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Sounding Better!

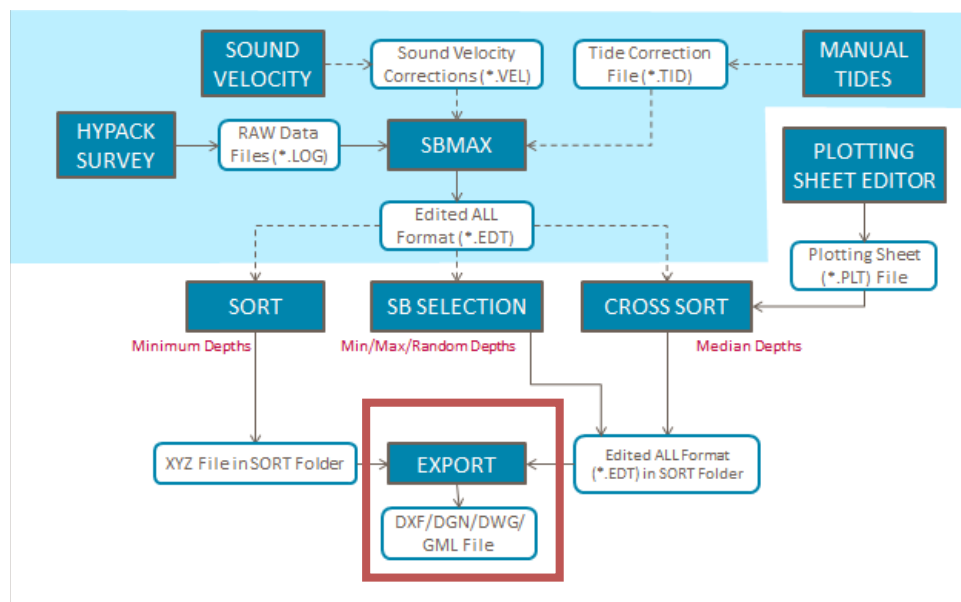
Flowcharts Hands On: Export to CAD

By Judy Bragg

This article continues our series of *Flowcharts Hands On* articles based on the Flowcharts provided in the HYPACK® Help menu, and in the Appendix of the *HYPACK® User Manual*. Learning the EXPORT TO CAD module completes the *Exporting Single Beam to CAD* process.

In previous articles, we've looked at [preparing tide and sound velocity corrections files](#) that you can use to apply such corrections in the editing process, cleaning your single beam data in the 32-bit [SINGLE BEAM EDITOR](#), and thinning your data with [sounding selection](#) programs. Now we're ready for Final Products. The flowchart we've been following, so far in the Hands On series, shows the work flow to transform your raw single beam soundings to a finished CAD format chart.

FIGURE 1. Sample Flowcharts



EXPORT converts HYPACK® data files to other formats. The primary formats supported are DXF, DWG, DGN and XYZ.

You can use EXPORT to convert most HYPACK® files to DXF, DWG or DGN format, which can be very useful if you integrate HYPACK® data with work in CAD systems, or if you want to display them as charts in HYPACK®. Files of types that can not be converted to the designated output format are marked with red X's.

