



HYPACK® 2021 Release Notes

Changes Since the HYPACK® 2020 Release

By Judy Bragg

Our programmers have been hard at work this year on some nice upgrades for you in addition to some longer term development projects, and the usual bug fixes. (There are always bug fixes!) The following highlights the majority of release items in the HYPACK® 2021.

SHELL

- **Restored circle settings to the Shell settings dialog for default values.** If the attributes exist, they draw with the values assigned. If they don't, they draw the default settings.
- **Grid settings** have been moved from the Control Panel to the Widgets in each Map window.
- **Locked Licenses:** Appear in the License Manager and tell you the computer to which it is locked.

License Manager (Key View) Shows if License is Locked and to Which Computer

Target Display
 Circle Alarm

Circle Settings
Number of Circles:
Circle Radius:

Alarm Distances
Low (Green):
Medium (Yellow):
High (Red):

Key View

File Help

Locked License Key 163 Server Config

Products

- HYPACK® MAX
- HYSWEEP®
- DREDGEPACK®
- HYPACK® ACOUSTIC
- HYPACK® MARINE SEARCH

Key ID: 163
User ID: 1
Leased:
Term/Subscription:
Licenses: 5
Maintenance Plan Ends: 31-Dec-2029

User Name: JL
Reseller: HYPACK Inc
S63 Permit: [Redacted]
ARCS Permit: [Redacted]
ARCS Pin: 1234

Load License... Update Key

Rescan Close

Key View

File Help

Locked License Key 163 Server Config

This key's license is locked to the computer \\USXIN [Redacted]

- **Drawing HS2X Soundings for multitransducer sonars:**
 - > If there are two or fewer transducers, the soundings will draw.
 - > If there are three or more transducers, the soundings will not draw.
 - > HS2x files with SonTek M9 HydroSurveyor data draw the center beam soundings.
- **Corrected S57 drawing engine.** Unicode and case sensitive resulted in question marks in place of certain chart objects.
- **Interface translations** updated.

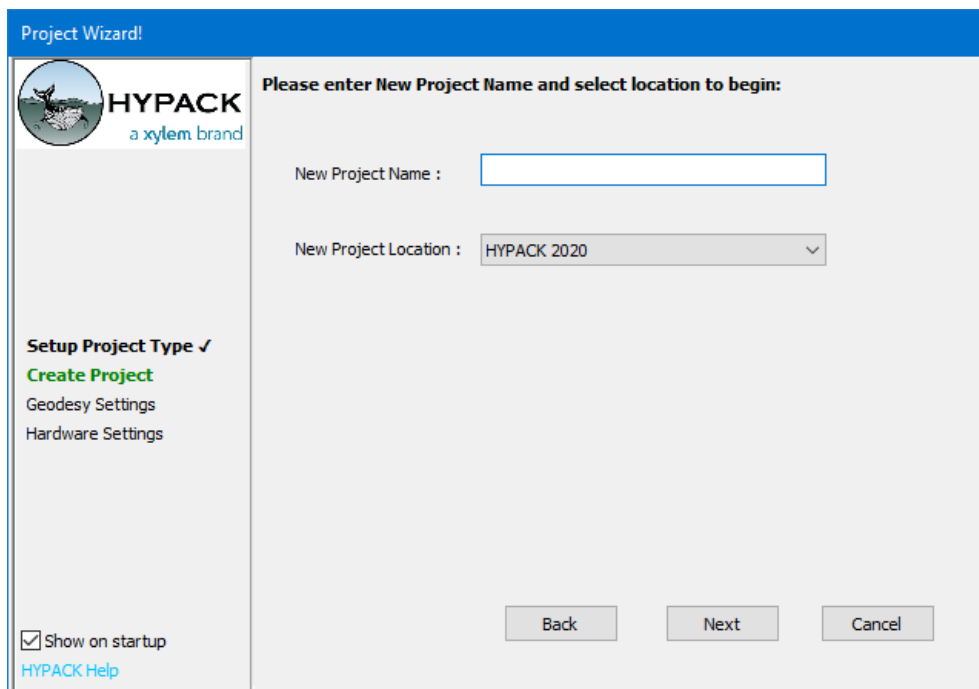
PROJECT WIZARD

In the Project Wizard, you can quickly open an existing project or create a new one using the same or similar geodesy, hardware and data acquisition settings as an existing project. When you create a new project, you can use only the geodesy, hardware and acquisition settings (Create New Project), or also include the planned lines, charts and most other non-data files (Copy Existing).

NOTE: If there is no existing project from which to copy, it may be just as easy to create your project from the Project Manager then use the GEODETIC PARAMETERS and HARDWARE programs to configure your geodesy and device options, respectively.

The Project Wizard is ideal for users who use the same vessel with the same hardware and work in the same project area. Your work might be predredge and postdredge surveys, historical comparisons for environmental studies or beach replenishment, or updating depth data in areas of high erosion or sedimentation.


Naming your New Project



The screenshot shows the 'Project Wizard' dialog box. On the left side, there is a sidebar with the HYPACK logo (a xylem brand) and a navigation menu. The menu includes 'Setup Project Type' with a checkmark, 'Create Project' (highlighted in green), 'Geodesy Settings', and 'Hardware Settings'. At the bottom of the sidebar, there is a checkbox for 'Show on startup' which is checked, and a link for 'HYPACK Help'. The main area of the dialog box has a blue header with the text 'Please enter New Project Name and select location to begin:'. Below this, there are two input fields: 'New Project Name' with an empty text box, and 'New Project Location' with a dropdown menu currently showing 'HYPACK 2020'. At the bottom right of the dialog box, there are three buttons: 'Back', 'Next', and 'Cancel'.

Project Wizard Geodesy Settings Interface

Project Wizard!



Setup Project Type ✓
Create Project ✓
Geodesy Settings
Hardware Settings

Show on startup
[HYPACK Help](#)

Edit Geodesy Settings: [Advanced Settings](#)

Grid
 UTM North
 UTM South
 State Plane NAD-83
 Other


Zone:

Distance Unit:

RTK Tide Method:

Project Wizard Hardware Settings Interface

Project Wizard!



Setup Project Type ✓
Create Project ✓
Geodesy Settings ✓
Hardware Settings

Show on startup
[HYPACK Help](#)

Edit Hardware Settings: [Edit Settings](#)

Mobiles ▲
Boat
 HYPACK File Simulation

Information	Source
Position	HYPACK File Simulation
Depth	HYPACK File Simulation
Heading	none
Heave	none
Pitch	none
Roll	none
HYSWEEP Survey	Not Configured
Sidescan Survey	Not Configured

Position
 Depth
 Heading
 Heave
 Pitch
 Draft

AREA MAP DISPLAY

CURSOR LAT/LON DISPLAY

Option to display the cursor Lat/Lon position in the status bar using Local or WGS84 coordinates. Previously, Lat/Lon was always displayed using local datum coordinates.

Control Panel—General Tab

The screenshot shows the 'Control Panel—General Tab' with three main sections:

- Data Colors:** A list of color swatches for 'Borders' (black), 'Matrix Outline' (red), 'Plot Sheet' (black), 'Background' (white), and 'KTD Color' (black). A 'Color' button is located to the right of the swatches.
- Lat Lon Display:** Two radio buttons: 'Local' (selected) and 'WGS84'.
- LAT LON Format:** Three radio buttons: 'Degrees', 'Minutes', and 'Seconds' (selected).
- Automatic Searching:** Three checked checkboxes: 'Data Files', 'Project Files', and 'Scan Project when opened'.

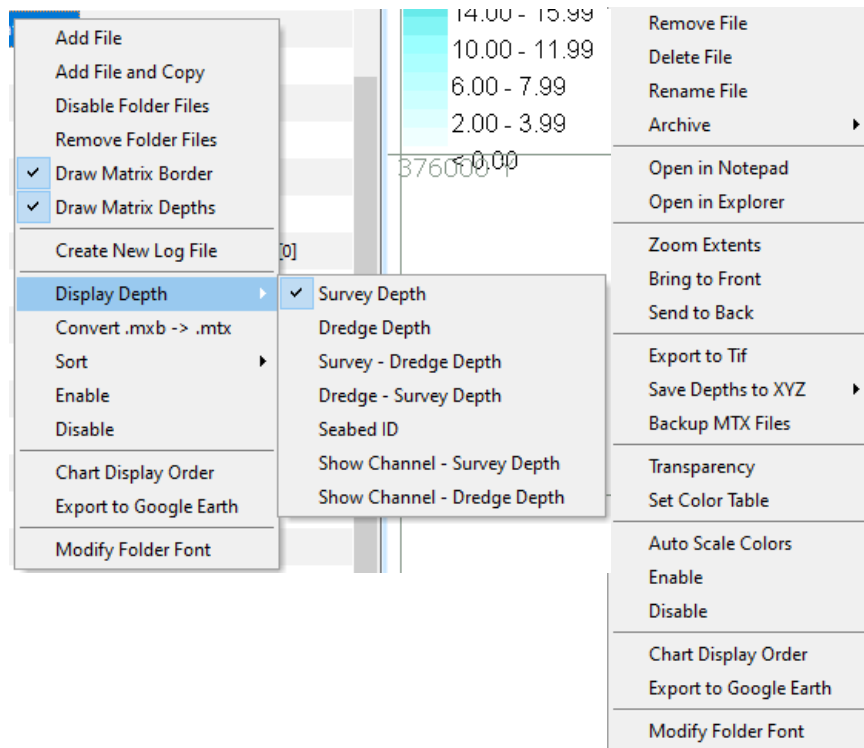
NEW MATRIX FILE VIEW OPTIONS

Access the display options by right-clicking on the Matrix Files label and on the matrix file name in the Project Items list. In each case, a pop-up menu appears:

The Draw options control how all matrix files appear in the map:

- **Draw Matrix Border** shows all matrix file borders.
- **Draw Matrix Depths** shows the filled cells.

IMPORTANT: You must select at least one of these options to see enabled matrix files in the Map window display.



PROJECT COLORS SIMPLIFIED

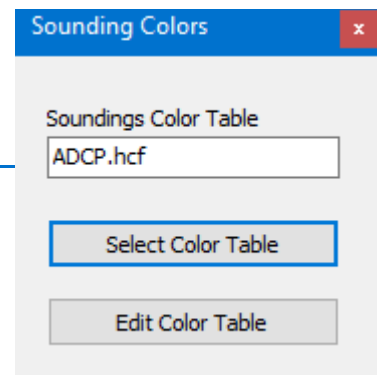
The HYPACK Color Table has not changed! It is the mechanism HYPACK® uses to assign a color to a value for display purposes. A value is typically regarded as a depth, but might also be a magnetometer reading or other sensor value. The table itself consists of a series of (value, color) entries, called bands, in ascending order from least to greatest value. A band represents a color transition point. All values greater than or equal to a band up to the next band will thus be assigned the same color. The first table entry provides a default color for all values less than the minimum defined band, while the last entry provides the color for all values greater than the highest defined band. In this way we ensure a color is output for any given input value. Each of these color table configurations is stored in its own HYPACK® Color Files (*.HCF).

What has changed?

- The **Sounding Colors** panel displays the color table that defines the default project colors, and provides tools to edit the current table or choose a new default table.

Sounding Color Panel

- > **Displays the name of the current default color table** in the project.

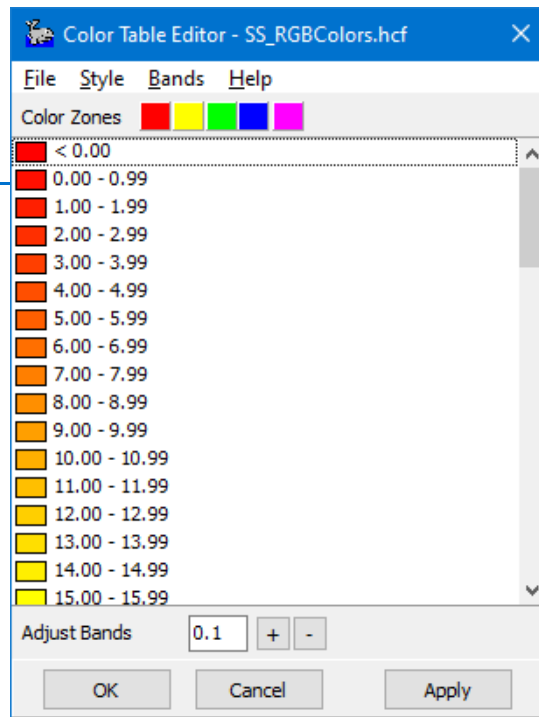


- > **[Edit Color Table]** Opens the familiar Color Table Editor where you define or modify the ranges and colors in a HCF file.

Color Table Editor

Define as many color files as you want and name them whatever makes sense to you. (It is probably helpful to name them in a way that you know when to use it appropriately in your future work!)

Tip: *New in this release:* HYPACK® Color Files may be stored in the project folder or in C:\HYPACK Store. The HYPACK Store location enables you to share one or more color files across all of your projects.

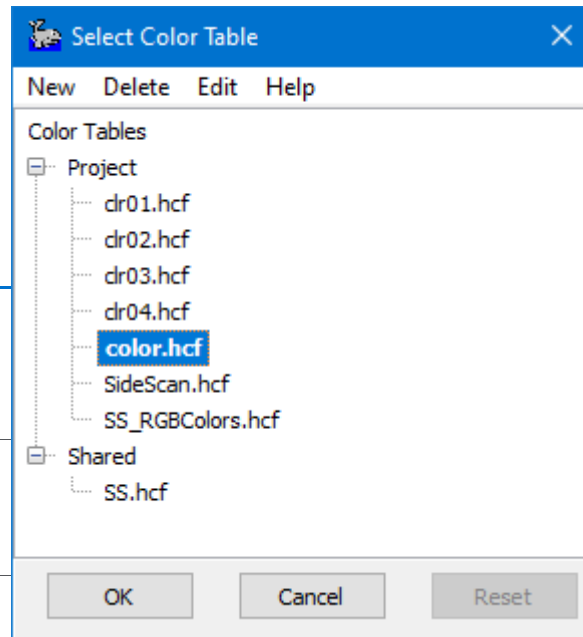


- > **[Select Color Table]** opens the Color Manager (Select Color Table dialog) where you can choose a different HCF file for the default project colors from a list of all of the HCF files in your project folder and in C:\HYPACK Store.

Color Manager

Tip: When you select a color file, you can preview its effect in the Map display before you give it the [OK]!

NOTE: Select and Edit Color Table options are also available when you right-click the color bar.



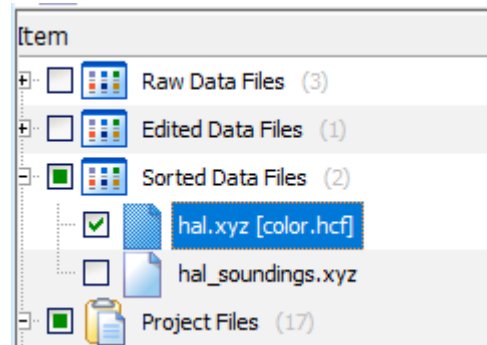
- **Palettes have been eliminated** in favor of a selection of HYPACK® Color Files (*.HCF).

- **Assign HCF colors to one or more individual XYZ or Matrix files:** Select then right-click on the file or files in the Project Items list and select Set Color Table. Select your color file and click [OK]. The color file name appears next to each file using a color file other than the default.

To remove the individualized HCF assignment, return to the Set Color Table dialog and click [Reset].

