WinFrog Device Group:	Sounder
Device Name/Model:	Innerspace 449
Device Manufacturer:	**Innerspace Technology Inc.** 36 Industrial Park Waldwick, NJ 07463 USA Tel: (201) 447-0398 Fax: (201) 447-1919 E-mail: info@innerspacetechnology.com
Device Data String(s) Output to WinFrog:	RS-232 ASCII format (Depth, Status)
WinFrog Data String(s) Output to Device:	N/A
WinFrog .raw Data Record Type(s):	Depth: Type 411 and/or 911 For 411: depth, status & dtime are repeated 15 times

DEVICE DESCRIPTION:
The INNERSPACE 449 Thermal Depth Sounder Recorder is a precision survey and scientific depth sounder with black and gray tone thermal printing hardcopies available. Chart recordings may provide detail where prevailing conditions include suspended sediments (fluff), light silt, mid water layering (thermal or biological) or aquatic vegetation. The unit is available in single and dual frequency models. The single frequency operates at 24 kHz and the dual frequency operates at 24 or 41 kHz and 208 or 125 kHz.

The INNERSPACE 449 comes standard with a single bi-directional port (A) for outputting single frequency depth data. An optional second port (B) is available for outputting depth data from the second frequency.
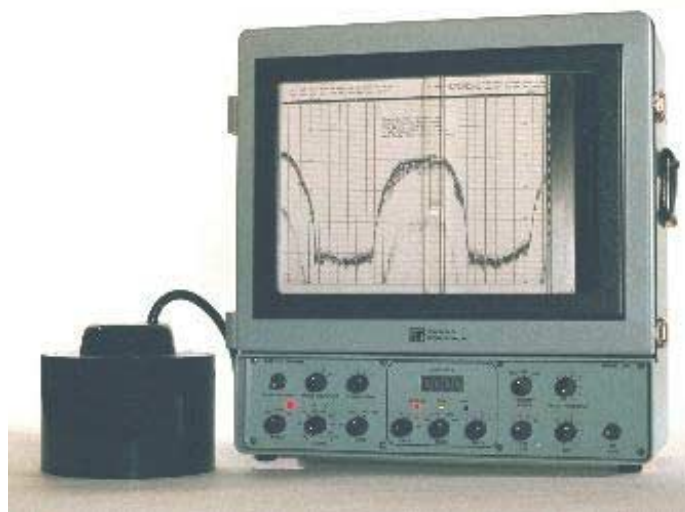
Innerspace 449 Fathometer

The Innerspace Data must go directly from the Innerspace into a BCD converter before it can be read into WinFrog. See documentation on the BCD converter used for details on installation and wiring for that device.

DEVICE CONFIGURATION INSTRUCTIONS (Suggested):
Baud Rate: configurable from 300 to 9600
Data Bits: 7 or 8
Stop Bits: 1 or 2 (1 ½ not recommended)
Parity: Odd or Even

WINFROG I/O DEVICES > CONFIG OPTIONS:
The Innerspace 449 is added to WinFrog from the Sounder device category. There is no configuration required or available at the "generic" I/O Device window level.

For receiving dual frequency data in WinFrog, two INNERSPACE 449 devices must be added to WinFrog, i.e. one for the high frequency depth data and the other for the low frequency data output.

WINFROG VEHICLE TEXT WINDOW > CONFIGURE VEHICLE DEVICES > DEVICE > EDIT OPTIONS:
Adding the Innerspace 449 sounder to WinFrog creates the **SOUNDER, INNERSPACE 449, 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, INNERSPACE 449, BOTTOMDEPTH data item and click the Edit button. The standard **Configure Sounder** dialog window appears as seen below.
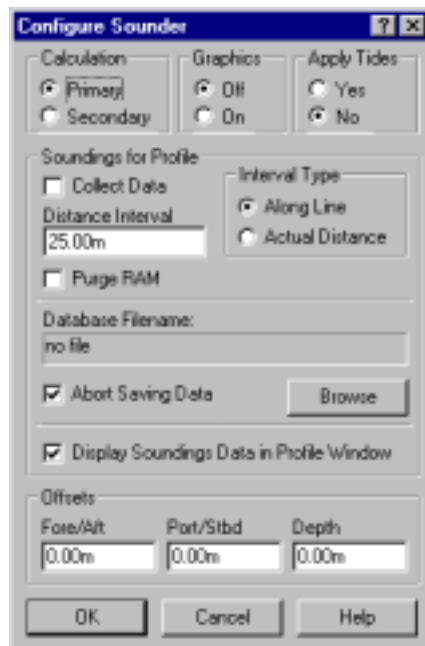
Calculation:
Set the type of calculation to Primary or Secondary using the appropriate radio button. WinFrog will only utilize (i.e. display and record) data from a Primary sounder device. If there is more than one Primary sounder attached to a vehicle's device list, WinFrog will not mean the data (as 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 an .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 selecting the Purge RAM checkbox, then clicking the OK button to exit the dialog box.

