Chapter 9: Vehicle Data Source

WinFrog provides you with the ability to decide which **Data Source** will be used to provide data to a WinFrog vehicle. Typically, data required for real world, real- time operations come from interfaced **real-time** data sources. For that reason, WinFrog defaults every vehicle's **Data Source** to real-time devices. You are able to select which real-time devices to add to the appropriate WinFrog vehicle.

However, there are occasions when other sources of data are required, especially when you are using WinFrog on a networked computer. These networked computers are referred to as **Smart Remote** systems. Rather than receiving data directly from the interfaced devices, **Smart Remote** systems acquire navigation information from a **real-time** WinFrog system via a local area **network** data source.

Other **Data Sources** available include **Simulated**, **Controlled Remote**, **Pre Recorded WinFrog Files**, and **Pipe Track.**

Note: real-time systems require security approval before real-time data can be applied to a vehicle, whereas **Smart Remote** systems can be operated in **Demonstration** mode. Without the appropriate security approval, real-time devices can still be added to the WinFrog system, but not to a vehicle. This allows you to confirm that devices are working correctly and that the physical interfacing parameters are correct. Remember, a vehicle can utilize only one **Data Source** at a time.

The following sections detail all WinFrog **Data Sources**. For more information about adding **Peripheral Devices** to WinFrog, see the **Peripheral (I/O) Devices** chapter.

Definition of Data Source Options

Any WinFrog vehicle can be configured to use one of six different **Data Sources**:

Simulated	This option allows you to utilize all of WinFrog's navigation, tracking, and data collection utilities with simulated data that are generated internally by WinFrog.
Network	This option allows one WinFrog computer to access navigation information from another WinFrog computer via a network connection.
Controlled Remote	This option allows you to use one WinFrog computer to control the operation of another WinFrog computer connected via a radio telemetry link or network connection.
Real-Time	This option allows WinFrog to utilize data being received from real-time devices connected to WinFrog via the computer's serial ports and via data using the socket I/O devices "WriteToSocket" and "ReadSocket"
File	This option allows you to use previously recorded WinFrog data as a data source.
Pipe Track	This option is used to provide a pipeline

touchdown position based on a layback from a specified reference vehicle.