- **Auto-Scale Colors to the range of a data file.**

Right-click XYZ or MTX files and select Auto-scale Colors. The current number and colors of bands in your HCF are evenly distributed across the range of data in the selected file.



KNOWN BUG: Color zones can be out of sync with the chosen style in your color table. The autoscale process uses the zone colors, so it is best to assure your zones and style are in agreement by reapplying the style before the autoscale process, *even if your color style does not allow zones*. When you reapply the color style, the zones update.

- Open the desired color table in the Color Editor.** Select the HCF file name and click [Edit].
- In the Color Editor, reapply the color style.** Select STYLE and your desired color palette.
- Verify that the zones match the color bands** in your table and click [OK]. Note, some styles do not display zones. If you have reapplied your style, you can assume the bug condition has been corrected.
- In the Color Manager, select your verified color table and click [OK].** The colors in the table distribute evenly across the depth range in the data.

PREPARATION

CHARTS

- **Restores enabled/disabled DGW chart layers** after restart.
- **DG2 EDITOR allows parentheses in attributes** as required by the Signal Group attribute for S53 light features.
- **New web server bug fix:** Corrected bug that caused an error message when adding a new web server.

GEODESY

RTK SUPPORT

- **Support for ITRF2014 Time Varying Transformations** required for the Trimble RTX Correction Service.
- **Corrected RTK calculations using a geoid model with a KTD file.** They were not applying KTD.

GEOIDS

- **Updated g2018-CONUS.geo and g2018-PR_VI.geo** based on the updated NOAA data.
- **Added Geoid Model for Poland.**---Source of measurements on which it's based pending.
- **Updated geoid for Finland:** FIN2005N00.geo. The model contains geoid heights to transform ellipsoidal heights in the ETRF89 system to normal heights in the Finnish N2000 height system.
 - Latitude: 59.00 - 70.70 degrees,
 - Longitude: 17.48 - 33.00 degrees
 - Latitude spacing: 0.02
 - Longitude spacing: 0.04
- **Denmark S-34 grid** bug fix.

PLANNED LINE TEMPLATE VALIDATION FOR VOLUME CALCULATIONS

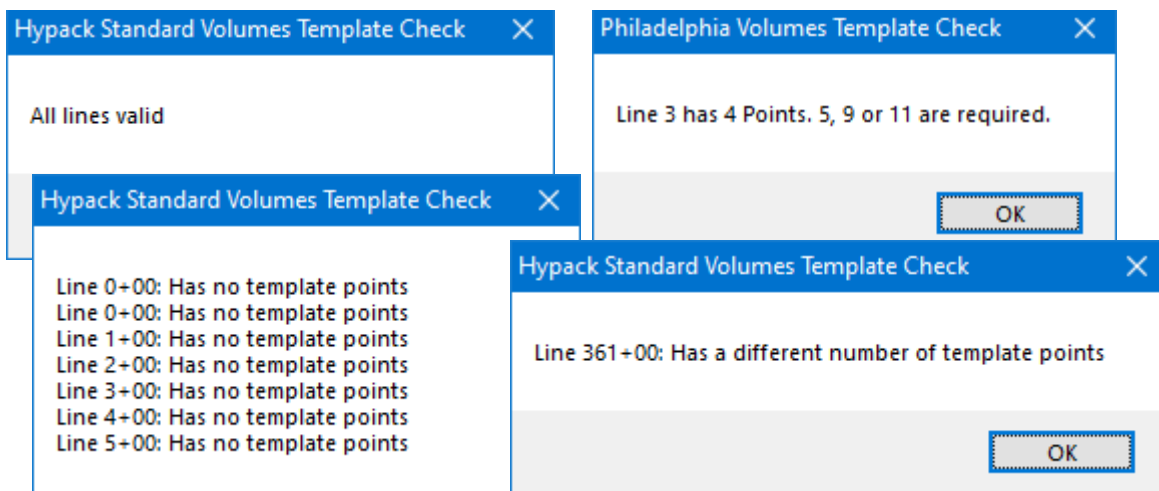
The LINE EDITOR can check the template information in a 3D planned line file to verify it is appropriate for Standard HYPACK® or Philadelphia volumes calculations in the CROSS SECTIONS AND VOLUMES and TIN MODEL programs.

It looks for the following characteristics:

- Each line has template information.
- A consistent number of points define the template in each line in the file.
- Philadelphia methods require 7, 9 or 11 template points.

Select TEMPLATES-VOLUME CHECKS and the volume calculation method. When the check is complete, a message appears with the results:

Messages for Checking the Planned Line Templates



HARDWARE

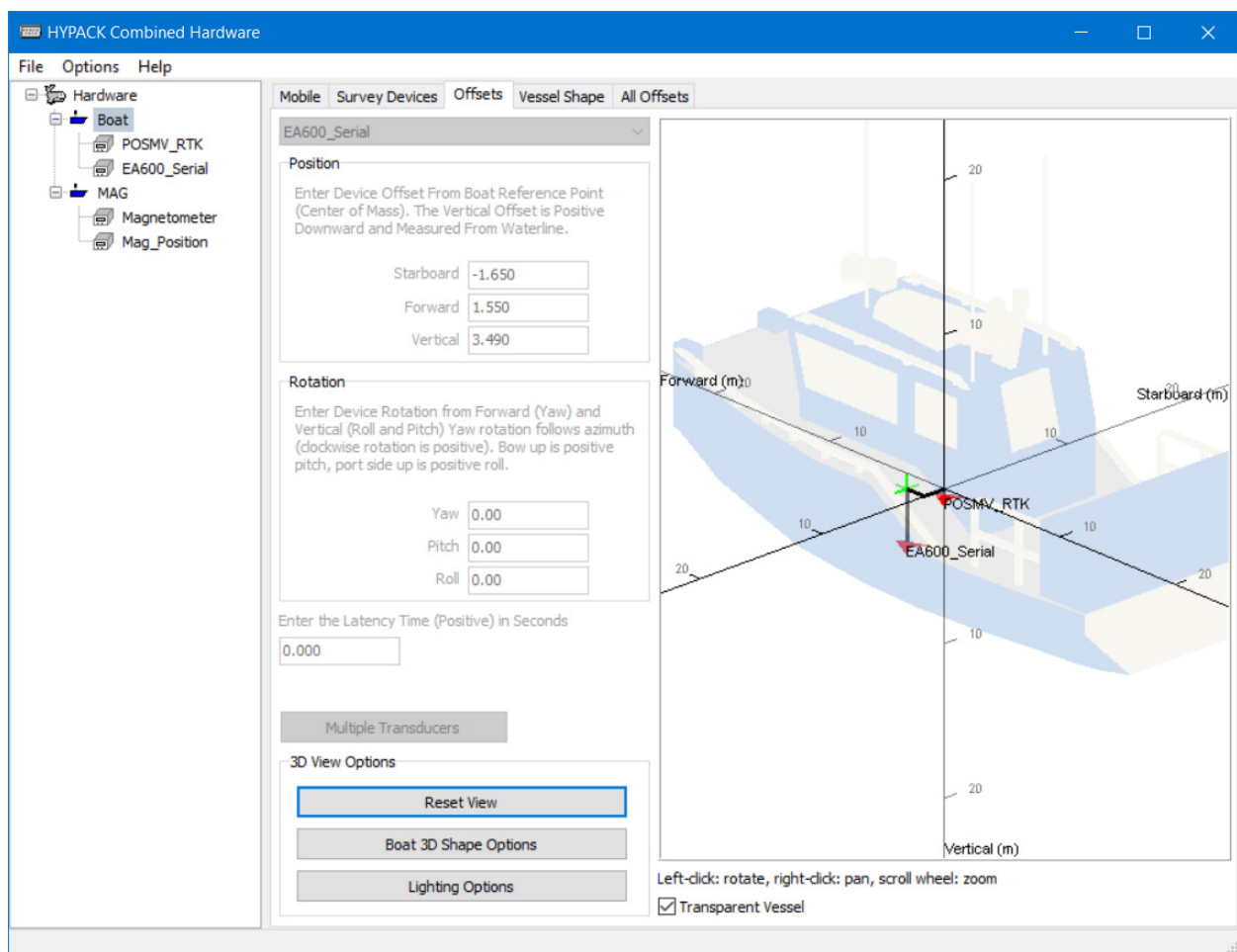
3D HARDWARE

3D VISUALIZATION

3D visualization in the Offsets tab, and the spreadsheet in the new All Offsets tab, make it easier to see and configure the device positions relative to the vessel center and each other.

The Offsets tab shows one mobile at a time with all of its devices displayed according to their offset positions. A small green symbol indicates the defined tracking point. You can use your cursor to shift and rotate the display to view it from any angle. In the 3D Options dialog, you can configure a 3OD shape file of each mobile and device to represent your configuration as closely as possible.

3D Visualization



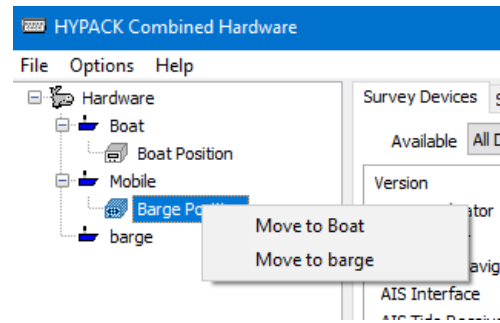
ALL OFFSETS SPREADSHEET

The All Offsets tab shows a spreadsheet of all devices in the configuration and their offsets. You can edit your offsets in either the Offsets or All Offsets tab, as necessary.

Device	Type	Starboard	Forward	Vertical	Yaw	Pitch	Roll	Latency
Survey Devices								
POSMV_RTK		0.000	0.000	0.400	0.000	0.000	0.000	0.000
EA600_Serial		-1.650	1.550	3.490	0.000	0.000	0.000	0.000
Magnetometer		0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mag_Position		0.000	0.000	0.000	0.000	0.000	0.000	0.000

REASSIGNING DEVICES TO ANOTHER MOBILE

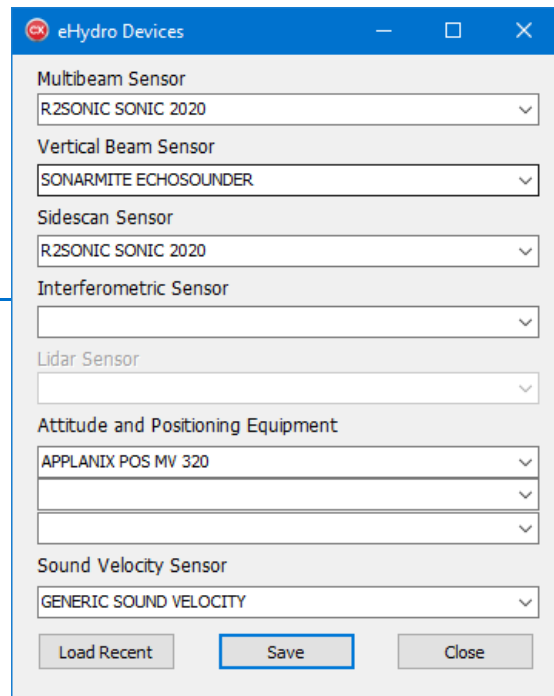
Previously, if you wanted to assign a device to a different mobile, you had to remove it from the configuration then reinstall it on the correct mobile. Now, just right-click the device in the tree view and choose the appropriate option.



eHYDRO DEVICE METADATA

If you are USACE eHydro reporter, set your metadata in the System tab in HARDWARE: Click [eHydro Devices] then enter and save the device information. This metadata is stored in the headers of your HSX data files and passed to the 64-bit HYSWEEP® EDITOR in post-processing. ([Exporting eHydro Metadata](#))

FIGURE 1. eHydro Devices Dialog



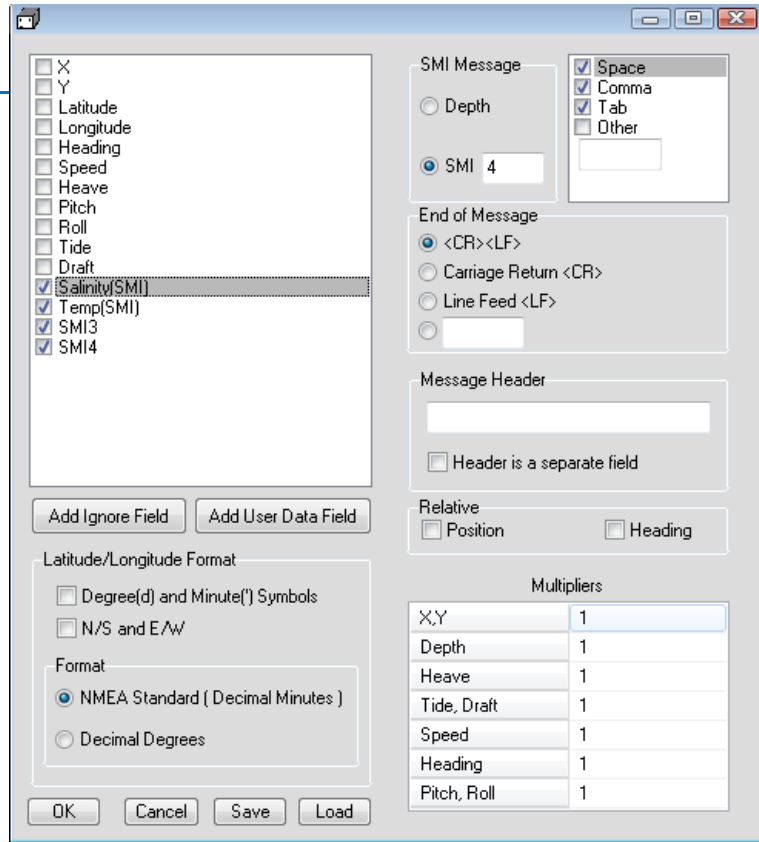
HYPACK DRIVERS

- **Coverage.dll:** Replace DIG with DG2 files with filled areas.
- **Echologger.dll:**
 - > Added new output modes for D24 dual frequency.
 - > Support for Simple Altimeter (output 1) and Altimeter Dual (output 7).

