



HYPACK
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Sounding Better!

HYPACK® 2020 Q3 Updates

By Judy Bragg

Our third quarter updates are ready for download. You can find the on our [Programs and Updates](#) webpage. The following are the highlights:

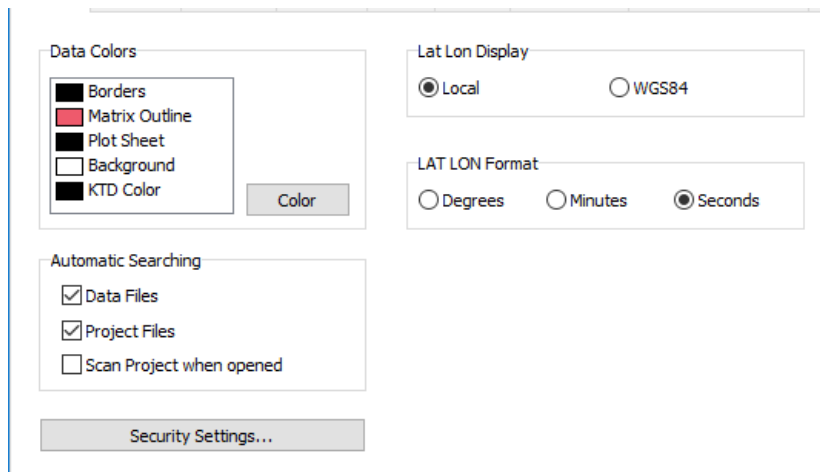
HYPACK

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



NEW MATRIX FILE VIEW OPTIONS

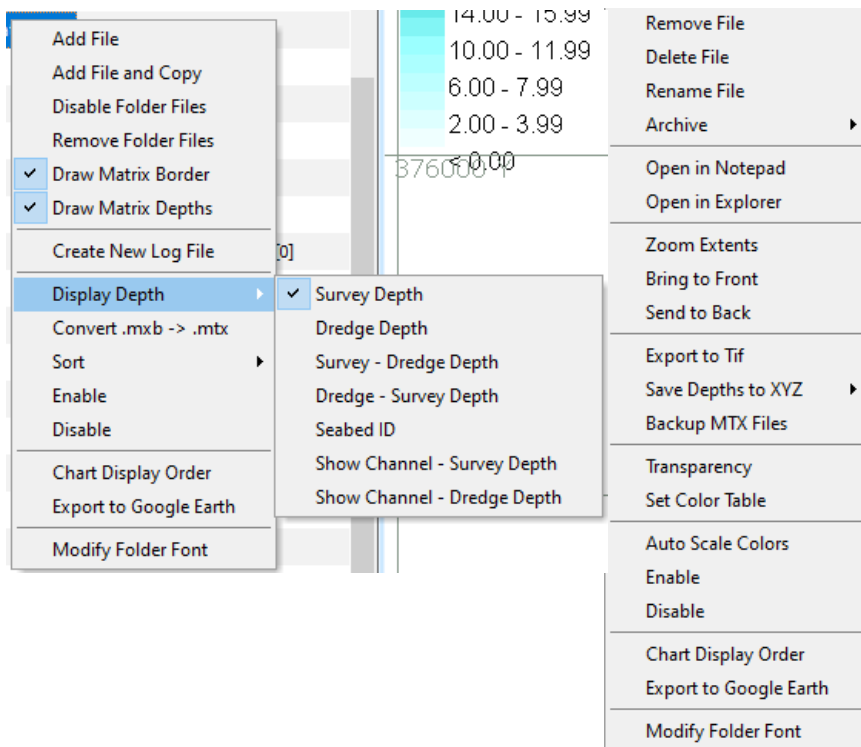
Access the display options by right-clicking on the Matrix Files label and on the matrix file name in the Project Items list. In each case, a pop-up menu appears:

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.

FIGURE 1. Matrix Right-click Menus: From Matrix Folder (left) and Matrix File (right)



CHARTS

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

EHYDRO SUPPORT FOR MULTIBEAM SURVEYS

Beta updates are available for USACE districts that submit multibeam surveys to eHydro. The updates are for ease of use and reliability of information. It is intended as another tool in the HYPACK® toolbox.

