WinFrog Device Group:	ROV
Device Name/Model:	**GeoAcoustics**
Device Manufacturer:	GeoAcoustics Limited Shuttleworth Close, Gapton Hall Industrial Estate, Great Yarmouth Norfolk NR32 0NQ England +44 (0)1493 600666
Device Data String(s) Output to WinFrog:	$Aaltitude*<checksum><CR><LF> $Cheading*<checksum><CR><LF> $Ddepth*<checksum><CR><LF> $Eerror*<checksum><CR><LF> $Mmagnetic field strength, magnetometer field level, magnetometerdepth, magnetometer altitude *<checksum><CR><LF> $Ppitch*<checksum><CR><LF> $Rroll*<checksum><CR><LF>
WinFrog Data String(s) Output to Device:	$Wsystem,nember,level*<checksum><CR><LF> $Xinterval,divider1,divider2*<checksum><CR><LF>
WinFrog Data Item(s) and their RAW record:	ROVDATA 496 HEADING 410 BOTTOMDEPTH 411 ATTITUDE 413 MAGNETOMETER 800-001

DEVICE DESCRIPTION:
GeoAcoustics tow fish. See the GeoAcoustics manual for details.

DEVICE CONFIGURATION INSTRUCTIONS

WINFROG I/O DEVICES > EDIT I/O:

Serial
Configurable Parameters

**WINFROG I/O DEVICES > CONFIGURE DEVICE:**

There are two tabs on this configuration dialog box that allow you to send Waveform and Trigger Generation commands to the GeoAcoustics.

Waveform Tab
WinFrog always sends a complete string to the GeoAcoustics so all three values must be selected (e.g. system, waveform and level). Up to ten sets of these settings may be associated with a user-entered name and saved. One may over-write an existing name simply by using the same name and clicking "Add to List". When this dialog is opened the values shown were the last sent to the GeoAcoustics.
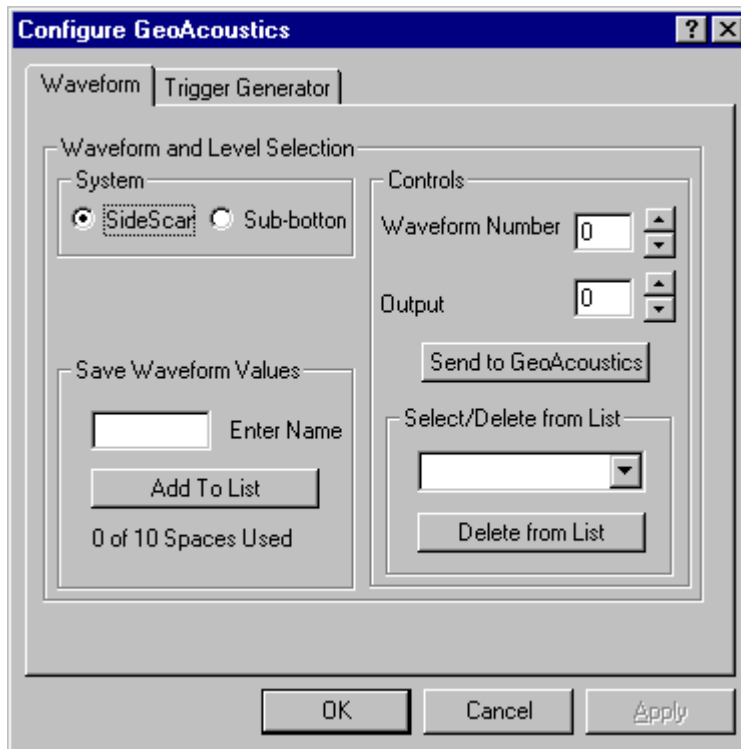
Trigger Generator Tab
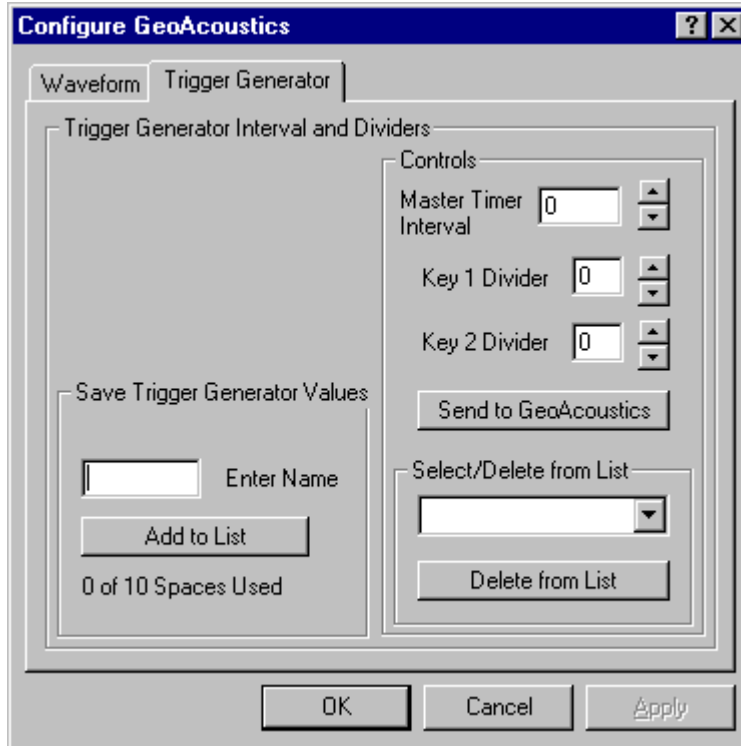
If the master timer interval is 0 then both keys are off and the command sent is X0, otherwise the whole command is sent with all three values. The range of the master timer is 20 to 29999 and 0 if off. See the Waveform tab above for information on the user list.

