

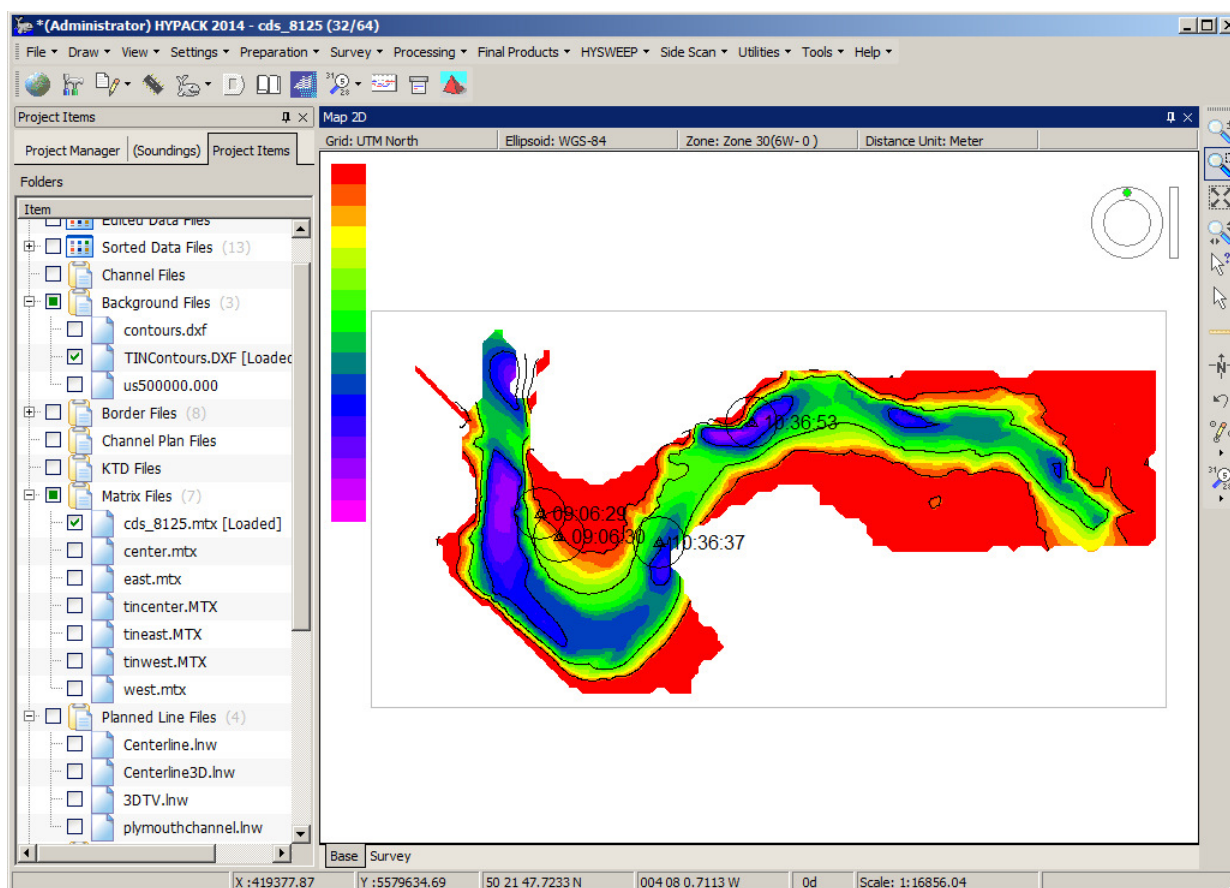


# HYPACK® 2014: Changes Since the HYPACK® 2013 Release

By Judy Bragg

## NEW INTERFACE

FIGURE 1. HYPACK® 2014 Shell



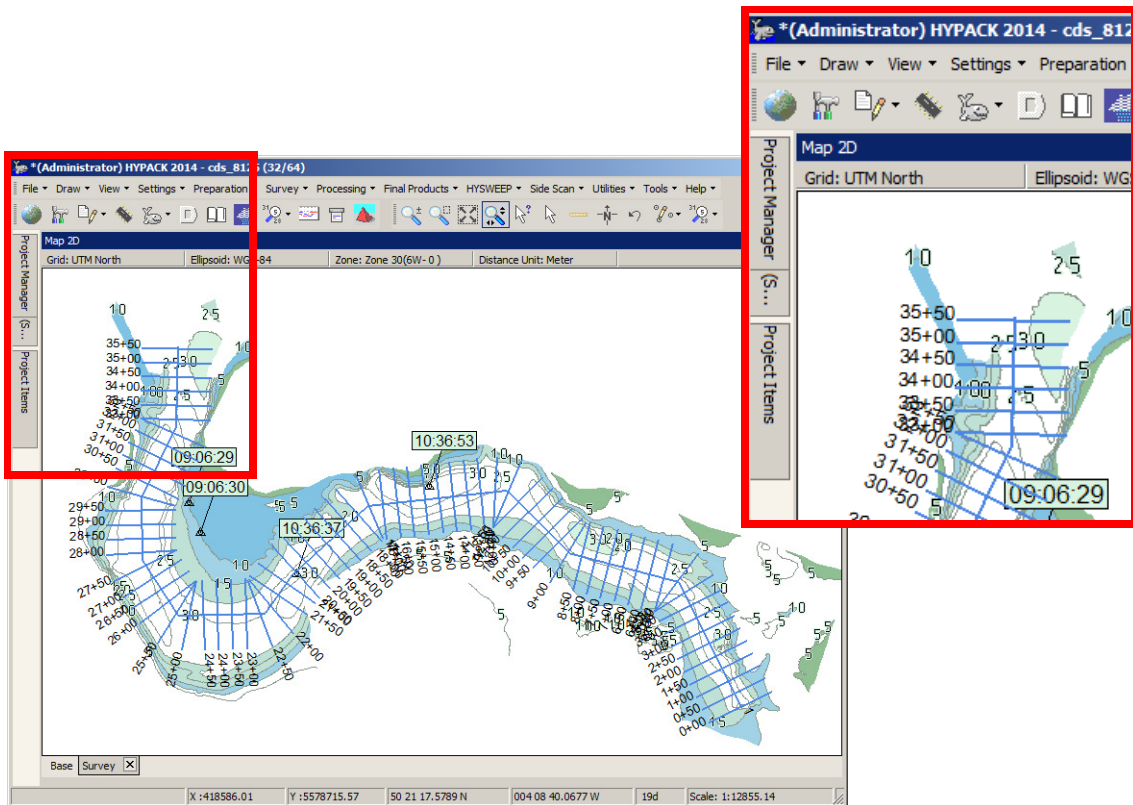
## MORE ACCESSIBLE PROJECT MANAGER AND COLORS DIALOG

It's no longer just the project files list on the left, but also the Project Manager and Color Editor. They are all stacked on top of each other, each with its own tab for quick and easy accessibility. No icons or menu selections required!

## LAYOUTS

In HYPACK® 2014, you can, not only adjust the widths of the file list and map window, but you can resize and reposition all of the windows—the map view, Project Manager, Color Editor, and file list—into any layout you want or, in one easy click, pin them to the side of the HYPACK® window.

**FIGURE 2.** Pinned Project Manager, Color Editor and Project Files List



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 following figures show a couple more layout possibilities. In the first one, the Project Manager, Color Editor and Project Items list are all unstacked and docked separately. You can see that you can dock windows side-by-side or one over another. In the second example, the file list is docked across the bottom to provide a wider window in which you can see the file path without scrolling. The Project Manager is pinned on the right.

FIGURE 3. 4-Window Layout

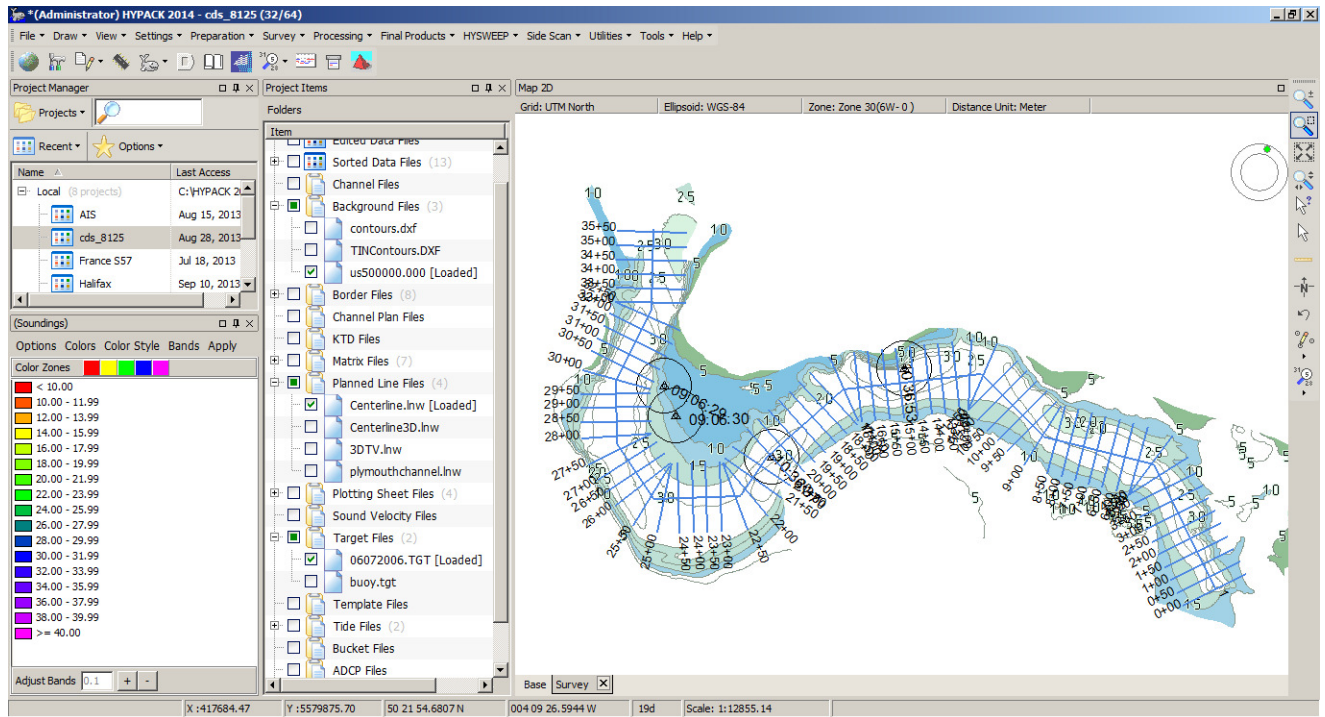
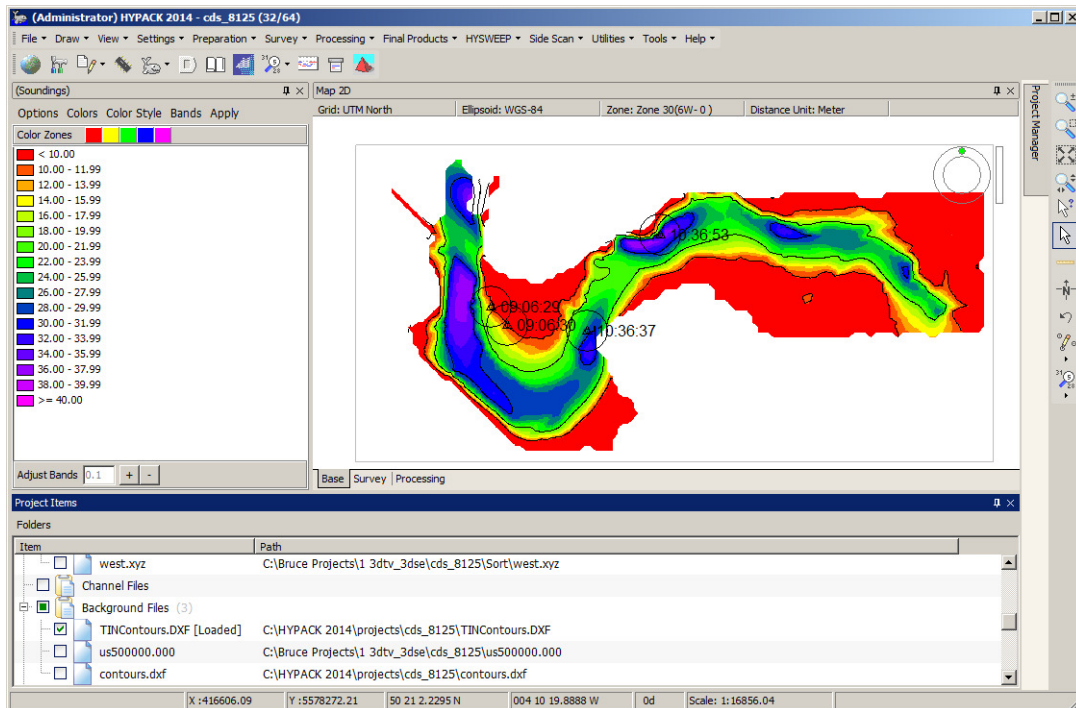