Where possible, the ISO 19115 standard is used for metadata. The metadata file will be CD_O7-BUF-20200923.XML.

- **HARDWARE:** [eHydro] on the System tab.
- **MBMAX64:**
 - > **Survey Identification:** Select TOOLS-USACE EHYDRO-NAME and enter the name. If the project name suffices, a button quickly copies it to the eHydro Survey Name.
 - > **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.

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- > **XYZ Export:** In the Save Survey dialog, select the XYZ file format and check the eHydro Naming option under XYZ Options.
 - High resolution grid points are saved to CD_O7_BUF_20200923.XYZ
 - Plot resolution grid points are saved to CD_O7_BUF_20200923_P.XYZ
 - All multibeam points are saved to CD_O7_BUF_20200923_FULL.XYZ

PREPARATION

GEODESY

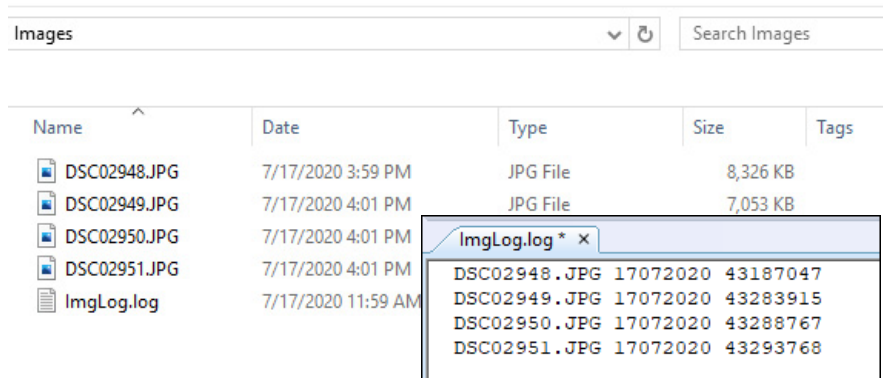
- **Updated geoid for Finland:** FIN2005N00.geo. The model contains geoid heights to transform ellipsoidal heights in the ETRF89 system to normal heights in the Finnish N2000 height system.
 - > Latitude: 59.00 - 70.70 degrees,
 - > Longitude: 17.48 - 33.00 degrees
 - > Latitude spacing: 0.02
 - > Longitude spacing: 0.04
- **Denmark S-34 grid bug fix.**

DEVICE DRIVERS

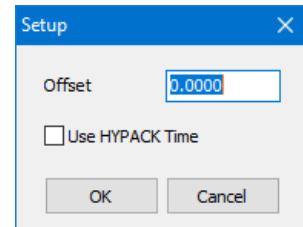
HYPACK DLLS

- **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).
- **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)
- **Playback.dll:** Reads EC2 records
- **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 2020\Projects*ProjectName*\Images\ImgLog.log, which facilitates the correct image display with the corresponding survey data in the 64-bit HYSWEEP® EDITOR.

FIGURE 2. Sample ImgLog File and its Image Files



- **Trackp.dll:** Uses mobile pitch/roll for USBL corrections.
- **Valeport 710.dll:**
 - > Added driver setup window.
 - **Offset:** Applies a tide offset
 - **Use HYPACK Time:** Time tags tide data using the time HYPACK receives the message; otherwise, it uses the time from the device.
 - > Displays offset tide and time of last tide reading.



DREDGE DLLS

- **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.

