



# HYPACK 2023 Q3 Release Notes

By Caroline Liu

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## HYPACK SHELL

- **New feature: Visual Geodesy with dynamic webmap.** The Project Wizard now has an alternate and simpler way of setting up geodetic parameters when you are using UTM Grids and US State Plane NAD-83. This interface allows you to set up geodesy with just a click on a dynamic map!

To set up geodetic parameters using Visual Geodesy:

1. Open the Project Wizard, which is either when HYPACK® starts, or click File-> Project Wizard.
2. Select “Create New Project” and click [Next]. This will take you to the new project creation page.
3. Give a project name and click [Next]. Next is the geodesy page.
4. On the Geodesy page, select Click on Map in the Selection Mode drop-down. This opens the World Map where you can click on the area to set up your geodetic parameters. You can see the Lat-Long value on the bottom of the window along with grid area and zone information.
5. An interactive dynamic web map will appear. You can turn on and off the zone grid lines by clicking the “Show Zone Grid” button and vice versa if you are using UTM Grids. You can zoom in and out by using the mouse scroll wheel and scroll bar in the map window. You can also pan around the map area by dragging the map using the mouse. You can see Lat-Long in the bottom right of the map window, while UTM grid and zone info can be seen in the bottom left of the window.
6. If you are using the State Plane NAD-83 grid, you can click on the [State Plane] button and US state plan zones will appear. You can zoom in and out like explained in the previous step. Select the zone of your choice and your selection will appear at the bottom left of the map window. You will need a \*.kml file for the state plane system in the datum folder under the HYPACK® installation directory. File name is “StatePlaneNAD83.kml”.
7. When the information is correct for your project, click [Set Geodesy]. This will take you back to the geodesy page in the Project Wizard, and you can see the updated geodesy settings.
8. When you are done with Geodesy settings, click [Next].
9. You have created the project and set up your geodesy with just click on a map.

- **Added a dialog that accepts various user and file inputs to produce either a Contour Line Bathymetry or an Environment, Seabed and Beach AML compliant chart.** Source data extending beyond boundaries of chart is automatically clipped to interior of chart. Inputs include defining various chart and feature level attributes as well as specifying files for importing of data from Border, Planned Line, XYZ, Target Database, DXF and KML file formats.
- **Added a dialog that accepts various user and file inputs to produce either a Contour Line Bathymetry or an Environment, Seabed and Beach AML compliant chart.** Source data extending beyond boundaries of chart is automatically clipped to interior of chart. Inputs include defining various chart and feature level attributes as well as specifying files for importing of data from Border, Planned Line, XYZ, Target Database, DXF and KML file formats.

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## LINE EDITOR

### Entire lines can now be moved and rotated:

- Added ability to click anywhere on a line, grab it and move.
- Added ability to select a pivot point on a line and rotate the selected line.
- Added keyboard shortcuts, M keypress to move line, R keypress to rotate line. To enable keyboard shortcuts, user must first use the menu or click on a line node in the shell.
- The M and R keys can be used as toggle switches and enabling move/rotate mode will disable the other mode and addition of new points.
- These functionalities can also be accessed through the menu by right-click on the line in tree view of the Line Editor.

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## PREPARATION

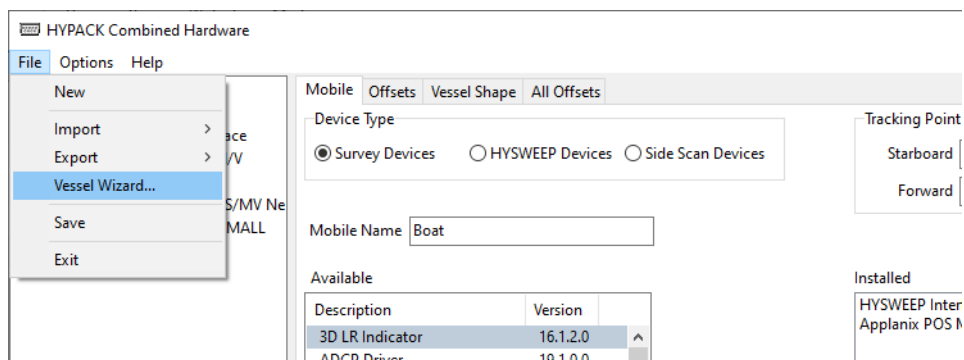
### GEODESY

- Added checkbox in Time Variable transformations to allow height transformation using the datum transformation parameters. When the checkbox is checked, all height calculations will be vertically transformed based on the datum transformation parameters.
- Added new dialog in Tools, “Datum Height Calculator” to allow users to calculate the height correction using the datum transformation parameters by entering a Latitude and longitude value, this generated value will be applied to “Orthometric Height Correction”
- Updated “Orthometric Height Correction” label to “Datum Orthometric Height Correction” when the fudge factor is generated using the Datum height calculator.
- Added an edit box in Grid Conversion dialog to display the datum vertical shift.
- Combined HAS/RAW file filter in Tools->Import HSX/RAW data.

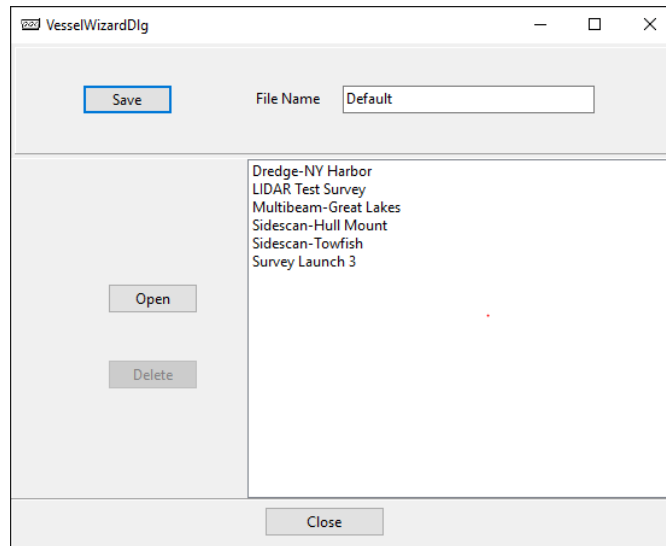
### HARDWARE

- **New Feature: We’ve added the new dialog Vessel Configuration Wizard, which allows users to quickly save and load vessel configurations from the C:\HYPACK Store\Vessels folder.**

To use the Vessel Wizard, from the HYPACK Shell click Preparation -> Hardware Setup. In the HYPACK Combined Hardware, click File -> Vessel Wizard. The Vessel Wizard Dialog Box opens.