- **GenDevParse.dll:**

GenDevParse Driver Setup

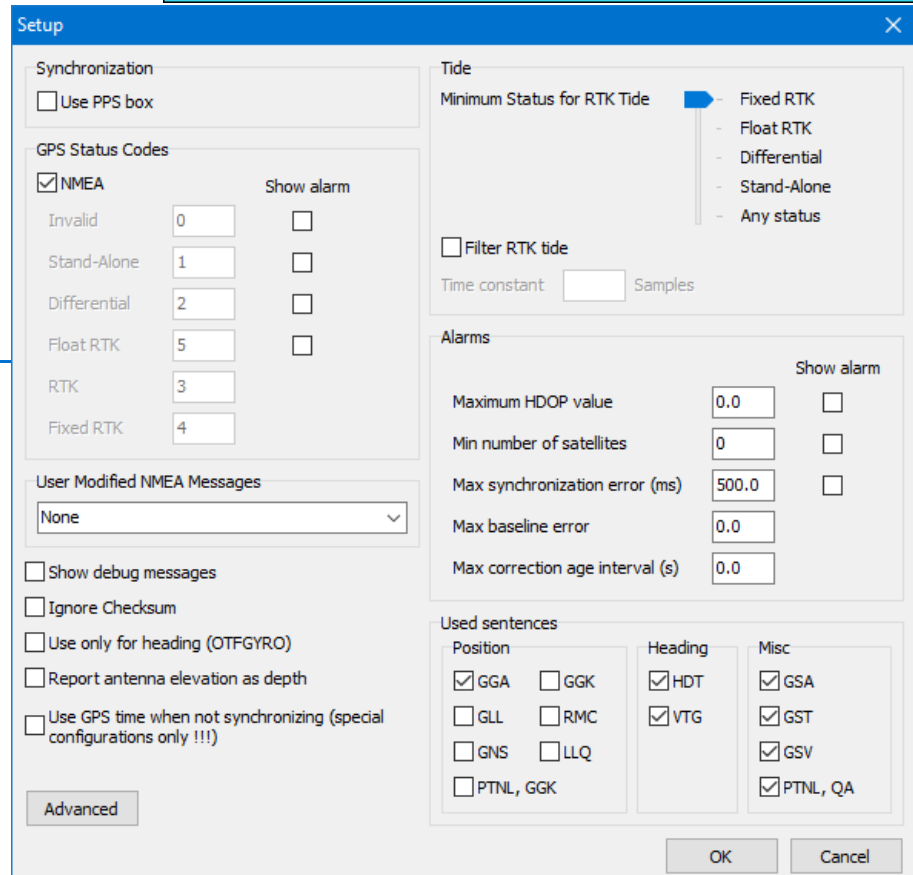
- > Expanded to support logging environmental data to HYPACK® SMI records. Specify the number and names of each recorded value in the driver setup dialog.
- > Added directional checkboxes when Lat/ Lon is selected.



- **GPS.dll:**

- > Changed Driver Setup. The same options are available, but in a single panel dialog.

New GPS Driver Setup Dialog



- > Changed Device Window. The display groups related items. Using the arrow buttons on the headings, expand and hide groups, to show only the information you need.

Sample GPS Device Window

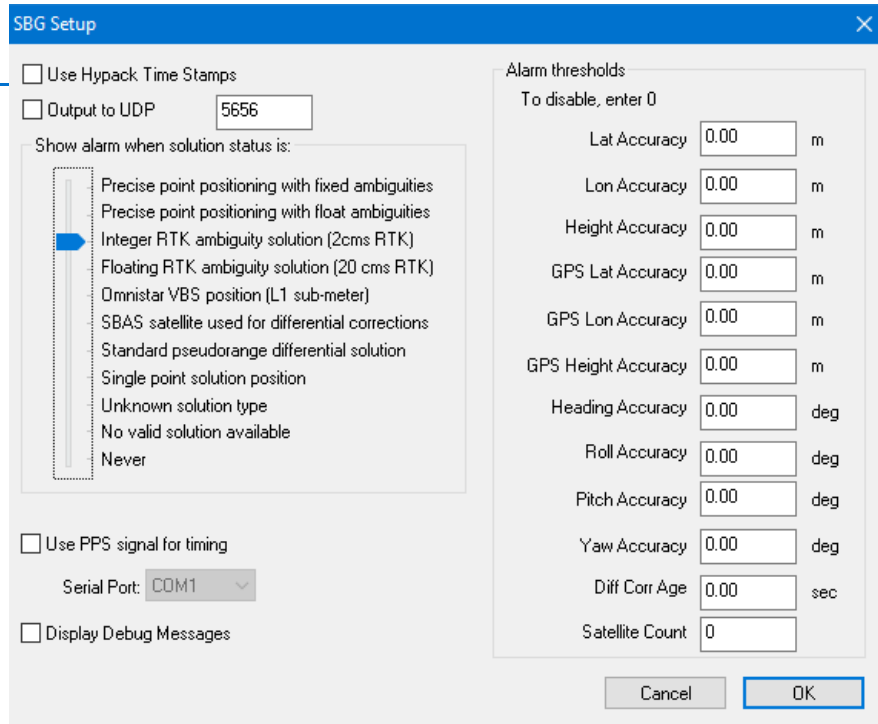
- > RTK in the device window and Data Display corrected. Values had been labeled in reverse.
- > Depth shows as N/A when the Depth function is unselected.
- **NMEAOutput.dll:** Exports GGA ellipsoid height to 3 decimal places per NMEA standard.
- **Novatel.dll:** Output Novatel SPAN-CPT data to HYSWEEP data over loopback. Set the port number to the same port as the HYSWEEP driver (any port will work as long as they match)
- **Phins.dll:** Reads correct heave field.
- **Playback.dll:** Reads EC2 records
- **POS MV:**
 - > Updated to support new correction services from FUGRO. (Codes 17-19 in Group 3)
 - > Updated Survey window
 - > Corrected misplaced RTK (N and K) labels.
 - > Stores KTD record to the RAW header.

GPS NMEA-0183	
General	
Mode	Differential
Lat	41°29.6511 N
Lon	072°41.3001 W
Easting	-309151.23
Northing	4639175.92
Tide Corr	-0.00 m
Speed	N/A
Depth	62.15 m
Heading	0.0°
Time source	computer
Sync Error	N/A
RTK	
Ell Height	62.15 m
Elevation	0.00 m
A= WGS84 height	62.15 m
H= Z offset	0.00 m
D= Draft	0.00 m
N= Geoid Ht above CD	N/A
K= Undulation	N/A
K-N= Ellipsoid Ht above CD	N/A
WGS84	
WGS84 Latitude	41°29.6511 N
WGS84 Longitude	072°41.3001 W
WGS84 Height	62.15 m
Uncertainty	
Sigma N	0.00
Sigma E	0.00
Sigma Z	0.00
Number of Satellites	9
HDOP	1.3
Corr age	4
Misc	
Baseline	N/A
Baseline err	N/A

- **SBG.dll:**

- SBG Driver Setup*

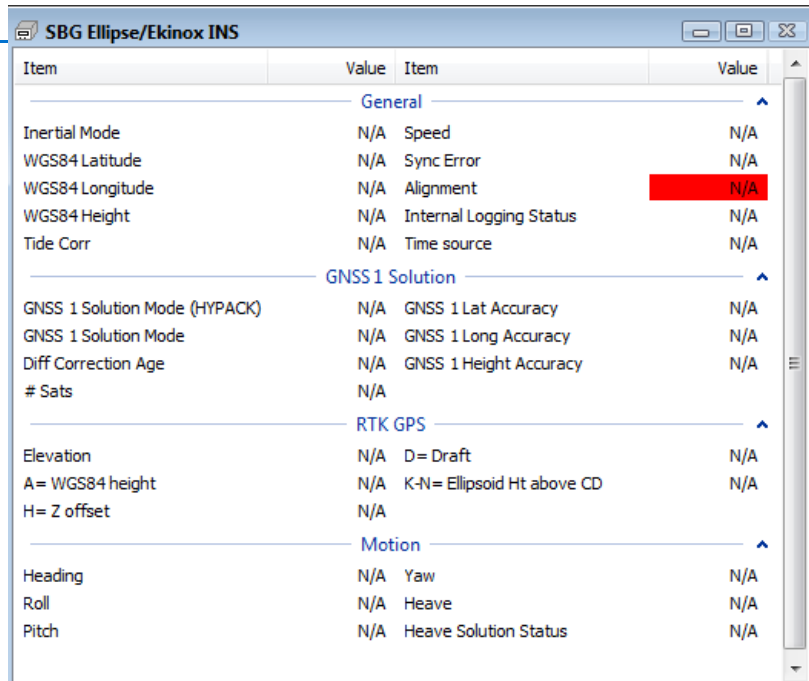
- > Accuracy is now combined with actual measurement field, e.g. "Long: 4°56'36.00"N (0.02m)".
 - > Device window displays 'd' for degrees.
 - > In the setup, the alarm levels for GPS status now mimic the actual reported GPS statuses, *not HYPACK statuses*.



- > Records POS and SBG Solution status

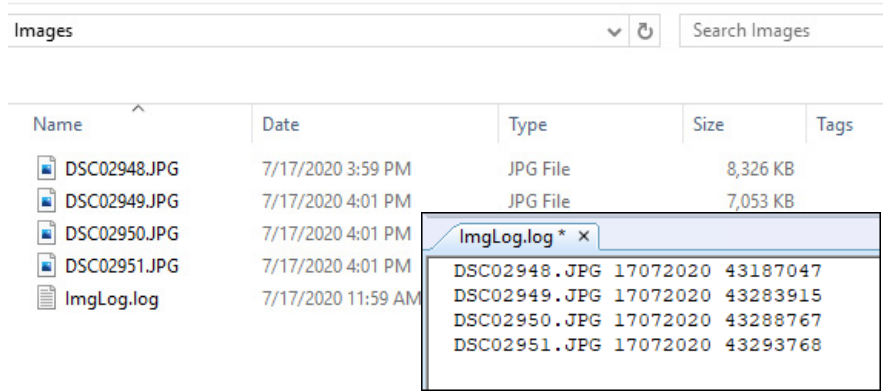
- SBG Device Window*

- > Records Roll, Pitch, Yaw and SBG Solution status
 - > Records Heave and SBG motion Solution status
 - > Handles SBG Invalid Mode.
 - > Handles SBG Raw Datagram.
 - > Expanded Data Display in the SBG Device window.



- **SonyIntf.dll: New Driver**

- for Sony UMC R10C camera: This driver outputs image files at user-defined picture interval and displays the most recent in the device window. Each image is recorded with a time stamp to \HYPACK 2021\Projects\ProjectName\Images\ImgLog.log, which facilitates the correct image display with the corresponding survey data in the 64-bit HYSWEEP® EDITOR.



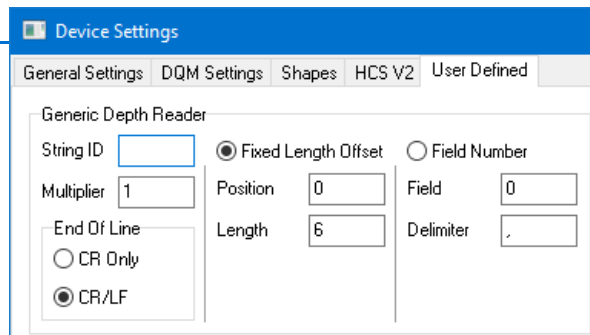
- **Subbot.dll:**
 - > Supports new HMS-621.
 - > Falmouth device depths logged to SEG Y
- **SHOMMagnet.dll:**
 - > Support Gamma, Depth, and Altitude in the Data Display.
 - > Supports Seaspy output modifications (altimeter off).
- **Towfish.dll:**
 - > Displays Cyrillic fonts correctly.
 - > Prevents problem when using a cable counter and layback=0.
- **Tritech.dll:**
 - > Updated to match manufacturer specifications and ping rate is displayed in the Device window.
 - > Added ping rate status bar.

DREDGE DRIVERS

- **Bucket.dll:** Added Push Button (DSR Only) method to trigger buckets whenever the driver reads DSR from the COM port. Select this option if the CTS in your system is always on, which would cause constant buckets from the Push Button CTS/DSR option.
- **DQM Hopper24.dll:** Bug fix to save time scale for the chart.
- **DQM_Mech.dll:**
 - > **User-defined System Type:** When the System Type is User-Defined, the User-defined tab appears where you configure the driver to parse the string received as depth.

FIGURE 2. Driver Setup—User Defined Tab

- > **T7 Boom Inclinometer/T7 COM Port:** When the boom angle is measured using an inclinometer, check this option. Enter the serial port number that receives its data and choose which angle value (from the three in the device output) the driver should read.



-
- > **Added Relative To option in the Setup** to select the mobile to which the heading is relative. We found it was not reliably either the device defined in the HARDWARE Offsets tab or the first mobile.
 - > **Custom System Type:** Added a tab that becomes visible when you select the Custom type. Depth string output: xxx.xxx, CR, LF. This tab is similar to the DraftTable User-Defined option. Right now the only field it will parse is Depth.
 - > **Added custom boat shapes** in \HYPACK 2021\Boat Shapes\Shapes for the DQM Crane Drivers.
 - **Numerous custom drivers by contract.**

HYSWEEP DRIVERS

- **NORBIT:**
 - > **Rotator angle pass through to HYPACK® SURVEY through shared memory** (Use Rotator Data option in the driver setup) for rotator pan angle in multibeam calculations.
 - > **Basic GPS data pass-through to HYPACK® SURVEY through shared memory** (Use Pass Through Position, Heading and MRU option). Requires HYPACK® 2021 and HYSWEEP_Extended.dll.
- **Novatel** driver reads data over loopback from the HYPACK® Novatel.dll
- **Dual Head Reson T50P:** Instead of breaking side scan into two channels (one channel per head) data appears in a single, merged display.
- **Teledyne Optech Polaris TLS laser scanner:** [New Driver](#)
- **Velodyne VLP-32:** [New Driver](#)
- **VLP 16 Hi Resolution (20 degree):** [New Driver](#)

TARGET EDITOR

- Target positions exported with 2 or 3 decimal accuracy.
- S57 symbol displays restored.

DATA ACQUISITION

SURVEY

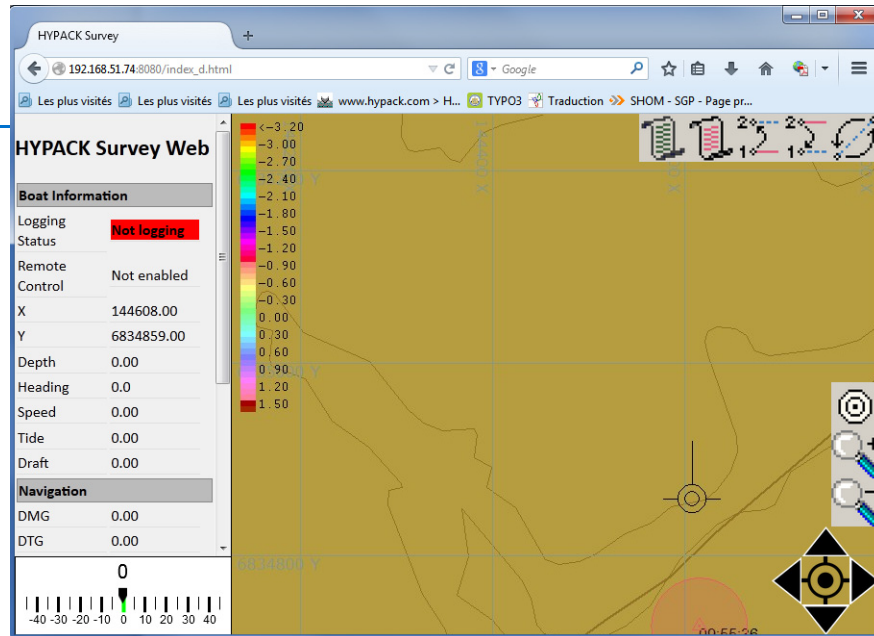
Bugfixes:

- **Survey Remote View:**

[Survey Remote View](#)

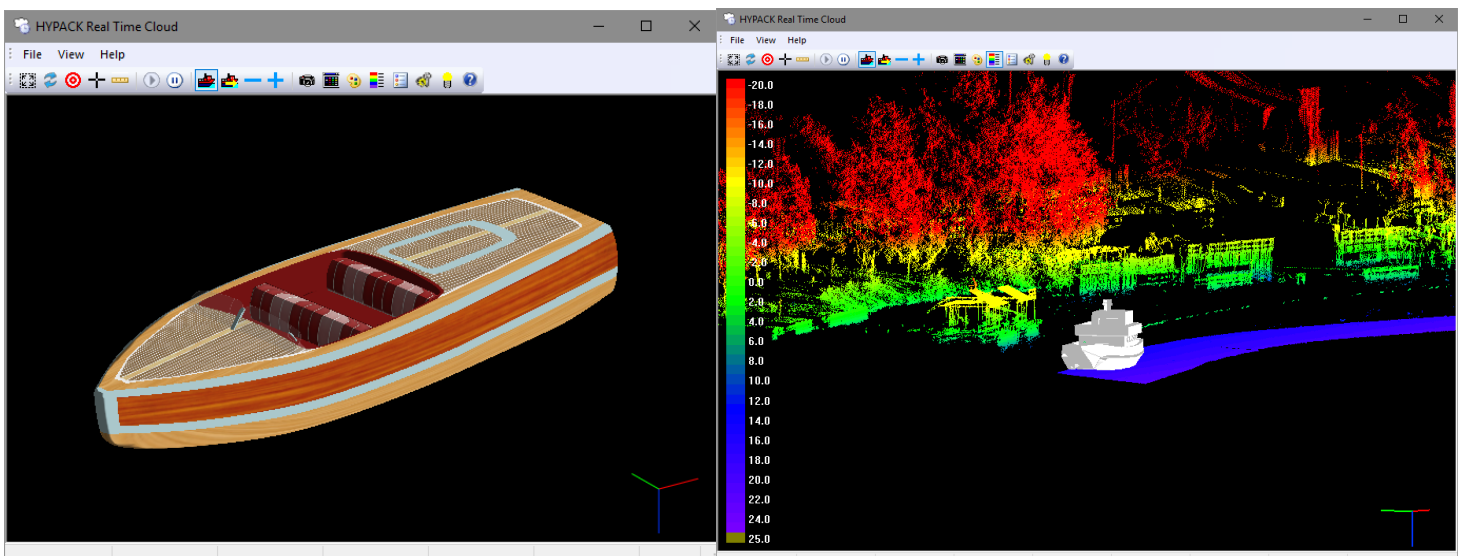
The survey controls (top right) show only if permission has been granted on the survey computer. In the Remote Access setup, the Allow Remote Users to Start/Stop Logging option must be checked.