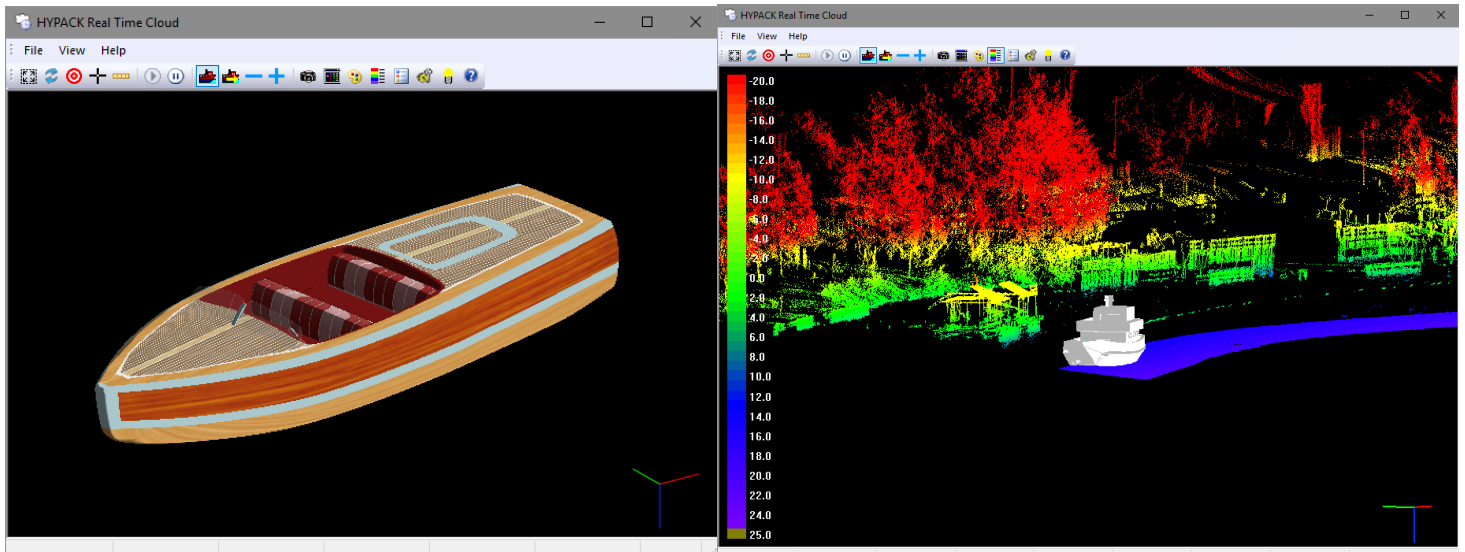
HYSWEEP DRIVERS

- **VLP 16 Hi Resolution (20 degree):** [New Driver](#)
- **Teledyne Optech Polaris TLS laser scanner** [New Driver](#)
- **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.

AQUISITION

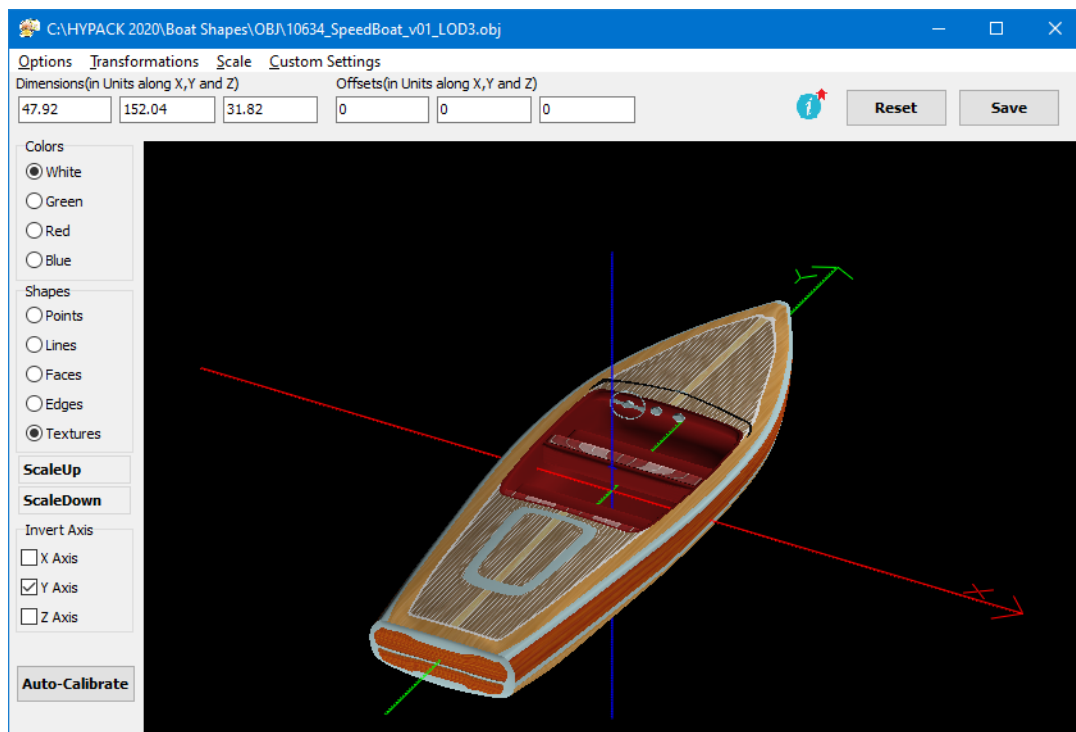
3D OBJ SHAPES IN THE REAL TIME CLOUD DISPLAY IN SURVEY

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.