To Configure a Vehicle's Data Source

1 Choose **Configure > Vehicles**.
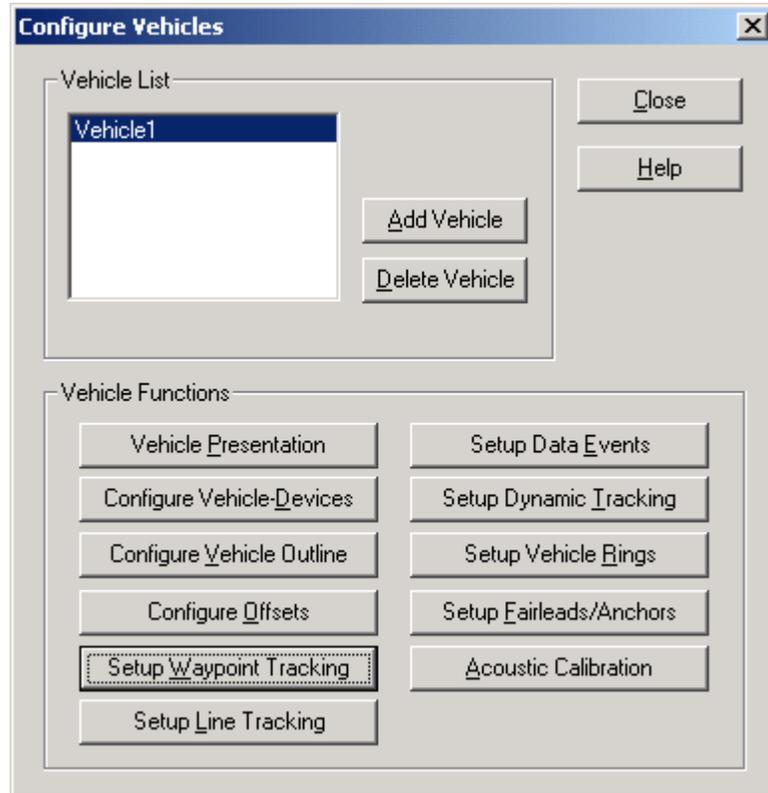
2 Select the **Vehicle** to be configured.

3 Click the **Configure Vehicle-Devices** button. The **Configure Vehicles-Devices** window appears, as seen in the next figure.
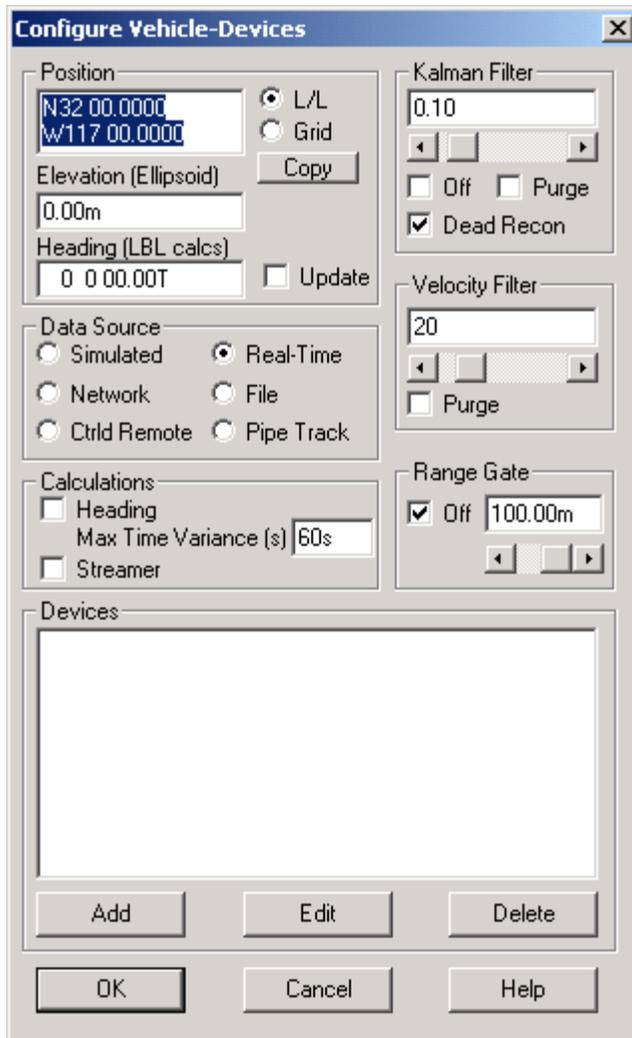
The **Configure Vehicle-Devices** dialog box configures the devices associated with a vehicle and how the information is used by that vehicle. One of the configuration parameters in this dialog box is the vehicle's **Data Source**.

4   In the **Data Source** area, click the desired **Data Source** radio button.

Simulated Data Source Configuration

WinFrog's **Simulated** data source configuration can be used for training, evaluation, and demonstration purposes. WinFrog allows you to simulate position, speed, heading, and ROV depth data for a vehicle. This feature allows you to use WinFrog without the trouble and expense of having working devices connected to the computer. The simulated devices are designed to mimic real devices, as closely as possible, and to allow you to experiment with WinFrog to learn about the software's behavior and options.

Note: if you choose the **Simulated** data source options, the software picks which simulated devices are used. If you would like to be able to choose the devices and have the ability to changes some of the configuration settings, select the **Real-Time** data source option and add the

Simulated devices of your choosing from the various categories. The **Real-Time** option is preferable to the **Simulated** option as it allows you to control which simulated devices are added to the vehicle.

For more information about simulated data in WinFrog, see the **Simulator** chapter.

Network Data Source Configuration

WinFrog allows you to configure a WinFrog system to utilize navigation data being generated by other WinFrog systems that are connected via a LAN network connection. This provides the ability for more than one WinFrog system to provide navigation/tracking/display functionality without each computer to actually be connected to the peripheral devices. The data transmission uses UDP/IP sockets.

> **Note:** The use of the **ship.nps** file or TCP/IP sockets for the transmission of data is no longer supported by WinFrog version v3.3 and later.

The WinFrog computer that is connected to the peripheral devices is referred to as the **Master** or **Primary** system (a **Secondary** system is also connected to the peripheral devices and can fulfill the role of **Master**). These devices provide the required sensor information updates to WinFrog to support the derivation of multiple vessel's position information (e.g., latitude, longitude, elevation, water depth, heading course over ground and speed) and navigation information (range and bearing to waypoint and along line and offline line tracking data). The **Master** broadcasts the navigation and position information for each vehicle configured, along with the vehicle's name. The update depends on the number of vehicles; there is a minimum 75 milliseconds delay of between each vehicle's transmission.

Those WinFrog systems providing the navigation/tracking/display functionality through receiving the information from the **Master** are referred to as **Smart Remotes** or simply **Remotes**.

The **Remote** can be setup manually or remotely by the **Master**. The remote configuration is detailed in the Smart Remote Control section of Chapter 8. See that section for some diagnostic information. The manual configuration is detailed here.

