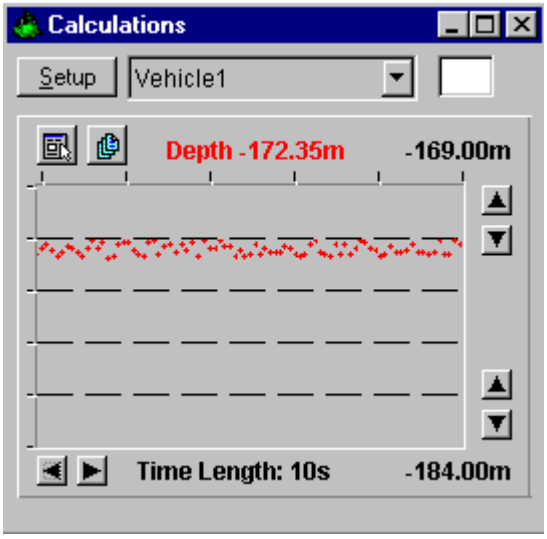
4 Select and slide the bar at the bottom right corner to set the **Horizontal Panel Width** (range) of the window.

Note: the **Center** value will change as you change the **Width** value at the bottom of the screen. This may cause your data to "disappear" from the display window, requiring you to re-center the data to a realistic value.

Time Series

Select this option to display a graphical representation of a device's **Data relative to Time**. This can be used to view how the position, water depth, etc. change over time.

The data displayed in the **Time Series** graph are for the selected device, set to **On**. Only one data item can be graphed in each window at a time, but you can simultaneously display multiple **Time Series** windows in the same **Calculations** display. A new window will be created for each device turned **On** in the **Calculations** window **Setup**. This window is typically used for the display of sounder depth data.



To Configure the Time Series Graph

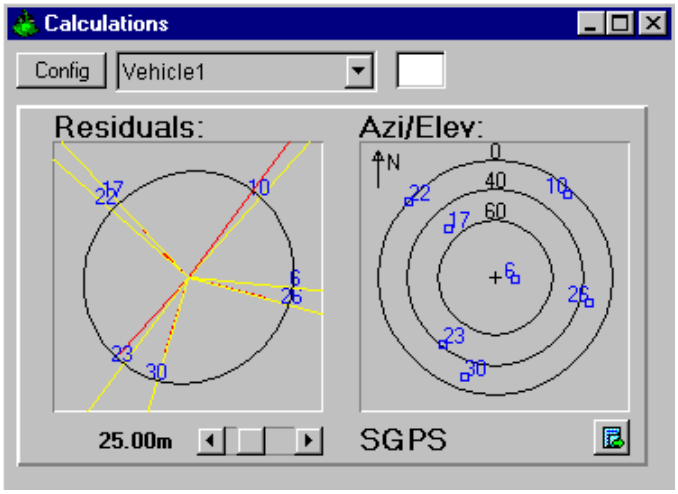
1 Select the adjustment arrows on the right side of the time series window to change the **Top** and **Bottom** limits of the data display (in the same units as the device data).

This is used to set both the vertical scale of the display as well as the center of the data.

2 Select the adjustment arrows found at the bottom of the display window to set the time range (i.e. the horizontal scale) of the plot in seconds.

LOP

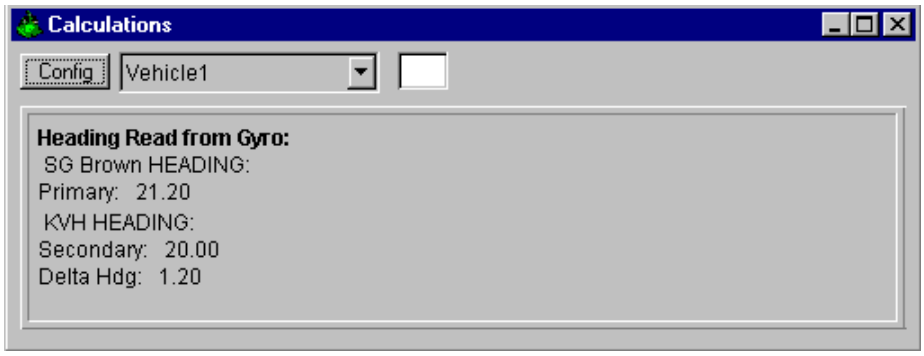
This **Setup Calculations Views** window option is used to display "Lines of Position". This term is derived from the time when shore-based ranging systems were the primary method of vehicle positioning, before GPS. The term "Line of Position" refers to a range used in the position determination. The **LOP** display in the **Calculation** window can be used to display "ranges" from range/range, LBL acoustic, and GPS pseudorange devices. The example below shows the ranges from GPS satellites used in the pseudorange solution.



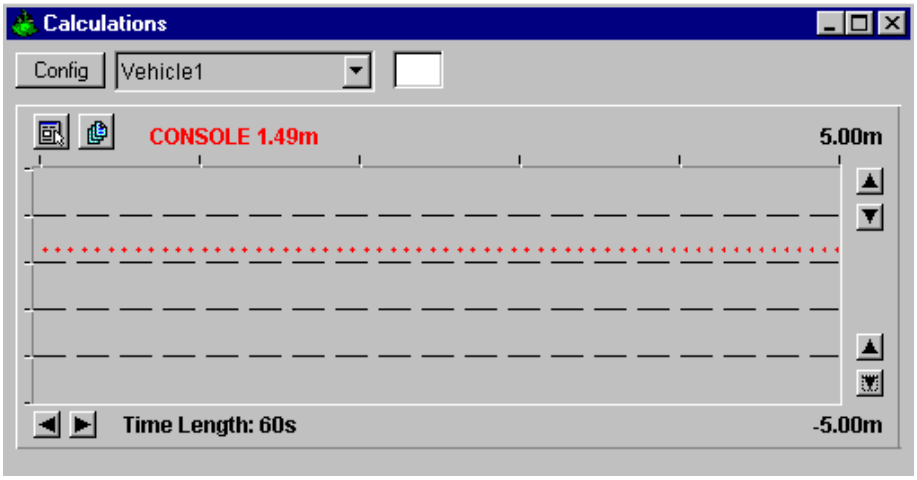
The azimuth and elevation of the GPS satellites used in the pseudorange solution are displayed too.

Heading Comparison

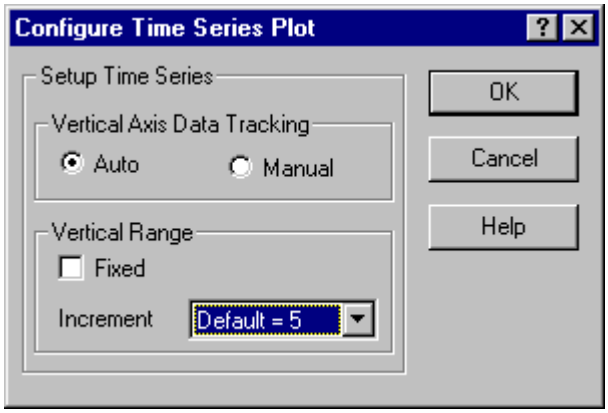
This **Setup Calculations View** window option is used to present a comparison of the data from a vehicle's **Primary** and **Secondary** heading devices, as seen in the next figure.



Pos. Comp. Time Series This option is used to present a graphical time series comparison of the data from a vehicle's **Primary** and **Secondary** positioning devices, as seen in the next figure.