FIGURE 4. 3-Window Layout - Web Maps



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With so many layout options now, you may actually like to configure your display differently according to your task at hand. While it's pretty easy to move windows around, you can save and restore your layouts through simple menu selections. A saved layout only restores the size and position of the windows: the shell and the windows inside. It does not affect the toolbars.

## DRAG-AND-DROP

**Load input files directly to select programs:** the SINGLE BEAM EDITOR, 32-bit HYSWEEP® EDITOR, 64-bit HYSWEEP® EDITOR, TIN MODEL and HYPLOT.

- **Drag-and-drop:** Select your input files in the File Items list and drag them to the toolbar icon of the program to which you want to load the data.
- **Send To:** Right-click on the selected files and select SEND TO and the required program.

## MULTI-SELECTED FILE OPERATIONS

**To multiselect files**, hold the Ctrl key and select multiple individual files or hold the Shift key and click on the first and last file in a range of consecutive files.

You can multiselect files to do any of the following operations:

- **Remove files:** Select one or more files or folders in the File Items list then right-click and select REMOVE FILE or REMOVE FOLDER FILES respectively. The files are omitted from the File Items list, but remain on your hard drive.
- **Delete files:** Select one or more files in the File Items list then right-click and select DELETE FILE. The files are omitted from the File Items list *and deleted from your hard drive*.
- **Archive files:** Select one or more files in the File Items list then right-click and select ARCHIVE. The Archiving process compresses files and stores them in a separate folder within your project.
- **Send To:** Right-click on the selected files and select SEND TO and the required program.
- **Drag-and-drop:** Select your input files in the File Items list and drag them to the toolbar icon of the program to which you want to load the data. Programs supported include the SINGLE BEAM EDITOR, 32-bit HYSWEEP® EDITOR, 64-bit HYSWEEP® EDITOR, TIN MODEL and HYPLOT.

## COLOR TABLES

Typically, with the project colors, you are color-coding survey or dredge depths, but you may also plan color sets for number of soundings per matrix cell according to your selection in the Colors menu. Each option has a default HYPACK® Color File (\*.HCF) that stores the latest settings for the type:

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### Default Files

| Colors Menu Selection | Default HCF File Name |
|-----------------------|-----------------------|
| Soundings             | color.HCF             |
| Number of Soundings   | clr01.HCF             |

Use the COLOR EDITOR to optimize your project colors for your chosen data type.

## COLORING XYZ AND MTX FILES BY FILE

**Color By File** enables you to set specific colors for each catalog file or individual data files through the right-click menus in the Project Items list. Files loaded as part of a catalog all inherit the color of the catalog.

In 2014, this option is extended to include XYZ and matrix (\*.MTX) files.

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## HYDROGRAPHIC DATABASE

The HYDROGRAPHIC DATABASE is used to store any XYZ, edited All format or LNW files from any project for easy retrieval and use in future projects.

When you add a file to the database, you also enter metadata—Creation Date, Positioning System, Spatial Extents (coordinates or HYPACK® border file) and Key Words—that are later used as filtering criteria to help you retrieve your file.

**FIGURE 5.** Adding the File and Metadata to the Hydrographic Database

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The screenshot shows a Windows-style dialog box titled "AddFile - C:\HYPACK\_2013\Projects\Salvage for Asiana\Sort\0817-100mArea.xyz". The dialog box contains the following fields and controls:

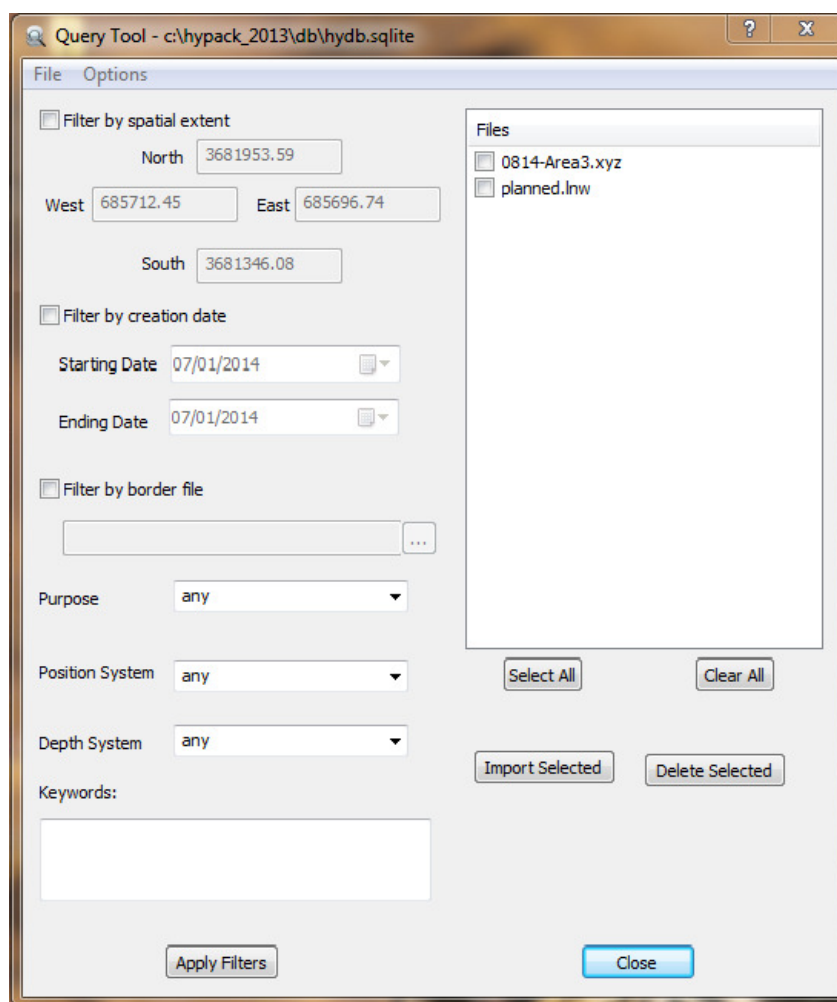
- Survey Date:** A date field set to "05/11/2013" with a calendar icon.
- Title:** A text field containing "Area 816".
- Abstract:** A text area containing "Multibeam survey to locate submerged targets".
- Purpose:** A dropdown menu set to "Reconnaissance".
- Supplemental Information:** A text area containing "Depth of 70 to 100 meters".
- Position System:** A dropdown menu set to "DGPS".
- Depth System:** A dropdown menu set to "Multi Beam Echoso".
- Buttons:** "OK" and "Cancel" buttons at the bottom.



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**FIGURE 6.** *Retrieving the Files in the Database*

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The HYDROGRAPHIC DATABASE requires a HYPACK® Max or HYPACK® Office license.

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## **PREPARATION**

### **WEB MAPS: GEO-REFERENCED PNG CHARTS FROM THE INTERNET**

If you have an Internet connection, HYPACK® can generate geo-referenced PNG files from satellite images available on Web servers. HYPACK® stores the files, by default, to the project \Satellite folder, but you may define an alternate location.

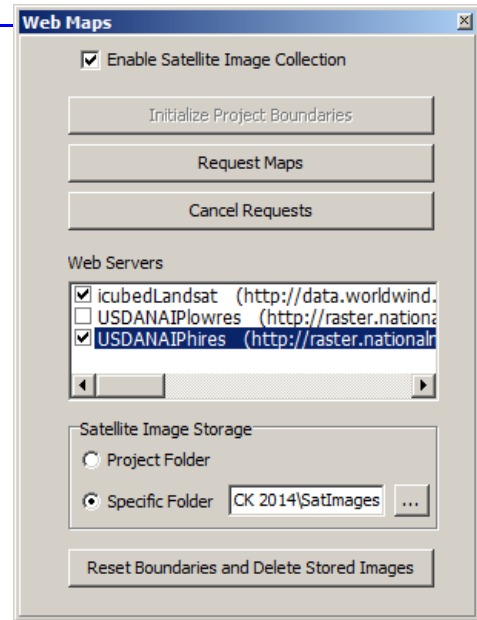
These geo-referenced PNG charts may be used as any other chart file in all HYPACK® modules.