- **Data Display honors Stay On Top** setting (Style menu)
- **Layer Manager:** Arrows enabled only when a display item is selected.



3D OBJ SHAPES IN THE REAL TIME CLOUD DISPLAY IN SURVEY

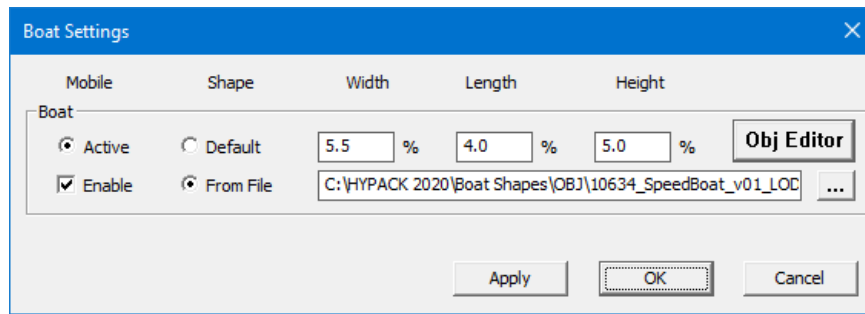
We recently added support for a new 3D file format in Real Time Cloud (RTC)—the OBJ file. These are more available for different objects than the 3DS and 3OD shapes we currently support. They also support textures that provide more interesting objects.



OBJ shapes aren't always created using the same convention for the X, Y and Z axes, and sometimes the shapes are not well-centered over the reference axes.

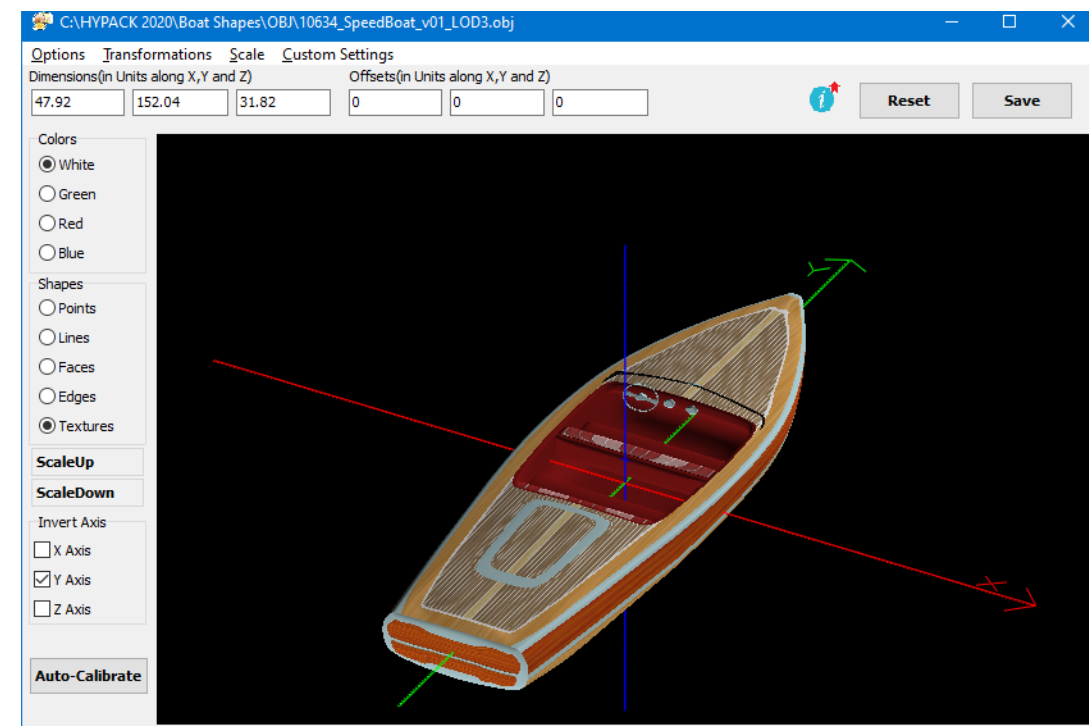
To open an OBJ shape file in the OBJ Editor, open the Boat Settings dialog, select your OBJ file, then click [OBJ Editor].

Launching the OBJ EDITOR from the Real Time Cloud Boat Settings Dialog

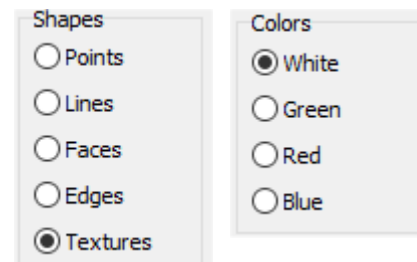


The OBJ EDITOR enables you to modify the files to conform to HYPACK® orientation conventions, to size appropriately for your survey vessel, and to optimize the OBJ shape display in Real Time Cloud.

OBJ Editor



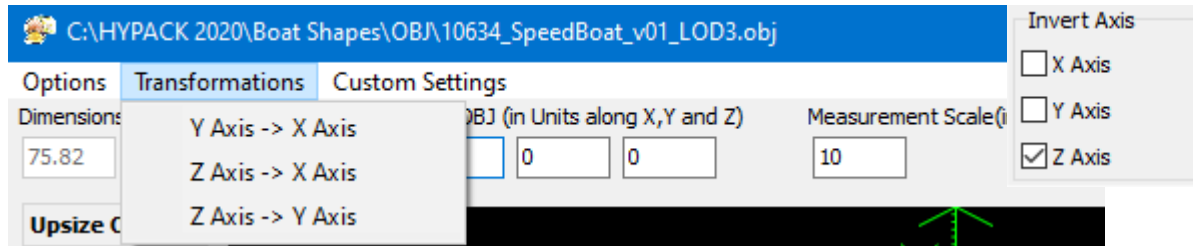
- **Textures:** If you have a texture file, you can apply it during the load process or from the OBJ EDITOR. You may also choose from a selection of alternate surface display methods according to your needs and your computer resources.



NOTE: Complex shapes and large texture files can significantly slow the drawing in Real Time Cloud.

- **Axes:** The OBJ shape should be oriented on the axes according to HYPACK® convention: X runs port and starboard, Y runs forward and aft, and Z is vertical. You can swap and invert axes if necessary.

Modifying Axis Configuration

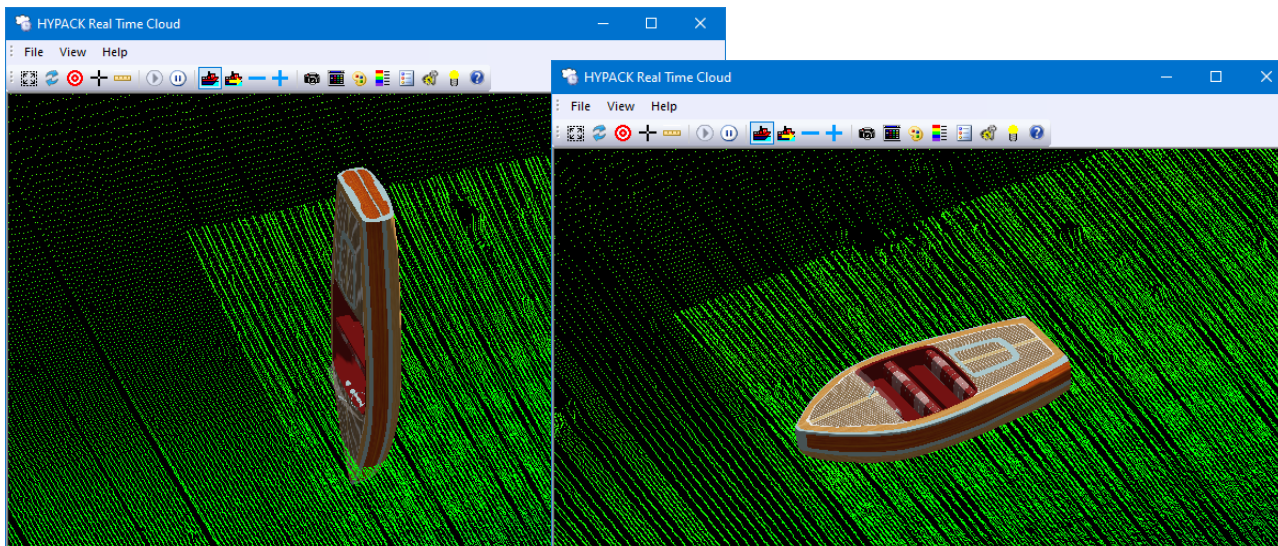


- > **Scale:** The dimensions of your OBJ shape appear (in survey units) on the toolbar. The editor includes scaling tools to size the shape to more closely match your survey vessel. Additionally, OBJ shapes may be offset from their origin indicated by the onscreen axes. To assure proper placement in HYPACK®, use the coordinates under Shift OBJ to realign the origin of the shape to the intersection of the axes.

When your configuration is complete, save the configuration and close the OBJ EDITOR. If you reopen the OBJ EDITOR, you can choose whether to use the same configuration or load the shape in its original configuration.

In the Real Time Cloud Boat Settings dialog, click [Apply] so you can see your changes.

Swapping the Y and Z Axes, and Inverting the Y Axis—Before (left) and After (right)

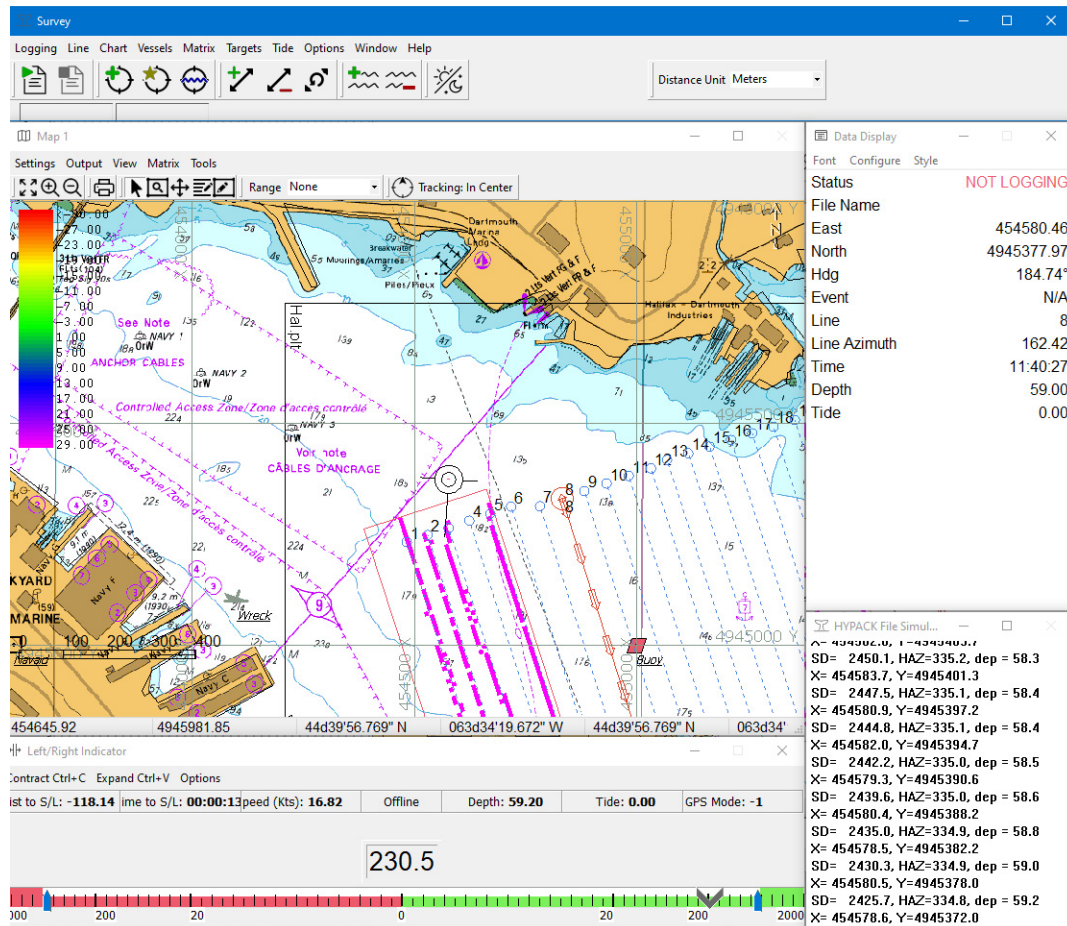


SURVEY UPDATE—BETA RELEASE

Not only does HYPACK 2021 support advancing technologies in hydrographic and topographic surveying, an new SURVEY Update Beta program supports changing software programming technologies.

HYPACK 2021 includes an updated, beta version of our HYPACK® SURVEY program that have been rewritten in a more modern, more flexible and powerful coding language that will improve stability and usability, and support future development plans.

SURVEY Beta Interface



DREDGEPACK®

Bugfixes:

- **Prevents bucket print loss** by saving the bucket file after each new bucket mark through the Excavator and Bucket drivers.
- **Dredge Report:** Corrected a drawing problem that caused missing charts and matrix.

NOTE: If draw speed is a problem, use a larger mtX cell and/or smaller project area.

DREDGEPACK® UPDATE—BETA RELEASE:

HYPACK 2021 includes an updated, beta version of our DREDGEPACK® program that has been rewritten in a more modern, more flexible and powerful coding language that will improve stability and usability, and support future development plans.