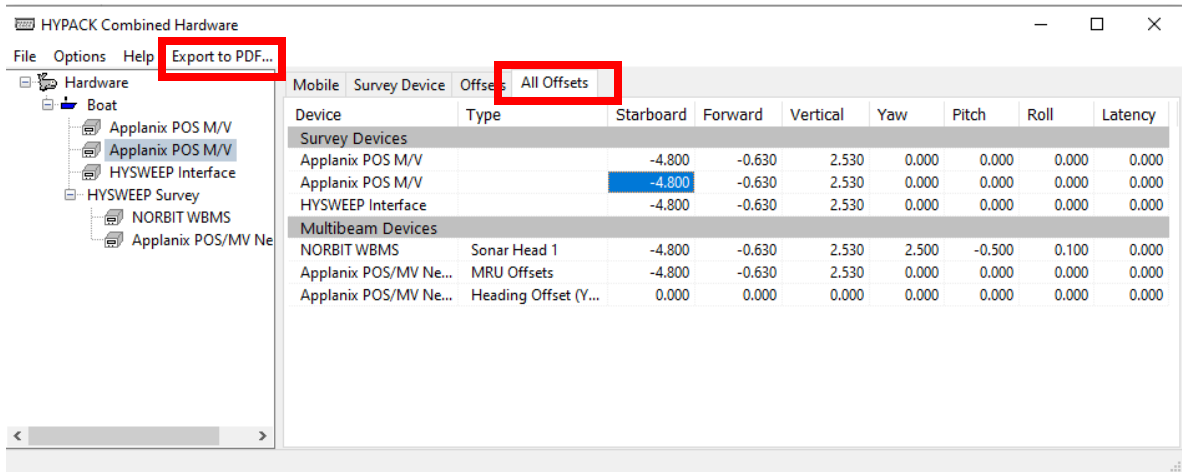


- > Click [Save] to save the currently opened project's hardware configuration to the Vessels folder.
- > To load one of the listed vessel configurations, click the name of the configuration and click [Open].
- > To delete a vessel configuration, click the name of the configuration and click [Delete].

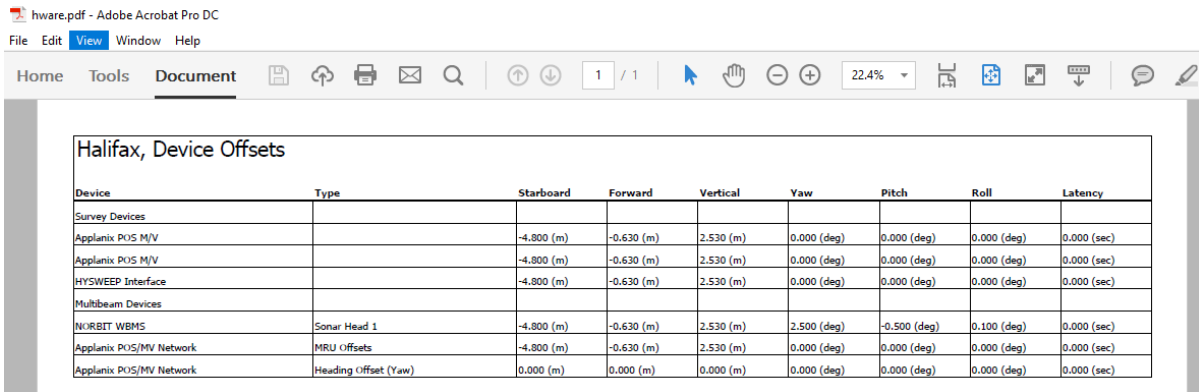


- **In the HYPACK Combined Hardware, users can now save device offsets to a PDF.** To do this, enter your device offsets in the HYPACK Combined Hardware window, then go to the All Offsets tab and click Export to PDF. Give the PDF file a name and select the

save location.



The following image shows an example PDF containing the entered offsets.