The new Web Maps panel (VIEW-WEB MAPS) provides all of the controls:

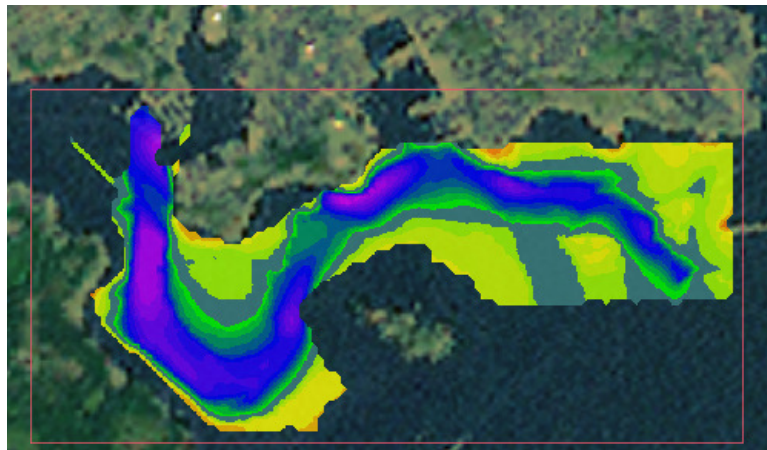
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**FIGURE 7. Web Maps Panel**

1. **Enable Satellite Image Collection option.**
2. **Select one or more Web servers** that are applicable to your needs and survey area.
  - **USA:** USDA Low resolution or high resolution images
  - **Outside the USA:** NASA satellite images
3. **Select an alternate satellite image storage location**, if desired.
4. **Initialize Project Boundaries to the extent of the area map.**
5. **Request Maps:** The program searches the selected server for images to best match the defined extents and generates the following:
  - **PNG image** that displays in your area map.
  - **PGW file** that contains coordinates that describe the location, scale and rotation of the PNG image.
  - **TXT file** that lists the coordinates of the lower left and upper right corners of your defined area, and one or more satellite image sources for the generated images.

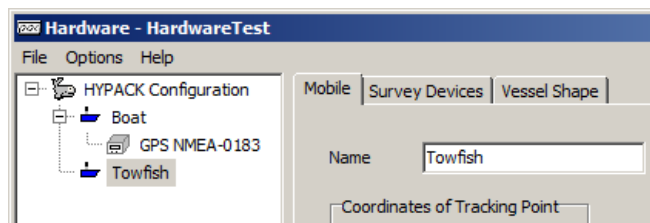


**FIGURE 8. Filled Matrix Overlaid on the Geo-referenced PDF**



## RENAME ANY MOBILE

The HYPACK® HARDWARE program enables you to rename any mobile, *even the first vessel!* Just select the mobile and enter the name in the Mobile tab.



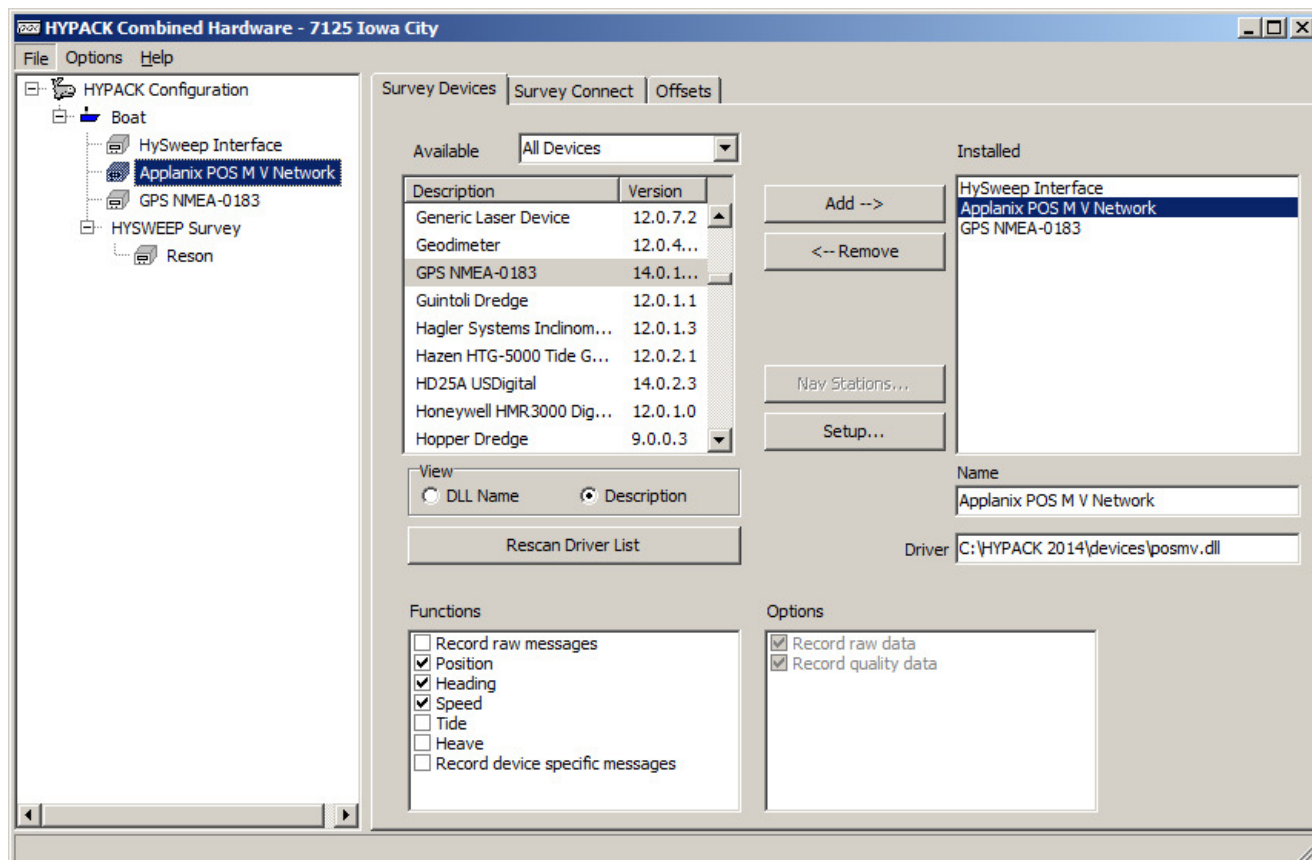
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## MERGED HARDWARE PROGRAMS

In 2014, HYPACK® HARDWARE, HYSWEEP® HARDWARE and SIDE SCAN HARDWARE are merged into the HYPACK® HARDWARE program. When you indicate that your configuration includes multibeam, side scan or both on either the first vessel or towfish, corresponding subheadings appear below the main vessel which, when selected, display the multibeam (HYSWEEP® HARDWARE) and side scan (SIDE SCAN HARDWARE) devices and options.

**FIGURE 9.** HYPACK® HARDWARE

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With all of your hardware configured in one interface, you only have to configure your positioning system once. You no longer need to configure the HYPACK Navigation and HYPACK Mobile with the other HYSWEEP® and side scan device drivers; they are automatically implemented behind the scenes. The Hysweep.dll is still required to pass heading and motion sensor data from HYSWEEP® SURVEY or SIDE SCAN SURVEY to HYPACK® SURVEY.



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# DRIVERS

## *HYPACK® DRIVERS*

- **Bortide.dll:** Custom driver for Port of Bordeaux that receives multiple tide gauges and interpolates the tide based on current boat position.
- **Capture.dll:** Option to turn on a binary filter for ASCII mode that will delete anything that is not ASCII code 32-126. You can also set beginning and end of sequence.
- **DCMS.dll:** Export depths to display window even if the transducer number is greater than 32.
- **Drafttable.dll:** Added a function to connect this to a serial port and read in a speed log.
- **Leica.dll:** Process type "4" angle format "DDMMTTT" (T is tenth of sec).
- **Magnet.dll:** Added the Seaspy Horizontal Gradiometer. When the user-defined alarm is triggered, the altitude value highlights in red in both the spreadsheet and the bigger view box.
- **Novatel.dll:** Integrates the Novatel SPAN-SE inertial navigation system via a network connection. Brings position, heading and motion into HYPACK® and HYSWEEP® via a single Ethernet cable.
- **OdomCV\_3.dll:** Modified the driver to read the GGA message coming in from the ODOM and remove the header. Once the header is removed the data is sent back out a UDP port so the GPS driver can read in the GGA message.  
The ODOM CV series sonars currently only pass the GGA message, but the driver will forward any valid NMEA message in this manner if ODOM sends more across the Ethernet in the future. This allows a serial GPS to be connected to the ODOM CV series sounder and passed to the computer in one network cable.
- **Phins.dll:** Message logging still applies only to ASCII messages. The driver now includes an option to reverse pitch.
- **SeabedID.dll:** Added Record Raw Messages function and the option to record square root of E1/E2.
- **Si\_sender.dll:** Output for Draft and Ullage changed to 1 decimal place. Supports change in the SI specification that requires the DQM data to be filtered before being sent to their computer.
- **SwingInd.dll:** You can manually enter a cut heading in place of a planned line.
- **Syqwest.dll:** Supports a dual frequency system using 1 transducer.
- **Towfish.dll:** Replaces the towcable.dll. You can choose the depth of the channel when not using the shallow fish option.
- **TSS350:** Works with TSS440 pipeline tracker. It reads position and thickness from the sensor.
- **Weeksopc.dll:** Added the math to the driver because the delay from the PLC was making the hopper volume and displacement readings off by a small amount. Also added 10 point averaging required by DQM.

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## *HYSWEEP® DRIVERS*

- **Novatel.dll:** Integrates the Novatel SPAN-SE inertial navigation system via a network connection, supplying motion and heading to HYSWEEP®.
- **Kongsberg EM2040, R2Sonic, Odom MB1:** Support dual-head logging.
- **R2Sonic:** TruePix Data option enables HYSWEEP® SURVEY to log TruePix data to \*.R2S files. These files may become large, so don't select this option unless you wish to post-process the TruePix imagery. (Log Snippet Data option is ignored; Dual head driver does not support snippets.)
- **Riegl and MDL Laser Scanners:** Modified to log to TOP records for simultaneous logging with Multibeam data.
- **Seabat 7xxx/81p:** Separated setup into two dialogs—7k and 81p. New command sent to Seabat controller for snippet setup. Now uses Seabat command 1118 instead of command 1103.
- **New Drivers:**
  - **Imagenix DT100**
  - **Klein HydroChart3500:** Interferometric side scan. It provides bathymetry, side scan, heading, pitch, and roll over a network stream.
  - **Odom Dual MB1** supports simultaneous ping, buffering to accommodate MB1 transmission delays, uses side scan constructed from snippet data. (Single head MB1 also changed to use snippet side scan.)
  - **Seabat 7160:** Multibeam sonar with network interface and UTC time synchronization to provide multibeam and side scan data.