Use the **Up** and **Down** arrows on the right side of the window to change the center value and the width of the display window. Click on the left "page" icon to access the **Configure Time Series Plot** dialog window, as seen below.



Use the **Configure Time Series Plot** dialog window to configure **Automatic** or **Manual** control of the **Vertical** (distance) **Axis** mid-point and the total range of the vertical data displayed.

Controlled Remote Window

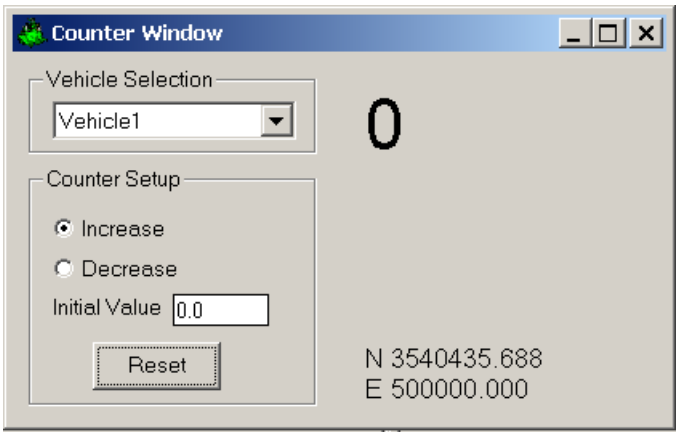
WinFrog's **Controlled Remote** window allows you to configure a **"remote"** WinFrog system and display real-time data for that vehicle. A **remote** WinFrog system is a WinFrog system connected to another WinFrog system via a token ring telemetry network. See the **Controlled Remote Tug Telemetry** chapter for complete details on the use of the **Controlled Remote** window.

Distance Counter Window

WinFrog's **Distance Counter** feature is used for calculating and displaying an incremental counter of the distance between a selected **Offset** point on a vehicle from a specified starting location. The initial value of the counter can be set to an arbitrary value and can be set to increase or decrease as the vessel moves to or from the start.

To Display the Distance Counter Window

1 From the **View** menu, choose **Distance Counter**.



Vehicle Selection — Select the vehicle from the drop down list that you wish to use with the counter.

Counter Setup

- **Increase** — Causes the counter value to increase as the vessel moves away from the initial position, or decrease as it moves towards the position.
- **Decrease** — Causes the counter value to decrease as the vessel moves away from the initial position, or increase as it moves towards the position.
- **Initial Value** — Enter the desired initial value of the counter at the start position. The counter will start to increment or decrement from this value.
- **Reset** — Click this button for any changes you have made to take effect. No changes are made to the counter settings until this button is clicked.

Counter Value — The counter value is displayed in the top right corner of the window. The counter displays the grid distance in the current distance units between the selected start location and the current location of the vehicle or specified offset.

Start Location — At the bottom right corner of the window is the start location where the counter started to increment/decrement. The start location is selected whenever the **Reset** button is clicked.

Note also that the font, size and color of the counter and start position can be changed by right-clicking on the window to display the font popup menu. Select either **Change Counter Font** or **Change Start Position Font** to open a standard font selection dialog.

When the window is closed but WinFrog is not shut down, all settings for the initial counter value, direction and start location are lost and need to be reset when the window is opened again.

Dynamic Tracking Window

WinFrog's **Dynamic Tracking** feature is used for calculating and displaying the positional difference from a **Tracking Offset** point on one vehicle to a **Tracking Offset** point on another vehicle. The positional difference can be displayed in four different formats:

1 **Range**, **Bearing**, and **Difference in Depth**

2 **Difference X, Y**, and **Z**

3 **Difference North, East,** and **Depth**

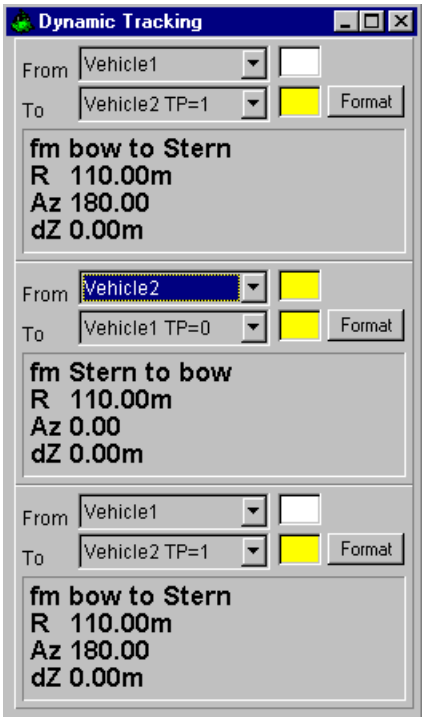
4 **Range, Relative Bearing** and **Difference in Depth**

Each combination of **Tracking Offsets** is referred to as a **Track Pair**. The **Dynamic Tracking** window displays the positional differences of up to three **Track Pairs**. **Track Pairs** are configured using the main menu item **Configure > Vehicles > Setup Dynamic Tracking.** This option displays the **Setup Dynamic Tracking** dialog box. For more details about configuring **Track Pairs**, see the **Dynamic Tracking** section in the **Vehicles** chapter.

To Display the Dynamic Tracking Window

1 From the **View** menu, choose **Dynamic Tracking**.

The **Dynamic Tracking** window displays information for a maximum of three different enabled Track Pairs. For more details about using this window, see the **To View the Dynamic Tracking Information** section in the **Vehicles** chapter.



GPS QA/QC

The GPS QA/QC display will display GPS quality data for a particular vehicle. The window has six tabs to display the QA/QC data available from a GPS receiver. Right-clicking on the Bar Charts tab or Time Series tab will reveal a menu allowing selection of different data that may be displayed on that tab.

To display data in all the tabs available, the GPS receiver needs to send the following NMEA telegrams: $--GRS, $--GSA, $--GST, and $--GVS.

One window may be opened for each vehicle. The data for only one GPS receiver should be selected for display. This is controlled by selecting the checkbox on the POSITION data item configuration dialog. The device must also be set to Primary for the data to be displayed in the window. This checkbox should be unchecked for non-GPS devices that have POSITION data items as they will not have the necessary QA/QC data to display in this window. Some devices however, may have partial data.

The displayed units in the window are controlled by the elevation selection in the Configuration > Units dialog.

The coordinates displayed on the Position/QC tab are the current reference point coordinates.

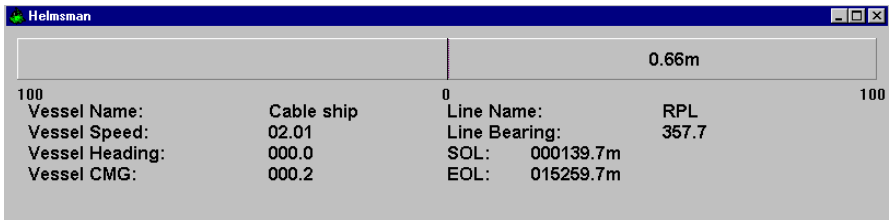
Helmsman Display

The **Helmsman** display shows **survey line tracking** and **navigation** information in both graphic and text formats, specifically intended for quick reference by the helmsman. Only one **Helmsman Display** can be viewed at a time.

Note: the size and shape of the **Helmsman** display can be altered by "grabbing" an edge or corner and dragging it "in" our "out" as desired.