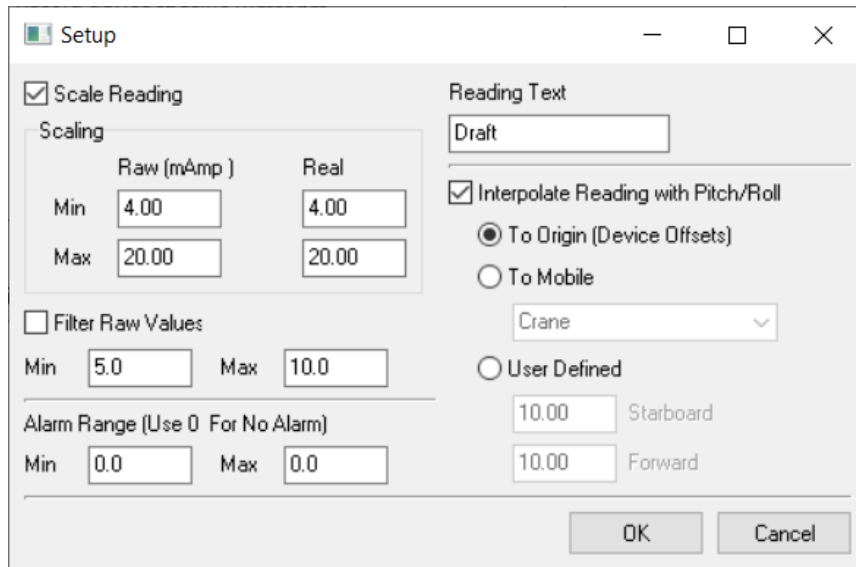


## SURVEY DEVICE DRIVER UPDATES

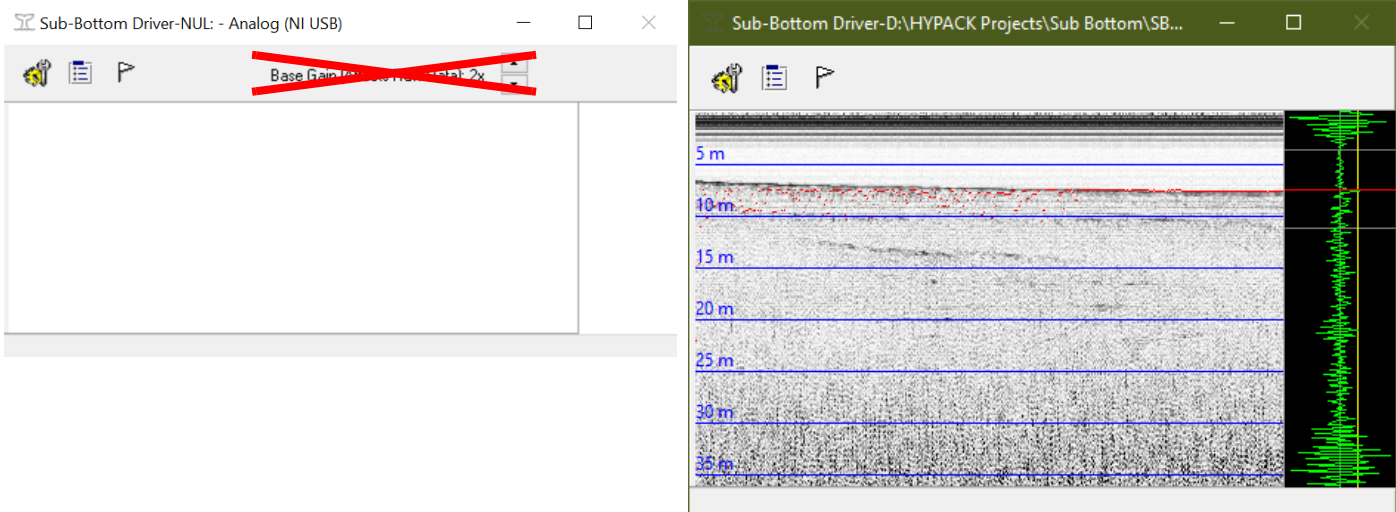
- **ScaledDGH.dll:** Added options to interpolate pitch/roll readings to the origin point, to a mobile's current position, or to a user-defined offset.

To use these option, from the HYPACK Shell click Preparation -> Hardware Setup. In the HYPACK Combined Hardware window, add ScaledDGH.dll, then open the Setup window.

Check the box next to “Interpolate Reading with Pitch/Roll”, then select the reference point.

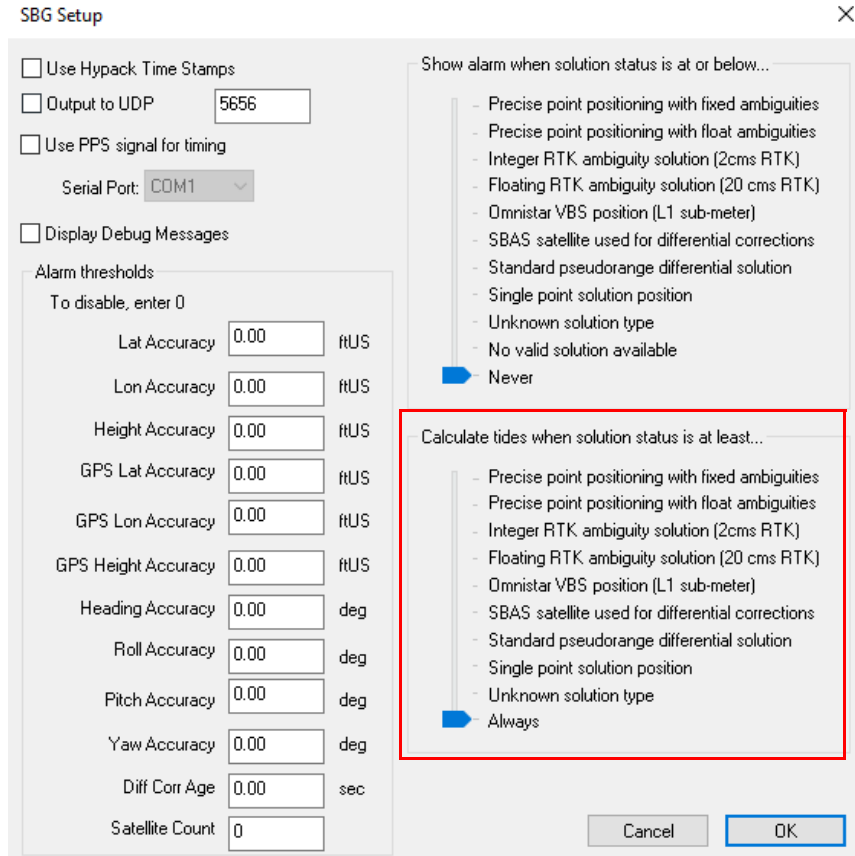


- **Subbot.dll:** Removed the base gain setting from the Subbot.dll window in Side Scan Survey, since its function is redundant and caused undesired side effects. Gain can still be applied in the Analog Monitor and display controls.



- **Sbg.dll:** Added the “Calculate tides when solution status is at least...” slider in the SBG Setup window, which allows users to set the minimum solution level to record tides. These choices are similar to the alarm threshold conditions.

To use this function, add sbg.dll in the HYPACK Combined Hardware, then open the SBG Setup window. Drag the slider to the condition you want, then click [OK].

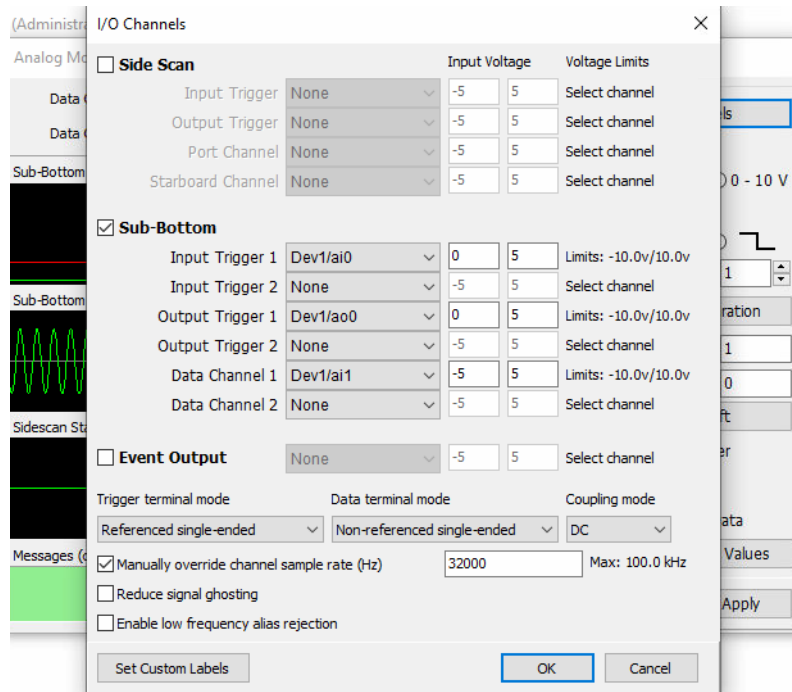


- **Subbot.dll: Users can now separately set the Trigger and Data terminal mode inputs from the I/O Channels window associated with the Analog Monitor in HYPACK Survey.** These options work for National Instruments devices like Fugro.