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## *SURVEY*

### *AUTO-MATRIX*

Auto-matrix is a method by which matrix data is logged to a binary data file and stored in the project \Automtx folder. When you close the SURVEY program, HYPACK® generates a matrix file according to user-defined options, and with the right dimensions to fit your survey data. This eliminates the need to “size” a matrix over your survey area in advance with the MATRIX EDITOR.

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**Note:** The auto-matrix feature is only available for multibeam surveys.

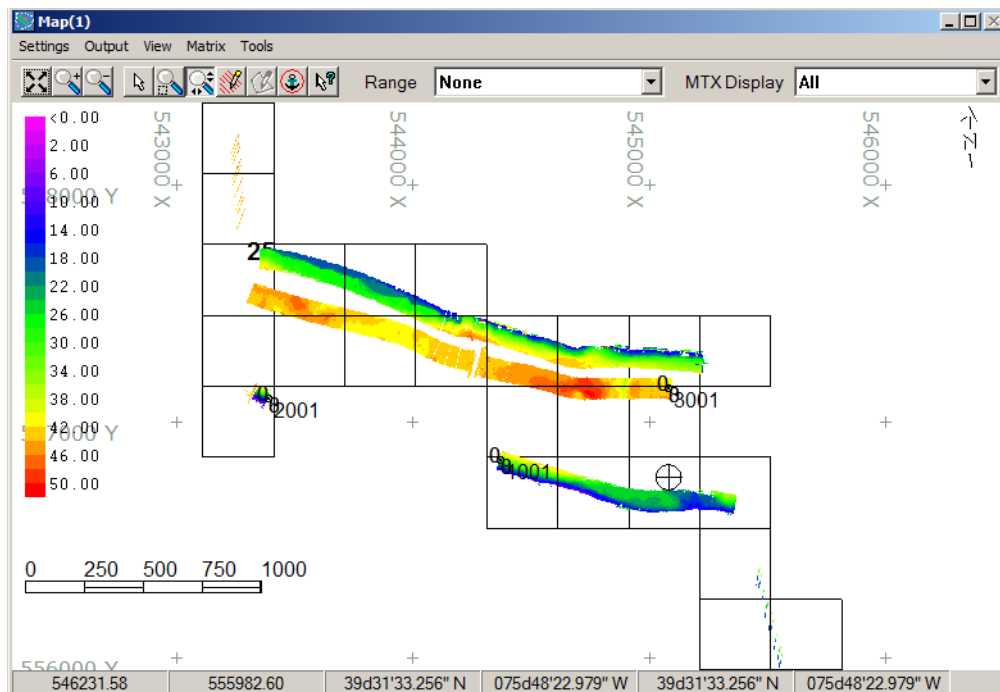
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When HYPACK® SURVEY starts to paint sounding data, a series of matrix blocks appears in the Map window. HYPACK® SURVEY starts with a 3x3 matrix block pattern.

- *During logging*, as you move toward the edge of the 3x3 block cluster, the HYPACK® SURVEY program adds additional blocks ahead of the vessel and removes the row or column farthest behind the vessel so it always maintains the 3x3 block cluster.
- *When you are not logging*, the Matrix Display drop-down in the HYPACK® SURVEY Map windows enables you to choose how much data to display:

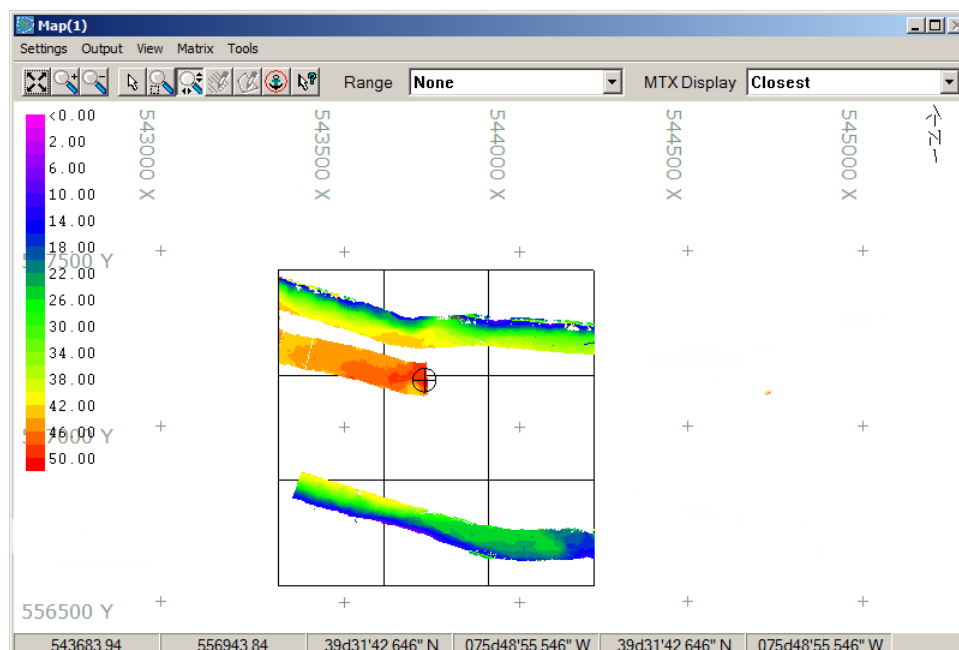
- **All** blocks containing sounding data.

**FIGURE 10.** Viewing All Auto-matrix Blocks When not Logging



- **Closest:** The blocks in the 3x3 block area closest to the current vessel position if they contain sounding data.

**FIGURE 11.** Viewing the Closest Auto-matrix Blocks When not Logging



- **None**

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## NEW MARINE CONSTRUCTION ROUTINES

HYPACK® includes additional tools to assist in accurate positioning of barges and rigs, and generate a statistical report regarding the accuracy.

### *MULTIPLE POSITION DEVICES ON ONE MOBILE*

Your hardware configuration may include multiple positioning devices (gps.dll, posmv.dll and novatel.dll) on one mobile. In HYPACK® SURVEY, you can then monitor the quality of your positioning and switch between positioning systems, or use an average of multiple systems without leaving the SURVEY interface.

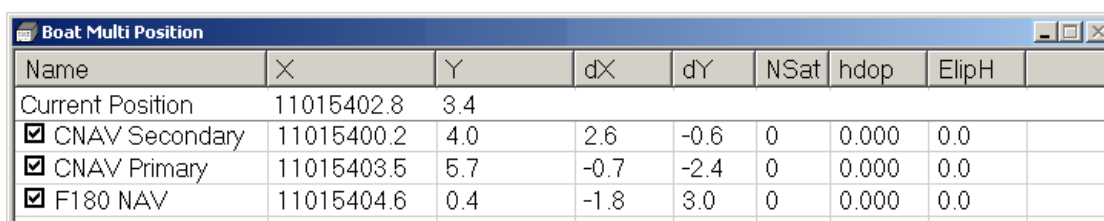
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**Important:** In the HYPACK® HARDWARE setup, every multi-positioning driver must log *only position*.

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For each mobile with multiple positioning devices, SURVEY or DREDGEPACK® displays a window with the mobile name in the title bar and a list of all of its positioning devices with their current position and quality information. Use the check box for each device to enable and disable the device. When you select multiple devices, the program calculates the average position. (You can not disable all of the positioning devices.)

**FIGURE 12.** SURVEY Calculates the Average Position from Multiple Position Devices



| Name                                               | X          | Y   | dX   | dY   | NSat | hdop  | ElipH |  |
|----------------------------------------------------|------------|-----|------|------|------|-------|-------|--|
| Current Position                                   | 11015402.8 | 3.4 |      |      |      |       |       |  |
| <input checked="" type="checkbox"/> CNAV Secondary | 11015400.2 | 4.0 | 2.6  | -0.6 | 0    | 0.000 | 0.0   |  |
| <input checked="" type="checkbox"/> CNAV Primary   | 11015403.5 | 5.7 | -0.7 | -2.4 | 0    | 0.000 | 0.0   |  |
| <input checked="" type="checkbox"/> F180 NAV       | 11015404.6 | 0.4 | -1.8 | 3.0  | 0    | 0.000 | 0.0   |  |

HYPACK® SURVEY logs position records for each enabled positioning system individually, as well as the averaged position using an additional device ID number. Using the configuration in Figure 12, SURVEY will log four POS records: one for each GPS and one for the average position of the currently selected systems.

### *MULTIPLE TRACKING POINTS (OFFSETS)*

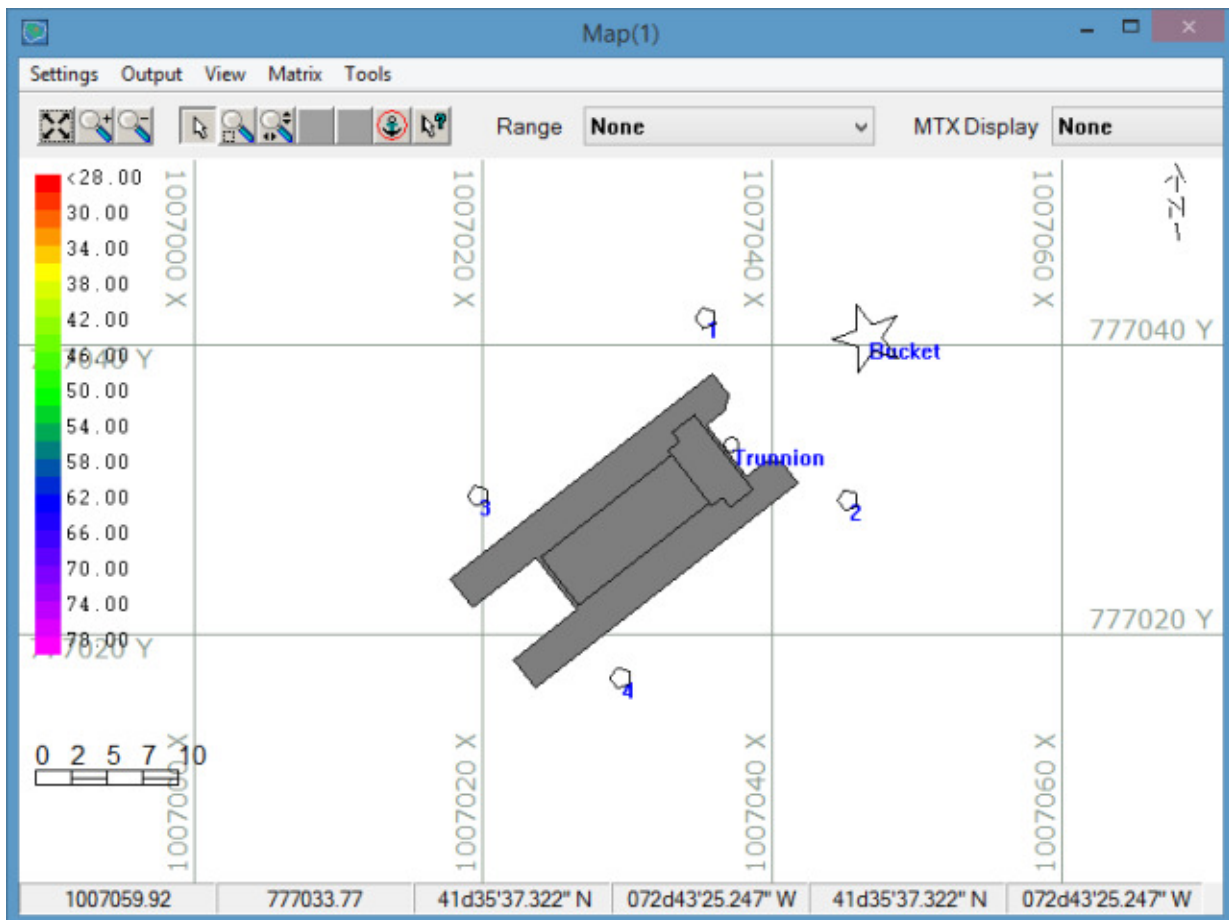
The **tracking point** is the position used by SURVEY or DREDGEPACK® to position the mobile in the world. It is used to provide left/right guidance, make automatic “start line” and “end line” decisions, and calculate horizontal distances between the vessel and features in your survey area. It is also the location at which Quickmark targets are marked. The tracking point is configured by entering horizontal offsets relative to the boat origin in the Mobile tab of the HYPACK® HARDWARE program.