To View the Helmsman Display

1 From the **View** menu, choose **Helmsman.**



The following information is found in the **Helmsman** display window:

Steering Bar

The top portion of the window graphically displays the amount that the vehicle's currently tracked reference point is perpendicularly **Offtrack** from the current **Tracked Survey Line Segmen**t. The bar will "grow" in size from the center to the appropriate side as the vehicle

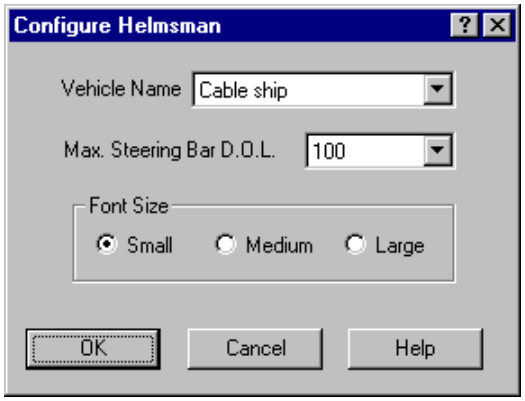
	moves further offtrack. The **Offtrack** distance is also displayed numerically in this portion of the window. **Note:** the numerical value is always **positive**, regardless of which side of the line the vehicle is on.
Vessel Name	the **Name** of the **current** vehicle.
Vessel Speed	the calculated **Speed** of the vessel.
Vessel Heading	the vessel's heading (as received from a gyro or other interfaced directional device, plus any user-configured offset).
Vessel CMG	the vessel's calculated **Course Made Good**.
Line Bearing	displays the **bearing** of the current segment of the survey line being tracked.
Line Name	displays the **name** of the survey line being tracked.
SOL	displays the distance to the **S**tart **O**f **L**ine.
EOL	displays the distance to the **E**nd **O**f **L**ine.

The numbers in the moving bar will change to reflect the distance from the center of the display to the edge. Select the main menu item **Configure > Units > Distances** to change the units displayed.

If no **Survey Line** is currently being tracked, **0.0** is displayed and no changes will occur in this part of the display.

To Configure the Helmsman Display

1 Move the mouse pointer to within the limits of the **Helmsman** display, then press the right mouse button. The **Configure Helmsman** dialog box displays.



Vehicle Name dropdown	Choose the appropriate vehicle from the options presented in the dropdown box.

Max Steering Bar D.O.L.	
dropdown	Select from the options presented in the dropdown box to change the maximum horizontal **Distance Off Line** (D.O.L.) to be depicted in the **Steering Bar** section of the **Helmsman** display**.**
Font Size radio buttons	Select the desired **Font** size.

2 Adjust the **Vehicle Name**, the **D.O.L.**, and the **Font Size** options accordingly.

3 Click **OK**.

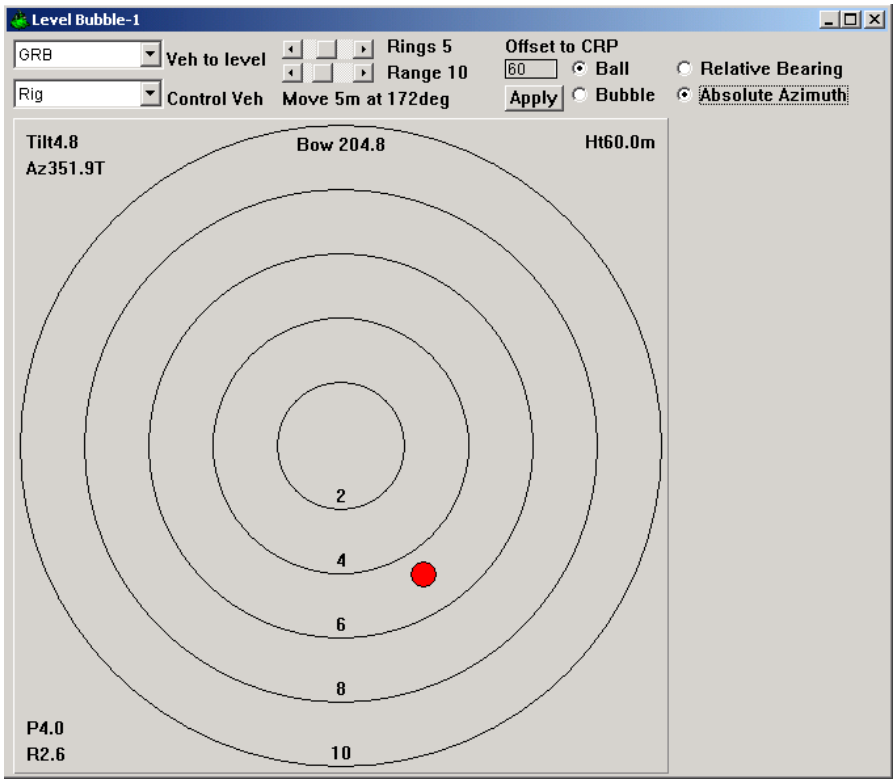
Level Bubble Window

This window displays the pitch and roll of a vehicle using a bull's eye display. If desired, it can also estimate the approximate amount of movement a surface vehicle would need to move, and its direction, in order to bring a subsurface vehicle to the level position. This assumes the surface vehicle is overtop the subsurface vehicle and is attached by some semi-ridged structure such as a drill stem. The vehicles' CRP elevations are used to determine the vertical distance between the vehicles. If there is casing below the bottom vehicle the operator may enter an offset to the fulcrum point.

Up to five Level Bubble windows may be displayed.

To Display a Level Bubble Window

1 From the **View** menu, choose **Level Bubble**.



To Configure the Level Bubble Window

1 Select the vehicle whose attitude is to be monitored from the top dropdown list box (Veh to level).

2 Using the slider bars, select the number of rings and the total range (1° to 50°) desired. Depending upon the number of rings selected, the full range may not be displayed; either change the number of rings or the range to display the full range.

3 The red circle indicates the levelness of the vehicle. The circle may simulate either a bubble (air in oil) or a ball (steel in oil). The two radio buttons, Ball and Bubble, determines the mode. If Bubble is selected and the vehicle has positive pitch (bow up) the red circle will move towards the bow. If in the same situation Ball was selected, the red circle would move towards the stern.

4 The top of the bull's eye is always considered the bow of the vehicle being leveled.

5 In the top left corner of the bull's eye is the total tilt of the vehicle. Below this is either the azimuth or bearing relative to the bow of the tilt. The remaining two radio buttons, Relative Bearing and Absolute Azimuth, determine which is displayed. If the Relative Bearing is chosen, the angle is measured from the bow to the red circle. If the Absolute Azimuth is chosen, the angle is measured from true north to the red circle.

6 Displayed in the lower left of the bull's eye is the pitch and roll in degrees. Positive pitch is bow up; positive roll is starboard down.

7 If there is a leveling vehicle as described above, select it from the lower dropdown list box (Control Veh).

8 To level the lower vehicle use the display "Move 25 m at 323 degrees" located below the slide buttons. The distance to move uses the tilt angle and difference in the CRP elevations; the angle is the true azimuth indicating the direction to move the rig. To correct the height difference for a section of casing which will act as the pivot point or to correct this difference for any other offset, enter a value in the Offset to CRP edit box and click the **Apply** button. This value will be added to the elevation difference and displayed in the upper right corner of the bull's eye. This elevation difference is always considered positive.