To Manually Configure a Smart Remote

1 On the **Smart Remote** WinFrog, create a new vehicle with its **Name** identical to that of the vehicle in the **Primary** WinFrog system. The **Name** must be **identical** (including upper and lower case characters and spaces in the name) or the **Smart Remote** system will not be able to match the vehicle information.

See the **Vehicles** chapter for details about adding a new vehicle, naming the vehicle, and configuring the vehicle position.

2 On the **Smart Remote** WinFrog, set this new vehicle's **Data Source** to **Network**.

See the **To Configure a Vehicle's Data Source** section earlier in this chapter.
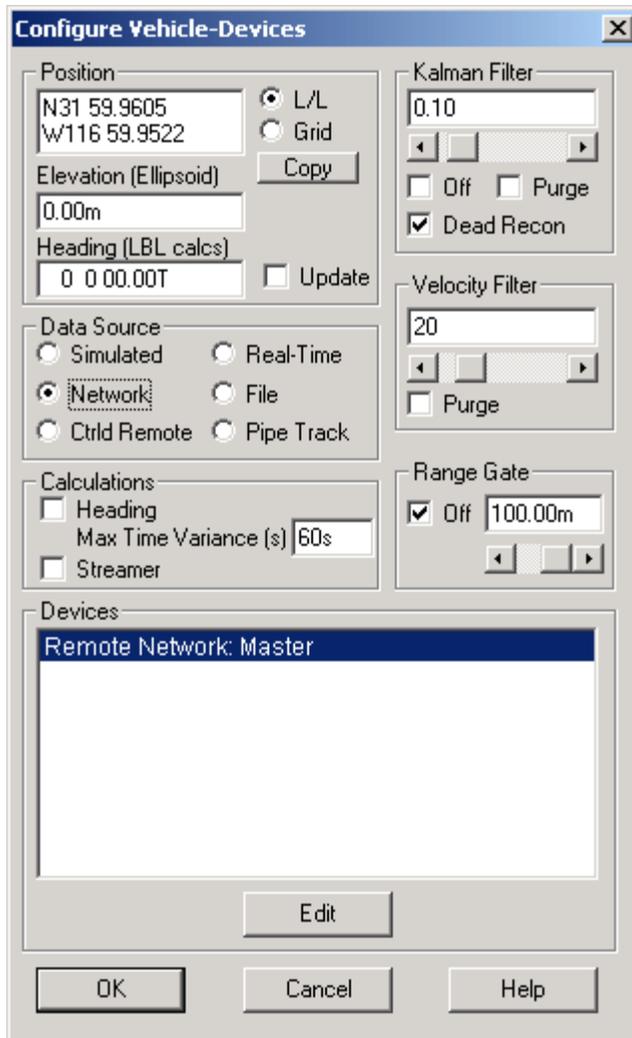
WinFrog displays a data item Remote Network: Master. The smart remote WinFrog will accept data from any WinFrog outputting data as long as the vehicle names match.

3 Click the **Edit** button.

The **Network Vehicle** dialog box appears as seen below.
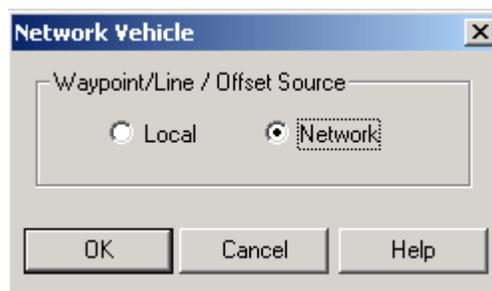
The **Network Vehicle** dialog box defines how the **Smart Remote** WinFrog handles **Waypoint Tracking**, **Survey Line Tracking**, and **Vehicle Offsets**.

There are two possible configurations:

Local	The user at the **Smart Remote** WinFrog computer can select local (internally configured) **Offsets**, **Waypoints Tracking**, and **Line Tracking**.
Network	The **Smart Remote** WinFrog uses/displays the same **Offsets**, **Waypoints**, and **Survey Lines** that the **Primary** WinFrog system is using. If you change the **Primary WinFrog** vehicle's **Offset**, or change which **Survey Line** or **Waypoint** is being tracked at the **Primary** WinFrog system, this change occurs at all **Smart Remotes** as well.