Now, in SURVEY or DREDGEPACK®, you can configure *up to 15 additional tracking point locations called offsets* and, at any time, you can change to any of the 16 locations to use as the tracking point.

You can also configure the display of any number of these 16 locations in SURVEY or DREDGEPAK®. For each location you choose to display, you also set the symbol, its size and whether it is labeled with its name.

**Note:** Offsets can only be defined on the main vessel.

**FIGURE 13.** Six Offsets Displayed in DREDGEPAK®



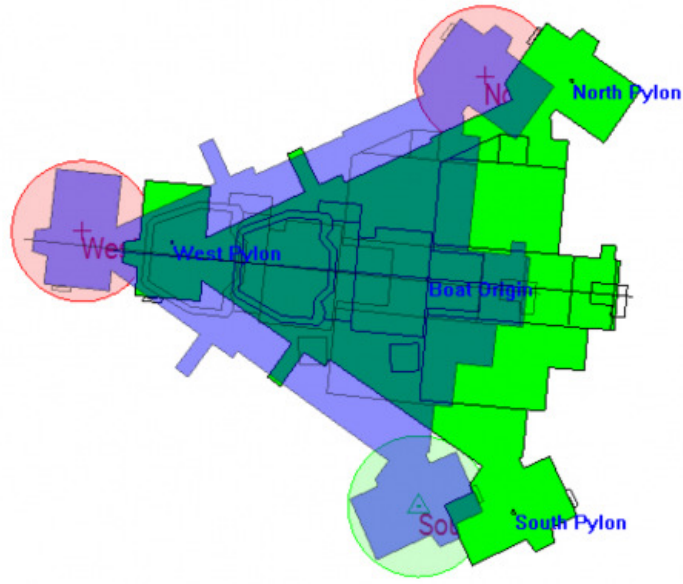
By using these offsets in conjunction with the HYPACK® Barge device driver, or a target file with the required final world position of each offset tracking point, you can accurately position your mobile in the world.



**FIGURE 14.** *Real-time Rig Approaching its Final Destination*

In this example, the green, real-time mobile approaches its final, required destination, which is marked by the blue boat shape using the barge.dll. The targets represent the final positions for each offset tracking point on the real-time mobile.

Once you are in position, you can then generate a statistical report of the average position of each offset and the standard deviation in each direction (SD-X, SD-Y and SD-Z) over a user-defined time range.



**FIGURE 15.** *Sample Report*

Offsets\_20131127\_133023.txt - Notepad

File Edit Format View Help

Report Date: 11/27/2013  
 Report Start Time: 13:30:04  
 Report End Time: 13:30:23  
 Units: Meters

HDOP: Min 0.00 Max 0.00  
 Num of Sats: 0 0  
 GPS Mode: -1 -1

| Offset | Name        | Avg X     | Avg Y      | Avg Z | SD-X | SD-Y | SD-Z |
|--------|-------------|-----------|------------|-------|------|------|------|
| 1      | Boat origin | 500002.16 | 1999994.30 | 0.00  | 0.02 | 0.98 | 0.00 |
| 2      | West Pylon  | 499821.36 | 2000023.50 | 0.00  | 0.46 | 2.80 | 0.00 |
| 3      | North Pylon | 500106.76 | 2000133.00 | 0.00  | 2.26 | 2.18 | 0.00 |
| 4      | South Pylon | 500059.66 | 1999828.40 | 0.00  | 2.68 | 1.55 | 0.00 |

## LOGGING TOPOGRAPHIC LASER DATA

HYSWEEP® SURVEY can log laser scanner data simultaneously with multibeam sonar data.

Laser scanner data is logged either to multibeam RMB records or to TOP (topographic) records.

- **Logging to RMB records** essentially treats topographic lasers as upward-pointing multibeam sonars, using the same display and logging code for both. This requires the number of beams to be downsized to conform to the 1440 beam per ping limit, but they can be processed in the 32-bit HYSWEEP® EDITOR or 64-bit HYSWEEP® EDITOR.
- **Logging to TOP records** provides a 10,000 beam/ping limit; *the laser data is not downsized.*

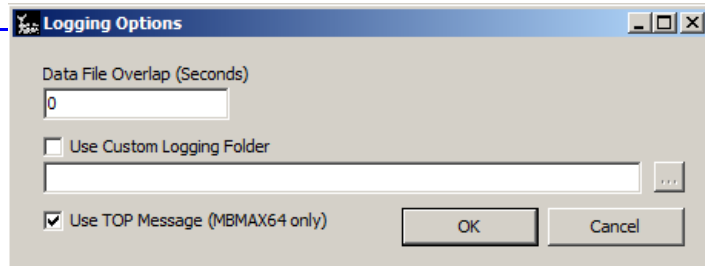
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**Important:** You can process TOP records only in the 64-bit HYSWEEP® EDITOR. If you do not have a 64-bit capable computer for editing your data, you should log RMB records.

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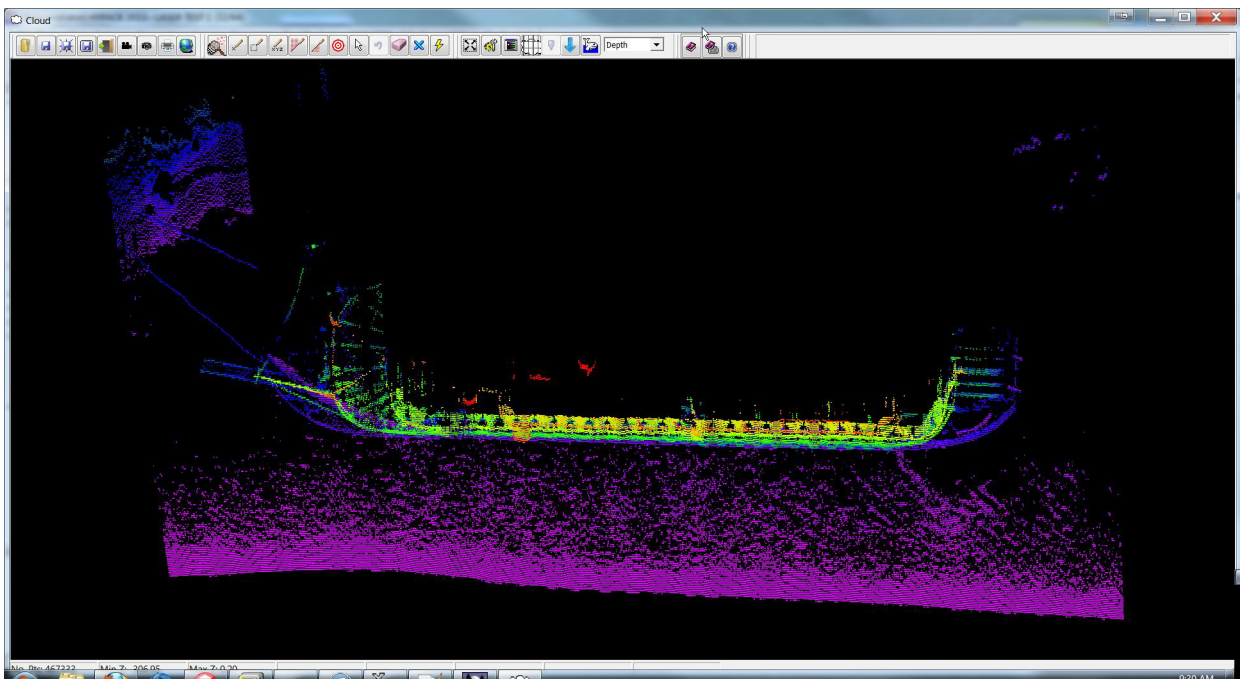
#### Logging Options Dialog

The **Use TOP Message** option in the Logging Options dialog (FILE-LOGGING OPTIONS) determines the record format for laser data. Check the option to log TOP records, clear the checkbox to log RMB records.