Numerics Display

The **Numerics** display provides you the ability to view various user-selected real-time **Device** and **Vehicle** data items. This display expands on the data presented in the **I/O Devices** and **Vehicle Text** windows. See the appropriate sections found earlier in this chapter for more information on these other windows.

To View the Numerics Display

1 From the **View** menu, choose N**umerics**.

A blank **Numerics** window displays. As with most WinFrog windows, the **Numerics** window can be moved by "grabbing" the top bar of the window and dragging the window to the desired location. The window can also be changed in size by "grabbing" any edge of the window and "dragging" it as desired.

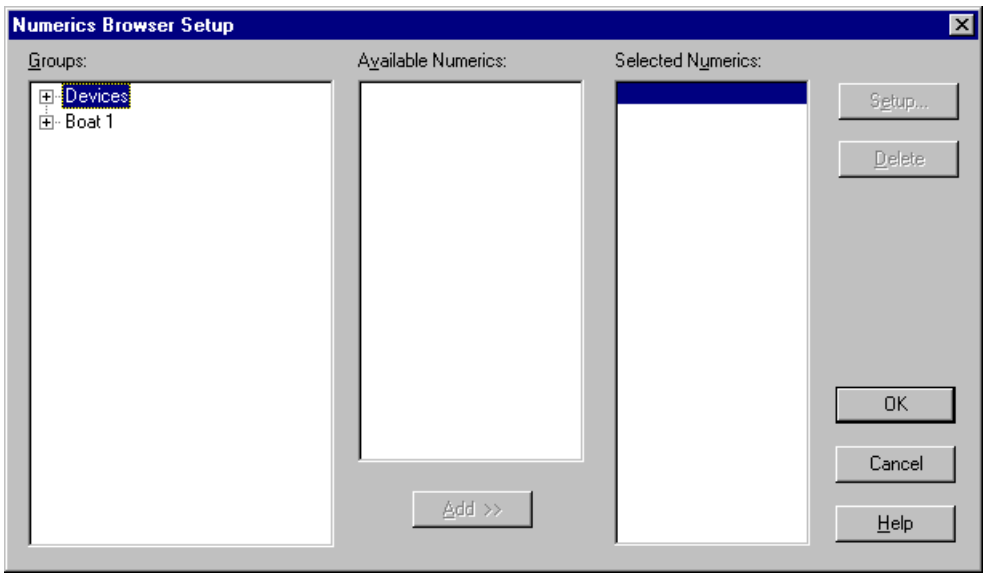
To Configure the Numerics Display

1 To configure this display, move the mouse pointer to within the limits of the Numerics display and click the right mouse button.

A small dialog box appears offering **Setup...** and **Font Size...** options. Select the appropriate option.

Setup

Select this option to display the **Numerics Browser Setup** window.



Groups

This section of the **Numerics Browser Setup** window divides the available data into two source groups: **Devices** and **Vehicles**.

Devices	This grouping contains all devices that have been added to WinFrog. Click on the "+" symbol beside the word "**Devices**" to see a list of these devices. Click on the "+" symbol beside a specific device name to see what data are available from this device. Select the data name to see what **numerics** are available from this data type, listed in the **Available Numerics** window.

NOTE: If a device supports multiple instances of the same data type, these are displayed with a common name followed by a counter digit. This counter starts at 0. For example, a USBL device generally supports tracking of up to 10 beacons. When the USBL device is expanded, the ten possible beacons are listed as **Bcn. *n*** where the *n* increments from 0 to 9. The counter does not reflect the beacon code, but the index of that beacon with respect to the device.

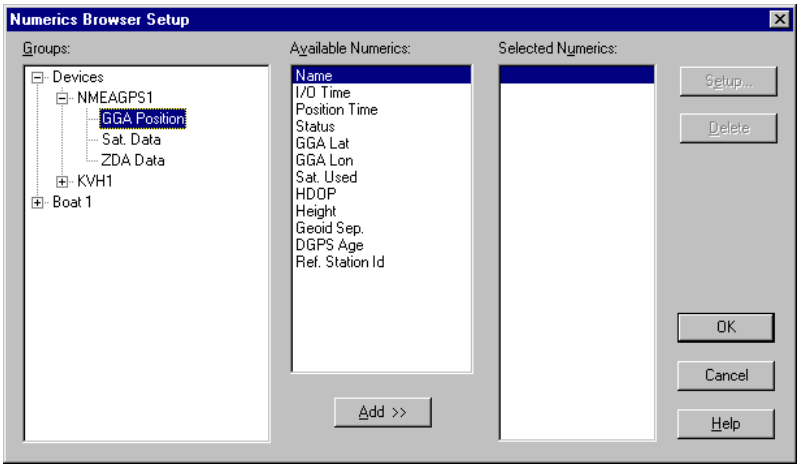
Vehicles	The name of each vehicle added to WinFrog will be listed in the **Groups** section. Click on the "+"

beside a vehicle name to see what data categories are available for that vehicle. Click on a data category to see what data items are available for each vehicle data category, listed in the **Available Numerics** window.

Available Numerics

Available Numerics

This section of the **Numerics Browser Setup** window lists all individual **Numeric** items associated with the highlighted "group" data item. The example below shows what **Available Numerics** are associated with a NMEA GPS device.



Selected Numerics

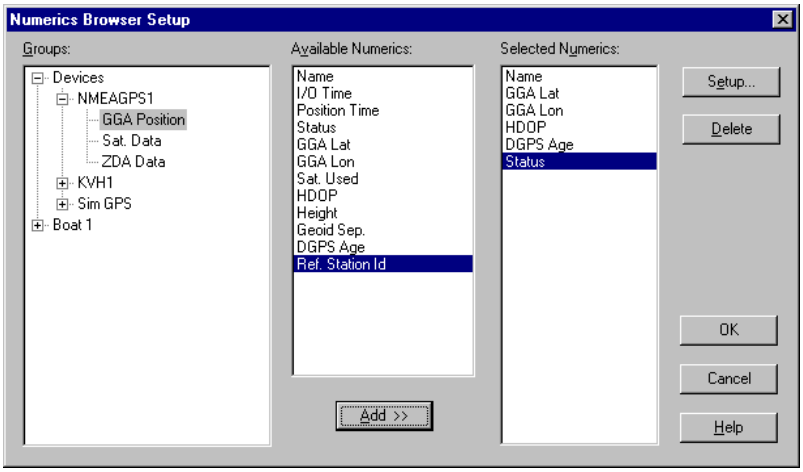
This portion of the **Numerics Browser Setup** dialog box lists the items that have been selected from the **Available Numerics** listing.

To Add an Item to the Numerics Display

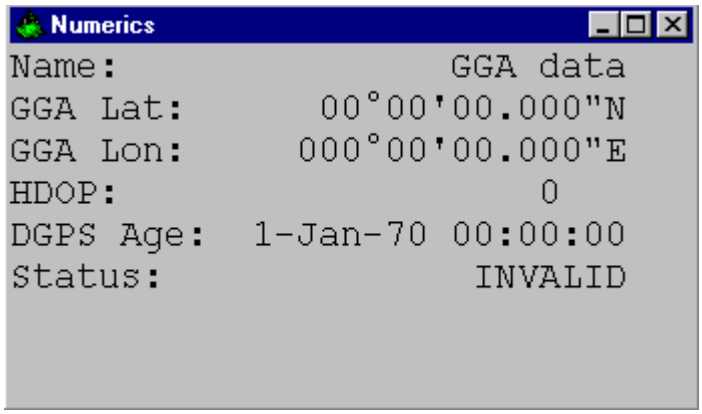
1 Highlight the **Available Numeric** item

2 Click the **Add>>** button.

In the example below several items have been added from the **Available Numerics** for a GGA Position.