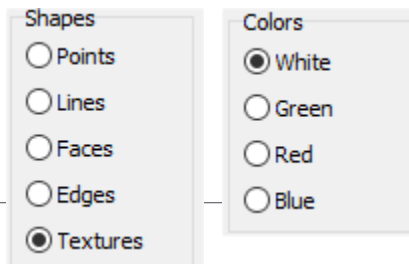


OBJ shapes aren't always created using the same convention for the X, Y and Z axes, and sometimes the shapes are not well-centered over the reference axes. The OBJ EDITOR enables you to modify the files to conform to HYPACK® orientation conventions, to size appropriately for your survey vessel, and to optimize the OBJ shape display in Real Time Cloud.

FIGURE 3. OBJ Editor



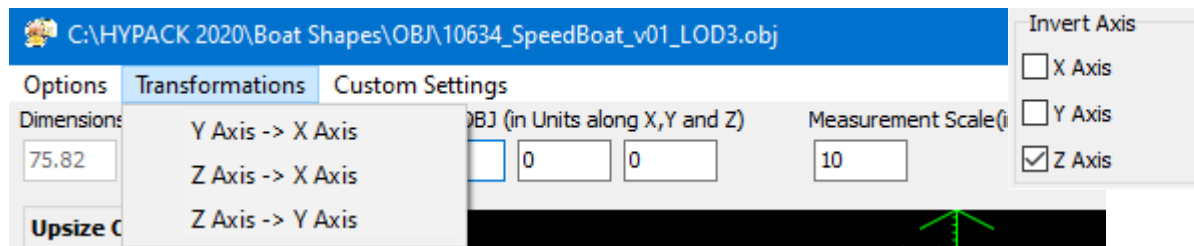
- **Textures:** If you have a texture file, you can apply it during the load process or from the OBJ EDITOR. You may also choose from a selection of alternate surface display methods according to your needs and your computer resources.



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



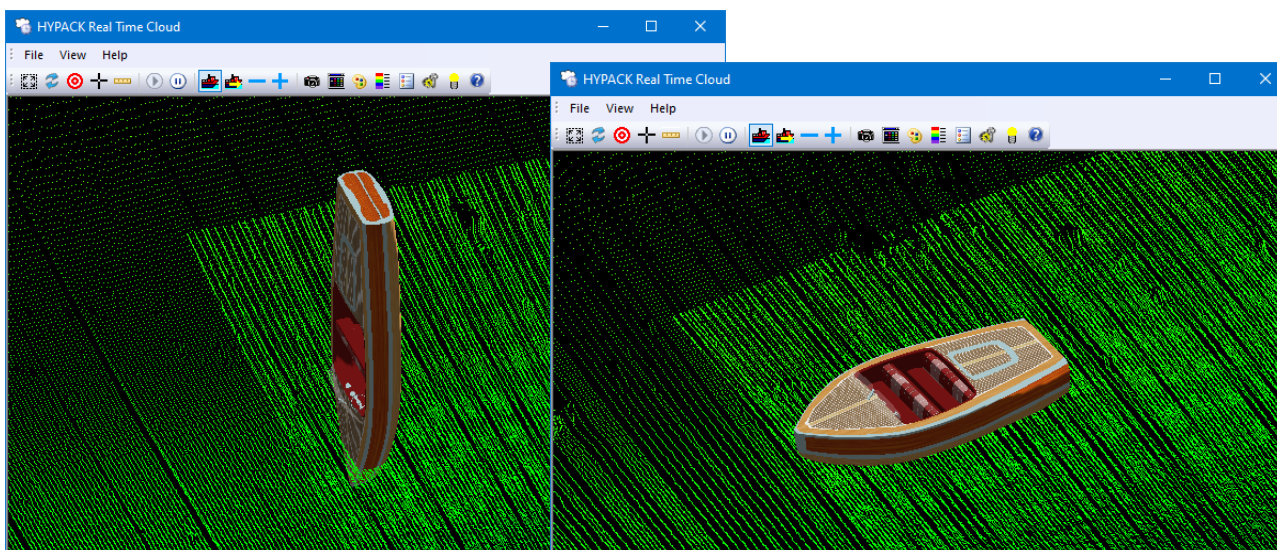
- > **Scale:** The dimensions of your OBJ shape appear (in survey units) on the toolbar. The editor includes scaling tools to size the shape to more closely match your survey vessel.