**FIGURE 16.** Here's the American Queen From the Top

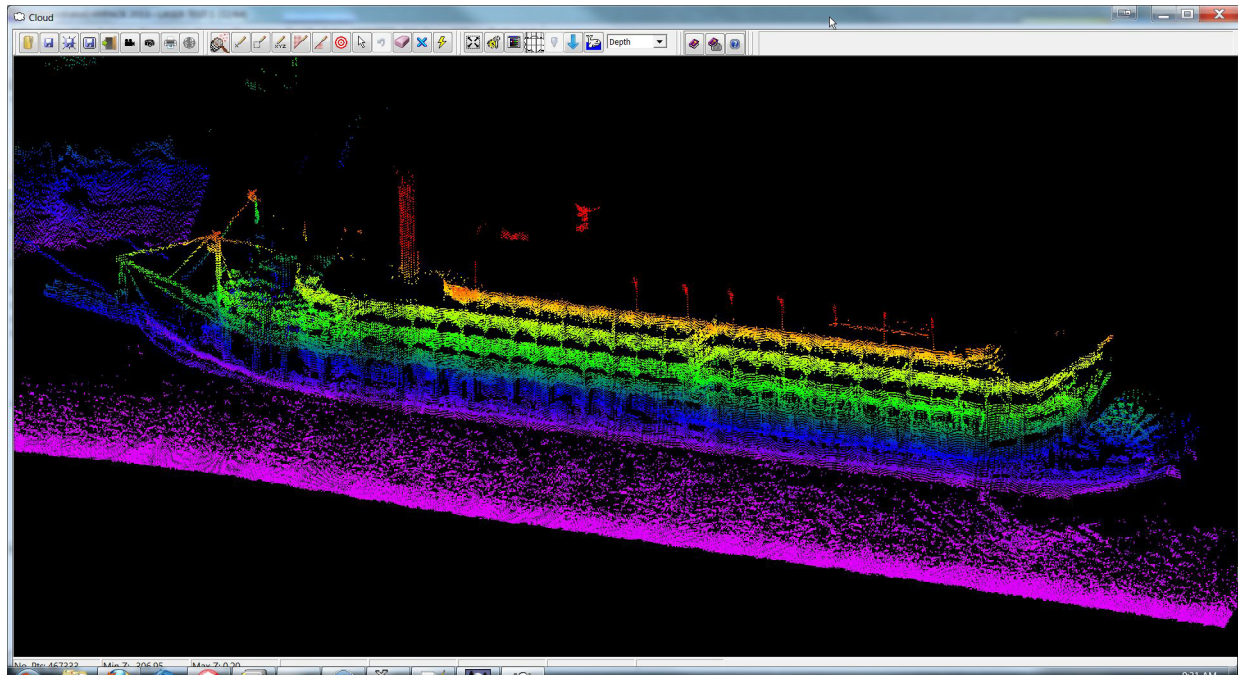
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**FIGURE 17.** *And Again From the Side. Check out the water wheel and rigging:*

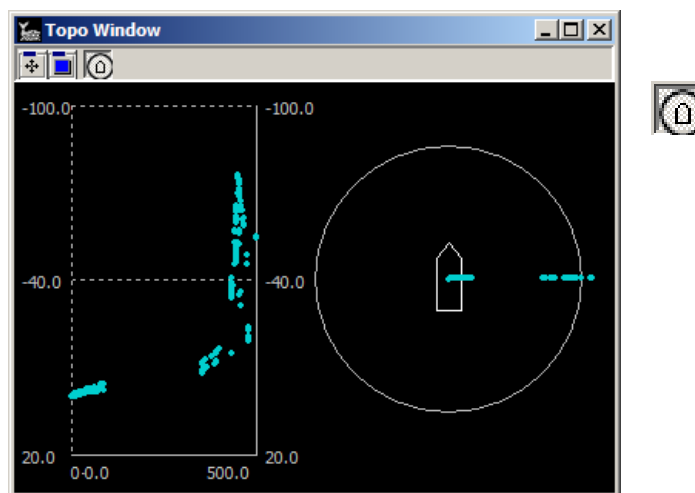
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The **new Topo window** is similar to the Beam Profile and shows laser coverage using real-time corrections. It displays the profile view and an optional map view that you can turn on and off with the Toggle Overhead View icon.

*Topography Window (left), Toggle Overhead View Icon (right)*

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The **Coverage Map** can paint a matrix with both multibeam and the new TOP data or draw topographic coverage as “sticks.”

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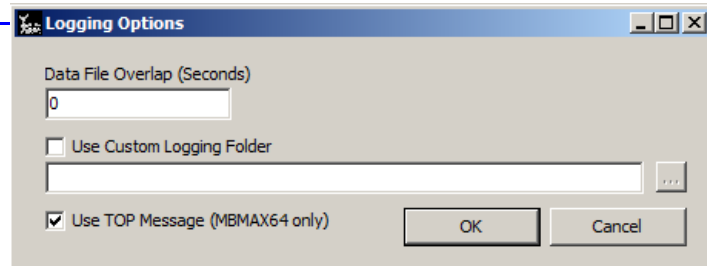
## LOGGING OVERLAP TO PREVENT GAPS IN HYSWEEP® AND SIDE SCAN SURVEY

Long survey lines are often broken into smaller segments using the Log Back Time (in the HYPACK® SURVEY Navigation Parameters). **Log Backup Time** starts logging a new data file every 'n' minutes. It is easier in processing to have a lot of smaller files than just a few overly large files.

**Data File Overlap** prevents data gaps, by continuing to log to the previous raw HSX file after a new one has been opened. Select Overlap in the Logging Options dialog of HYSWEEP® SURVEY and SIDE SCAN SURVEY(FILE- LOGGING OPTIONS).

### *Logging Option Dialog*

Three seconds should be enough unless you are working in deep water. Then, logging overlap is based loosely on sonar range allowing for three pings of delay within the sonar. There's no harm in too much overlap, but too little will lead to data gaps.



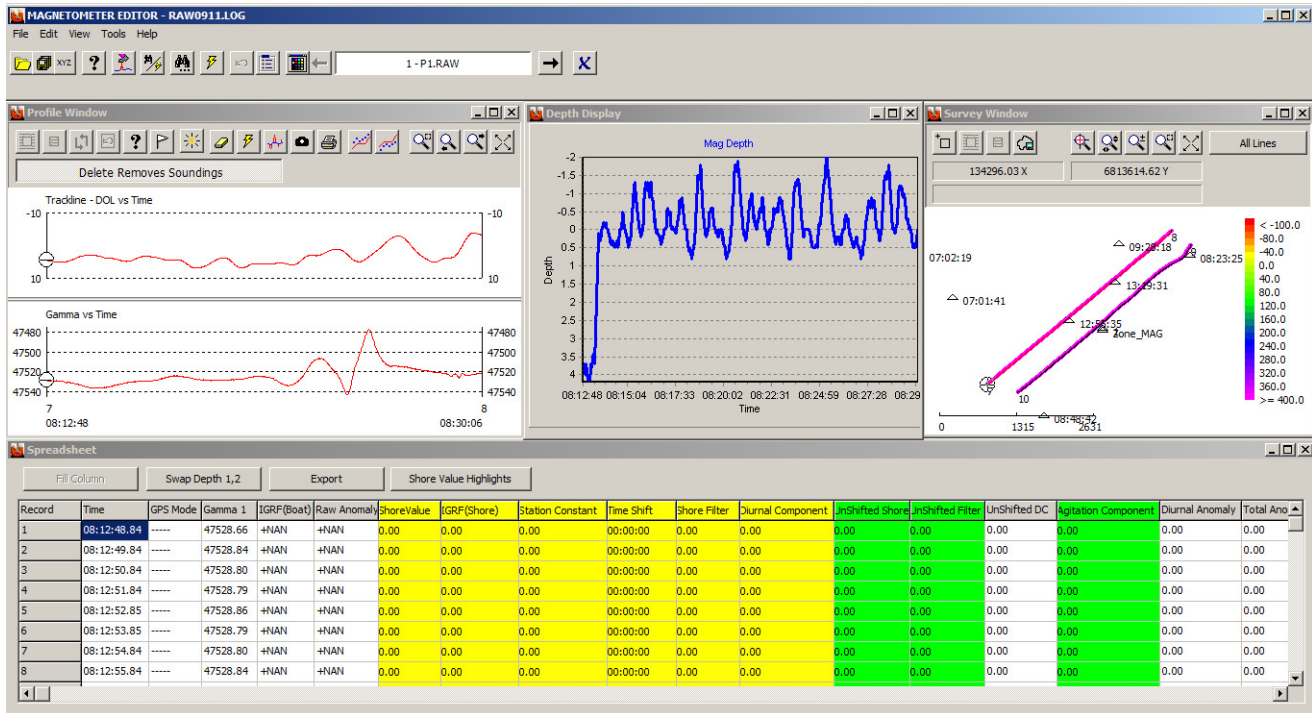
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## PROCESSING

### MAGNETOMETER EDITING

The MAGNETOMETER EDITOR (MagEdit) supports IGRF and shore-based corrections to remove the noise from your magnetic data. It can be used to process data from stand-alone magnetometers, with or without IGRF corrections; or a sea magnetometer with a shore-based magnetometer, both with IGRF corrections.

**FIGURE 18. MAGNETOMETER EDITOR**



- **IGRF** (International Geomagnetic Reference Field) corrections calculate the earth's magnetic force at a particular location and time. The program subtracts the magnetic force from the raw reading to obtain the raw anomaly (removing the 'background gamma' from the recorded data):

**Raw Reading - IGRF(ship,time)**

(EQ 1)

IGRF corrections, by default, save the raw anomaly to the corrected value in All format files, or to the Z-value in XYZ files.

- **Shore-based corrections** require a data file from a shore-based station. You must input the position of the station as it is used for several calculations:
  - **IGRF** for the shore station itself.
  - The **time shift** to accommodate the difference in distance of the boat and shore station. If shore data is at a different time interval than the raw data, the MAGNETOMETER EDITOR interpolates the shore data to calculate values to match the raw data.

Shore-based corrections save the total anomaly to the Z-value, by default, but you can change it to another anomaly (raw, diurnal, total field) in the File Save options.



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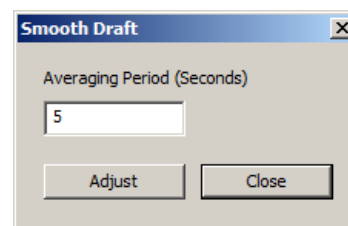
## 64-BIT HYSWEEP® EDITOR

### *INTEGRATED CUBE*

In HYPACK®, CUBE models are implemented in the 32-bit, stand-alone HYSWEEP® CUBE program, and in the 64-bit HYSWEEP® EDITOR. Integrating CUBE in the 64-bit HYSWEEP® EDITOR enables you to correct and edit your data then continue directly into the CUBE calculations.