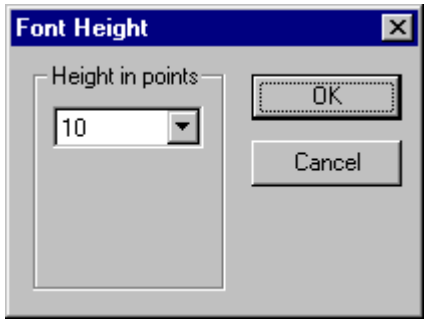


3 Once all desired items have been added, select the **OK** button to return you to the Numerics display, which now reflects the changes just made.



Font Size

Select this option to display the **Font Height** window as seen below. Use the dropdown to select the desired **Font Height**.



Smart Remote Control

WinFrog supports the operation of Smart Remotes. A WinFrog system that is not configured with real-time inputs and outputs may provide the means to view and monitor the positioning and navigation being performed by the primary WinFrog system. A Smart Remote does not require a license. A computer running WinFrog in demonstration mode can be operated as a Smart Remote.

To simplify the operation of the Smart Remotes, WinFrog provides the means for you to configure the Smart Remotes from the primary WinFrog system, referred to as a master in this section. The Smart Remotes will simply be referred to as remotes.

Network Communications

WinFrog uses UDP/IP to communicate between the master and remotes. This requires a suitably configured Ethernet card to be installed in the computer. When WinFrog is launched, whether it's to be used as a remote or a master, it retrieves the IP address of the computer's Ethernet card. This is used to read/write the required remote navigation information. If at launch, WinFrog detects two or more Ethernet cards and none has been directly selected as the card to use, a dialog will appear allowing you to choose which card to use. If the computer does not have an Ethernet card when WinFrog is launched, or if the Ethernet cable is not connected, WinFrog will not be able to retrieve the IP address. In these cases, a message will appear to indicate this and instruct you to select, from the main menu, **Configure > Ethernet Card and Device Output Control** to select the card address when the Ethernet cable has been reconnected. In the case of an Ethernet card not being present, the PC will need to be powered down, a card installed and WinFrog re-launched. This dialog is also used for the device output control which uses the same network as the Smart Remote. See the Peripheral (I/O) Devices chapter.

As previously mentioned, WinFrog uses UDP/IP to send navigation data to the remote computers. It uses port 7050 for this. This data is broadcast and can be received by all the suitably configured computers on the network. This is determined by the subnet mask entered as part of the TCP/IP Properties for the particular card in use. The remote does not respond to this data.

The master uses port 7060 to send configuration data to the remotes. But first the master sends a command on port 7050 to inform the remotes to open and listen on port 7060 for the configuration data. This communications involves transmission of configuration data by the master and a confirmation of receipt by the selected computers. It should be noted that the output of the navigation data on port 7050 is suspended during configuration updates.

Remote Position Data Reception

If any vehicle on a given WinFrog system is configured to Network for the Data Source, that WinFrog listens for data from a master. The data is transmitted in packets. Each navigation packet contains the complete position information for all vehicles in a compressed format. The packet that informs a remote that it is to be configured only contains the computer's name. When a remote receives a packet it checks to see if it is a message informing it that a configuration update is going to be transmitted (see **Remote Configuration**) and if so, is it intended for this computer (see **Master Operation**). If a data packet is detected, the vehicle names in the packet are compared to those of the vehicles configured to Network for the Data Source at the remote. The comparison is case sensitive. If a match is found, the position data is assigned to that vehicle. If no match is found, the data is discarded.

After the receipt of position data from the master, the remote sets a time out clock. If new data is not received within 15 seconds, a message appears indicating a data time out. This message will not appear again until the reception of another position data packet restarts the timeout clock.

Note: It is critical that the names assigned to the vehicles configured at the remote are identical to those used at the master, including case. The use of the remote configuration ensures this.

Note: It is important to note that the remote will accept position data from any master. There should be only one master on the network at one time. If the overall system includes a primary and secondary WinFrog, the primary should be used to send the position data to the remotes. If it fails, you must turn the data transmission on at the secondary. The remotes do not require a configuration update in this case.

Remote Configuration

After launching WinFrog on the remote computer, the remote can be configured manually at the remote computer or remotely from the master. It is important to note that for the purpose of this section, configuration refers to the critical components of WinFrog that are required for the successful operation of a Smart Remote, specifically the geodetic and map projection parameters; vehicle name, shape and presentation; and though not so critical, the working survey lines and waypoint files and the BMM file used for the Graphics windows background display.

For manual configuration refer to the Vehicle Data Source chapter, Network Data Source Configuration section.

To execute the remote configuration, after launching WinFrog first check that the system is configured to accept remote configuration. This is done from the main menu item **Configure > Smart Remote > Enable Configuration by Master**. If the remote is configured to accept remote configurations, there will be a checkmark beside this item. Click this item to toggle between enabled and disabled. This setting is saved to and loaded from the *.ini and *.cfg files. The default setting is enabled for a WinFrog running in demonstration mode, disabled for a licensed WinFrog.

Second, open the desired Graphics, Vehicle Text and Dynamic Tracking windows. The master cannot open windows on the remote. Furthermore, if no Graphics windows are open on the remote when executing the remote configuration, the BMM map files assigned will not take affect.

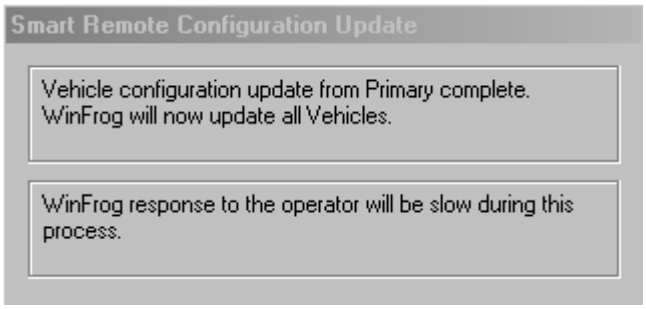
The master sends data in three stages to match the configuration of a remote to itself:

1) Primary Configuration Components:
    - Geodetic and Map Projection parameters.
    - Display Units.
    - Vehicles including their names, colors, shape (at the remote each vehicle is set to Network for the Data Source and defaulted to Network for Waypoint, Line and Offset Source). Only vehicles that are configured at the master are setup at the remote. Any vehicles present at the remote that are not present at the master are removed.
    - All dynamic tracking information.

2) Assigns the file name and path for the remote's Working Survey Line and Waypoints Files to those of the master.

3) Creates copies of the BMM files displayed in the Graphics windows at the master and then links the remote Graphics windows to these files.

When a remote configuration is taking place, a window such as the one below is displayed at the remote stating the process being executed.



Note: The remote will accept a configuration update from any master. There should be only one master on the network at one time.