Database filename
Click 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 field.

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 selected.

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

Offsets
This section 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. 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 Innerspace 449's RS-232 interface ports can be configured be means of the 'SW' switches on the RS232 logic board.

The Innerspace 449's data output baud rate is controlled by switches SW-1, SW1-3, SW1-2, and SW1-1. The chart below details the switch settings required to set the various available baud rates:

Baud Rate	SW1-4	SW1-3	SW1-2	SW1-1
300	on	on	off	on
600	on	on	off	off
1200	on	off	on	on
2400	on	off	on	off
4800	on	off	off	on
9600	on	off	off	off

The Innerspace 449's data Parity is controlled by the 'SW-2' switches, as detailed below:

Parity	SW2-2	SW2-1
Inhibit	on	-
Odd	off	on
Even	off	off

The Innerspace 449's data Stop Bits are controlled by switches 'SW1-6' and 'SW1-5', as detailed below:

Stop Bits	SW1-6	SW1-5
1	on	off
1-1/2	off	on
2	off	off

The Innerspace 449's data Word Lengths are controlled by switches 'SW1-8' and 'SW1-7', as detailed below:

Word Lt.	SW1-8	SW1-7
5 Bits	off	off
6 Bits	off	on
7 Bits	on	off
8 Bits	on	on

The structure of the depth message is as follows:

| STX | 100's | 10's | 1's | .1's | Bad Data | CR |

Each character is output in standard RS-232 ASCII format.

Note: the default communication parameters for the Innerspace 449 are 9600 baud, 8 data bits, 1 stop bit.

The Innerspace 449's output connector pin assignments are as follows:

Signal Name	449 Panel MS/12-10	Port A/B	EIA Pin# DB-25	EIA Pin# DB-9	Signal Name
TXD-A	A	A	3	2	RXD
RXD-A	B	A	2	3	TXD
CTS-A	D	A	4	7	RTS
SIG-GND	K	A	7	5	Sig.GND
- - -	- -	A	*(6,8,20)	*(1,4,6)	- - -
TXD-B	E	B	3	2	RXD
RXD-B	F	B	2	3	TXD
CTS-B	G	B	4	7	RTS
SIG-GND	K	B	7	5	Sig.GND
- - -	- -	B	*(6,8,20)	*(1,4,6)	- - -

Name	MS/12-10	A/B	DB-25	DB-9	Name
TXD-A	c	A	3	2	RXD
RXD-A	b	A	2	3	TXD
CTS-A	h	A	4	7	RTS
SIG-GND	K	A	7	5	Sig.GND
- - -	- -	A	*(6,8,20)	*(1,4,6)	- - -
TXD-B	Y	B	3	2	RXD
RXD-B	X	B	2	3	TXD
CTS-B	a	B	4	7	RTS
SIG-GND	d	B	7	5	Sig.GND
- - -	- -	B	*(6,8,20)	*(1,4,6)	- - -

Note: *These pins are jumpers in the standard IT cables.

RAW DATA LOGGING:
The raw depth records may take 2 forms, the 411 record and the second is a 911 record. Note that the 411 is repeated 15 times.

SPECIFICATIONS:

Measuring Ranges:	0 – 1060 metres
Operating Frequency:	24kHz standard (optional 3.5 to 300kHz)
Computer Interface:	RS232
Power Requirements:	120 /240VAC,and 12, 24 VDC
Sound Velocity Setting:	1350-1550 m/s
Pulse repetition Frequency:	1200 soundings/min max. (Automatically adjusting according to depth)