4   Once the appropriate radio button has been selected, click **OK** to close this dialog.

To Configure the Primary System for Network Data Output

1   On **Master** WinFrog, select **View > Smart Remote Control** from the main menu**.**
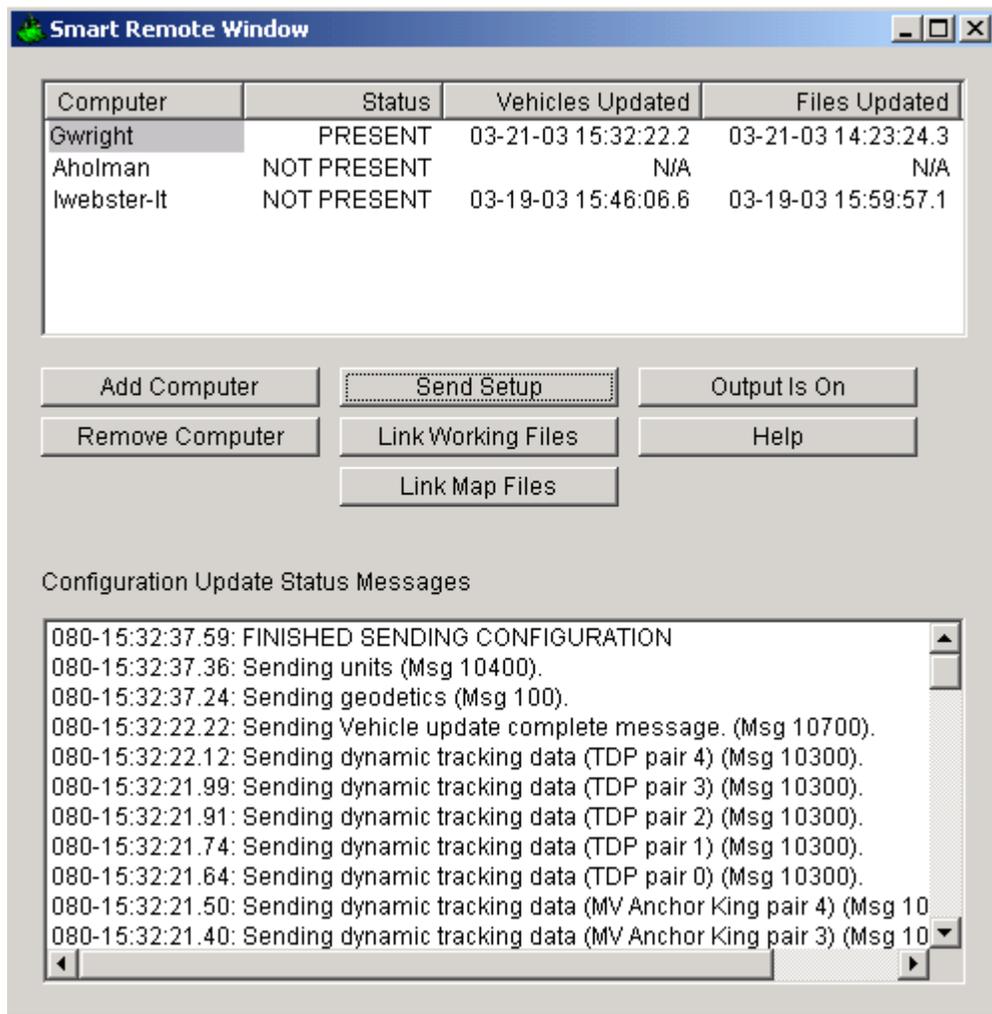
2   Click the (Position) **Output Is Off** button to toggle to (Position) **Output Is On** mode. Broadcast of the position and navigation information starts as soon as this mode is toggled. It is not necessary to select a computer for output of the vehicle navigation data. That and the other buttons are for remote configuration. Refer to the Smart Remote Control section in chapter 8 for remote configuration and socket information.

3 This window can be closed.

> **Note:** Data is only transmitted for those vehicles at the **Master** WinFrog whose data source is set to other than **Network**.

> **Note:** No vehicle data is transmitted if the data source for first vehicle at the **Master** WinFrog is set to **Network**.

> **Note:** Only one WinFrog system should be set to output position data (**Master**). If more than one WinFrog were operated as **Master**, the **Network** vehicles at the **Remotes** would receive and use position and navigation data from all **Master** WinFrog systems.

Controlled Remote Data Configuration

This option tells WinFrog that the data source is a remote site connected via radio telemetry or a **TCP/IP** network. The **Control Site** can configure the **Remote Sites** to send position data, raw data, and event data at independent, specified intervals. This is intended for networks with more than one WinFrog system connected via token ring telemetry. The **Control Site** can also control many features of the **Remote Site** including vehicle, display, and data collection configurations.

See the **Remote Control** chapter for more information discussing controlled remote data configuration.