The Trigger and Data terminal mode dropdowns are populated with options that are based on what the connected device(s) report back as their capabilities. Note that if you do not have a National Instruments device connected, all of the dropdowns will be empty.

For the terminal modes, potential options include Referenced single-ended, Non-referenced single-ended, Differential, and Pseudodifferential mode.

The Coupling mode options are AC or DC.



To use this new feature:

From the HYPACK Shell, click Preparation -> Hardware Setup to open the HYPACK Combined Hardware window. Add subbot.dll, and select a National Instruments device (ie: Fugro).

Back in the HYPACK Shell, open HYPACK Survey. In the Analog Monitor window under the Settings section, click [I/O Channels] to open the I/O Channels window. Check the Sub-Bottom checkbox, then select the desired input from the Trigger terminal mode, Data terminal mode, and Coupling mode dropdowns. Click [OK].

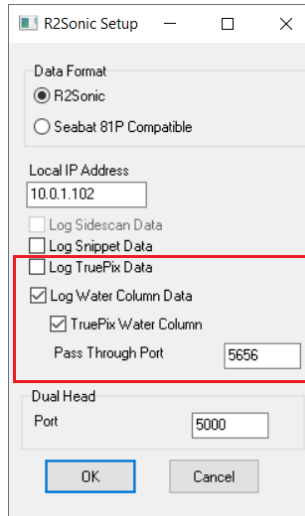
## HYSWEEP<sup>®</sup> DEVICE DRIVER UPDATES

- **R2Sonic Devices:** The HYPACK 2023 Q1 release introduced the option to log TruePix compressed water column data for R2Sonic HYSWEEP devices. However, it was found that a UDP pass through is necessary to correctly transfer data from HYSWEEP to the water column logger.

**In this update, the Pass Through Port field has been added to the R2Sonic Setup window. When logging TruePix water column data, you need to specify the UDP**

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port for HYSWEEP Survey to water column logger pass through.

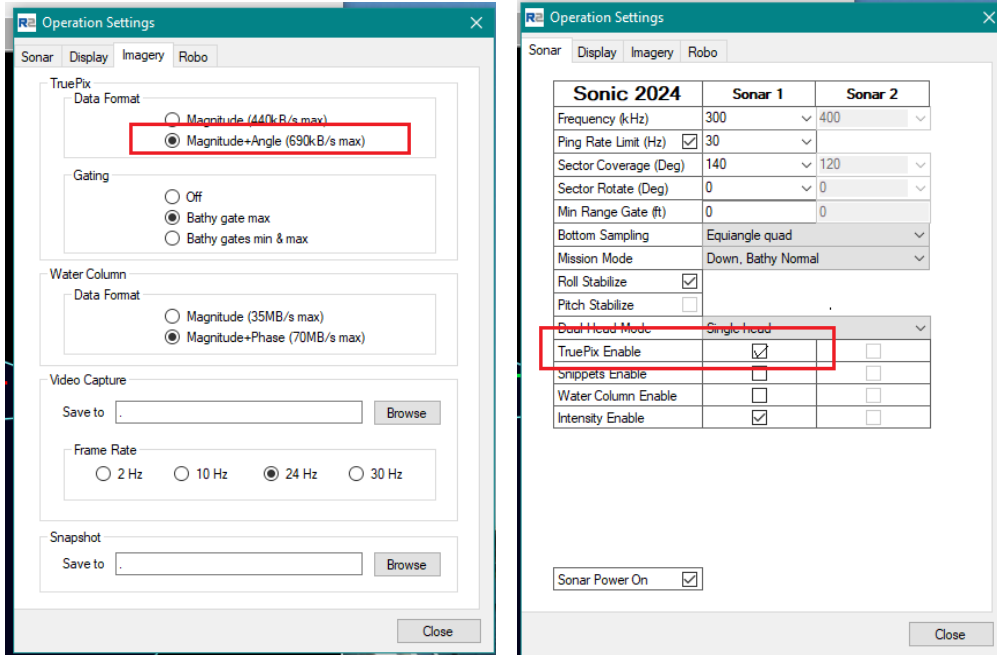


Now, use the following steps when setting up HYPACK Combined Hardware and the R2Sonic Sonic Control software when logging TruePix water column data:

In the HYPACK Combined Hardware setup window, select HYSWEEP Devices and choose from the following R2Sonic devices: R2Sonic Dual Head 2020, Dual Head 2024, SONIC 2020, and SONIC 2024. Double click the device name to open the R2Sonic Setup window. Check both “Log Water Column Data” and “TruePix Water Column”. Enter the value of the pass through port. The default pass through port is 5656, which should work for the majority of situations. If data is not transferring, try 5657 instead.

In the R2Sonic Sonic Control, open the Operation Settings window and make sure TruePix Enable is checked in the Sonar tab, and Magnitude+Angle is selected as the TruePix data format in the Imagery tab.

The compressed data will be logged and displayed in the HYSWEEP® Water Column Logger window while HYSWEEP® SURVEY is running.



## TPU EDITOR

- RTF reports generated from the TPU Editor now include a Devices Info table, which lists the selected positioning, MRU, multibeam, and heading devices. To generate an RTF report, after choosing each device, click File -> Save RTF Report.

**TPU Report - Single Beam Mobile**

Project Name: Single Beam Mobile  
Date Report Generated: 07/26/23 13:41:11

General		Tuning Parameters	
Angular Coverage (deg)	175	Amplitude/Phase Measurement Crossover Samples	12
Maximum Ping Rate (Hz)	50	Amplitude Detect Denominator	6
Along Track Beam Width (deg)	0.7		
Across Track Beam Width (deg)	1.0	Estimation Graph Parameters	
Pulse Length (ms)	0.050	Number of Beams	400
Sector Steering Angle (deg)	60	Depth of Bottom (m)	20
Frequency (kHz)	230.0	Roll Angle (deg)	0.0
Receive Bandwidth (kHz)	6	Pitch Angle (deg)	0.0
Range Sampling Resolution (m)	0.0125		