Note: The transmission of the primary configuration components starts with the Geodetics, then the units and then the transmission of the list of vehicles to be configured, followed by the configuration for each vehicle. The master then waits for the remote to inform it when the vehicle updating is completed before continuing. The above figure is the message displayed at this time. During this time, the remote will be very slow to respond to operator interaction (mouse clicks such as Zoom In). This is normal.

Note: The smart remote must have access to the Working Survey Line file, the Working Waypoint file, and the *.BMM file and all files that are referenced in the BMM file (e.g. DXF, DWG, etc.) if it is to use them. This requires that the immediate parent folders in which the files are located be shared and that permission be granted to the remote computer's user to access the files. This is most easily accomplished by ensuring that the **Master** computer has a **Guest** account. For the folders containing the Working Survey Line file and Working Waypoint file, it is very strongly recommended that access be limited to **Read Only** to ensure that the remote operator is not able to change them. However, for the folder(s) containing the BMM file and all of the referenced files, **Write** access must be given to the remote in order for WinFrog to support the linking of the map files.

Time synchronization of Smart Remotes

In addition to position data, a master WinFrog will also broadcast its WinFrog time. Any smart remote that is in *demo* mode (i.e. unlicensed) and has been enabled for Configuration by Master will automatically set its WinFrog time to match the master.

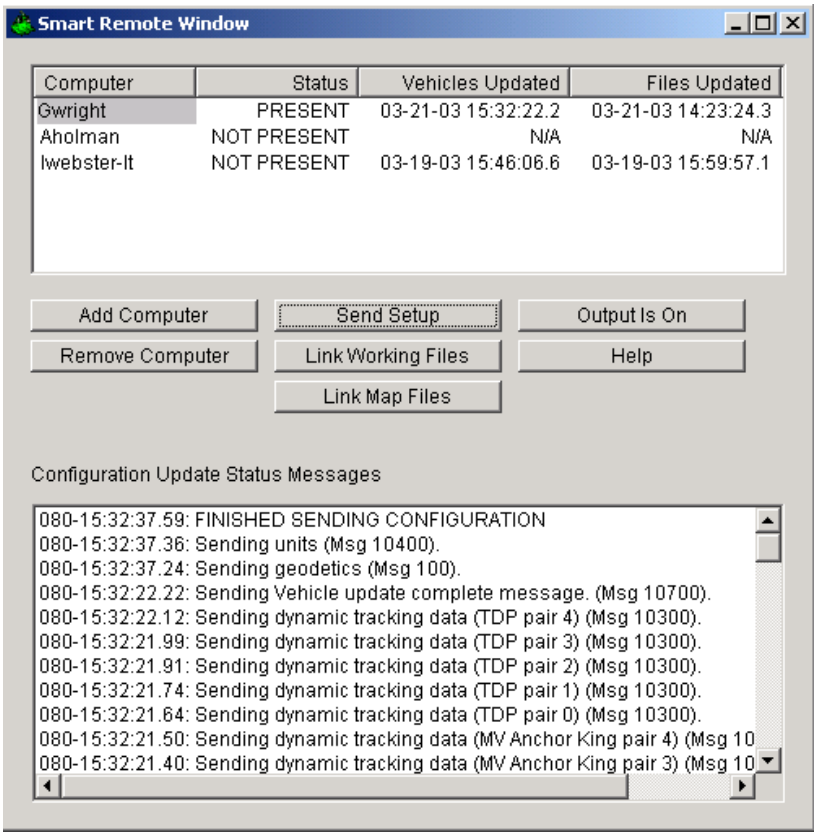
Note: This does not set the actual PC clock time, just the time that WinFrog uses.

Note: Do not use the time synchronization window at the smart remote.

Master WinFrog Operation

The WinFrog that is to operate as the master must be configured to do so. The configuration is performed from the **Smart Control Window**. This window is opened from the main menu item

View. The window appears as below, though initially, the computer list window and the status message list box are empty.



The following details the window components and button functions.

Computer List Window — The computers that have been added are listed in this window. Note that these are the computers that can then be selected for remote configuration. The addition, selection or removal of computers does not affect the transmission of the position data packets. Computers can be selected by clicking on the name. Multiple computers can be selected by pressing the **Ctrl** key while clicking on the computer name.

Status — Indicates whether or not the computer was detected when a configuration update was transmitted to it.

Vehicles Updated — This is the date and time of the last successful update of this remote for the primary configuration components.

Files Updated — This is the date and time of the last successful update or refresh of this remote for the Working or Map Files.

Add Computer — Click this button to browse the network and select a computer to add to the list of those that can then be selected to receive configuration updates.

Remove Computer — Click this button to remove any computers selected in the computer list window.

Send Setup	Click this button to instigate the transmission of the primary configuration components to those computers selected in the computer list window. While the transmission of the configuration is taking place, this button changes to an **Abort** button. Clicking this cause the configuration update to abort.
Link Working Files	Click this button to instigate the transmission of the Working Survey Line and Waypoint File names and paths to those computers selected in the computer list window.
Link Map Files	Click this button to instigate the transmission of the file names and paths for those BMM files that are configured as the backgrounds for those Graphics windows open at the master to those computers selected in the computer list window. If the respective Graphics windows are open at the remote, they will display the same layer files as their corresponding Graphics window at the master. This includes the setting of the **Plot Map** option in the Graphics window configuration **Background** tab.
Output is On/Off	This button toggles the broadcast of the position data on and off. The button text indicates the current status. This is not affected by those computers added or selected, as it controls the broadcast of the position data packets, which are then received by all computers on the network. When a configuration update is in progress, the output is suspended and this button displays **Output Is Suspended** and is disabled. When the configuration is completed, the button and the position output mode returns to normal. **Note:** This output must be turned on in order for remotes to operate regardless of whether or not they are configured remotely or locally.
Help	Access the help for Smart Remote configuration and operation.
Configuration Update Status Messages	The messages detailing what the Smart Remote Control is executing are listed in this box.

With the exception of the **Add Computer**, **Output is On/Off** and **Help** buttons, the buttons are only active when there are computers listed in the computer list window and at least one computer selected.

Note: When a configuration is initiated, all the selected computers are set to **NOT PRESENT** in the computer list. WinFrog looks for responses from all selected computers before sending the next packet. When a computer responds to confirm that it has received the configuration packet, it is set to **PRESENT**. If after five seconds not all computers have responded, the computers that have not responded are removed from the list of those that are expected to respond (they will still appear selected in the list) and the next packet is transmitted. If no computers respond, the configuration is aborted.