WINFROG VEHICLE > CONFIGURE VEHICLE DEVICES > DEVICE DATA ITEM > EDIT:

Data item: ROV, GEOACOUSTICS, ROVDATA

Attach this data item to the ROV. The dialog appears when this data item is edited.
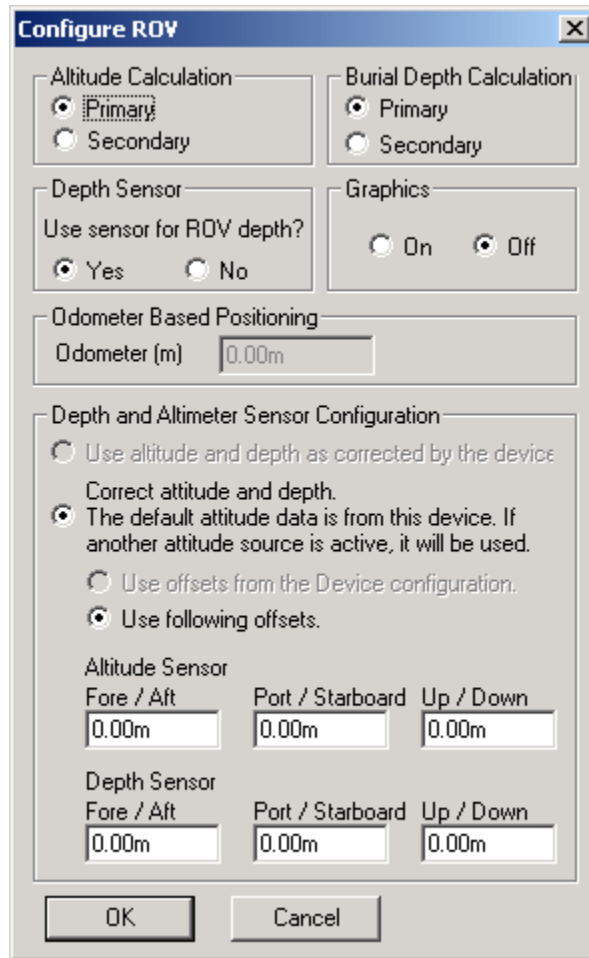
Altitude Calculation:
> **Primary** will result in this vehicle's altitude being determined from the observed altitude value found in the string from this device minus the altitude offset also found on this dialog. This value will be displayed in the vehicle text window as ROV Alt.

> **Secondary** will result in no calculation or assignment of the vehicle's altitude from this device. The raw data is still always recorded.

Depth Burial Calculation: Not available from this device.

Graphics: Not used by this device.

Depth Sensor:
    Use sensor for ROV depth:
    Yes will cause the depth of this vehicle's CRP to be determined from the observed depth value found in the string from this device plus the depth offset entered below. This vehicle's elevation will be the negative of the depth. This value will be used to calculate the bottom depth.

    The bottom depth will be determined as:
    Observed depth +Depth Offset + observed altimeter - altitude Offset

    No will result with this device obtaining the depth of the CRP from the vehicle itself, as opposed to assigning it to the vehicle as above. You must assign another device to determine the depth of the vehicle (e.g. USBL and assigning it as the source for depth).

    The bottom depth will be determined as:
    CRP height from another source + observed altimeter - altitude Offset

    Note: The observed altimeter value is always used for depth determination regardless of the prime/secondary altimeter setting.

Odometer Based Positioning: Not used by this device.