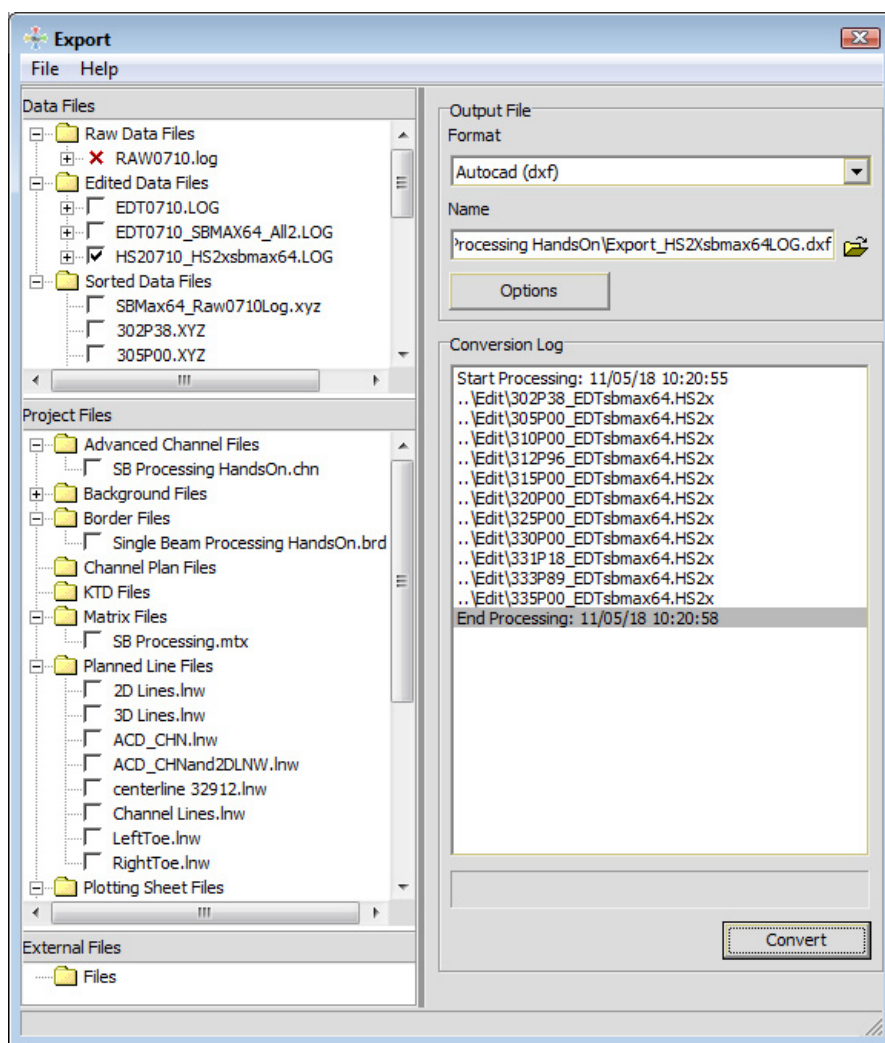
For the sake of brevity in this article, let's look at converting only sounding files. The process to include additional project files in your CAD output only varies in configuring the output

options relevant to the additional file types. Please refer to the manual or help files for a detailed explanation of each option.

PROCEDURE

1. **Start the EXPORT program** by selecting FINAL PRODUCTS-EXPORT. All files associated with the project are loaded in their current enabled or disabled state to the EXPORT interface.

FIGURE 2. *The EXPORT Interface*



2. **Select the Output file type** to which you want to export from the Output File Format drop-down menu. For this example, we'll generate a DXF file.

FIGURE 3. Selecting the Output Format

3. **Click the File Open icon and name your output file.** The path will default, in most cases, to your project directory. XYZ output formats default to the Sort directory.

4. **Select the file or files you want to convert** by enabling and disabling them in the file tree on the left side of the window as you would in the main HYPACK® screen.

For CAD output, EXPORT supports both the HYPACK® All format and XYZ format files output by the single beam sounding selection programs. It also supports HS2X format generated by the 64-bit SINGLE BEAM EDITOR.

5. **For All format and single beam HS2X files, choose to export track lines, soundings or both.** Right-click on each catalog or individual file and choose one or both options. XYZ sounding files have no track lines associated with them, so you only need to enable them in the file tree.

Tip: If you want to display numeric sounding values in your CAD file, export soundings that have been sorted with adequate spacing that the numbers don't overlap in your chart.

6. **Set your Input and Output Options:**

FIGURE 4. Export Options Dialog

- a. **Click [Options]** or F9 to access the Options dialog.
- b. **For dual frequency data, use the Input Filters** dialog to elect to convert either Depth 1 or Depth 2 to your exported files.
- c. **For each CAD Parameters item on the left applicable to your output, select the item and set the related output options displayed on the right.**

To export our soundings to CAD, requires options on multiple tabs:

- [CAD Parameters](#)
- [CAD Parameters - Soundings](#)
- [CAD Parameters - Track Lines](#)
- If your Output File Type is DGN, [CAD Parameters - Origin and Units](#).

- d. **Click [OK].**

7. **When your list is complete and all parameters have been set, click [Convert].** You can see the conversion progress in the conversion log displayed on the screen. This shows which files have been successfully converted and if, for some reason, any have not.