SIDE SCAN SURVEY (HYSCAN)

Bugfixes:

- In the Bottom Tracking tab of the View Options, the **Use Second Frequency** under **Use HYSCAN Bottom Tracking** correctly tracks using the second frequency in a dual-frequency dataset.
- **Synchronized TVG mode controls** (toolbar and side scan controls).
- **Device Selection in Side Scan Controls** truncates device name longer than the 34 characters supported.
- **Corrected Target positioning problem during retargeting.**

HYSWEEP®

- **Support for GPS data passed through shared memory** by HYSWEEP_Extended.dll.
- **Logs eHydro device selections and geodesy** to the headers of the *.HSX files.
- **Alarm for empty HSX files.**
- **Support for side scan sonars with separate port and starboard heads.**
- **Bugfixes:**
 - > **Increased NORBIT S7K beam limit to 1024** in HYSWEEP and MBMAX64.
 - > **Corrected time tag in Kongsberg KMALL** datagrams.

WGS POSITION AND UTC TIME LOGGED IN RAW HSX

For each GPS update, we record a RAW record with the WGS-84 position and UTC time stamp. The format is identical to GPS logging in HYPACK RAW files:

```
RAW d t 4 latitude longitude height utc_time
```

Where:

- > d is the HYPACK device number,
- > t is the HYPACK time tag,
- > 4 is 4,
- > latitude is DDMMM.MMMMM,
- > longitude is DDMMM.MMMMM,
- > height is ellipsoidal elevation is meters,
- > utc_time is HHMMSS.SSSSS past midnight.

Sample String:

```
RAW 0 51248.150 4 413561.17194 -724341.79081 1.67920 181408.15000
```

This data can be used in the 64-bit HYSWEEP® EDITOR to recalculate position or tide corrections in the HSX data using [GPS Recalc](#) in place of the Raw File Adjustments routine

which uses the GPS data in the corresponding RAW file. Reach the same results more efficiently!

SUPPORT FOR MULTIBEAM DEVICES WITH PAN/TILT

HYSWEEP® SURVEY processes the pan and tilt data in real time for Cloud and matrix displays.

- Generic Attitude driver supports pan/tilt devices.
- NORBIT and Reson drivers now support 'pass through' pan/tilt data (datagram 1017) to HYSWEEP® SURVEY.

It also logs the angles to the raw HSX files for post-processing in the 64-bit HYSWEEP® EDITOR where all the data (including pan and tilt) is merged, processed and exported to final XYZ data.

NOTE: This feature is ready for field testing.

POST-PROCESSING

32-BIT SINGLE BEAM EDITOR (SBMAX32)

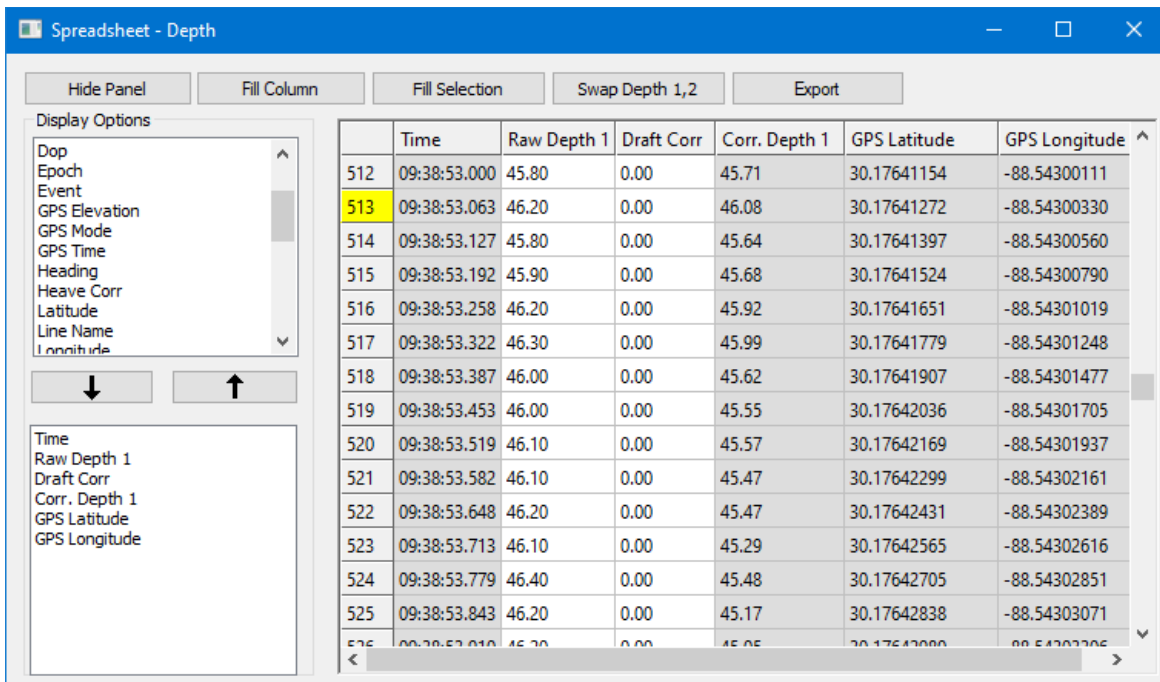
Added sounder draft to Sound Velocity Correction.

64-BIT SINGLE BEAM EDITOR (SBMAX64)

- **Read Parameters accommodates 2 devices with the same name.** (The 32-bit SINGLE BEAM EDITOR is updated in the same manner.)
- **Updated decimal places for GPS Lat and Lon in spreadsheet** to show 8 decimal places.

Bugfixes:

- **Echogram corrections:**
 - > Zoom extents zooms to template extents.
 - > Correct Tide corrections.
- **For dual beam datasets, SBMAX correctly calculates and displays both spike filters** when applied to both beams.
- **Mouse vs tool conflict** resolved.



64-BIT HYSWEEP® EDITOR (MBMAX64)

- Option to omit cursor crosshairs from the Survey window display.
- Reminder to save work.
- **Files out of POSPac time range:** When POSPac is applied and some survey files are outside POSPac time range, a popup shows which files were not adjusted.
- **Increased support for NORBIT S7K data.**
 - > Reads S7K files directly. No converter routine!
 - > Increased beam limit to 1024 in HYSWEEP and MBMAX64.
 - > Supports Autoprocessing.
- **The Reson 7042 accounts for no data due to blanking** using a sample delay.
- **SHOM QC report:** The SHOM QC report is a custom-formatted text file reporting beam angle, count, mean and standard deviation where the mean value is the average difference between the reference and check line of all soundings within the 1 degree angle bins.

Sample Segment of the SHOM Report

	A	B	C	D	E	F	G
1	Beam Angle	Count			Mean	Std Dev	
80	15 - 16	122			0.043	0.132	
81	16 - 17	135			0.036	0.126	
82	17 - 18	118			0.018	0.11	
83	18 - 19	121			0.014	0.145	
84	19 - 20	134			0.006	0.116	
85	20 - 21	124			0.012	0.132	
86	21 - 22	127			0.021	0.139	
87	22 - 23	128			0.023	0.146	

- **Upgraded to process the Pan/Tilt angles** now logged in the raw HSX files. (See [Support for Multibeam Devices with Pan/Tilt](#))
- **Removes pings showing 0 Sound Velocity Correction at the head.** (bug fix)

INTERMITTENT SAVE REMINDERS

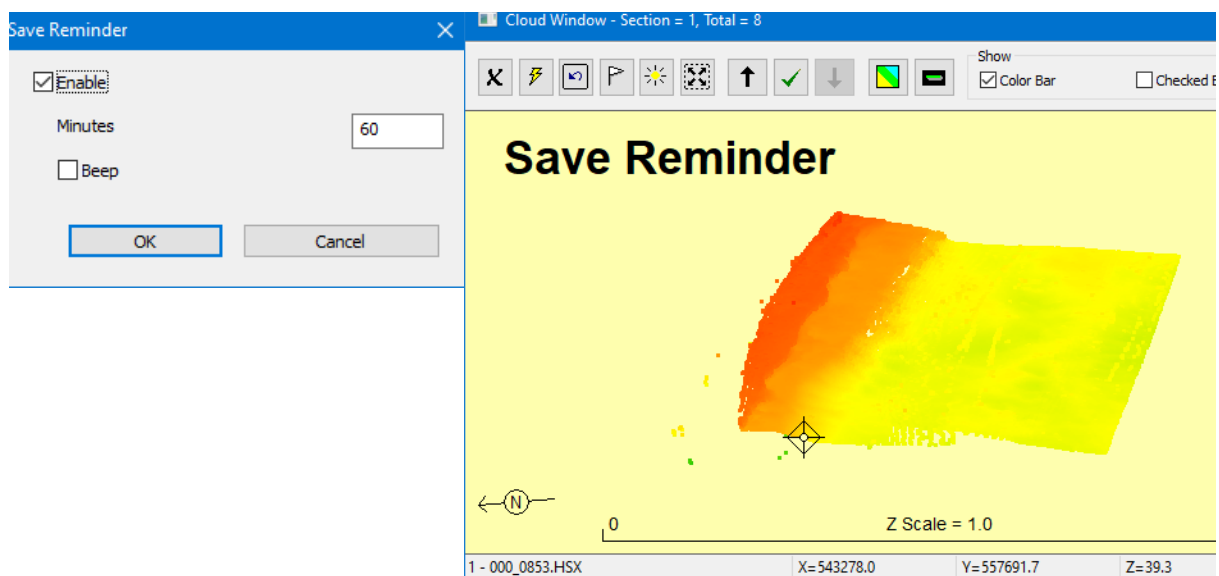
When you are editing over an extended time, it is wise to save your work intermittently to preserve your work in the case of system failure; however, it is easy to lose track of time and forget to do so. You may set regular reminders to appear in the 64-bit HYSWEEP® EDITOR to save your work during Stage 2 editing.

Beginning with your first edit, when the user-defined time interval has elapsed after the first edit the background of the data displays turn yellow with a large “Save Reminder” message. The displays return to normal after you save your work.

Configure the reminder in the Save Options dialog:

1. **Open the Save Options dialog.** Select FILE-SAVE OPTIONS.
2. **Click [Save Reminder], configure the reminder and click [OK].**

Save Reminder



GPS RECALC: CORRECTING POSITIONING/TIDE USING WGS84 DATA IN RAW STRING

New in this release, for each GPS update, HYSWEEP® logs a [Raw data string in the raw HSX file](#). When the 64-bit HYSWEEP® EDITOR detects the RAW strings, you can use the new GPS Recalc routine in the Tools menu to correct positioning and tide:

Figure 3: GPS Recalc Settings.

GPS Recalc			
<input checked="" type="checkbox"/>	Recalculate Positions Based on Project Geodesy		
<input checked="" type="checkbox"/>	Recalculate RTK Tides Using Project Geodesy		
Offsets			
Starboard	0.000	Vertical	2.700
Forward	0.000	Latency	0.000
First			
Latitude	45.60324	Longitude	-122.62329
Height	-20.19 M	UTC	21:26:57
Done Adjust Close			

The data under “First” shows the GPS data from the first position as a preview test.

The adjusted data is stored to records assigned to a pseudo-device “GPS_RECASC” so, in the Read Parameters, you can choose to use either the original or recalculated data by selecting the appropriate device name in the Device Offsets dialog.

Figure 4: GPS Recalc Pseudo Device in Read Parameters.

Device Offsets			
Navigation		Tide	
GPS_RECASC		GPS_RECASC	
Starboard	0.000	Vertical	0.000
Forward	0.000	Latency	0.000
		<input checked="" type="checkbox"/>	RTK Tides
Starboard	0.000	Vertical	0.000
Forward	0.000	Latency	0.000

SAVE AND RESTORE SEARCH AND FILTER OPTIONS

When you open the 64-bit HYSWEEP® EDITOR, it loads the most recent set of filter options used by the editor, *not necessarily in the current project*.

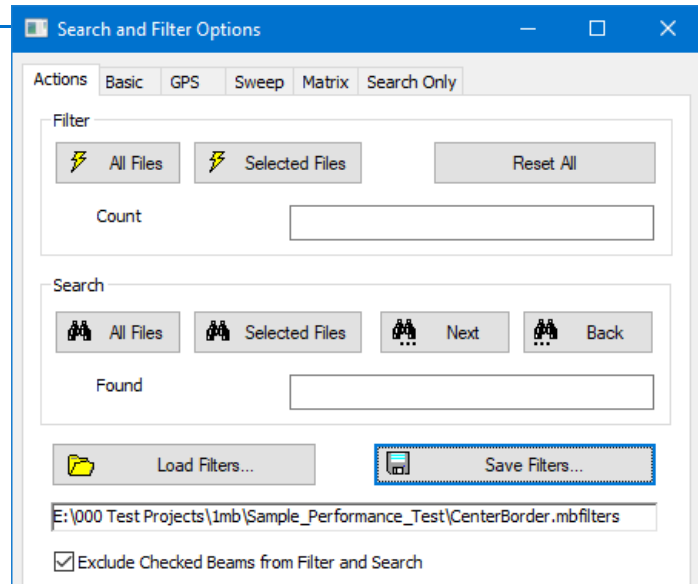
Reusing the same filter set is useful if your projects use the same sensors in similar survey areas and with similar survey specifications; however, that is not always the case and your filter settings vary between projects or even datasets within the same project,

In the Action tab of the Search and Filter dialog, you can save and quickly restore complete sets of filter options according to your needs instead of manually choosing each option for each editing session.

To save your filter options, click [Save Filters], name your filter set and click [Save]. All of the current Search and Filter options are stored to that file with an MBFILTERS extension in your project folder.

Tip: Use a name that is meaningful so you know which set to load in future sessions.

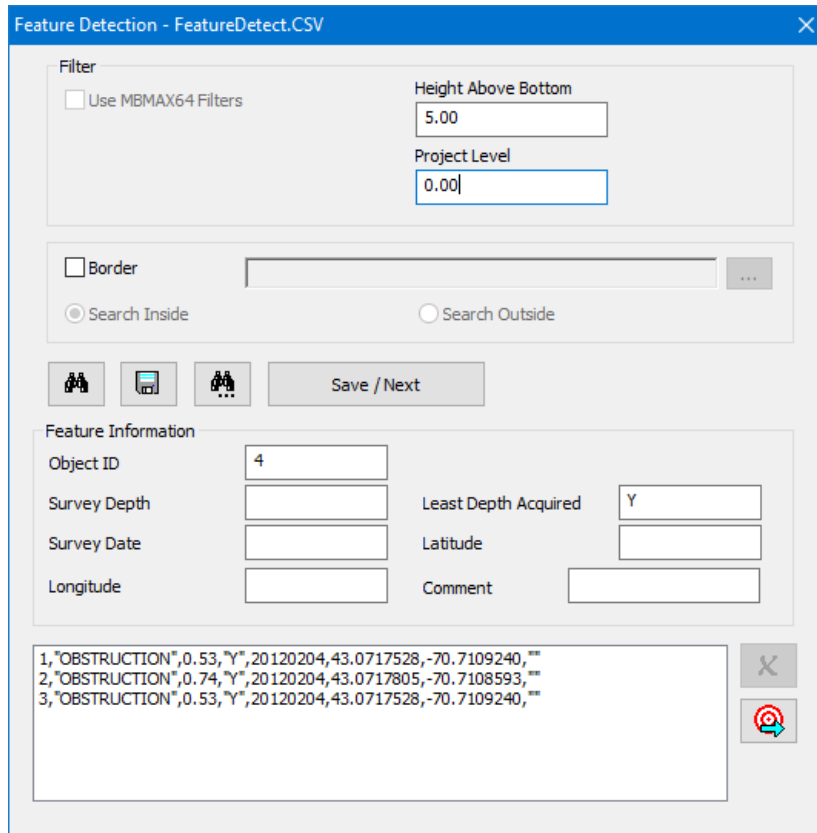
To load a filter option set, click [Load Filters], select the appropriate MBFILTERS file and click [Open].