Environment			
Speed of Sound (m/s)	1529	Sound Speed Sensor Uncertainty (m/s)	0.50
Peak-to-Peak Swell (m)	1.0	Surface Sound Speed Uncertainty (m/s)	0.25
F-A Seafloor Slope (deg)	0.0	Spatio-Temporal Variation (m/s)	1.00
P-S Seafloor Slope (deg)	0.0	Thickness of S-T Layer (m)	10.0
Water Level Uncertainty (m)	0.02	Sound Speed Uncertainty Beyond SV Profile	0.00
Spatial Tide Prediction Uncertainty (m)	0.02	Maximum Depth of SV Profile	21.0

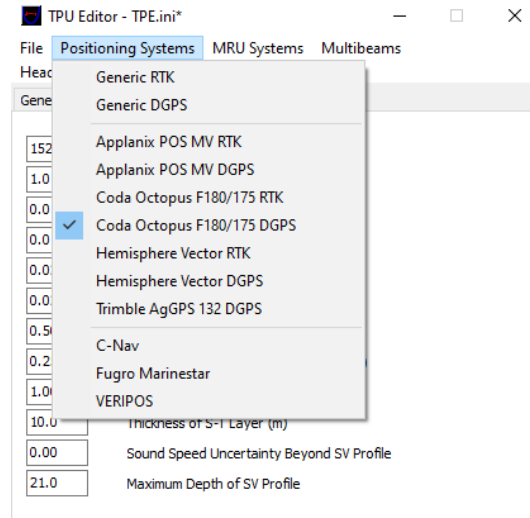
Sensor Info						
	Physical Offsets			Sensor Offset Uncertainty		
	Position	MRU	Transducer	Position	MRU	Transducer
Starboard	0.00	0.00	0.00	0.00	0.00	0.00
Forward	0.00	0.00	0.00	0.00	0.00	0.00
Vertical (+ Down)	0.00	0.00	0.00	0.00	0.00	0.00

Survey Speed (kts)	5.0	Fixed Heave Uncertainty (m)	0.05
Speed Uncertainty (m/s)	0.1	Heave (% of Heave Amplitude)	5
Roll Offset Angle of Transducer (deg)	0.00	Roll Sensor Uncertainty (deg)	0.025
Pitch Offset Angle of Transducer (deg)	0.00	Pitch Sensor Uncertainty (deg)	0.025
Heading Offset Angle of Transducer (deg)	0.00	Roll Offset Uncertainty (deg)	0.05
Transducer Draft (m)	1.050	Pitch Offset Uncertainty (deg)	0.50
		Yaw Offset Uncertainty (deg)	0.50

Positioning System Uncertainty (m) dgps	0.3	Positioning Time Lag (ms)	0.20
Heading Uncertainty (deg)	0.3	MRU Time Lag (s)	0.005
		Transducer Time Lag (s)	0.005
Draft Uncertainty (m)	0.02	Latency (s)	0.000
Squat Uncertainty (m)	0.02		
Loading Changes (m)	0.02		

Devices Info	
Device Type	Device Name
Positioning System	Coda Octopus F180/175 DGPS
MRU System	Coda Octopus F180/175
Multibeam	4600_230kHz
Heading System	Vector 103

- In the menu, a blue checkmark is now displayed next to the selected positioning, MRU, multibeam, and heading devices.

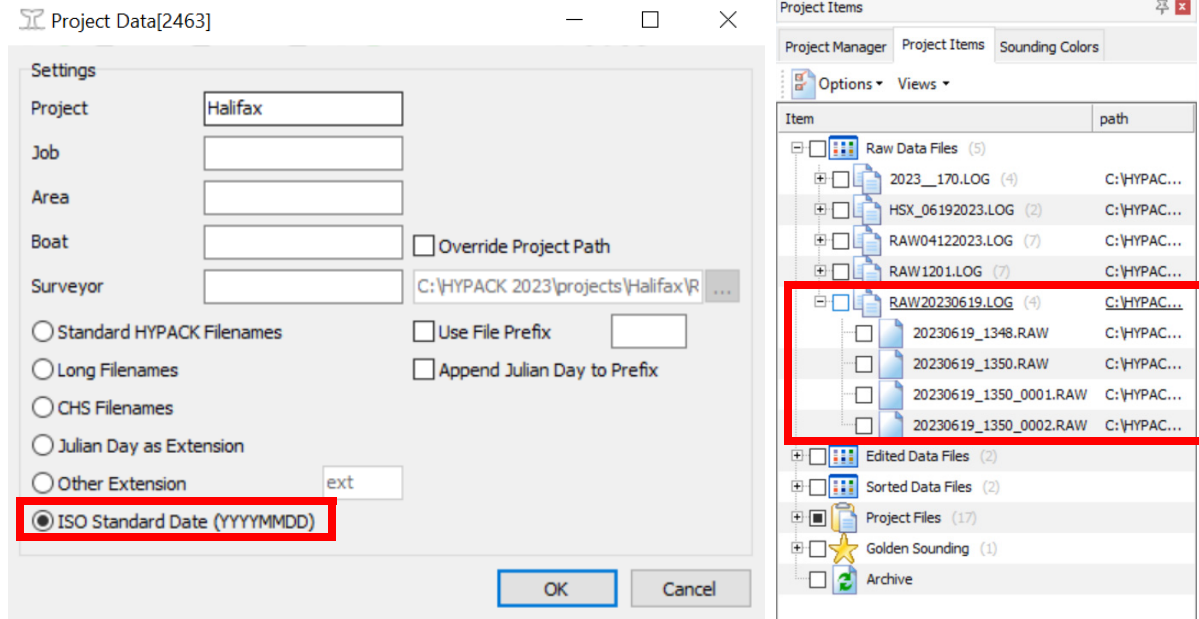


## DATA ACQUISITION

### SURVEY

- Users can now choose to name LOG files with ISO Standard (European) date format (YYYYMMDD). This format also applies to RAW, HSX, HS2X and XYZ files. To use this option, in HYPACK SURVEY click Options -> Project Information. In the Project Data window, click ISO Standard Date (YYYYMMDD), then [OK]. Subsequent LOG, RAW, HSX, HS2X, and XYZ files are named using date and time in the following format: YYYYMMDD\_HHMM.file type.