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.

FIGURE 4. *Swapping the Y and Z Axes, and Inverting the Y Axis—Before (left) and After (right)*



SIDE SCAN SURVEY (HYSCAN)

Bugfix: In the Bottom Tracking tab of the View Options, the **Use Second Frequency** under **Use HYSCAN Bottom Tracking** wasn't working. Now it tracks using the second frequency in a dual-frequency dataset.

DREDGEPACK®

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.

PROCESSING

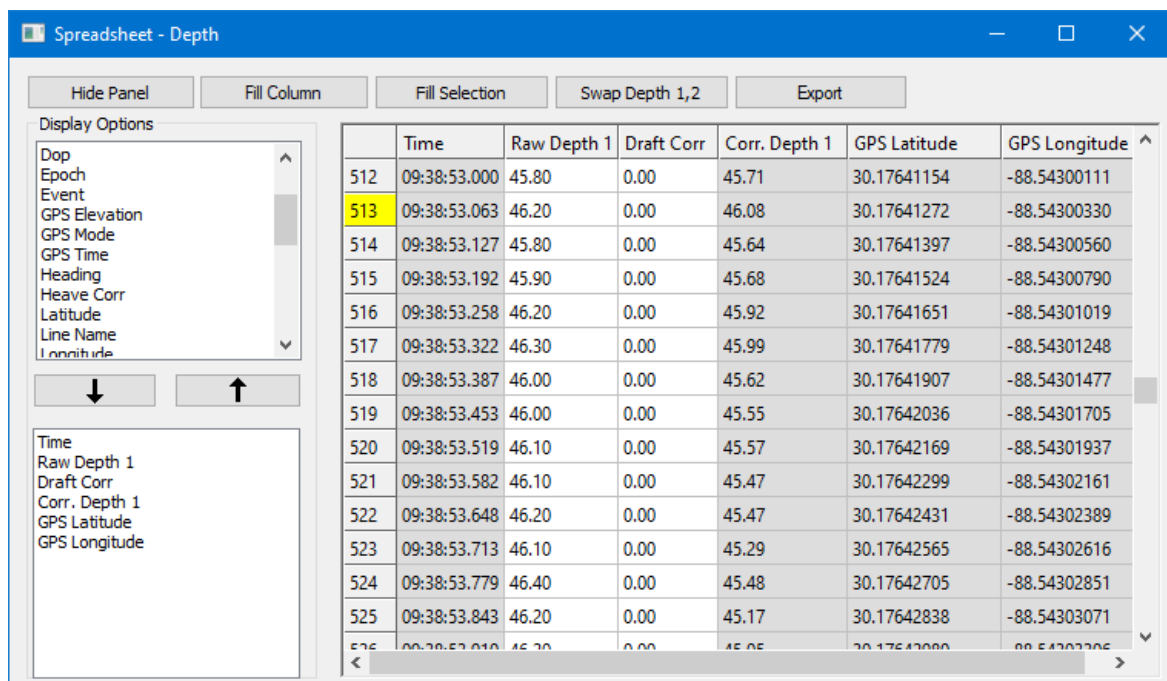
32-BIT SINGLE BEAM EDITOR (SBMAX32)

Added sounder draft to Sound Velocity Correction.

64-BIT SINGLE BEAM EDITOR (SBMAX64)

- Mouse vs tool conflict resolved.
- Updated decimal places for GPS Lat and Lon in spreadsheet to show 8 decimal places.