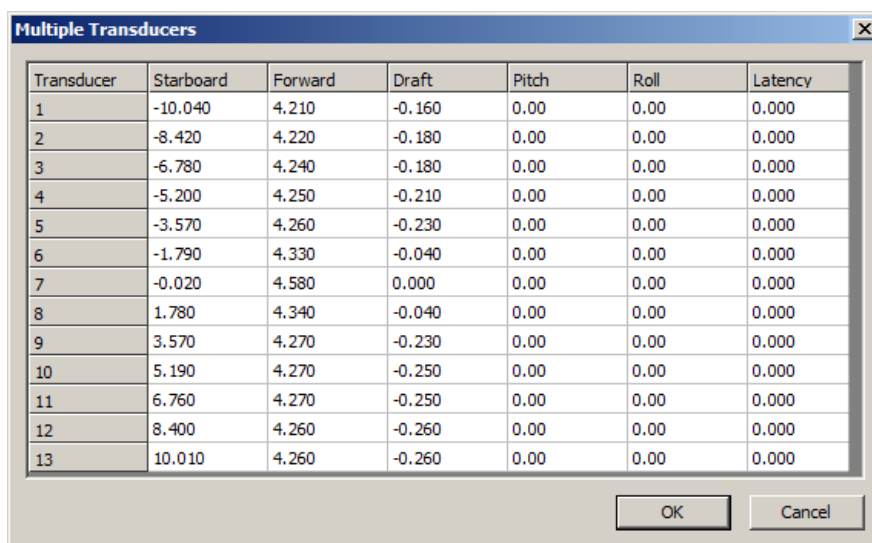
### *DRAFT SMOOTHING*

If dynamic draft has been logged to your data, particularly if you did so from a sensor on a towfish, the values may change frequently and abruptly. In Stage 1 or 2 editing, you can average the draft over a user-specified Average Period to remove the effects of the motion for the draft data.



### *MULTIPLE TRANSDUCER EDITING*

- In the Device Offsets, accessed from the Read Parameters dialog, the offsets under Sonar Head 1 and Sonar Head 2 are blank. Click [Multiple Transducers] and enter the offsets for each transducer.
- In the Color Settings dialog under Soundings, you can choose to color by sonar head.

A screenshot of the 'Multiple Transducers' dialog box. It has a title bar with 'Multiple Transducers' and a close button. Inside is a table with 7 columns: Transducer, Starboard, Forward, Draft, Pitch, Roll, and Latency. The table contains 13 rows of data. At the bottom, there are two buttons: 'OK' and 'Cancel'.

| Transducer | Starboard | Forward | Draft  | Pitch | Roll | Latency |
|------------|-----------|---------|--------|-------|------|---------|
| 1          | -10.040   | 4.210   | -0.160 | 0.00  | 0.00 | 0.000   |
| 2          | -8.420    | 4.220   | -0.180 | 0.00  | 0.00 | 0.000   |
| 3          | -6.780    | 4.240   | -0.180 | 0.00  | 0.00 | 0.000   |
| 4          | -5.200    | 4.250   | -0.210 | 0.00  | 0.00 | 0.000   |
| 5          | -3.570    | 4.260   | -0.230 | 0.00  | 0.00 | 0.000   |
| 6          | -1.790    | 4.330   | -0.040 | 0.00  | 0.00 | 0.000   |
| 7          | -0.020    | 4.580   | 0.000  | 0.00  | 0.00 | 0.000   |
| 8          | 1.780     | 4.340   | -0.040 | 0.00  | 0.00 | 0.000   |
| 9          | 3.570     | 4.270   | -0.230 | 0.00  | 0.00 | 0.000   |
| 10         | 5.190     | 4.270   | -0.250 | 0.00  | 0.00 | 0.000   |
| 11         | 6.760     | 4.270   | -0.250 | 0.00  | 0.00 | 0.000   |
| 12         | 8.400     | 4.260   | -0.260 | 0.00  | 0.00 | 0.000   |
| 13         | 10.010    | 4.260   | -0.260 | 0.00  | 0.00 | 0.000   |

## SIDE SCAN MOSAICKING FILTER

The **median filter** (in the Advanced tab of the Read Parameters in the SIDE SCAN TARGETING AND MOSAICKING program) removes outlying data spikes but retains features. This reduces noise and improves blending. (A similar filter is available in the blending options of the mosaic mode; however, it is less effective because you apply it to the lower-resolution, completed mosaic rather than the full set of pings available during the loading phase.)



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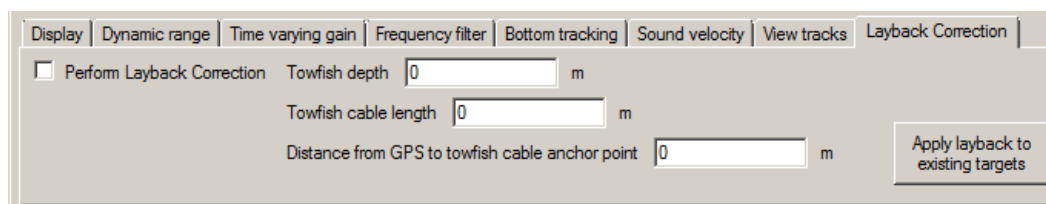
## HSX CONVERTER

- **Output Course Made Good for Heading:** In the case where there is no gyro, a value of 0 will be set for the heading. This option provides a GYR record, based on COG, based on the position data, to provide a heading in the 64-bit HYSWEEP® EDITOR.
- **Supports Imagenex DT100** to HSX Conversion.
- **Reverse Data option** in HSX Utilities fixes data (HSX) when collected with the mount in the Reverse mode.
- **New Binning methods for JSF bathymetry.**
- **Support for dual head EM2040 system ALL files.**

## SUB-BOTTOM PROCESSOR

- **Layback Adjustment options:** If you log data in HYPACK®, the towfish driver provides layback correction in the data files. If you are processing data that is not corrected for layback, enter the parameters in the layback correction calculations.

*FIGURE 19. Layback Corrections Parameters*



The screenshot shows a software window titled 'Layback Correction' with several tabs: 'Display', 'Dynamic range', 'Time varying gain', 'Frequency filter', 'Bottom tracking', 'Sound velocity', 'View tracks', and 'Layback Correction'. The 'Layback Correction' tab is active. It contains a checkbox labeled 'Perform Layback Correction' which is currently unchecked. To the right of the checkbox are three input fields: 'Towfish depth' with a value of '0' and unit 'm', 'Towfish cable length' with a value of '0' and unit 'm', and 'Distance from GPS to towfish cable anchor point' with a value of '0' and unit 'm'. A button labeled 'Apply layback to existing targets' is located at the bottom right of the dialog.

- **Supports little-Endian format** SEGY files.
- **Supports SEGY coordinate units type 3** in some 3rd party files.

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## FINAL PRODUCTS

### FINAL PRODUCT WIZARD

The FINAL PRODUCT WIZARD automatically processes edited (All format, HS2 or HS2x) and XYZ sounding data to produce one or more final products according to your sounding selection and output specifications. Output options include plotting sheets, which may also be used to generate georeferenced PDF or TIF chart files, DXF contours and channel condition reports.

**FIGURE 20.** Final Products Wizard

The screenshot shows the 'Final Product Wizard' dialog box. It is organized into four main panels. The 'Edited Data Files' panel on the left lists three files: '000\_0853.HS2x', '000\_0905.HS2x', and '000\_0918.HS2x'. Below this list are buttons for 'Add', 'Remove', and 'Clear'. Further down are 'Save Process', 'Load Process', 'Save Process As', 'RUN', 'Cancel', and 'Set Colors'. The 'Sounding Selection' panel contains 'Sort Method' (radio buttons for Sort, Cross Sort, SB Selection, Mapper, None), 'Depth Mode' (radio buttons for Depth 1, Depth 2), 'Sounding Selection' (radio buttons for Minimum, Maximum, Range (Max-Min), Average, Nearest to Cell Center, Strikes, Samples Per Cell), and checkboxes for 'Remove Below' and 'Remove Above'. The 'Contours' panel has an 'Export' dropdown set to '2D Contour', a 'TIN Max Side' input set to 30, 'Contour parameters' (Filtering: Minimum Leg 20, Minimum Area 20, Enable Smoothing), and 'Export' options for 'Contours' and 'Solid Area' with a 'Step' dropdown set to 'Color Scheme' and a 'Contour Attributes...' button. The 'HYPLOT' panel includes 'Plotting Files' (test\_mbm64.plt), 'Hyplot Template File' (C:\HYPACK 2014\Templates\IHO\_PLT.hyt), 'Background Files' (contour\_5\_black.DXF), 'Output' (PDF, GeoTIF), and 'Resolution (Pixels per Inch)' (72, 96, 144, 150, 300, 600). At the bottom is a 'Channel Condition Reporter' section with an 'Enable' checkbox and a file path field.

1. **Load the edited data to be included and configure your process.** Enable the final product routines for the output formats you want to generate and set the related options.
  - **In the Sounding Selection area**, select the sort method and the related parameters. If your data is pre-sorted, select None.

**Important:** Unless your data has already been sorted, *we strongly recommend sorting your data.*

- **In the Contours area**, set the options to generate contours from your data set as needed.
  - **In the HYPLOT area**, set the options to plot your data and any additional chart files as needed.
  - **A Channel Condition Report** requires an existing RPT file (generated and saved in the CHANNEL CONDITION REPORTER) with the channel and reach specifications.
2. **Customize your sounding colors.** (Optional) If you want to process your data using colors other than your current project colors, click [Set Colors] to access the Colors dialog and modify your project colors without leaving the wizard.
  3. **If you have configured a new process, save the settings.** (Optional) This stores your settings in a process file (\*.AFP). When you want to process another set of data using the same settings, you can quickly restore your settings by loading the process file.
    - **[Save Process]** saves a new process or overwrites the currently loaded process.

- 
- **[Save Process As]** saves the process to a new process file.
4. **Click [Run]**. The program reads the listed edited data files and processes them according to your specifications.

## CLOUD UPDATES

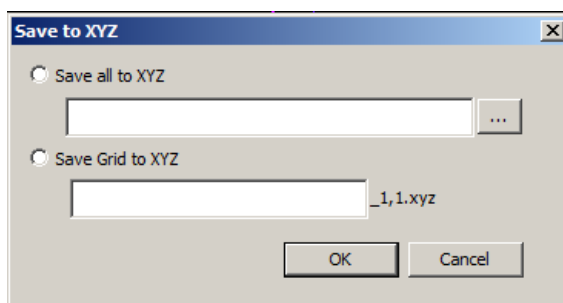
- HYPACK® now includes a 64-bit version of CLOUD. In addition to the features in last year's 32-bit version, it can read and write the 64-bit HS2x format.

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**Note:** To run the 64-bit modules, you must install HYPACK® on a computer with 64-bit capability.

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- In either the 32-bit or 64-bit CLOUD, when you save your data to XYZ format, you can choose to save one file for each cell in the CLOUD grid. The program automatically names each file, appending the column and row number of the cell to the user-defined root name (eg. CloudGrid\_1,1.xyz, CloudGrid\_1,2.xyz, CloudGrid\_2,1.xyz and CloudGrid\_2,2.xyz) and stores them in the project Sort folder.



## 64-BIT TIN MODEL

- HYPACK® now includes a 64-bit version of TIN MODEL. In addition to the features in last year's 32-bit version, it can read the 64-bit HS2x format.

