WinFrog Device Group:	Sounder
Device Name/Model:	NMEA Depth
Device Manufacturer:	**National Marine Electronics Association** PO Box 3435 New Bern NC 28564-3435, USA Tel: (252) 638-2626 Fax:(252) -638-4885 E-mail: nmea@coastalnet.com
Device Data String(s) Output to WinFrog:	$--DBS,xxxx.x,f,xxxx.x,M,xxx.x,F = depth below surface i.e. draught included */ $--DBT,xxxx.x,f,xxxx.x,M,xxx.x,F = depth below transducer*/ $--DBK,xxxx.x,f,xxxx.x,M,xxx.x,F = depth below keel*/ $--DPT,xxxx.x,xxxx.x = depth and draught; $-D1 = proprietary
WinFrog Data String(s) Output to Device:	N/A
WinFrog .raw Data Record Type(s):	Depth: Type 411 depth, status & dtime are repeated 15 times

DEVICE DESCRIPTION:
Unlike other echo sounders used by WinFrog, the NMEA Sounder is not a single specific device. The NMEA 0183 standard for Interfacing Marine Electronics Devices is a voluntary industry standard, first released in March of 1983. The NMEA 0183 standard defines electrical signal requirements, data transmission protocol, timing and specific sentence formats for a serial data bus. This standardization allows users to utilize various different manufacturers' devices without having to reconfigure for changes in data input format. Echo sounders are just one of several device categories that adhere to a NMEA standard.

NMEA standards are updated from time to time with the latest version (2.30) released in March 1998. The NMEA 0183 standard calls for data communication in the form of coded "sentences." Each sentence begins with the character "$" and ends with a carriage return and line feed (<CR><LF>). These last two characters are "control" characters and are not normally printed (for this reason they are shown enclosed in brackets). Between the beginning and end of each sentence are "fields" of data, each field separated by a comma. The first field in any sentence (field 0) begins with the two-letter talker mnemonic code ("talkers" are devices that send out information, "listeners" take it in) followed by the three-letter code for the sentence.

**DEVICE CONFIGURATION INSTRUCTIONS:**
Baud Rate: configurable
Data Bits: configurable
Stop Bits: configurable
Parity: configurable

WINFROG I/O DEVICES > CONFIG OPTIONS:
The NMEA DEPTH device is added to WinFrog from the SOUNDER device category. The NMEA DEPTH device must be edited at the "generic" I/O device window level. Highlight the NMEA Depth device, then right-click and select Configure Device from the presented options. The NMEA Sounder Input Format dialog box appears as seen below.
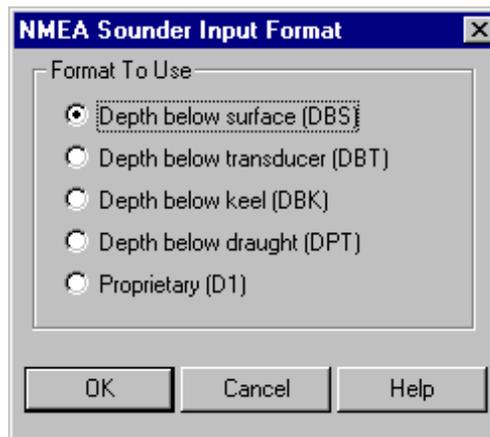
This window allows you to choose a format to use from the following options:

- Depth below Surface (DBS)
- Depth below transducer (DBT)
- Depth below keel (DBK)
- Depth below draught (DPT)
- Proprietary (D1)

The selection depends on the sounder's internal settings. Some sounders are configurable to output any one of the above shown options. You must ensure that the selection made in this WinFrog dialog box matches the data being output by the sounder. If the wrong selection is made, WinFrog will not recognize the received data string.

A simple Bar Check may assist with this determination if you are unsure of the type of depth that is being output.

WINFROG VEHICLE - DEVICE > EDIT OPTIONS:
Adding the NMEA DEPTH sounder to WinFrog creates a BOTTOMDEPTH data item that must be added to the appropriate vehicle's device list. Once the BOTTOMDEPTH data item has been added to a vehicle's device list, it must be edited to suit the application.