Real-Time Data Source Configuration

As mentioned in the introduction to this chapter, WinFrog's default **Data Source** for all vehicles is **Real-Time**. This option must be selected if WinFrog is to utilize data from interfaced **Real-Time Data Sources** such as GPS receivers, gyro compasses, or echo sounders.

The use of data from a peripheral device is a two step process: First, the devices must be added to WinFrog. Then individual devices must then be added to a vehicle's device listing. Only after both steps are completed will this information be used in the vehicle's real time navigation/data collection/display capabilities. **Note:** security approval must be established by WinFrog before any real-time data can be attached to a vehicle.

Adding a Peripheral Device to a WinFrog Vehicle

Before WinFrog can utilize data generated by a peripheral device, the device must be added to the vehicle's **Device list**. The **Configure Vehicle-Devices** dialog box is used for this purpose.

See the **Peripheral (I/O) Devices** chapter for information on adding a peripheral device to WinFrog.

To Add Data Generated by Peripheral Devices to a WinFrog Vehicle

1 Select **Configure > Vehicles**.

2 Select the **Configure Vehicle-Devices** button to display the **Configure Vehicle-Devices** dialog box.

3   Choose the **Real-Time** radio button in the **Data Source** area.

4   Click the **Add** button to display the **Select Data Items** dialog box.
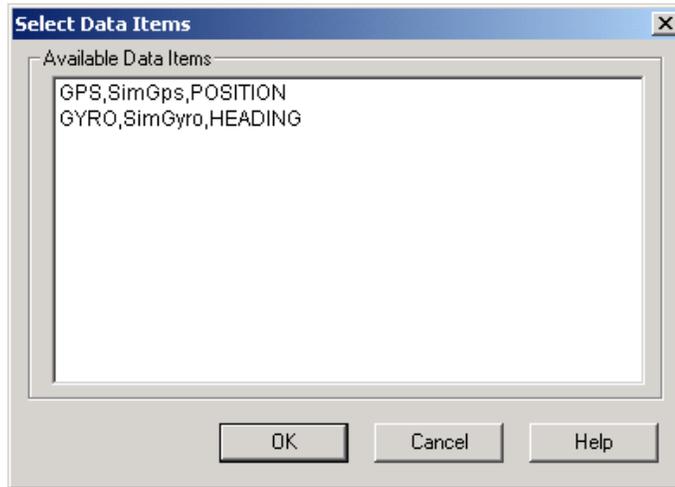
The **Select Data Items** window shows a complete list of all devices that have been added to WinFrog. **Note:** devices are not removed from this window even after they have been added to a vehicle's position.

5   Select the desired **Data Item**.

6   Click **OK**.

The selected **Data Item** now appears in the **Devices** list at the bottom of the **Configure Vehicle-Devices** dialog box. This signifies that it is now added to the vehicle's list of devices. You must now **Edit** this device to ensure that it is correctly configured for this vehicle.

Editing a Vehicle's Peripheral Devices

Most peripheral devices have specific parameters that must be edited to suit the vehicle and application for which they will be used. These parameters must be configured properly for WinFrog to correctly utilize the data generated by the device.

For example, when a GPS device is added to a vehicle, you must **Edit** that device to define its **Offsets** from the vessel's **CRP**. Failure to do so will result in incorrect positioning. Likewise, an echo sounder's transducer **depth offset** must be entered to correct for draft.

To Edit the Configuration of an I/O Device Once Added to a Vehicle

1   In the **Configure Vehicle-Devices** dialog box, select the specific peripheral device from the **Device** list.

2   Click the **Edit** button.

A unique **Configure** window will appear for this type of device. For example, highlighting a GPS device will bring up the **Configure Position** window, as seen below.
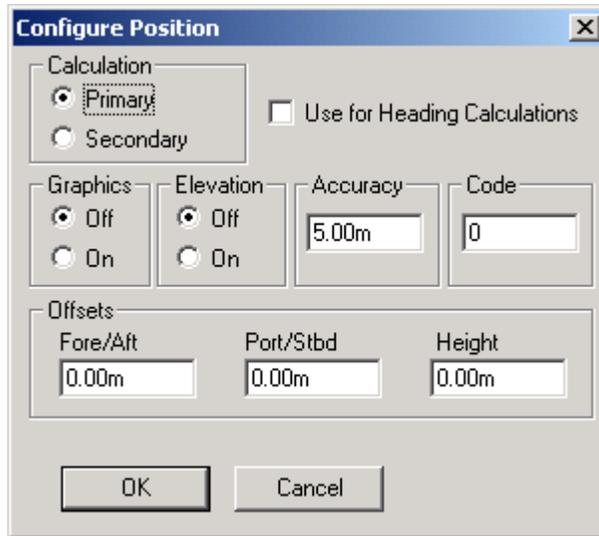
3   Enter the appropriate values/settings to suit the application.