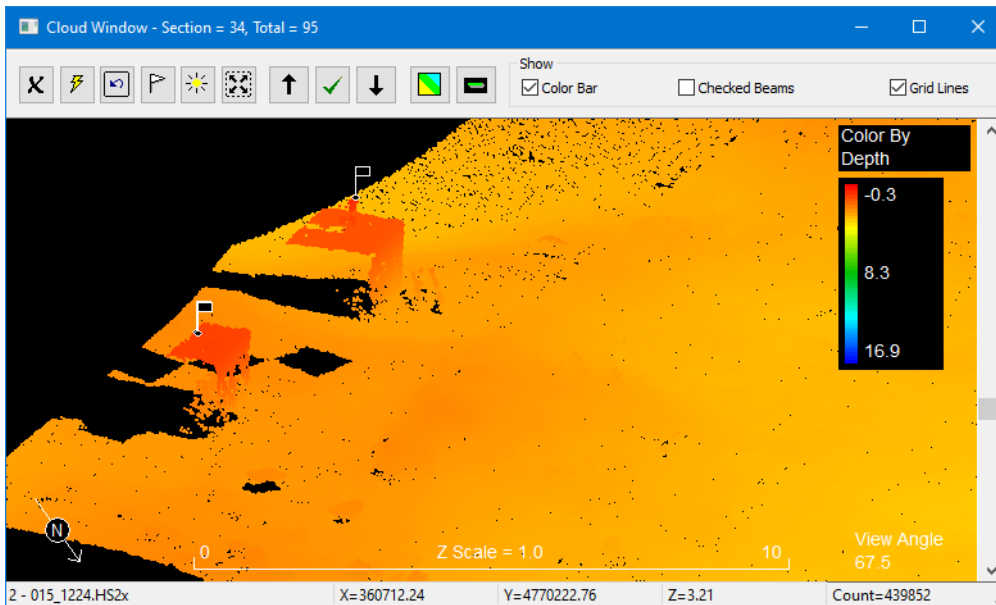
FEATURE DETECTION

After your data is clean and calibrated, the Feature Detection tool is an aid to find potential features of interest, record their locations and export them to the project FeatureDetection.CSV file for submission to eHydro. You may also export the same data to the HYPACK® target database.

Making the assumption that cell maximum is the bottom point, the routine compares cell vertical range to your Height Above Bottom. If the range is greater, we consider a potential feature. You can examine each feature, mark those you deem worthy, and export their positions in a spreadsheet report that satisfies the current USACE/NOAA requirements.



Feature Detection



EXPORTING eHYDRO METADATA

For eHydro reporting, TOOLS-USACE eHYDRO provides a series of forms where you can name your survey, enter your metadata, and select the targets to export. (See Also [eHydro](#))

[Device Metadata](#).) In each dialog, when you click [Save], the program generates a report file—a metadata file (*.XML) or a target file (*.TGT)—using the Survey Name, and stores it in the project folder.

Before you begin... The eHydro Survey Name dialog has a series of fields that are populated by the eHydroProjectAreaExport.xml file. USACE uses their eHydro console to generate the required XML file *for each district or office running eHydro*, and provides it to their HYPACK® users. You must copy it into your HYPACK® install folder before you open the eHydro tool.

NOTE: If eHydroProjectAreaExport.xml is missing a message alerts you to that. The *best practice* is to exit the routine until you have the required XML file, though you *can* make up a name and proceed.

- **Survey Identification:** Make the selections for your project and the program generates a project name according to eHydro standards.
- **Metadata** includes data source information, Quality of Bathymetric Data, Survey Equipment and Process Steps.
- **Target Export** outputs user-selected targets to CD_O7_BUF_20200923.TGT.
- **XYZ Export:** In the Save Survey dialog, select the XYZ file format and check the eHydro Naming option under XYZ Options.

USACE eHydro Survey Name Dialog

The screenshot shows the 'eHydro Survey Name' dialog box. The fields are as follows:

- Project Area:** C_D_CANAL
- eHydro Area:** CD_07_BUL
- Survey Type:** Condition Survey
- Survey Date:** 20200923
- X Project
- Free Text:** CD_07_BUL_20200923_CS
- Metadata >>** (highlighted with a dotted border)
- Targets >>**
- OK** and **Cancel** buttons.

eHydro Metadata Dialog—Data Source (left) and Quality of Bathymetric Data (right)

Metadata - CD_07_BUL_20200923_CS.XML

Data Source | Quality of Bathymetric Data | Survey Equipment and Process Steps

Responsible Party
RP - CD_07_BUL_20200923_CS

Contact Info
CI - CD_07_BUL_20200923_CS

Phone
P - CD_07_BUL_20200923_CS

Address
A - CD_07_BUL_20200923_CS

E-Mail
EM - CD_07_BUL_20200923_CS

Online Resource
<https://navigation.usace.army.mil/Survey/Hydro>

Legal
The information depicted on this map represents the results of survey on the dates indicated and can only be considered as indicating the conditions existing at that time.

Metadata - CD_07_BUL_20200923_CS.XML

Data Source | Quality of Bathymetric Data | Survey Equipment and Process Steps

Start Date
20200923

End Date
20200924

Vertical Coordinate Reference System
MLLW

Vertical Units
US FOOT

Horizontal Coordinate Reference System
State Plane NAD-83 DE-0700 DELAWARE

Full Bathymetric Coverage
Y

Grid Resolution
3

eHydro Metadata Dialog—Survey Equipment and Process Steps

Metadata - CD_07_BUL_20200923_CS.XML

Data Source | Quality of Bathymetric Data | Survey Equipment and Process Steps

Multibeam Sensor
R2SONIC SONIC 2020

Vertical Beam Sensor
SONAR MITE ECHOSOUNDER

Attitude and Positioning Equipment
APPLANIX POS MV 320

Sound Velocity Sensor
GENERIC SOUND VELOCITY

Vertical Datum Processing
(K-N) from user value

Geoid Model
Orthometric Height Correction

KTD File
Chart Datum Correction
0.170

VDatum Zone and Surface

Processing Software
HYPACK / MBMAX64

Save Cancel Apply

TARGETING AND MOSAICKING (HYSCAN)

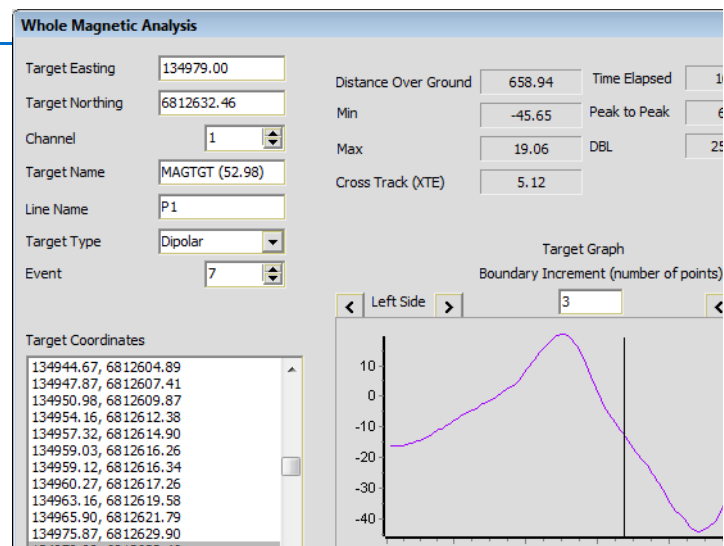
- **Screen capture in the Scan View** display captures the entire length of the current line to JPG, TIF or BMP format. These captures are *not geo-referenced*.
- **Bug Fixes:**
 - > **TVG** equation changes now correctly update the signal display.
 - > **Target Images can now save to the Target Classification database** as they should.
 - > **Corrected towfish depth display** in the spreadsheet.
 - > **Applies median filter** properly.
 - > **Mosaics data from user-selected head** in data with multiple side scan sonars.
 - > **Filters duplicate positions in SDF data** to avoid striping in the mosaic.
 - > **Prevents program crash when loading a dual-freq SDF dataset with bad data in the first frequency.**

MAGNETOMETER EDITOR

- **Updated IGRF Model** based on new NOAA data.
- **Added Quick Delete** editing mode.
- **Choice of (project) Color or Black/White for sorted data.**
- In the **Whole Magnetic Anomaly** window, the target Event and Channel options are editable.

Sample WMA Window

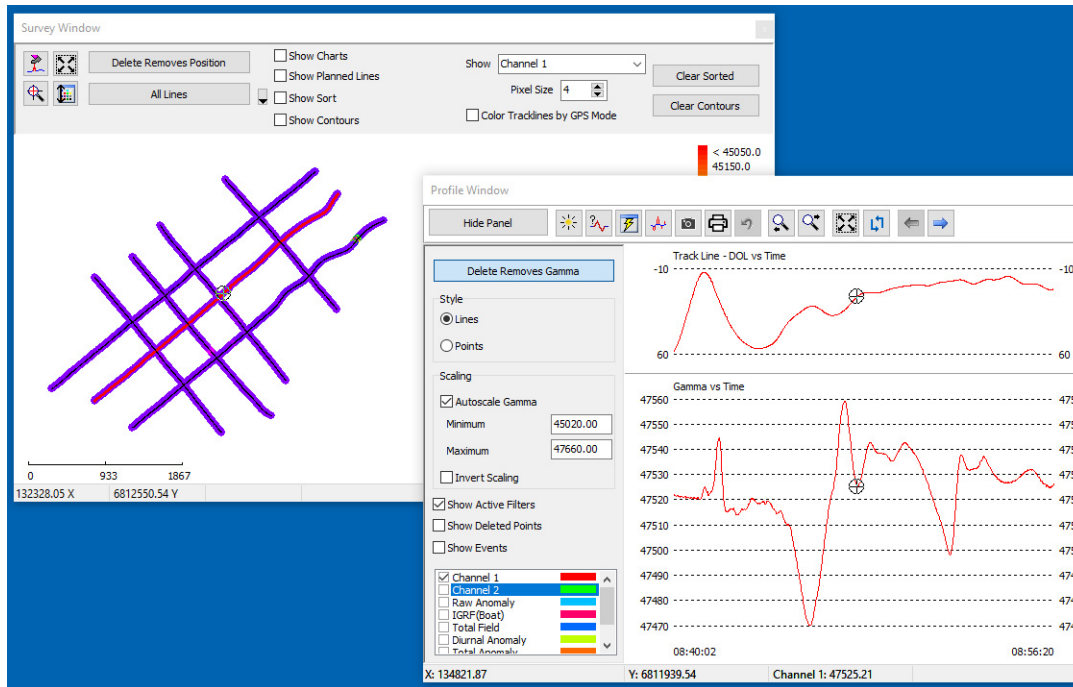
- **Bug Fixes:**
 - > Icons in the Survey window toolbar respond as expected.
 - > Color palette change automatically updates in the Survey window.
 - > In SHOM format, exported multiday data includes day.
 - > Honors delete/interpolate value selection.



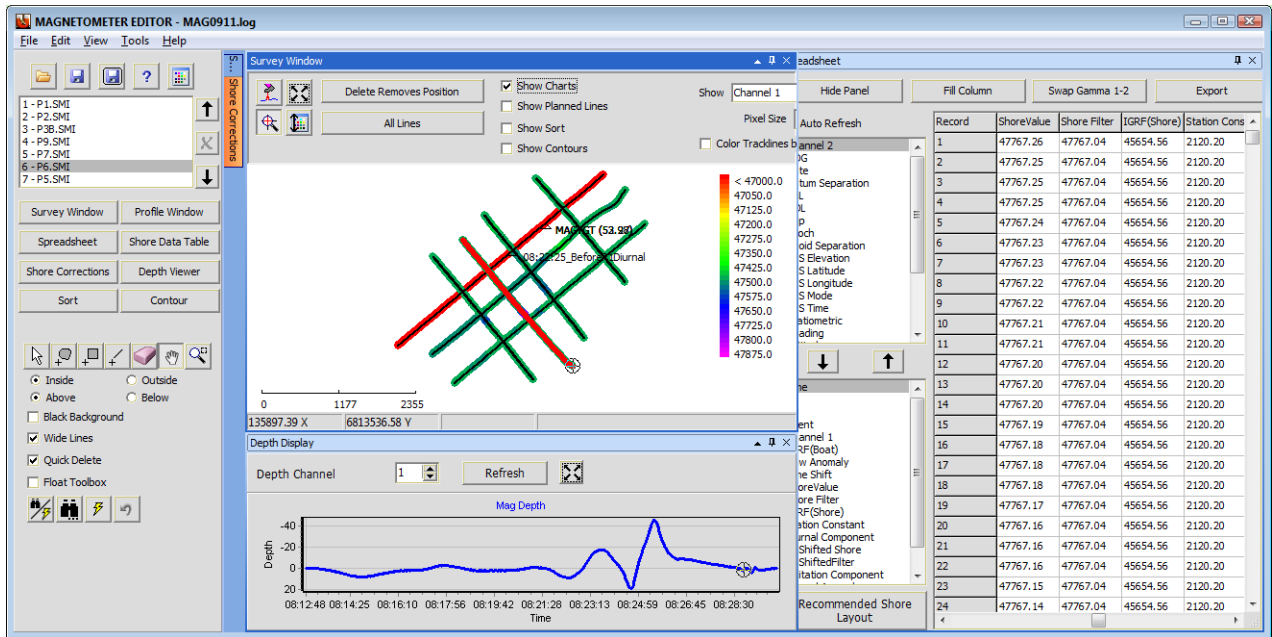
WINDOW MODES

The program offers two window display modes that you select through the VIEW-WINDOW MODES menu item.

- In **Basic Mode**, the Survey window is built into the shell. All other displays are free floating and you can resize and position them individually.



- In **Advanced Mode**, all windows can be free floating and you can resize and reposition them into any layout you want, but you can also dock and pin them in the MAGNETOMETER EDITOR shell.
 - > **To dock a window**, drag the toolbar of any window. The interface displays "landing pads" where you can dock your window.
 - > **To pin a window**, click the tack in the window title bar. When you pin a window, it "slides out of view" leaving a 0.25 inch (0.5 cm) tab on the side of the window where it is docked. When you want to access the pane, click its tab and it slides into view. When you move your cursor to a different window, HYPACK knows you have finished in the pinned window and it slides back out of view and out of your way, providing a larger map view display area.



The MAGNETOMETER EDITOR interface includes all of the options to configure your displays. The panel in the program shell provides settings that are not specific to any one window. Each window also includes a panel with the options pertinent only to its display.

Tip: When you have configured the Profile and Spreadsheet displays, click [Hide Panel] to increase screen space for your data displays.

PROCESSING ENVIRONMENTAL DATA

The tools in the MAGNETOMETER EDITOR can be used to process environmental data recorded to the raw data in SMI (Special Marine Instrument) records.

NOTE: The editor can also read the proprietary YSI i3XOLOG file.