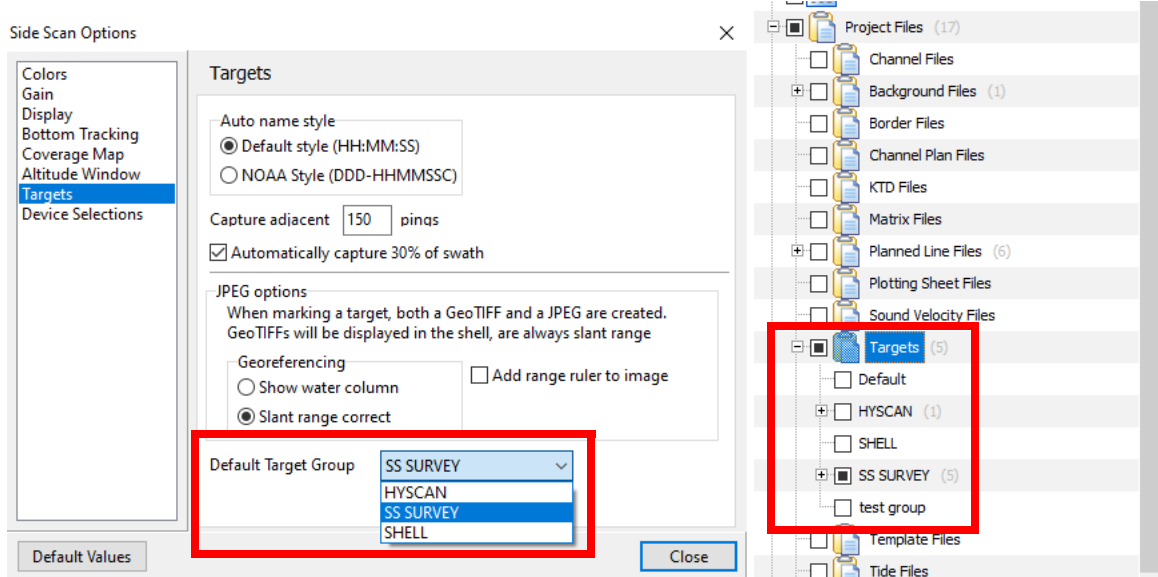
In the following example on the right, LOG and RAW files are now named using the new date standard.



## SIDE SCAN SURVEY

- Geodesy ini values are now written into HSX header in side scan.
- Users can now select the default target group to add targets to when marking targets in Side Scan Survey. To use this new feature:
  1. Open Side Scan Survey from the HYPACK Shell by clicking Survey -> HYPACK Survey and Side Scan Survey.
  2. In the Side Scan Survey window, click Targets -> Target Parameters... This opens the Side Scan Options window.

3. In the Side Scan Options window, select Targets from the list on the left. From the Default Target Group dropdown, click on the target group you want your targets to be saved to. As you can see, the target groups in the project are listed in the menu. Then, click [Close].



## HYSWEEP<sup>®</sup> SURVEY

- HYSWEEP<sup>®</sup> Water Column Logger now properly supports and displays TruePix compressed water column imagery. See the addition of the Pass Through Port field in R2Sonic Device Setup in the [HYSWEEP Device Driver Updates](#) for more information on setting up TruePix logging for R2Sonic devices.

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## DATA PROCESSING

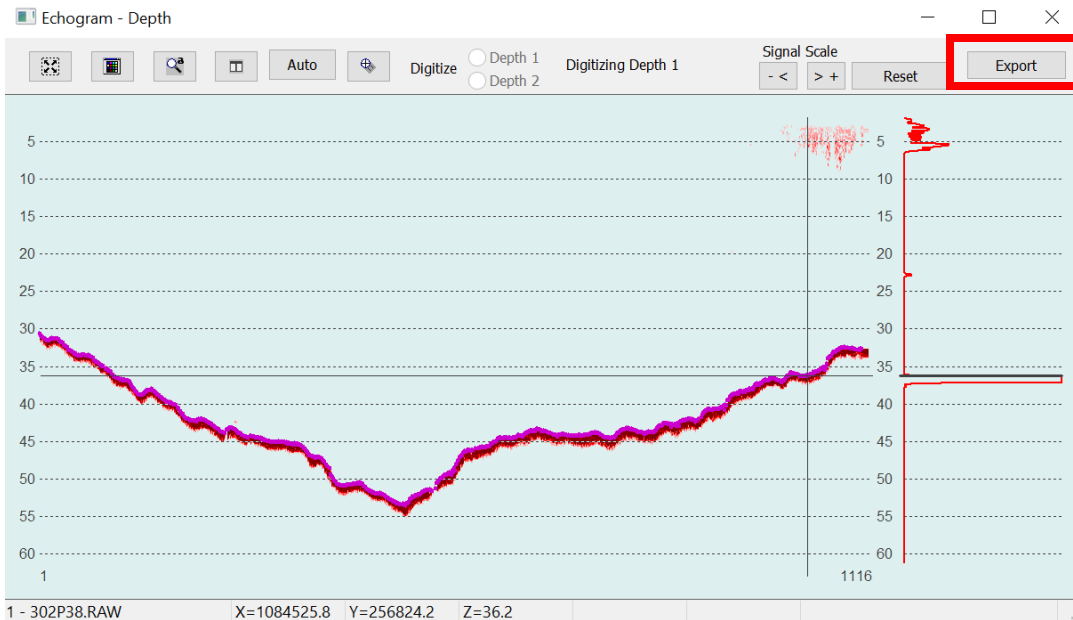
### 64-BIT SINGLE BEAM EDITOR (SBMAX64)

- Offline Statistics added from File Menu (has list with median.avg/std dev values and draws histogram underneath).
- Sounding Migration added from File Menu.
- Echogram window right click and drag to pan works like it does in Profile Window.
- Added message to Device Offsets that the place to adjust tide is in raw file adjustments
- Added note to device offsets stating what units everything is in.

### ECHOGRAM WINDOW

- Users can now export signal intensity data from echograms, and a new Export button has been added to the SBMAX64 echogram window to create these ASCII

## \*.txt files.

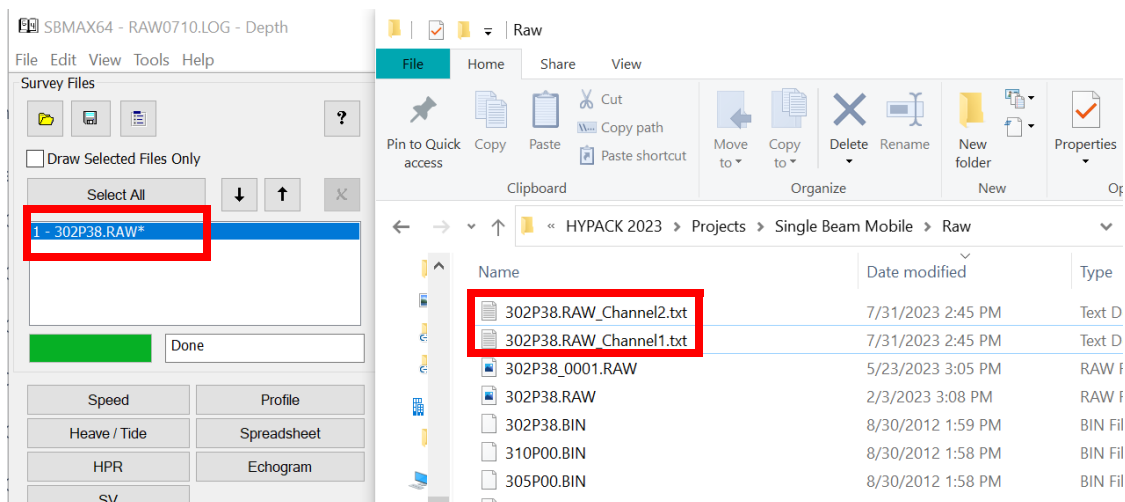


To use this new function, you will need to first load a \*.raw file and open the data in the echogram.