Depth and Altimeter Configuration:
    Altitude Offset is the distance between the altitude sensor and the CRP. Positive if the sensor is above the CRP.

    Depth Offset is the distance between the depth sensor and the CRP. Positive if the sensor is above the CRP.

The offset position will be corrected for pitch and roll then the vertical offsets will be applied to determine the depth and altimeter. If no pitch and roll corrections are required, enter 0 for the Fore/Aft Port/Starboard offsets but the Up/Down corrections will still be applied, unless they are 0.

The depth and altitude sensor offsets are used to determine the bottom depth, however the pitch and roll correction is not applied to these offsets when determining the bottom depth.

Data item: ROV, GEOACOUSTICS, HEADING

This is the heading of the ROV and may be used to orient the ROV. The dialog below is the same for any gyro.

Heading Data Item Options:
    Application Mode(Primary/Secondary):
    Set the type of calculation to Primary or Secondary by selecting the appropriate radio button. Devices set to Primary are used to provide the vehicle heading information. Devices set to Secondary are simply monitored, and are not used in the vehicle's calculations.

    Note that WinFrog supports automatic switching from a designated Primary to a Secondary in the event that data from the Primary fails (see Multiple Heading Sources Options).

    Heading Offset:
    A correction value (as determined from a gyro calibration) can be input in the Heading Offset box. This value is added to the heading value from the device to provide a corrected heading for the vehicle. Note that positive or negative values can be entered.

    Heading Filter/Heading Gate:
    The Heading Filter is used to "smooth" heading values used by the vehicle. The value entered in the Heading Filter indicates the number of headings that will be used to predict the next heading value. The larger the value entered, the

"heavier" the filter will be – i.e. the slower the vehicle's heading will respond to changes.

The Heading Gate defines a tolerance value to limit the use of anomalies in gyro readings. If the next observed gyro value received falls outside the specified range of predicted values (i.e. plus or minus the entered value), the value will not be used.

Multiple Heading Sources Options:
WinFrog supports automatic switching from a designated Primary source to an alternate Secondary source in the event that the Primary fails. The first Secondary source to receive data after the Primary has failed becomes the alternate Primary providing the heading for the vehicle. When the designated Primary is detected as active again, the alternate Primary source reverts to Secondary and the designated Primary provides the heading data to the vehicle.

If an alternate Secondary fails and there are additional Secondary sources, it in turn is detected by the first of the remaining operational Secondary sources to receive data after the failure, at which time this Secondary becomes the alternate Primary.

Note that this option is only available if more than one HEADING source is associated with the respective vehicle. Changes made to the Auto Switching options for any one of the HEADING data items are automatically assigned to the others upon exiting this dialog with OK. If the Auto Switching option is enabled and the respective HEADING source has been set to Primary, all others are automatically set to Secondary. The exception to this is when configuring a WinFrog Controlled Remote (WinFrog with a Remote module) from a Controller. In this case, changes made to one HEADING source are not automatically made to other HEADING sources. The operator must explicitly make them for each HEADING source.

This option is not available in the WinFrog Remote package.

Disable/Enable Auto Switching Operation:
Select the mode you wish to operate WinFrog.

Age of data in seconds when switch occurs:
Enter the age of data that is permitted before the source is considered to have failed.

Data type: ROV, GEOACOUSTICS, BOTTOMDEPTH

Attach this data type to the ROV in order to log bottom depth. Bottom depth is calculated from the ROV depth and the altimeter value, plus any offsets entered. The dialog appears when this data type is edited. It does not use the magnetometer depth and altitude.

Calculation:

Primary: If selected, will result in this vehicle's depth being assigned the value determined above plus the depth offset found in this dialog box. Beware - do not enter this offset twice; it should be entered in the ROVDATA dialog box. Tide will be applied if enabled.

Secondary: No assignment of depth will be made using data from this device. The raw data is still always recorded.

Graphics:
On displays the offset position of the sounder in the Graphics window.
Off does not display this point.

Soundings for profile:
    Collect Data If this option is selected the soundings can be displayed in the Profile window and can also be stored in a Microsoft Access database (if the cable module is available). Note: whether or not this is selected does not affect storage in the raw file. See chapter 8 of the WinFrog User's Guide for more details on configuring the Profile window.

    Distance Interval is the distance the vessel must move before another sounding will be saved in memory or stored to the database.

Interval Type:
    Along Line: A sounding will be saved when the vessel has moved the specified distance parallel to the track or survey line.

    Actual Distance: A sounding will be collected when the vessel has moved the specified distance in any direction.