When the MAGNETOMETER EDITOR recognizes SMI records, it makes them available for viewing and manual editing in the Profile and Spreadsheet windows. You can configure each window to display up to 32 such values in a single editing session. The Profile window graphs each value using a different color.

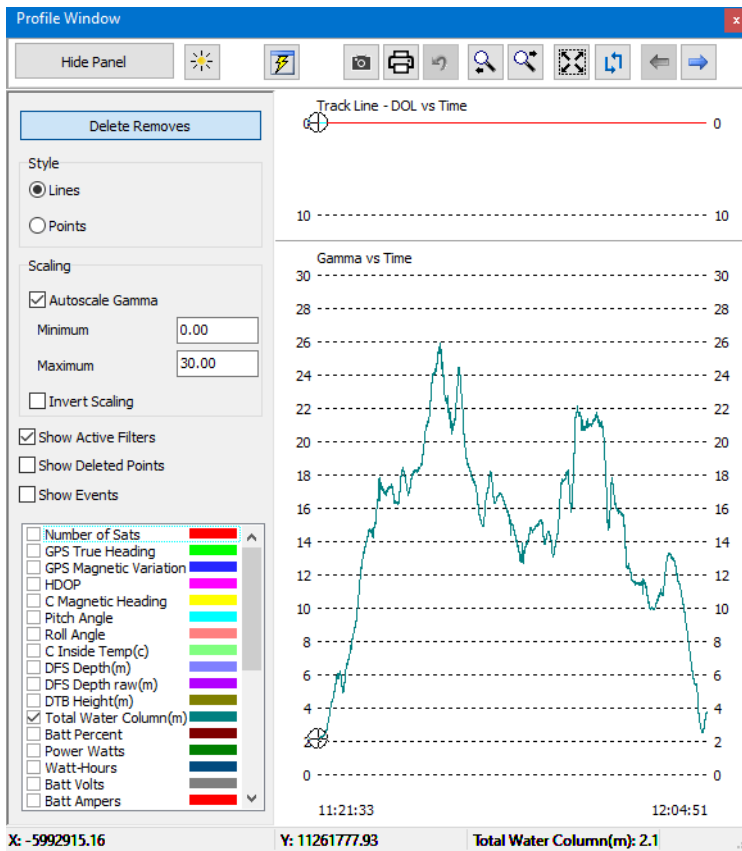
At any time you can save your work:

- **Save your editing session:** Select FILE-SAVE SESSION. MAGNETOMETER EDITOR saves each line to a binary file with an SMI extension. This format retains all data and can be reloaded for further editing.

Tip: It is best practice to *always save your session*. You can then reload the session files to restore your data in its current state without re-editing.

- **Save a user-defined set of values** to the HYPACK® All or XYZ format.

Environmental Data—Profile Window



Environmental Data—Spreadsheet

Record	Time	Number of Sat	GPS True Heading	GPS Magnetic	HDOP	C Magnetic	Pitch Angle	Roll Angle
1	11:21:33.63	10.00	325.50	7.98	0.95	299.90	2.30	-6.
2	11:21:34.15	10.00	325.50	7.98	0.95	298.90	2.50	-5.
3	11:21:34.68	10.00	325.50	7.98	0.95	298.30	2.50	-5.
4	11:21:35.19	10.00	325.50	7.98	0.95	298.40	2.50	-6.
5	11:21:35.71	10.00	325.50	7.98	0.95	298.70	2.50	-6.
6	11:21:36.24	10.00	325.50	7.98	0.95	297.80	3.30	-4.
7	11:21:36.79	10.00	325.50	7.98	0.95	294.40	3.50	1.
8	11:21:37.30	10.00	325.50	7.98	0.95	293.70	2.90	3.
9	11:21:37.82	10.00	310.60	7.98	0.95	296.20	2.00	1.
10	11:21:38.33	10.00	310.60	7.98	0.95	297.50	1.40	-0.
11	11:21:38.86	10.00	305.20	7.98	0.95	298.00	1.10	-0.
12	11:21:39.38	10.00	305.20	7.98	0.95	299.30	1.70	0.
13	11:21:39.91	10.00	304.90	7.98	0.95	300.10	2.10	-0.
14	11:21:40.42	10.00	304.90	7.98	0.95	300.10	2.60	-0.
15	11:21:40.94	10.00	305.60	7.98	0.95	300.80	2.90	0.
16	11:21:41.45	10.00	307.10	7.98	0.95	303.20	3.50	-1.

SORT

The MAGNETOMETER EDITOR you can sort your data based on a user-defined value in a routine that mirrors the SORT program for single beam data:

The Sort routine thins data while it guarantees the minimum data value at their proper locations. It looks for the minimum data value, saves it and eliminates any data point that is within the user-specified distance. It then repeats the process until all points in the file have been saved or eliminated.

Your sort results are automatically saved to an XYZ format file in the project Sort folder. The file is automatically named `MagEdit_Z-Value_hhmmss.XYZ`.

CONTOURS

The contouring routine generates DXF charts of magnetometer targets or data from environmental studies. The output files can be used as a HYPACK® chart or exported to third-party CAD programs. All DXF output information is written in real world coordinates.

Normalized magnetometer data can be effectively displayed as 2-dimensional contours. Contoured raw anomaly data clearly shows your monopolar and dipolar target areas.

The MAGNETOMETER EDITOR can also process environmental data from devices that measure and record any number of different values.

The screenshot shows a dialog box titled "Sort" with a close button in the top right corner. The dialog is divided into three main sections:

- Use as Z Value:** A dropdown menu currently showing "Channel 1".
- Type:** Three radio button options: "Radius" (selected), "DX", and "DY". Each option has a corresponding text input field containing the value "25".
- Mode:** Three radio button options: "Sort with Partitions", "Sort with no priority" (selected), and "Sort with Priority".

At the bottom of the dialog are two buttons: "OK" and "Cancel".

Send To x

Export 2D Contour ▾

Contour parameters

Filtering

Minimum Leg

Minimum Area

Enable Smoothing

Export

Contours Solid Area

Step Color Scheme ▾

Contour Attributes

Use as Z Value

Raw Anomaly(CH1-IGRF) ▾

Grid Spacing: 20m

Autoscale Colors Edit Colors

Test Save Save as

Clear Cancel

Send To x

Export 2D Contour ▾

Contour parameters

Filtering

Minimum Leg

Minimum Area

Enable Smoothing

Export

Contours Solid Area

Step 1.0 ▾

Contour Attributes

Use as Z Value

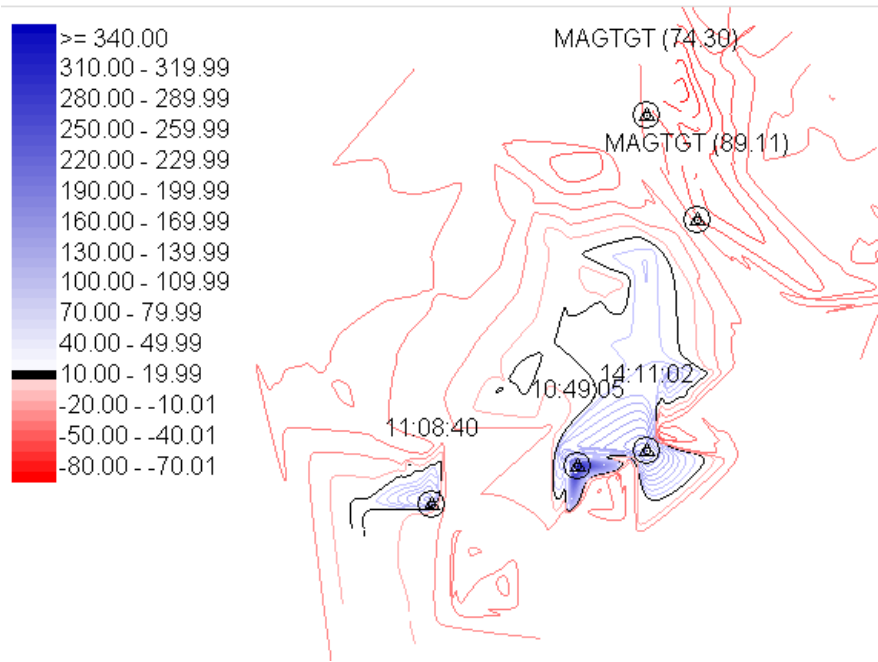
Total Water Column(m) ▾

Grid Spacing: 20m

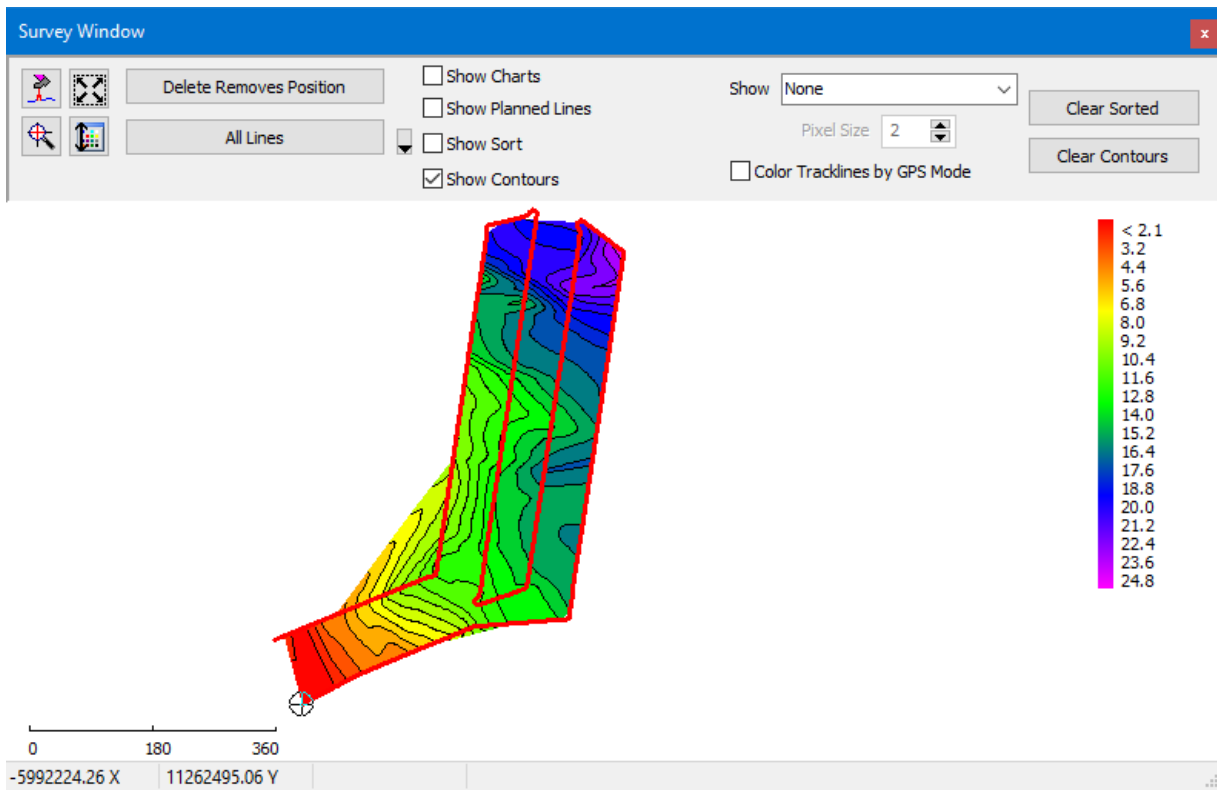
Autoscale Colors Edit Colors

Test Save Save as

Clear Cancel



Water Column Data from I3XO Environmental Data in the MAGNETOMETER EDITOR



MANUAL TIDES

- **Supports unlimited number of days, but only one tide/minute.** If you import a text file with more than one tide/minute, the later one overwrites the earlier one.

FINAL PRODUCTS

HYPLOT

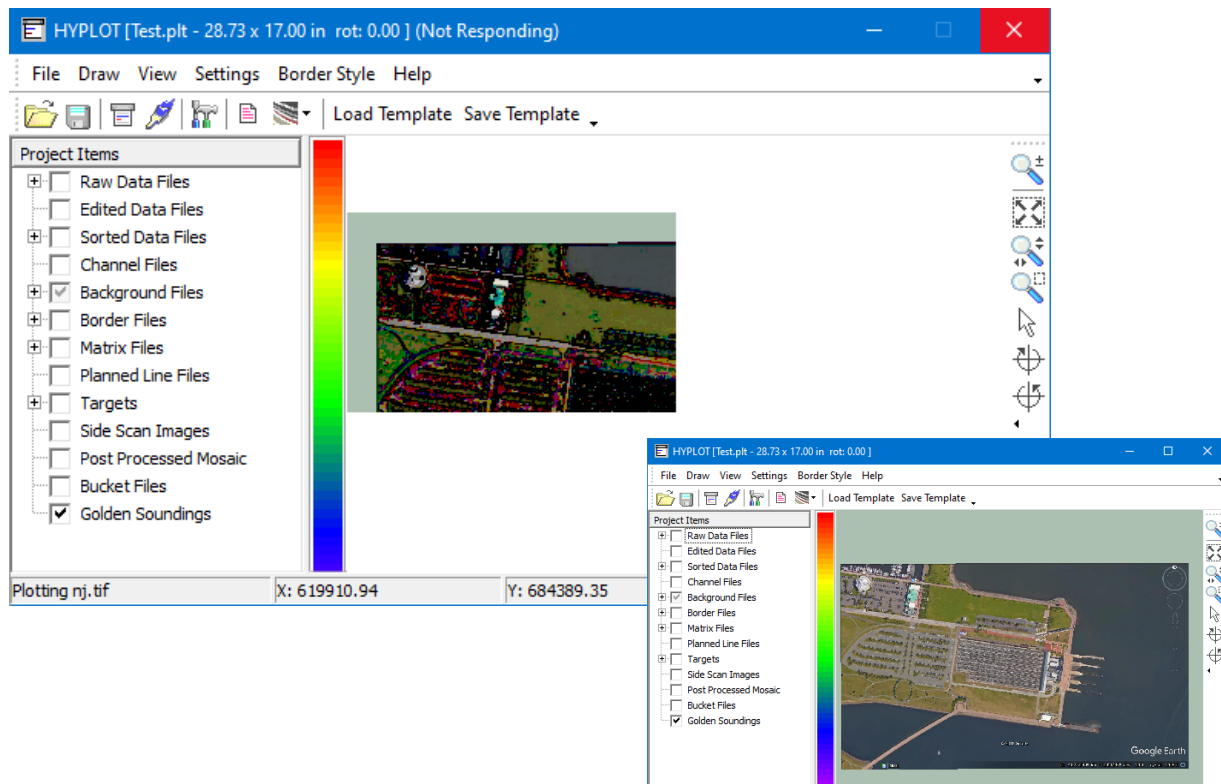
Bug fixes:

- **Draw targets** correctly.
- **Corrected color bar labels** that were off by 1.
- **Corrected background chart display** to show only enabled files.

FASTER HIGH-RESOLUTION PDF OUTPUT

HYPLOT generates high resolution (300-600 DPI) renderings of raster images in sections to accommodate system limitations. When this occurs, HYPLLOT shows each section to show its progress.

Tile Preview (top) and Complete (bottom)



This tiling process also improves the loading process in your PDF reader. You can click in the PDF image to highlight each tile.