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**Note:** To run the 64-bit modules, you must install HYPACK® on a computer with 64-bit capability.

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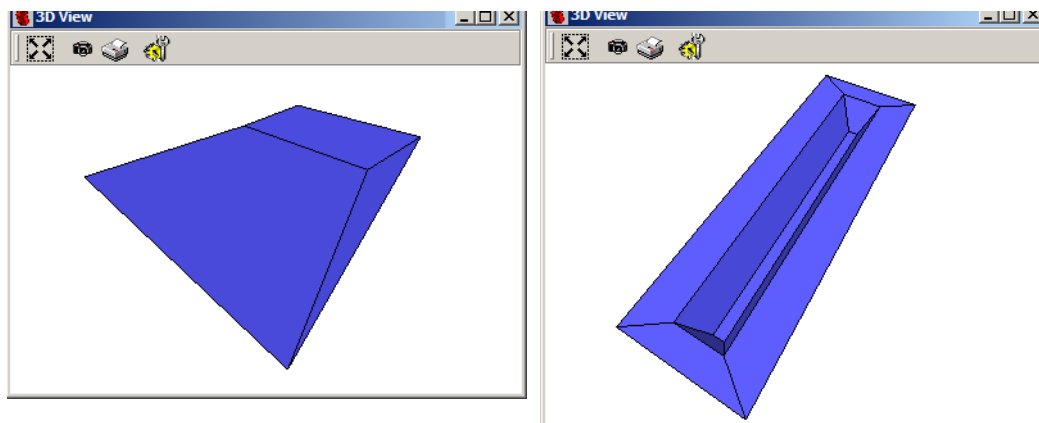
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## ADVANCED CHANNEL DESIGN

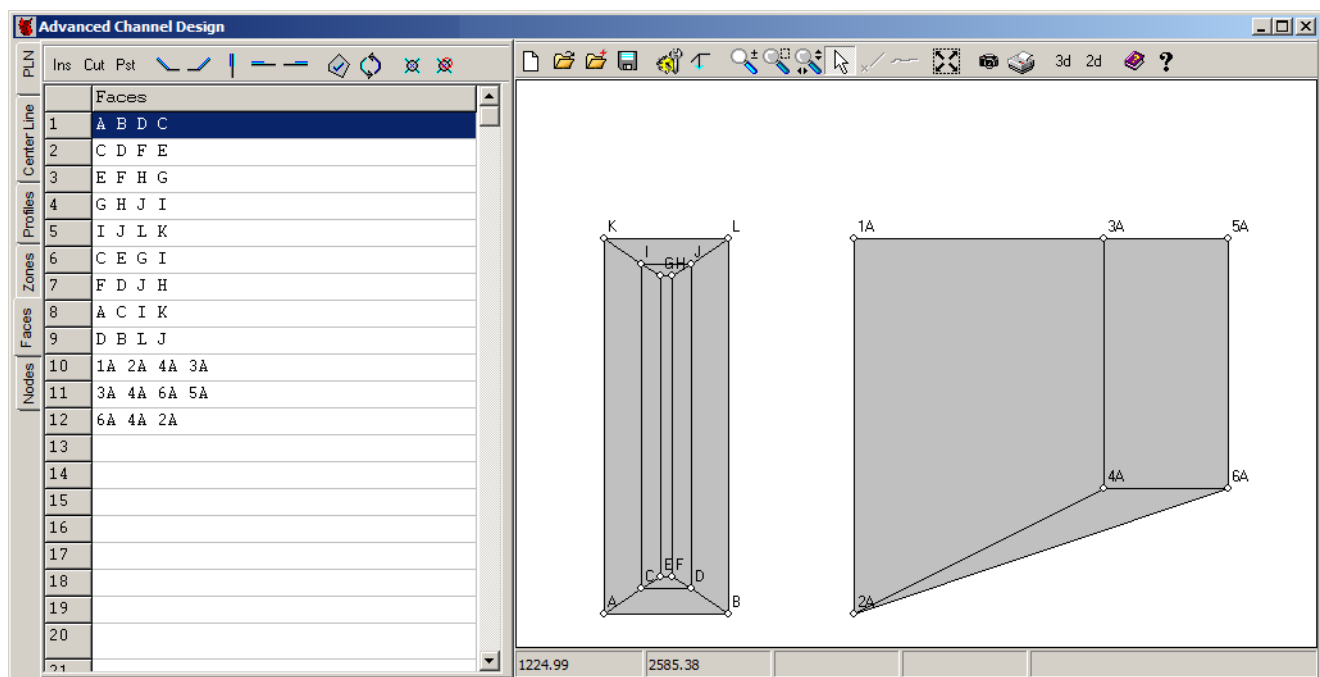
### MERGING CHN FILES

If you have two or more channel files (\*.CHN) in the same project area, and you can merge them into one channel file. Once you have loaded one CHN file to the program, the Add Channel icon enables you to copy the nodes and faces from one or more additional channel files.

**FIGURE 21.** Original Separate Channel Files

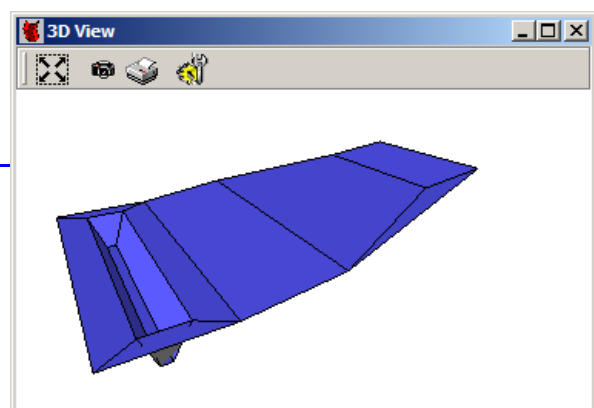


**FIGURE 22.** Nodes and Faces of Both Channels in One File



From there, just create any additional faces necessary to join the channels and save the new channel file.

**FIGURE 23.** The Resulting Merged Channel



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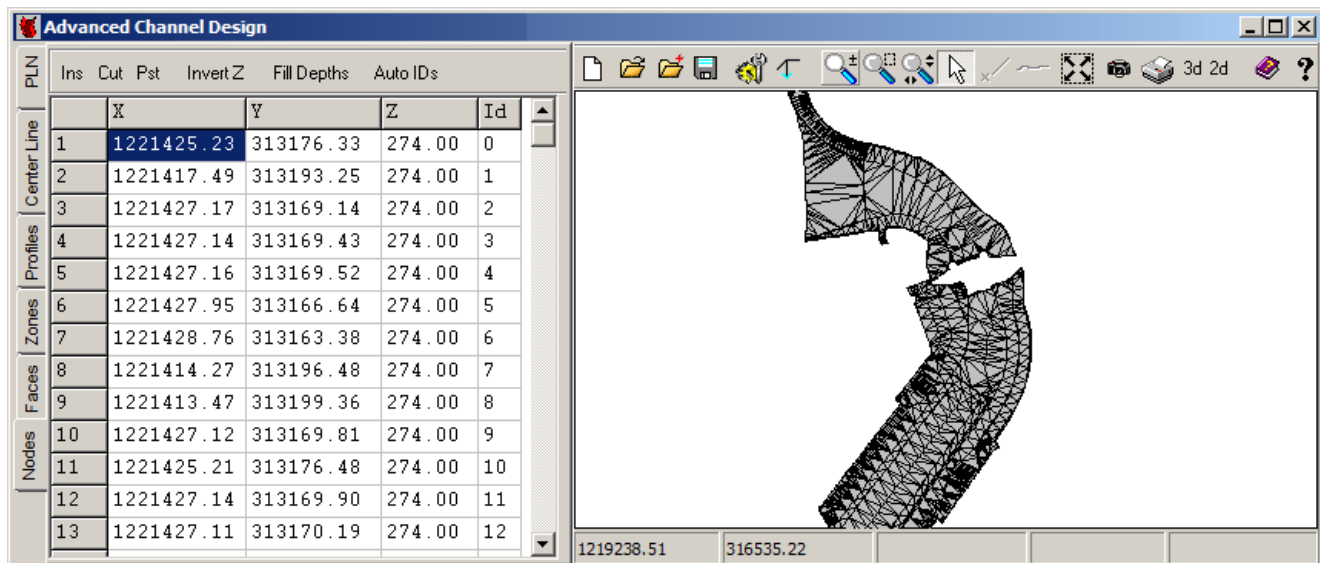
## IMPORT 3DFACE ENTITIES FROM DXF

If your DXF file is constructed using 3DFACE entities, ADVANCED CHANNEL DESIGN can import the information and populate both the Nodes and the Faces tabs.

**FIGURE 24.** Original DXF Displayed in CAD



**FIGURE 25.** Resulting CHN in ADVANCED CHANNEL DESIGN



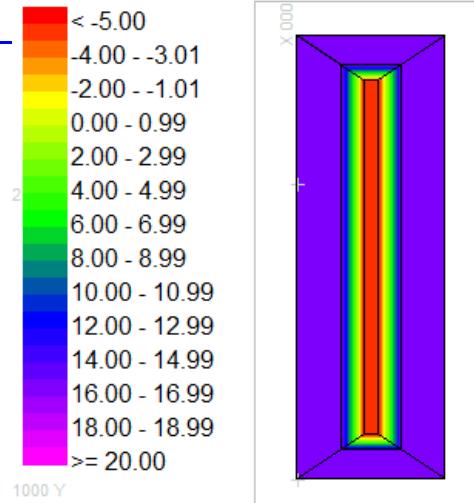
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## SAVE CHN TO MTX

ADVANCED CHANNEL DESIGN can save the channel surface to an existing matrix file that overlays the channel area. The filled matrix can then be used in SURVEY or DREDGEPACK® to show the channel template.

**FIGURE 26.** *The Resulting Matrix Overlaid with the Original Channel*

1. Use the **MATRIX EDITOR** to generate an empty matrix that overlays your channel area.
2. Use **ADVANCED CHANNEL DESIGN** to generate your channel design (\*.CHN).
3. Click the **File Save** icon and save your channel data to the matrix created in step 1.



## NEW ALGORITHM TO CREATE FACES IN THE CENTER CHANNEL

**Safe Center Line Face Creation:** The PLN tab provides an alternate algorithm for generating the faces in the center channel. ADVANCED CHANNEL DESIGN usually creates neat, center channel faces without this algorithm (and they would not be as neat using this option). However, for channels where the default algorithm fails (creating faces outside the channel limits, etc.), this should succeed.

**Tip:** Generate your channel first without the Save Center Line Face Creation option. If the results are poor, regenerate the channel with the option selected.