In the vehicle's device list, highlight the SOUNDER, NMEA Depth, BOTTOMDEPTH data item and click the Edit button. The standard **Configure Sounder** dialog box appears as seen below.
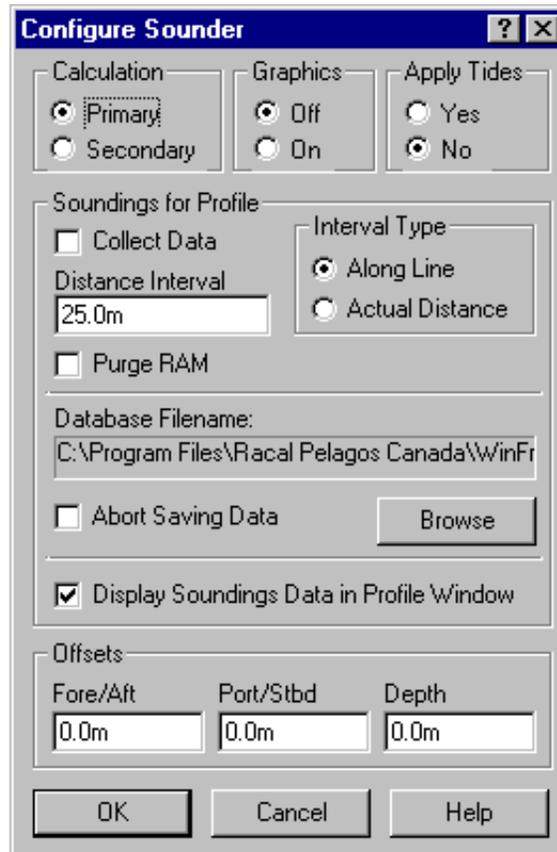
Calculation:
Set the type of calculation to Primary or Secondary using the appropriate radio button. WinFrog will only utilize (i.e. display and record) data from a Primary sounder device. If there is more than one Primary sounder attached to a vehicle's device list, WinFrog will not mean the data (as is done with positional devices), but rather alternate between the devices. Data from a Secondary status sounder will simply be monitored.

Graphics:
If the On radio button is selected, a labeled square representing the location of the sounder will be displayed in the Graphics and/or Bird's Eye windows.

Apply Tides:
If the Yes radio button is selected, WinFrog will apply tidal corrections to the observed water depths. Depths displayed in the Vehicle Text window and recorded in automatic event (i.e. .DAT, .SRC, and .RCV) and type 351 raw files will refer to the datum corrected depths. Note that type 411 raw data records will remain truly raw and will not reflect the tide correction.

The tide information can be supplied by a real time telemetry system or by predicted tide files. Either way, the tide "device" must also be attached to the same vehicle's device list. For more information, refer to documentation on Tide devices.

Soundings for Profile:
This section of the Configure Sounder window permits the collection of sounding data to an .mdb database file for display in WinFrog's Profile window. This collection is completely separate from automatic event or raw data collection.

Collect Data
Select this checkbox to enable the collection of data to a .mdb database file.

Interval Type
Select to utilize either Along Line or Actual Distance (i.e. between successive position updates) calculations for data collection intervals. Selecting Along Line requires that you also enable survey line tracking.

Distance Interval
Specify the distance Interval at which the data will be collected.

Purge RAM
Sounding data is stored in the RAM memory of the computer. Any data collected which will not be required at later time can be deleted by checking the Purge RAM button, then clicking on the **OK** button to exit the dialog box.

Database filename
Click on the Browse button to define where and to what filename the .mdb file will be written. The file name and location is displayed in this window.

Abort Saving Data
Select this checkbox to abort saving data to the .mdb file. In other words, to save data to the .mdb file ensure that this box is NOT checked.

Display Soundings Data in Profile Window
Select this checkbox to enable the display of this data in WinFrog's Profile Window.

Offsets
This section of the window allows for entry of Offset values as measured from the vessel's common reference point (CRP). Note that the Fore/Aft and Port/Stbd offsets are used for "cosmetic" visual purposes only: An echo sounder is not a positioning device, and hence its horizontal offsets have no application. If the echo sounder's position is to be recorded correctly, you must create and enable a vehicle Tracking Offset for that specific location. The offsets entered here can simply be used as a means of graphically confirming that the Tracking Offset values have been entered correctly.

The Depth Offset is applied: The entered value will be added to the received sounder data. As mentioned above, there are several different types of NMEA depths. You must be certain what type of data you are receiving from the echo sounder before you enter any values in this window.

Depths displayed in the Vehicle Text window and recorded in automatic event (i.e. .DAT, .SRC, and .RCV) and type 351 raw files will refer to the corrected depths. Note that type 411 raw data records will remain truly raw and will not reflect the depth offset correction.

CONFIGURATION DETAILS:

The following are list of NMEA strings that WinFrog will accept:

    $--DBS,xxxx.x,f,xxxx.x,M,xxx.x,F = depth below surface
    $--DBT,xxxx.x,f,xxxx.x,M,xxx.x,F = depth below transducer
    $--DBK,xxxx.x,f,xxxx.x,M,xxx.x,F = depth below keel
    $--DPT,xxxx.x,xxxx.x = depth below draught

Where: f = feet, M = metres, F = fathoms

All lines end with a (<CR>) carriage return and (<LF>) line feed as the end of sentence delimiter.

The Proprietary "D1" sentence format provides a means for manufacturers to use the sentence structure definitions of this standard to transfer data that does not fall within the scope of the other approved sentences.
A proprietary sentence contains, in the order shown, the following data:

"$"	Hex 24 – Start of sentence
"P"	Hex 50 – proprietary sentence ID
<aaa>	Manufacturer's Mnemonic code
[<valid characters>,"^",","]	Manufacturer's data
"*"<checksum field>	Checksum field
<CR><LF>	Hex 0D 0A – End of sentence