From the HYPACK Shell click Processing -> Single Beam Editor (64 bit), and the SBMAX64 window opens. Click Load Survey, and in the Raw folder select the LOG file and click [Open]. Click any of the \*.raw files in the Catalog window, then click [Select]. In the Read Parameters window, click [OK]. Back in the SBMAX64 window, click [Echogram] to open the echogram window(s).

Once in the Echogram window, click [Export]. In the Save dialog, choose the desired folder to save the exported files, then click [Select Folder]. The program exports each sample as a number, and data is grouped into rows by ping.

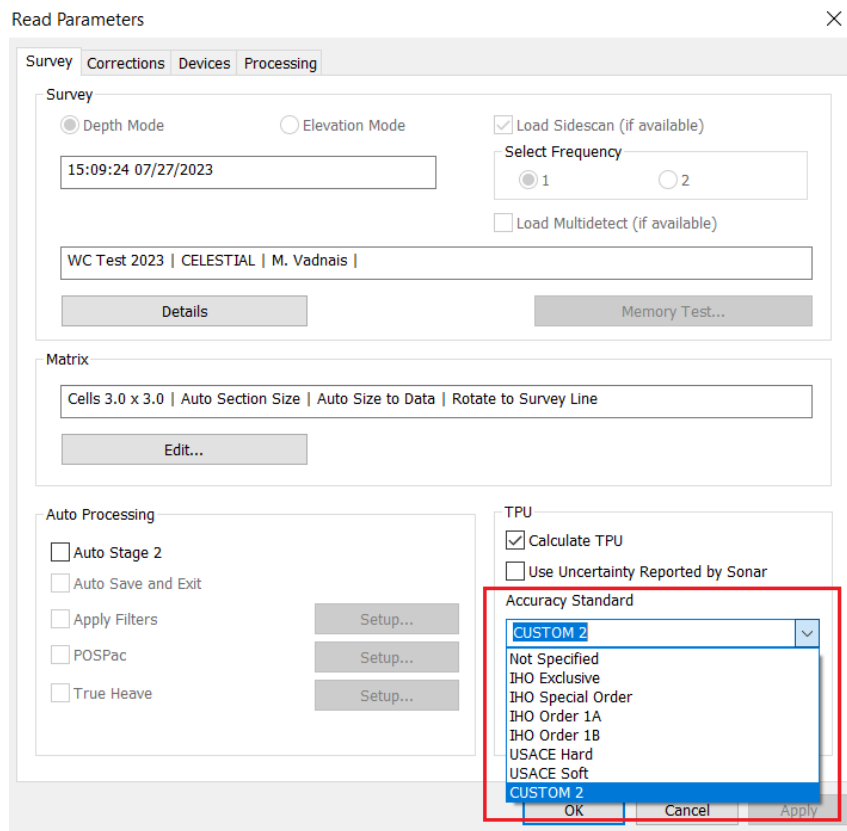
As you can see, each file contains intensity data from a single depth channel. File names are in the format of RawFileName.RAW\_Channel#.txt.



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## 64-BIT HYSWEEP® EDITOR (MBMAX64)

- The HYPACK 2023 Q2 release introduced the option to add custom accuracy standards to the TPU Editor. These custom accuracy standards can now be read in MBMAX64 and used in HYSWEEP CUBE, auto-filters, and in matrix display/export.



To use a custom accuracy standard from the TPU Editor in MBMAX64, from the HYPACK Shell click HYSWEEP -> HYSWEEP Editor (64-bit) to open MBMAX64. In MBMAX64, click Load Survey, select the desired LOG and RAW files, and in the Read Parameters window under the TPU section, select the custom accuracy standard from the Accuracy Standard drop down menu.

For more information on adding custom standards in the TPU editor, refer to [Custom Devices and Standards in the TPU Editor by Jocelyn Kane](#).

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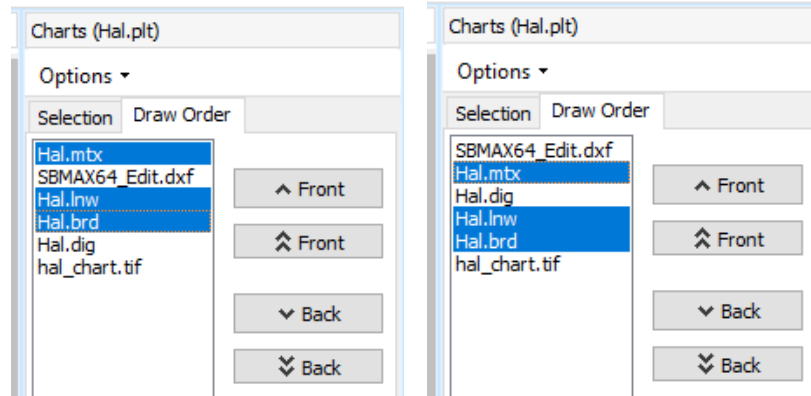
## FINAL PRODUCTS

### HYPLOT MAX

- Users can now select multiple charts and reorder them together in the Draw Order tab under the Charts section. To select more than one chart, hold CTRL and click on the chart names, then click [Front] or [Back] to move them. The following images show