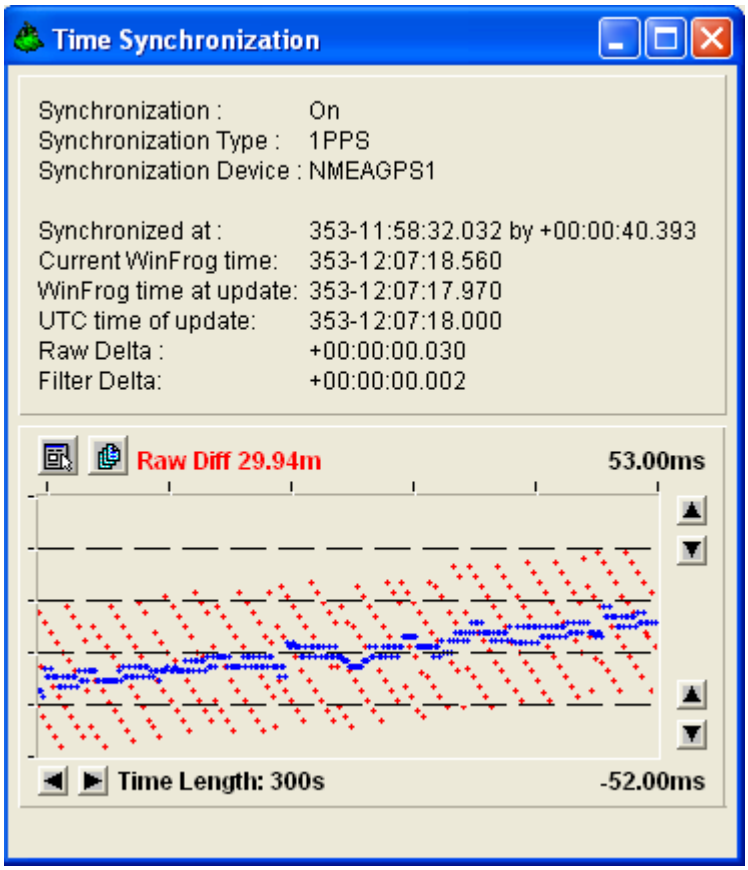
The **Smart Control Window** can be closed without affecting the transmission of the position data packets. Unlike most WinFrog windows, the next time it is opened, it will open in the same location at the same size it was when it was closed. The computer list is also maintained.

Note: The **Smart Control Window** cannot be opened if the computer is currently receiving a configuration or refresh command.

Note: When WinFrog is launched at the master, if the Ethernet cable is not connected, the Ethernet card will not be detected. After reconnection of the cable it is necessary to select the card from the main menu item **Configure > Ethernet Card and Device Output Control**. This selects the card for port 7050. Then close and open the Smart Remote window for a refresh so the configuration port (7060) can be used. Both ports are required for operations at the master.

Time Synchronization

WinFrog is able to synchronize to external time sources, typically a GPS receiver, with or without a 1PPS (1 pulse per second). The time synchronization is done using the configuration dialog box available from the configuration menu. The data may be displayed with the window available from the view menu. The window does not have to be present to set up time synchronization.



The top portion of the window displays:

Synchronization displays the On or Off status.

Synchronization Type displays the synchronization message or signal configured..

Synchronization Device displays the name of the device that the specified message or signal is to be obtained from.

Synchronized at displays the last time and amount of the last adjustment. If time synchronization was just started it also displays “Not adjusted, In Spec” or “pending”.

Current WinFrog time displays the current WinFrog time.

WinFrog time at update displays the WinFrog time stamp of the last specified message or signal.

UTC time of update is the time within the last specified message.

Raw Delta is the time difference between the UTC and WinFrog times of the last telegram. This does not include the local time offset.

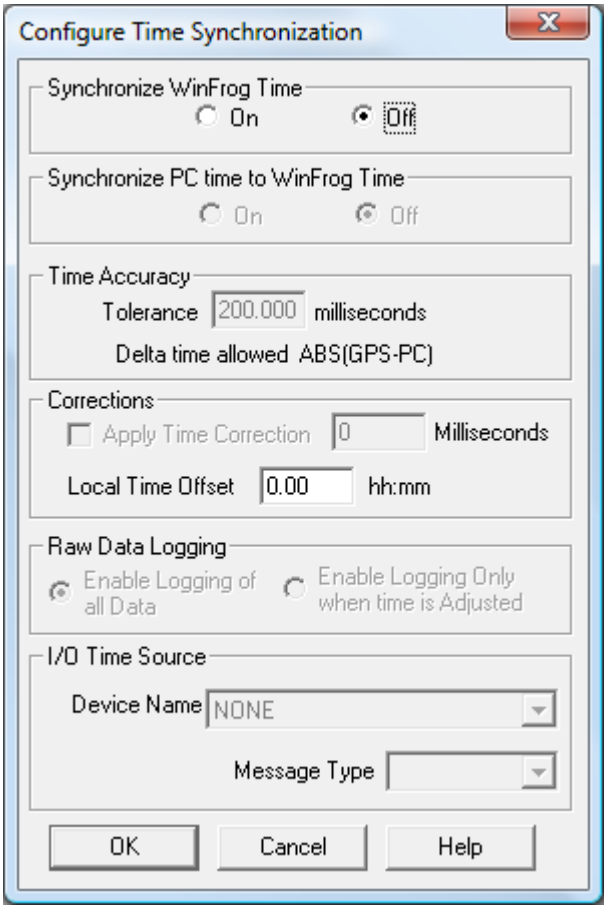
Filter Delta is the filtered difference for the last telegram. This does not include the local time offset.

Note: If the specified message or signal has not been received for approximately 10 seconds, a message alerting you to this will appear. Approximately 2 minutes after a message is acknowledged, if the situation has not been corrected another message box will appear. In addition, if the Time Synchronization window is open, after the initial message and until the situation is corrected, the Synchronization Type line in the window will flash black and red with a warning appended.

The time series panel contains the Raw Delta and Filter Delta values.

Configuration

Either right-click on the time synchronization window or select **Time Synchronization** from the **Configuration** menu to access the following dialog:



Synchronize WinFrog Time

When WinFrog first boots it reads the system clock and from thereafter it applies the system tick for a more precise clock. All changes to the WinFrog time just affect this sum and do not change the system clock.

Synchronize PC Time to WinFrog Time

Synchronizing the WinFrog time does not change the system time and if an adjustment has been made and WinFrog is closed then rebooted, the adjustment will have to be made again. Enabling this option allows WinFrog to set the system clock.

Note: This feature does not provide precise synchronization of the PC system time to an external time source. It is intended only to enable a rough synchronization of the PC time to eliminate large time adjustments to WinFrog time upon subsequent re-launches of WinFrog. The variation between the WinFrog time and the system time is checked every 20 seconds and system time is reset to WinFrog time if the variation is greater than 5 seconds.

Time Accuracy

The tolerance setting controls the maximum limit of the deviation of the WinFrog clock from the timing device before WinFrog resets its clock. This should not be set too small, as the clock will constantly be reset.

WinFrog monitors the variation between the UTC time and the WinFrog clock using a fading history of the last 20 samples of the variation between the WinFrog clock synchronization time stamp and the associated UTC time. This is filtered using a Central Tendency algorithm. When the filter result exceeds the tolerance, the clock is reset.

Corrections

Apply Time Correction	This check box and associated edit box allows for a minor correction to, for instance, correct for a constant transmission latency.
Local Time Offset	This allows the user time to be local rather than UTC. All logged and displayed times are in the local time, UTC plus offset.

Raw Data Logging

Logging is done to the *.RAW data files and is controlled by the selected method of raw data logging (see Configure Raw Data Logging). Selection here merely determines what is to be logged.

Enable Logging of All Data	If selected, then both time data and WinFrog clock adjustment information will be logged. Note, if the raw data is set up to log at events (**Event Configuration** dialog) then time data will only be logged when an event occurs. Changes will always be logged unless raw logging is off.
Enable Logging Only when time is adjusted	If selected, a record will be logged only when the WinFrog time is adjusted. This record will be logged when it occurs for any raw logging (**Event Configuration**) option except Off.