[64-bit SINGLE BEAM EDITOR Spreadsheet](#)

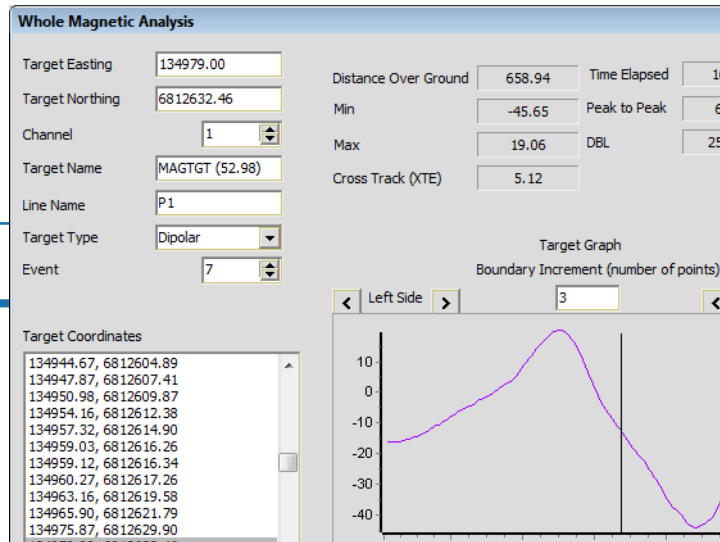


	Time	Raw Depth 1	Draft Corr	Corr. Depth 1	GPS Latitude	GPS Longitude
512	09:38:53.000	45.80	0.00	45.71	30.17641154	-88.54300111
513	09:38:53.063	46.20	0.00	46.08	30.17641272	-88.54300330
514	09:38:53.127	45.80	0.00	45.64	30.17641397	-88.54300560
515	09:38:53.192	45.90	0.00	45.68	30.17641524	-88.54300790
516	09:38:53.258	46.20	0.00	45.92	30.17641651	-88.54301019
517	09:38:53.322	46.30	0.00	45.99	30.17641779	-88.54301248
518	09:38:53.387	46.00	0.00	45.62	30.17641907	-88.54301477
519	09:38:53.453	46.00	0.00	45.55	30.17642036	-88.54301705
520	09:38:53.519	46.10	0.00	45.57	30.17642169	-88.54301937
521	09:38:53.582	46.10	0.00	45.47	30.17642299	-88.54302161
522	09:38:53.648	46.20	0.00	45.47	30.17642431	-88.54302389
523	09:38:53.713	46.10	0.00	45.29	30.17642565	-88.54302616
524	09:38:53.779	46.40	0.00	45.48	30.17642705	-88.54302851
525	09:38:53.843	46.20	0.00	45.17	30.17642838	-88.54303071

MAGNETOMETER EDITOR

In the Whole Magnetic Anomaly window, the target Event and Channel options are editable.

[Sample WMA Window](#)



FINAL PRODUCTS

HYPLOT

- Corrected color bar labels that were off by 1.
- Corrected background chart display to always show only enabled files.

TARGETING AND MOSAICKING

- Corrected towfish depth display in the spreadsheet.

UTILITIES

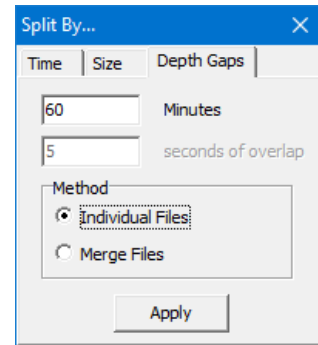
DATA SPLITTER-JOINER

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.

The merge 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.