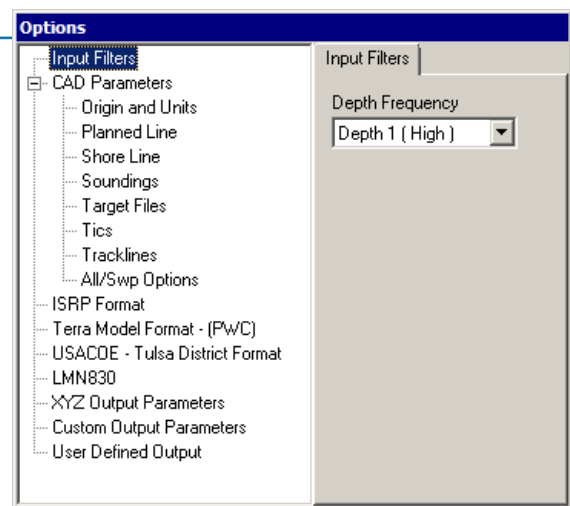
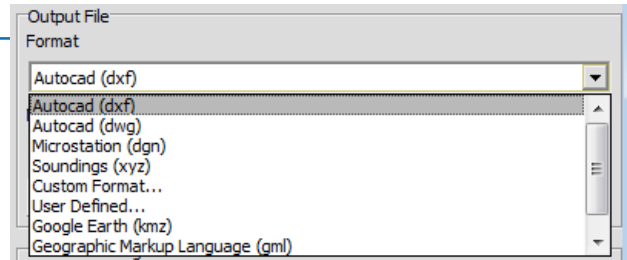
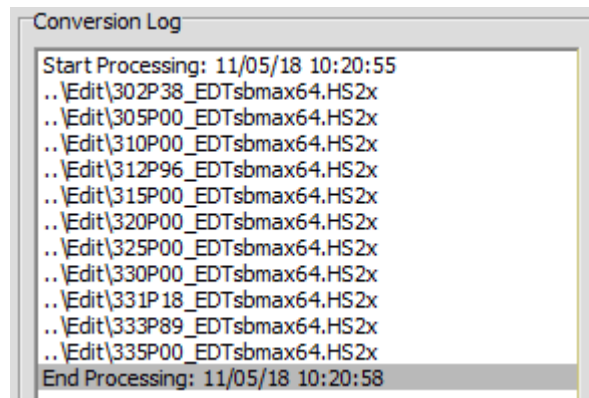


FIGURE 5. Conversion Log



OUTPUT OPTIONS

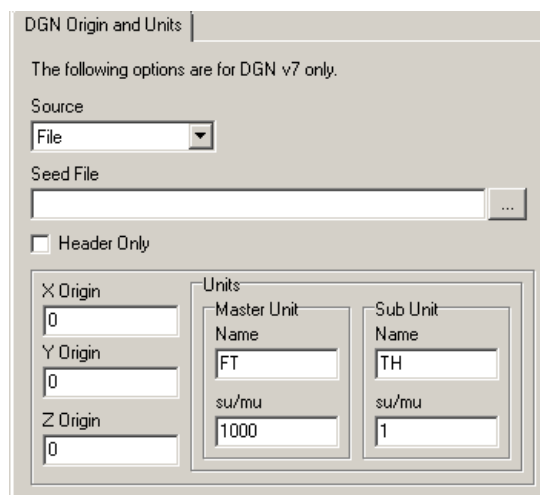
Let's take a look at the options required to export your sorted soundings to a CAD chart. You must configure all settings for the project data you want to include in all CAD charts. DGN output also requires DGN Origin and Units.

DGN OPTIONS

The DGN Origin and Units are used for one of two purposes:

- To specify the origin, Master Unit and Sub Unit for a new DGN file.
- To merge project data with existing DGN data (the seed file)

FIGURE 6. DGN Parameters Window



Source enables you to select a DGN **Seed File** from which you read all data or only the header information. **Header Only** reads the header from the Seed File to the header of your new, otherwise empty DGN file to assure the two files overlay accurately. Deselect Header Only to also read the data from the seed file, thus merging your project data with the seed file data in your exported DGN file.

TABLE 1. DGN Selections According to Output Goals.