For more details on the entry windows, see the **Peripheral Devices** chapter.

4   Click **OK** to confirm the changes and close this window.

Deleting a Vehicle's Peripheral Device

You can remove the data generated by a peripheral device from being included in a WinFrog vehicle's calculations.

To Remove a Device from a Vehicle's Calculations

1   In the **Configure Vehicle-Devices** dialog box, select the specific peripheral device which is to be removed from the **Device** list.

2   Click the **Delete** button.

The device will now be removed from the vehicle's calculations. **Note:** the device is not removed from WinFrog entirely, just from being included in this particular vehicle's calculations.

File Data Source Configuration

If you choose the **File** option from the **Data Source** list, you can use previously collected **.raw** format WinFrog data as a vehicle's position source. This allows you to review past data in a "playback" mode. In this playback mode, you can replay data observing the position, speed, heading, and course made good of the vehicle at the time of data collection. The records used for this playback are 300 and 351. The 300 record is created in the *.RAW file when you enter a recording interval when setting up the RAW recording from the menu item Configuration > Raw Data Recording. The 351 record is an event record and will be added only if eventing is on and RAW data recording is enabled.

Older 351 records did not record the heading and as a consequence, the course made good will

be used for the heading when playing back these older 351 records.

See the **Eventing** chapter for information about **.raw** data files and collection.

Using a **File** as a data source is a two step process.

First, positional data are collected and saved to a **.raw** file. This **.raw** file contains time, position, heading, and other available navigation information on the desired vehicle(s).

Second, after data are collected, the **.raw** data files are specified as the position source for a vehicle of the same name. WinFrog reads the time, position, and other available navigation information in the .**raw** file and applies it to the vehicle. You can **rewind** and **fast forward** the data to make it easy to find a specific point of interest. In addition, the data can be played back at **1**, **2**, **5**, **10**, and **20** times the normal speed. This allows you to examine previously collected data in a more efficient manner.

You can also play back several vehicles' data in a synchronized manner. In this case, select the data for each vehicle and enable each vehicle for synchronized playback (see below). Then the controls for one synchronous vehicle affect all the synchronous vehicles.

To Use .raw File Data as a Position Source

1   Select **Configure > Vehicles**

2   Highlight the appropriate vehicle and select the **Configure Vehicles-Devices** button.

3   Set the vehicle's **Data Source** to **File**.

4   Click the **Add** button.

5   Select the **.raw** files to use.

There are two methods to select **.raw** files using the **Select WinFrog Files** dialog box: **Hand Picked** or **Time Picked**.

Hand Pick button	Opens the **Add Files** dialog box. You need to navigate to the appropriate directory and select the desired **.raw** files.
Time Pick button	Selects all **.raw** files that fall within the **Start**

	Time and **End Time** found in the specified directory. You must first specify the appropriate **Directory, Start Time,** and **End Time**.
Start Time field	Use with **Time Pick**. The times must be entered in the following format: **dd-mm-yy hh:mm:ss.sssss**.
End Time field	Use with **Time Pick**. The times must be entered in the following format: **dd-mm-yy hh:mm:ss.sssss**.
Remove button	This button removes a **.raw** file selected from the available **Selected Files** list. Use this to further narrow the **.raw** files to be used for playback.
Browse button	Use with **Hand Pick** or **Time Pick**. Opens a dialog box to navigate to a directory containing the **.raw** files to be used.
Directory field	Displays the path to the directory selected via the **Browse** button.

6   Once the desired files are selected, click **OK**.

Next, you must instruct WinFrog as to which vehicle's data to use (from within the selected files) and whether to use synchronized playback. If only one vehicle's data is to be played back, selecting the synchronized playback checkbox will not affect the playback.

7   Still in the **Configure Vehicle Calculations** dialog box, click the **Edit** button. The **Configure Playback** dialog box displays.
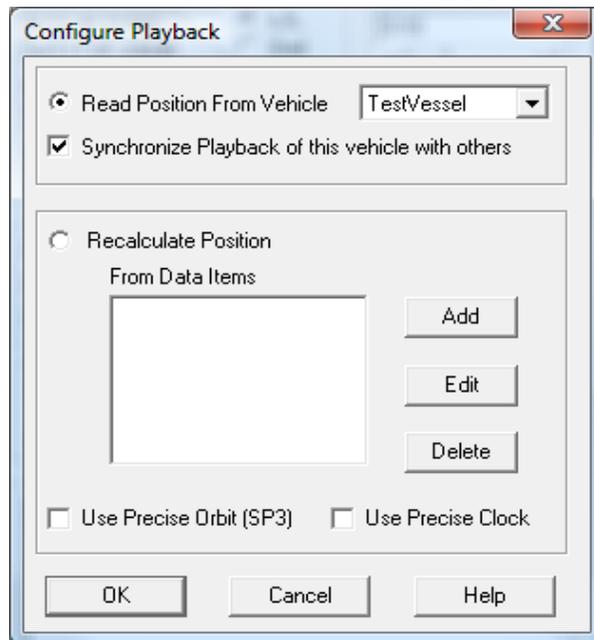
Currently, there is only one possible configuration from this dialog box: **Read Position From Vehicle.** The **Recalculate Position From Data Items** is reserved for future development.