Purge Ram: When selected the soundings in memory will be deleted. This does not affect any soundings that are being stored in the database or raw files.

Database File Name: Select the database file to store the soundings in using the Browse button. Once selected the "Abort Saving Data" checkbox will clear.

Abort Saving Data: If selected, storage to the database will cease.

Display Soundings in Profile Window: Select this checkbox to display the soundings in the Profile window. In order to see the soundings in the Profile window, a survey line must be assigned to this vehicle and the Profile window must be configured as "Continuous Profile Along Selected Survey Line" found with the display tab. See chapter 8 of the WinFrog User's Guide for more details on configuring the Profile window.

Offsets:
Enter the altimeter offsets. Note: if a vertical offset is entered here, it will be applied to the depth calculated from the ROVDATA data type before assignment to the vehicle.

Data item: ROV, GEOACOUSTICS, ATTITUDE

When the ATTITUDE data item is edited, the Attitude dialog box appears as seen below.

Attitude
By default, the sensor mode is off, meaning that data from the device will not be used in the vehicle's calculations. To turn the sensor on, and begin using the inclination corrections in the position output, click the 'On' radio button.

Error flag testing
The error flag check box is applicable to those devices that output a code indicating the data is either good or bad. If checked and the device supports such a code in its telegram, WinFrog will look at the code and if the data is indicated as bad, WinFrog will not use the data.

Sensor Update Frequency Rate
If the associated attitude sensor has a high frequency update rate (e.g. 10Hz and higher) it is appropriate to extract attitude data for application by either interpolating or extrapolating for a given epoch. In this case, the *High frequency update* option

should be selected. Some attitude sensors have slow update rates, in particular those installed in acoustic transponders that require interrogation. For these sensors interpolation/extrapolation can produce a bad value as there is insufficient information to determine the correct shape of the curve (aliasing). Thus the most current attitude needs to be used. In this case, select the *Low Frequency update* option. This option applies to the use of the attitude data by the following data items:

- POSITION
- ELEVATION
- ALTITUDE
- XPONDER
- LBL TRANSCEIVER
- PROFILE

Pitch and Roll
There are two control groups, one for each of pitch and roll. Correction values can be added in this section of the window. The correction values (entered in units of degrees-decimal degrees) are added to the raw pitch and roll values received from the device before the data is applied to the vehicle's calculations. Ensure that entered values adhere to the sign convention used by WinFrog. You can verify that the corrections are entered properly by viewing the pitch and roll values in the I/O Device window and the Vehicle Text window.

Filtering
Additionally you may filter the incoming values to remove extraneous noise or spikes – check boxes are provided to switch this feature on or off. A filter length (up to 30 samples) and a threshold value (applied to the median of the samples in the filter to obtain lower and upper bounds) can be entered. Any pitch or roll values outside of the bounds are rejected and not used in the vehicle calculations, but will be recorded in the RAW files. If either one of pitch or roll is rejected, both values are ignored, although you may set up the filtering parameters for them separately. The status of the filters, including the current valid range for each of pitch and roll, and the percentage of values rejected, can be viewed in the calculations window, selecting the appropriate ATTITUDE data item.

> *Important:*
> Do not enable filtering unless there is a high enough data rate (say 10hz) to correctly determine the shape of the curve. Essentially, if the low frequency update rate is selected above, do not enable filtering.

Primary Attitude Device Selection
If more than one attitude device is present, you may select one of them to be primary and the others to be secondary and allow WinFrog to automatically switch between them should the primary system stop sending data or has bad data. There must be at least two attitude data items added to the vehicle to use this feature. (Note: The attitude and offset data displayed in this dialog is for the attitude device

corresponding to the data item that is being edited. Selecting a Primary Attitude Device from the drop down list does not affect these values for any attitude device in the list. Every attitude device needs to be set up for its own corrections and offsets.)

Primary Device Auto Switch
Select the On radio button to turn on this feature. Then enter the time out time in the edit box. If WinFrog does not receive data from the primary attitude device, or if it receives bad data for this length of time, it will switch to the next secondary that is enabled and has good data.

Auto Switch Feature Usage
To use this feature first turn the sensor on as described in the Attitude section above. Next, select the attitude device that you wish to be primary from the drop down list box. Then turn the primary device auto switch on and enter the time out time. Then edit all the other attitude data items and enable them in the Attitude group box. Note that the same selected primary will be displayed for all attitude data items; similarly, the automatic feature will be turned on and the time out time will be the same. However, you must individually enable each attitude device in the Attitude group box.

Offsets
These are not applicable in this case.

Acoustic Options
This applies to long base line acoustic transponders that have inclinometers. See chapter 17 for more information.