I/O Time Source

The device name dropdown box lists all the current devices capable of providing time synchronization. Selecting the desired device will cause the message type dropdown box to be populated with the timing telegrams or methods available from this device. Note if 1PPS is selected, WinFrog must receive the pulse for the time synchronization to work.

Devices

The following devices support time synchronization:

GPS Devices

MX 7140	$--ZDA telegram
MX 9400	1PPS with$--ZDA telegram
NMEA GPS*	$--ZDA telegram and/or 1PPS with $--ZDA telegram
NMEA GPS (Sercel)*	$--ZDA telegram and/or 1PPS with $--ZDA telegram
POS/MV (NMEA)	$--ZDA telegram and/or 1PPS with $--ZDA telegram

NR103 Prop(rietary)	$--ZDA telegram
MultiFix UKOOA	Proprietary UKOOA telegram
TRIMBLE CYCLIC	Proprietary telegram
TRIMBLE TSIP	Proprietary telegram
NovAtel CON	$--ZDA telegram

TIME BASE Devices

TRIMBLE 1PPS	1PPS and Proprietary telegram
ODP TIME	Proprietary telegram
TRUETIME	Proprietary telegram

* These devices also support the synchronization of WinFrog to the NMEA $--GGA and $--GLL telegrams. However, these are not recommended as there is an inherent latency in the UTC time included in the telegram and the time the telegram is sent out. This is typically approximately 0.7 seconds for a $--GGA telegram.

Interfacing

The preferred and most precise option is the 1PPS, followed by the $GPZDA telegram, then the $GPGLL telegram and lastly the $GPGGA telegram. The generic option is device specific and is available when the device uses a proprietary telegram.

NOTE: The 1PPS option is not available when interfacing with TCP/IP sockets.

If using the 1PPS...

WinFrog looks for the 1PPS pulse on the CTS line of the serial port, therefore if the 1PPS signal is to be used, this must be connected to the CTS line at the WinFrog serial port for the COM port selected for the device. A logic ground must also be present.

Some GPS receivers produce a pulse that is too short and cannot be detected by a computer's hardware. In which case, the signal must be stretched. The voltage must also conform to EIA RS232C standard. The Trimble 4000 is an example of this. In this case, a pulse stretcher is required. The stretched pulse needs to be connected to the CTS line of the same COM port that the GPS receiver is sending its time and navigation data to.

On many receivers, the 1PPS can be used as is, for example the Sercel NR203.

Besides the 1PPS signal, WinFrog requires a telegram defining the time of the pulse just received. Typically the NMEA $--ZDA telegram is used unless a device specific telegram is used, for example in the case of the Trimble 1PPS device (Trimble 4000).

The 1PPS and associated time telegram must be input on the same port.

If using a NMEA telegram...

In the case of using a NMEA telegram such as the $--ZDA alone to synchronize WinFrog, the reception of the starting character ('$') of the telegram is detected and time stamped. This time stamp is used as the *pulse* detection time associated with the telegram's UTC time.

Note: NMEA specifies that the time in NMEA telegram be UTC. The following effects output using the NMEA Output device; if WinFrog is not synchronized to GPS then the time in the telegrams will be the WinFrog time, which is based on the PC time when WinFrog was run. If WinFrog is synchronized then you have a choice to either place UTC or local time in those telegrams that contain time. Local time will be UTC with the **Local Time Offset** applied.

Other devices that output messages always use the WinFrog time.

Tracking Offsets Window

The **Tracking Offsets** window displays the real-time **Working Map Projection** coordinates of all **Tracking Offsets** configured on a vehicle, as well as survey Line tracking **Distance Down Line** (**DDL**) and **Distance Cross Course** (**DCC**) information, if a survey line is being tracked.

Only one **Tracking Offsets** window can be displayed in WinFrog, but the same window can be used to view **Tracking Offsets** for any WinFrog vehicle by simply toggling the **Vehicle** button located in the top of the **Tracking Offsets** window.

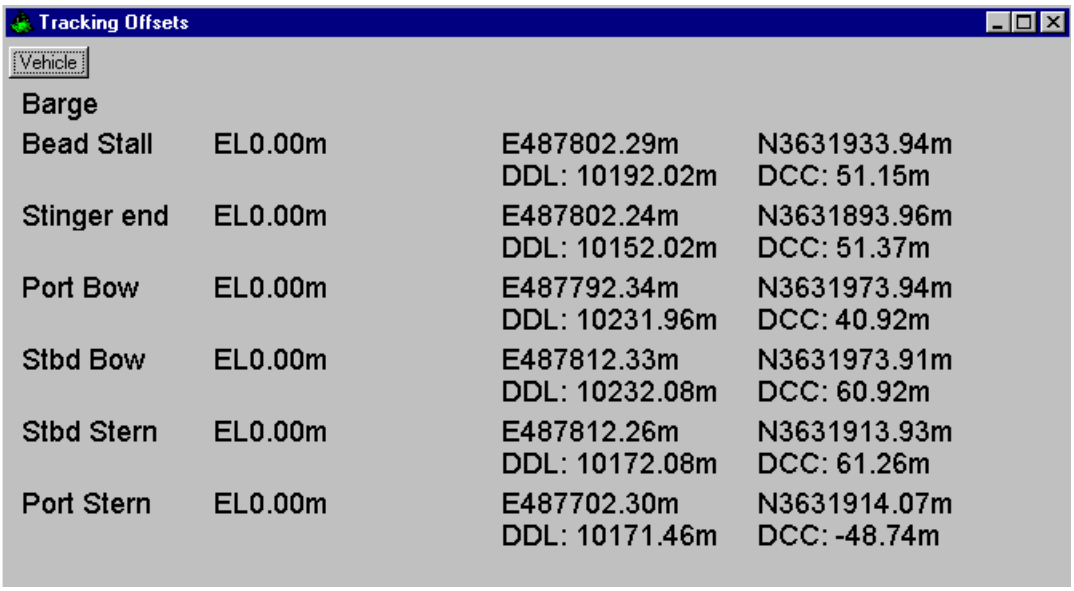
The **Tracking Offsets** window can only be configured for size. Only those **Tracking Offsets** that are configured with their **Plot** option enabled will be seen in the **Offsets** window.

Note: although the **Tracking Offsets** window displays the position of all **Plot** option enabled **Tracking Offsets**, only the coordinates displayed in the **Vehicle Text** window (i.e. the single **Tracking Offsets** point that is currently enabled) are recorded by WinFrog during **Automatic** or **Manual Eventing**.

Vehicle **Tracking Offsets** are configured by selecting the main menu item **Configure >Vehicles > Configure Offsets**. For more information, see **To Configure Offsets** in **Chapter 6: Vehicles**.

To Display the Tracking Offsets Window

1 From the **View** menu, choose **Tracking Offsets**.



In the **Tracking Offsets** display above, the **Barge** vehicle is configured with 6 **Tracking Offsets** and is also tracking a survey line. As mentioned above, to see information for other vehicles, select the **Vehicle** button in the top right corner of the window.

Cable Model Windows

WinFrog's **Cable Model** extension module provides real-time calculation and display of cable lay operational status. The real-time cable lay information calculated includes **Desired** and **Actual Slack** values, as well as cable installation "**Ahead and Behind**" information. This information, and various other data pertinent to the installation of a cable, is displayed in both the **Cable Model Large** window and the **Cable Model Small** window.

Details of the configuration and use of the **Cable Model** windows are found in the **Cable Management Extension Module User's Guide**.