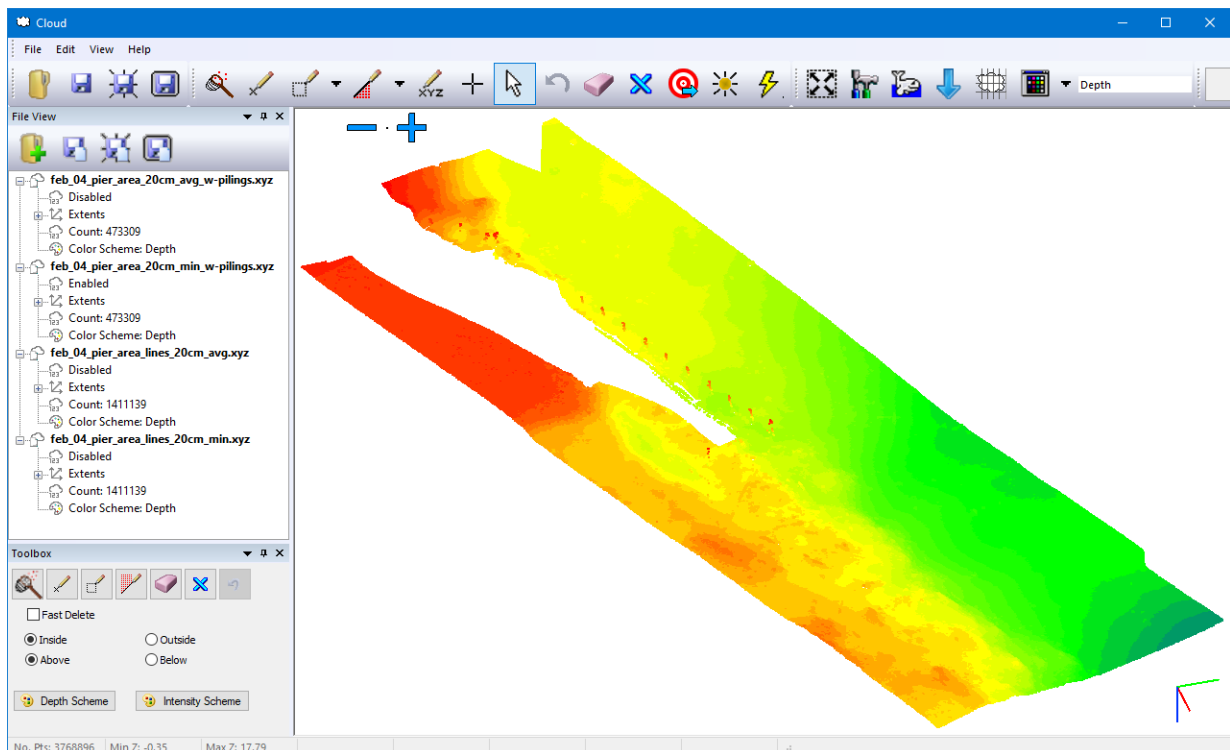
Tip: [Apply] displays a preview of the results based on the current settings. If it is not what you intended, just change your settings and click [Apply] again until you see optimal results.

- **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:

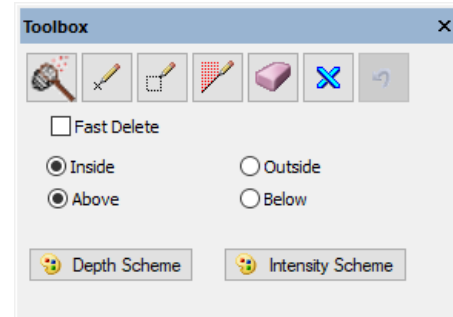
CLOUD Interface



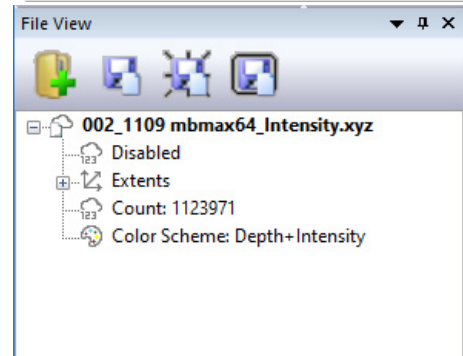
- The **new menu** moves some of the icons from the toolbar, placing more focus on those used for the data editing process. (As usual, the menu also replicates many of the icon functions.)
- The **editing tools** in CLOUD now more closely resemble the tools and function in the 64-bit HYSWEEP® EDITOR (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.

Control Point Report

Control Point File

Radius Save Difference ...

Key	Value
Arithmetic Mean	0.32
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

HYPACK Cloud Ground Truthing Report
 Cloud File: E:\000 Test Projects\1mb\R2Sonic Newcastle Pier\Sort\feb_04_pie
 Control Point File: E:\000 Test Projects\1mb\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

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