8 Select the **Read Position From Vehicle** radio button, select the appropriate vehicle from the dropdown menu, and select the Synchronized playback if desired.

You do not have to repeat this step for every **.raw** file listed.

9 Click **OK** to close the **Configure Playback** dialog box.

10 Click **OK** to close the **Configure Vehicle-Devices** dialog box.

11 Choose **View > Calculations.** WinFrog's **Calculations** window now appears with 10 **Playback** buttons, as seen below.
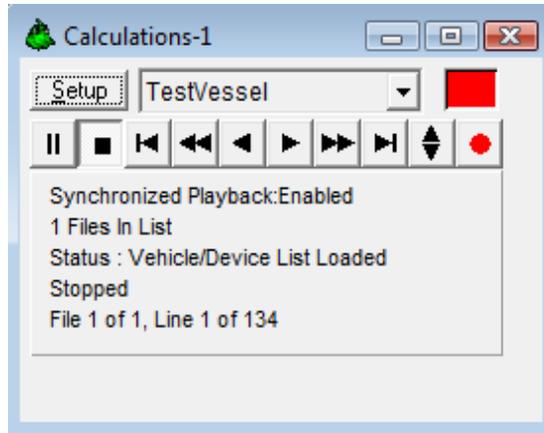
12 Select the appropriate vehicle from the dropdown list.
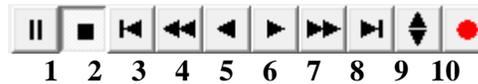
The playback control buttons allow you to do the following:

1	pauses playback; clicking again resumes at current speed
2	stops playback
3	return to the beginning of the first **.raw** file
4	fast reverse playback
5	reverse playback at 1:1 speed
6	forward playback at 1:1 speed
7	fast forward playback
8	skip to the end of the last **.raw** file
9	change current playback speed to 1:1, 1:2, 1:5, 1:10, 1:20, Fast (toggles up and wraps)
10	begin recording new raw data files from the playback results

13 Select the desired playback option(s).

Note: WinFrog's **Graphics** and **Vehicle Text** windows now display the playback data as configured above.

14 To play backwards you need to advance to the end of the files (button 8). To play forwards you need to advance to the beginning of the files (default button 3).

15 If synchronized playback is used, you need only operate these controls from one of the respective Calculation Windows.

Pipe Track Data Source Configuration

WinFrog's **Pipe Track** positioning feature allows you to calculate the position of a **pipeline touchdown** point relative to another vehicle's (i.e., the pipelaying **barge**'**s**) position and heading.

WinFrog treats the touchdown point as a separate vehicle (it is referred to as a **Layback** vehicle) and so requires that a new vehicle is added to and configured in WinFrog. This vehicle can be setup to track its own waypoints or survey lines, as required. The barge vehicle is referred to as the **Reference** (or **From**) vehicle. This vehicle typically utilizes **real-time** devices for its positioning.

The implementation of this feature requires the configuration of 3 specific parameters:

1 Select a reference (i.e. **From**) vehicle.

2 Specify the point on that vehicle from which the layback calculations will be initiated.

3 Select the method of bearing calculation to be used - either **Barge Heading** or **Barge Tracking**. The following sections detail each of these steps.

The configuration of layback distances and barge offsets affect not only the position of the **touchdown** point (i.e. layback vehicle), but also the line tracking features of the **barge** (i.e. reference vehicle). Typically, pipelaying route information is provided for the **touchdown** point as opposed to the barge. In order to keep the **touchdown** point on line, the **barge** may have to follow a different line from the line tracked by the **touchdown** point, particularly around curves. The **barge'**s tracking line varies from that of the **touchdown** point as follows:

- Curves start for the reference vehicle (i.e. barge) a distance equivalent to the layback distance beyond the design start of curve.

- Similarly, curves end a distance equivalent to the layback distance beyond the design end of curve.

- Offline distances are relative to the modified line, including the modified curves.