CROSS SECTIONS AND VOLUMES

- **Export Beach and Beach Centroid Pre- and Post-dredge volumes reports to an Excel spreadsheet.** Click the Export to Excel icon on the toolbar in the Volumes tab, name your output file and click [Save].
- **Bug Fix: Correct clipping data to a border file.**



VARIABLE DESIGN TEMPLATES

Minimum Design Template and **Maximum Design Template** are templates that are offset vertically above and below the Design Template, respectively, by user-specified distances. You can elect to calculate volume quantities for each template level. Past releases provided only fixed Minimum and Maximum template options.

Using Variable Design Templates you can set minimum and maximum template values individually for each template segment on each line.

NOTE: The fixed design templates can be used in conjunction with the variable templates, but there can be only one maximum and minimum design template for each segment; you must choose *either* the Maximum Design Template or Variable Maximum Design Template option, not both. You *can*, however, choose a Maximum Design Template with a Variable *Minimum* Design Template, or a Minimum Design Template with a Variable *Maximum* Design Template.

The **Maximum and Minimum tabs** separately show the maximum and minimum template values for each segment of each line in the current session.

The **Per Line tab** shows the maximum and minimum values for the currently selected line and you can use the arrow buttons to scroll through the lines.

Minimum and Maximum Tabs (left), Per Line (right)

Beach Variable Design Template

Variable Maximum Design Template
 Variable Minimum Design Template

Maximum Minimum Per Line

	Fill Column				Fill Row		
Segment	1	2	3	4	5	6	7
Line 1	0.5	0.0	0.5	0.0	0.5	0.0	0.5
Line 2	0.5	0.0	0.5	0.0	0.5		
Line 3	0.5	0.0	0.5	0.0	0.5		
Line 4	0.5	0.0	0.5	0.0	0.5		
Line 5	0.5	0.0	0.5	0.0	0.5		
Line 6	0.5	0.0	0.5	0.0	0.5		
Line 7	0.5	0.0	0.5	0.0	0.5		
Line 8	0.5	0.0	0.5	0.0	0.5		
Line 9	0.5	0.0	0.5	0.0	0.5		
Line 10	0.5	0.0	0.5	0.0	0.5		
Line 11	0.5	0.0	0.5	0.0	0.5		

Beach Variable Design Template

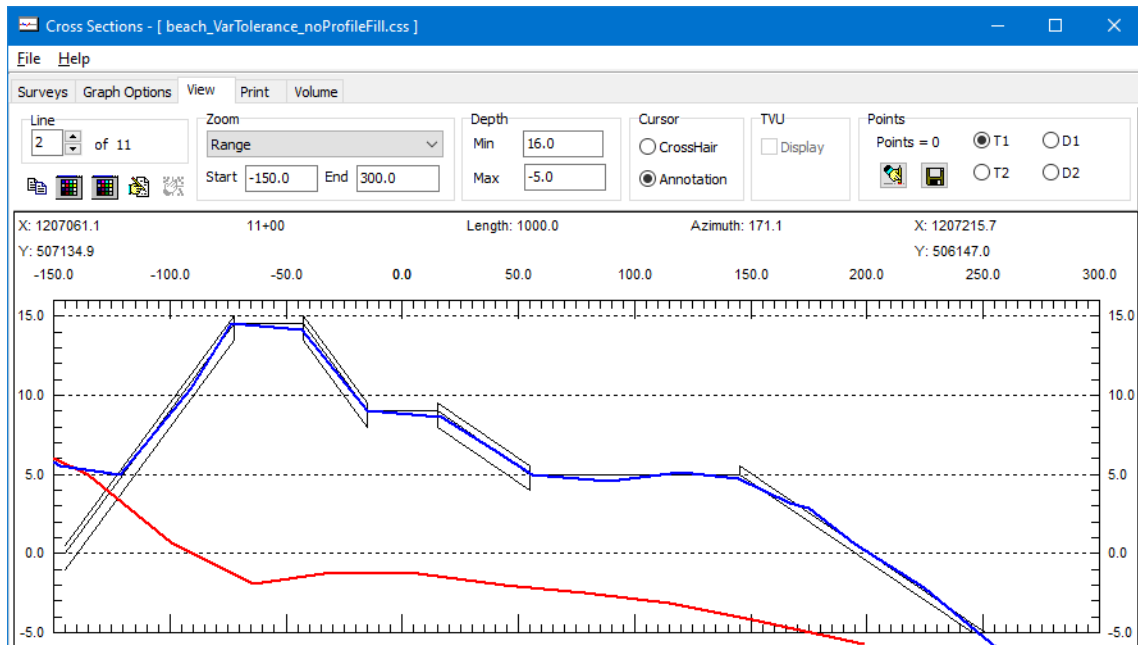
Variable Maximum Design Template
 Variable Minimum Design Template

Maximum Minimum Per Line

Line 1 of 11

	Fill Column				Fill Row	
Segment	1	2	3	4	5	6
Maximum	0.5	0.0	0.5	0.0	0.5	0.0
Minimum	1.0	1.0	1.0	1.0	1.0	1.0

View Tab with Variable Templates



TIN MODEL

- Improved PDF output of volumes reports.
- TIN-to-Channel volumes reported to 2 decimal accuracy.

TARGETING AND MOSAICKING (HYSCAN)

Bug Fixes:

- **Applies median filter** properly.
- **Mosaics data from user-selected head** in data with multiple side scan sonars.
- **Filters duplicate positions in SDF data** to avoid striping in the mosaic.
- **Prevents program crash when loading a dual-freq SDF dataset with bad data in the first frequency.**

ENC EDITOR

- **Bug Fix:** Corrected zoom extents of the selected background chart.

UTILITIES

- **Merge XYZ** supports both space and comma delimited files.

DATA SPLITTER-JOINER

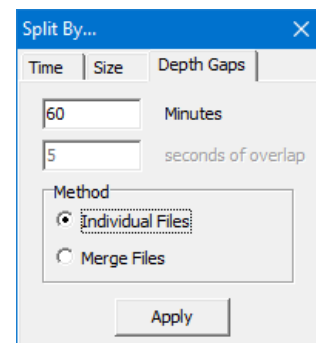
The DATA SPLITTER-JOINER is designed for you to define the segments of your RAW or HSX data that are useful for your survey and generate a new line set from the chosen segments. (You can, optionally, generate a separate line set with the *unselected* data.) It works with single frequency, dual frequency, multi transducer, sidescan, multibeam, and LiDAR/Topo data.

- **Faster File Load** by over 300%.
- **Faster Draw Times** in the Display Window: Drawing performance (zoom, pan and drawing data) is affected by multiple factors:
 - > Files with a large amount of position data.
 - > Multiple background files
 - > Generating a large number of files.

Improvements in this release have improved such performance significantly.

- **Added option to split data based on elapsed time between sonar updates.** In the Depth Gaps tab, enter the time (minutes) between sonar updates that you would consider a “gap”. The program splits the data where it finds sonar update intervals greater than or equal to the specified time.
- **Added option to merge overlapping files before splitting.** When you load multiple files, you can ask the program to split each line individually from start to finish, or merge the data into one line, then split it according to the other split criteria.

Merge Files vs Individual Files: The Merge Files option was intended for use where consecutive survey lines overlap end to end. In this case, the merge generates a single, continuous data file that divides neatly. If your input data has spaces between the lines (for example, parallel survey lines), the Individual Lines method is likely to give you better results.



The following images show the automated results using the same parallel line set divided into 2 minute segments. The start of the first line is at the bottom left and the lines run in alternating directions. They are colored by file and alternate lines are red to distinguish one line number from the next.

> The **individual** method begins a new output file at each start line of the input files.

Individual Method



> Using the **Merge** method and the same set of parallel lines, the time or size range may include the end of one line and the start of the next. In this case, the program generates two line files, one for each segment, and appends `_0001` to the file name. *It does not merge non-overlapping input.*

Merge Method

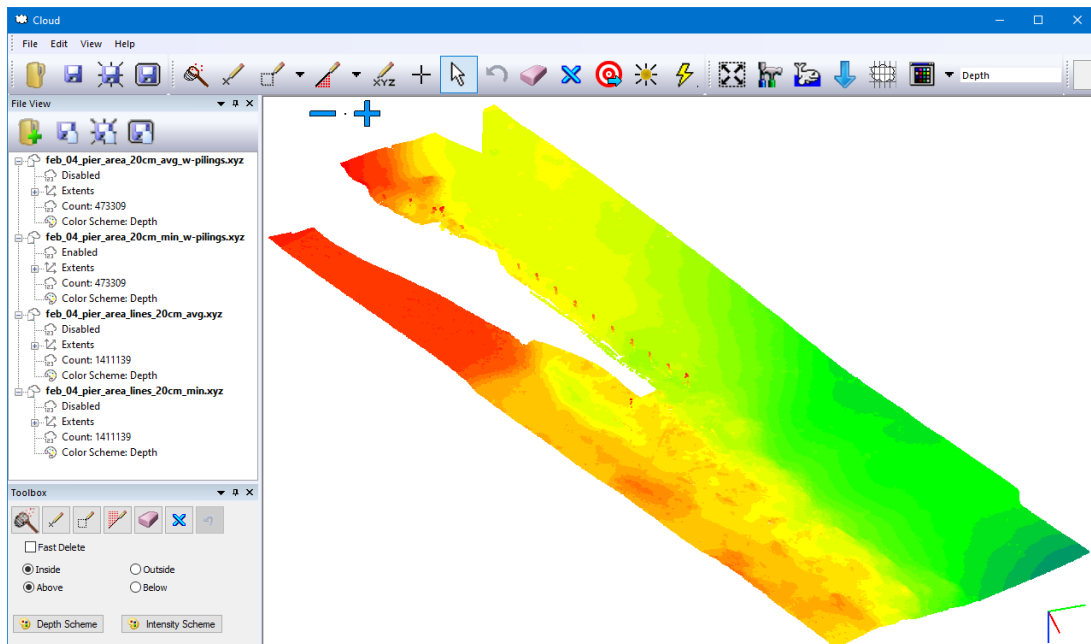


Tip: [Apply] displays a preview of the results based on the current settings. If it is not what you intended, just change your settings and click [Apply] again until you see optimal results.

- **500 Line Warning:** A warning appears if the output according to your current settings would generate more than 500 line files.

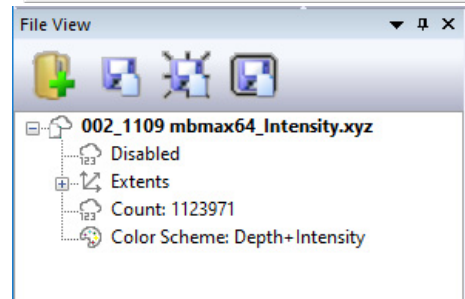
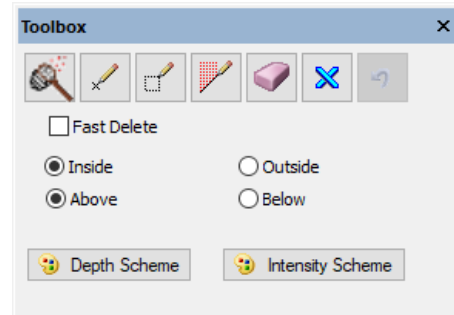
CLOUD

The CLOUD interface has several updates that take advantage of newer programming technologies and improve useability and expand the options to customize the CLOUD interface.



- The **new menu** moves some of the icons from the toolbar, placing more focus on those used for the data editing process. (As usual, the menu also replicates many of the icon functions.)
- The **editing tools** in CLOUD now more closely resemble the tools and function in the 64-bit HYSWEEP® EDITOR (MBMax64). Use the View menu to enable and disable toolbars. The toolbars are now dockable on any edge of the window.
- **New dockable panels:**

- > The **toolbox** includes the most common editing tools and settings, as well as buttons to set the color tables for color-coding for depth and intensity.
- > A **File View** panel lists the data files you have loaded, each with file statistics (point count and XYZ ranges) and display options (enabled/disabled, and color-coding basis (depth, by file, intensity, RGB, Depth + Intensity)).



You can, not only adjust the widths of the panels, but you can resize and reposition them into any layout you want or, in one easy click, pin them to the side of the window.

When you drag the panel, the interface displays "landing pads" where you can dock your panel in the window.

When you pin a window, it "slides out of view" leaving a 0.25 inch (0.5 cm) tab on the side of the window where it is docked. When you want to access the pane, click its tab and it slides into view. When you move your cursor to a different window, CLOUD knows you

have finished in the pinned window and it slides back out of view and out of your way, providing a larger data display area.

- The **Ground Truthing Report** compares your survey data to a user-defined file of control data, and generates a report to show the standard deviation of the data. The results appear in the Control Point Report dialog, and you can export the parameters and statistics in PDF format.

Ground Truthing— Dialog (left) and Sample Output Report (right)

The image shows a screenshot of the 'Control Point Report' dialog box on the left and a sample output report on the right. The dialog box has a title bar with a close button. It contains a 'Control Point File' field with the path 'Test Projects\lmb\R2Sonic Newcastle Pier\Sort\feb04_unh_20cm_min_sort10m.xyz'. Below this is a 'Radius' field with the value '10' and a 'Save Difference' checkbox. There are 'Run' and 'Save Report' buttons at the bottom of the dialog. The output report on the right is titled 'HYPACK Cloud Ground Truthing Report' and lists various statistics and standard deviation values.

Key	Value
Arithmetic Mean	0.32
Standard Deviation	0.50
Percentage Between +S ...	76.49%
-10S	14
-9S	4
-8S	14
-7S	43
-6S	328
-5S	513
-4S	1629
-3S	6324
-2S	39526
-1S	213791
+1S	148197
+2S	48982
+3S	9212
+4S	2496
+5S	1173
+6S	1057
+7S	3
+8S	0
+9S	0
+10S	0

```
HYPACK Cloud Ground Truthing Report
Cloud File: E:\000 Test Projects\lmb\R2Sonic Newcastle Pier\Sort\feb_04_pie
Control Point File: E:\000 Test Projects\lmb\R2Sonic Newcastle Pier\Sort\fe
Standard Deviation: 0.50
Percentage Between +S & -S: 76.49%
-10S: 14
-9S: 4
-8S: 14
-7S: 43
-6S: 328
-5S: 513
-4S: 1629
-3S: 6324
-2S: 39526
-1S: 213791
+1S: 148197
+2S: 48982
+3S: 9212
+4S: 2496
+5S: 1173
+6S: 1057
+7S: 3
+8S: 0
+9S: 0
+10S: 0
```

MANUAL TIDES

- NOAA import function updated to support their secure (HTTPS) web address.
- Added NAVD vertical datum.

DATA CONVERTER

- Converts FUGRO Starfix GSF format to HYPACK *.RAW format for the single beam data that the Starfix GSF file contains.

NOTE: GSF conversion for single beam is also available in the "...to HSX" tab. This method should be used with combined multibeam and single beam files. It will work with single beam only, but will also create an unusable HSX file. With this method, you must select the "Output RAW File" option under "Setup."

CROSS CHECK STATISTICS

- Bug Fixes for conditions that occur if you add and remove files multiple times.
- Scroll wheel on the mouse affects only the active display window.

PROJECT CONVERTER

- **Works even when you have all local projects.** (All projects are in \HYPACK 2021\Projects.)

XYZ MANAGER

Corrected logic error in the border clipping for export of final soundings.

SYSTEM

- **Corrected Unicode problem** associated with using passwords.
- **Localization:**
 - > **User Interface:** Updated files to provide more fully translated User Interface.
 - > **Documentation:** Russian and Spanish Manuals, Spanish Language Help file.

Translated Documentation