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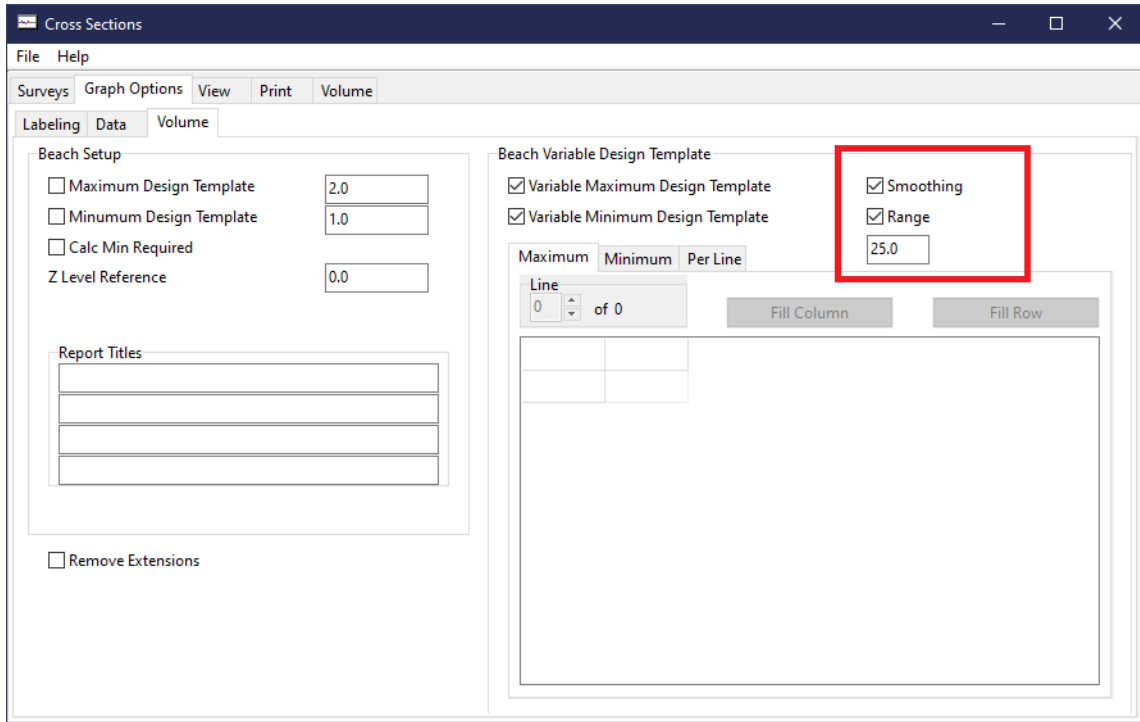
this behavior - the left image shows the selected charts, the right image shows the order of the charts after the top [Back] button has been clicked.



## CROSS SECTIONS AND VOLUMES

- **Added the Smoothing and Range options to Beach Variable Design Template in the Graph Options -> Volume tab.** Check "Smoothing" to connect the variable design template segments at their intersections. Check "Range" to limit this feature to intersections with a DBL value within +/- the value of the user-entered number from the original intersection of the two segments. The template segments are only smoothed if

the intersection line touches the segment within its points.



An example of smoothing applied to a beach variable design template is shown below.

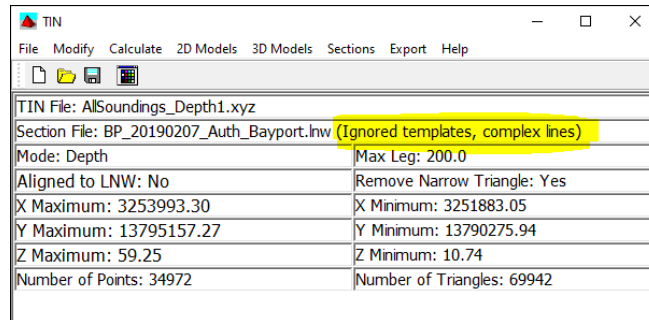


## TIN MODEL

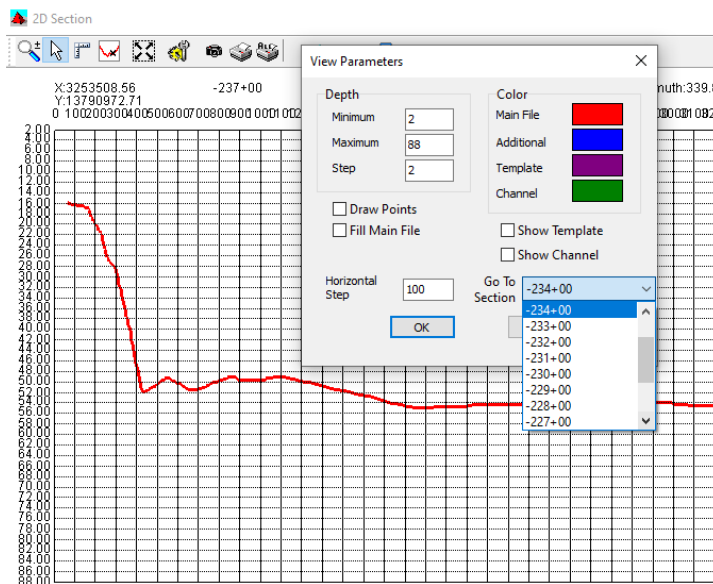
- Fixed an issue where checking Show Picture in the Export window resulted in nothing displaying in the in the picture area of the Volumes dialog. Now, when Show

Picture is checked, the channel, lines, and borders are shown while volumes are calculated, and the TIN model will be drawn when calculations finish.

- The TIN Model program now displays the warning message “Ignored templates, complex lines” next to the file name in the main window if a \*.lnw is loaded with templates but has lines with more than two points. Note that templates cannot be displayed with complex lines.



- The 2D Section View Parameters dialog has been updated to display section names instead of the section index.



## ENC EDITOR

- Added support for \*.tgt and \*.kmz files both for SHOM AML dialog and in general import dialog.
- Attribute editor now allows editing of string type attributes in a memo component, making it easier to edit lengthy text data.
- Colored elements in SHOM AML tree: Red: show stopper! Yellow: Warns of missing source file. Green: All good.
- Moved Boundaries tree item to the top to show its importance.
- Completion message at end of process.
- Corrected format specifiers inside hySchema.hsf.
- Added name builder behavior and protective marking attribute to SHOM AML dialog.

- 
- Remarks from hySchema.hsf displayed in Attribute Editor for Code String attribute types.
  - Double click to edit Spatial Attribute.
  - Proper handling of Agency attribute.
  - Removed side effects, both potential and actual, from editing attributes from multiple points inside the UI.
  - Added a “TIN Import” item to the SHOM AML dialog. Allows the user to select a TIN generated \*.dxf file and run the TIN Import routine upon it. This routine creates Depth Areas and Depth Contours in the final chart.
  - Cosmetic Change - Item “TIN Import” renamed “Depth Contour” and moved under the CLB branch.