- Downline distances, distance to go, and KPs are relative to the original design line. If this were not the case and they were relative to the modified line, there would be no correlation of reference vehicle and layback vehicle line tracking data. In addition, they would change whenever the layback was changed, resulting in a new modified line being created for the reference vehicle.

- A **Required Heading** is available for display in the **Vehicle Text** window. This is the heading that the barge (i.e. **From vehicle**) must maintain in order to keep the touchdown on the design line.

To Configure Touchdown Point Positioning Based on a Layback From a Reference Vehicle

1   Select **Configure > Vehicles.**

2   Highlight the touchdown point "vehicle."

3   Select the **Configure Vehicle-Devices** button.

4   Set the data source of the touchdown point "vehicle" to **Pipe Track**.

This will add the **Layback** device to this vehicle's **Devices** list. Ensure that there are no additional devices included in the vehicle's **Devices** list.

5   Still in the **Configure Vehicle-Devices** dialog box, select the **Layback** data "device" in the **Devices** list.

6   Click the **Edit** button to display the **Layback Control** window as seen below.
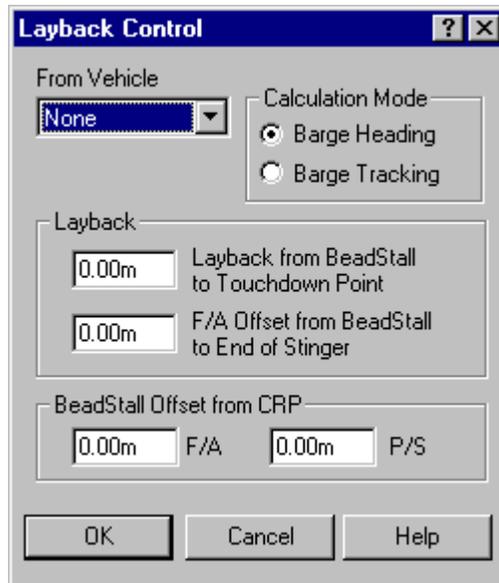
The information entered in this dialog box enables WinFrog to compute the position of the touchdown point (i.e. **Layback** vehicle) relative to the barge (i.e. the **From** Vehicle).

From Vehicle

Select the **From Vehicle** (i.e. barge vehicle) from the dropdown menu.

Calculation Mode

Select the appropriate **Calculation Mode** from the two choices offered:

Barge Heading	The touchdown point (i.e. **Layback** vehicle) position is calculated by using the **From** vehicle's **heading** (as supplied by an interfaced heading device) and the layback distances entered below.
Barge Tracking	The touchdown point (i.e. **Layback** vehicle) position is calculated in a "vehicle following" mode using a computed

azimuth from the latest **From Vehicle** position and the last **Layback Vehicle** position and the entered layback distances. Choose this option if gyro compass information is not available on the barge (i.e. **From**) vehicle.

Layback

Layback from BeadStall
to TouchDown Point   Enter the measured horizontal distance from the **BeadStall** (or relevant reference point) to the **Touchdown Point**. This value is always a positive value.

F/A Offset from BeadStall
to End of Stinger   Enter the offset from the **BeadStall** to the point that the pipe/cable leaves the barge, usually the end of the stinger. Offsets in the aft direction from the CRP are entered as negative values.

Beadstall Offset from CRP

F/A   Enter the fore/aft offset from the CRP to the **BeadStall**. Aft values are negative.

P/S   The port/starboard offset from the CRP to the **BeadStall**. Port values are entered as negative values.
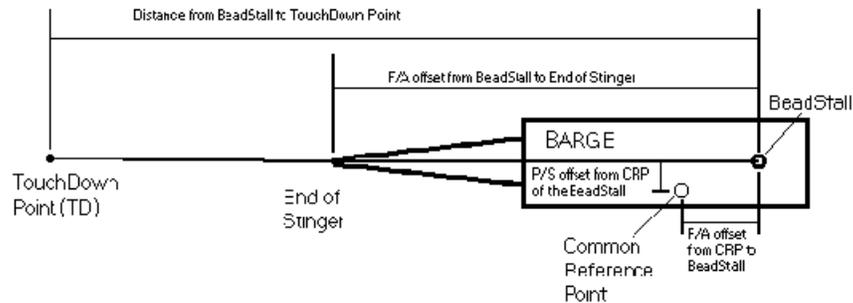
7 After configuring the parameters in the **Layback Control** dialog box, click **OK**. The touchdown point "vehicle" now appears behind the barge at the distances specified by the offset entries.

All layback information is sent to each Smart Remote.

This page intentionally left blank.