Export File	Source	Header Only	Origin & Units
New DGN	Custom	No	Yes
New DGN to overlay existing DGN	File + Seed File	Yes	No
New DGN combining existing DGN with new data	File + Seed File	No	No

TEXT OBJECTS

Text objects—soundings and labels—may be formatted differently, each according to the feature to which they are associated. The options appear on each tab where text is relevant to the feature, however, the options on each tab are the same:

- **Text Height** is defined in survey units, usually feet or meters. The width is scaled according to this measurement and the **Text X-Scale Factor** in the CAD Parameters tab.
- **Text Angle Style:** Soundings and labels can either be written perpendicular to the planned line, or at a user-defined, fixed angle. This option is not applicable to XYZ data, which has no planned line information.

Tip: If numeric soundings overlap using an appropriate text size, you can re-sort your edited files to increase your sorting distance.

CAD PARAMETERS TAB

The CAD settings are for creating the chart regardless of which features are included. Use these options to configure the CAD version, and the text width of soundings and other labels.

FIGURE 7. CAD Parameters Dialog

Additionally, there are two options that affect soundings.

3D Position of Sounding: We recommend exporting soundings to levels corresponding with the sounding value—the default **3D Sounding at Level = Z**. (Storing all soundings on the same level (0) or in a 2D file usually defeats the purpose of exporting soundings to a CAD format.) **3D Sounding at Level = -Z** inverts the file in case your CAD project uses the opposite sign convention from HYPACK®.

Sounding Text Object specifies the sounding value displayed:

- **Do Not Negate Text** (Default) leaves the text as it is.
- **Negate Text** inverts value of the sounding.
- **Absolute Value of Text** displays the absolute value of the sounding.

NOTE: The 3D Position of Soundings and Sounding Text Object act separately. Each will consider the *source* depth/elevation and make their adjustments accordingly.

CAD SOUNDING PARAMETERS

The Sounding Parameters dialog defines the layer name(s) and the text appearance in the CAD output.

In single beam surveys, EXPORT supports both the HYPACK® All format and XYZ format files output by the single beam sounding selection programs. It also supports HS2X format generated by the 64-bit SINGLE BEAM EDITOR.

Tip: Remember to check the 3D CAD Dimension in the CAD Parameters tab.

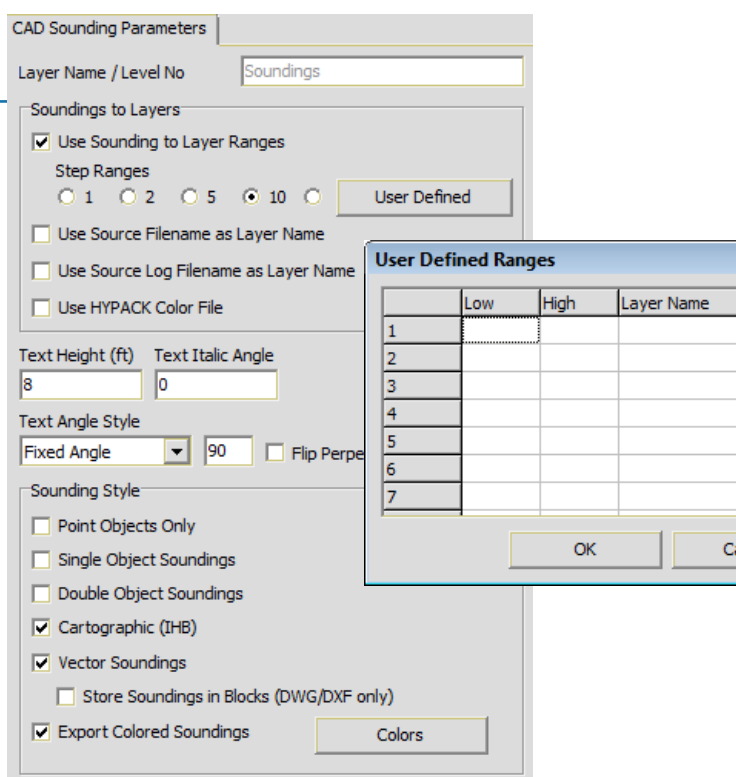
FIGURE 8. Sounding Parameters Window (left), User-Defined Ranges Dialog (right)

Layers

Layer Name/Level Number displays the default “Soundings”. Alternatively, you can save soundings to CAD format on more than one layer according to depth ranges or source file names:

- **To create layers based on depth ranges**, check Use Sounding to Layer Ranges. You can elect to create a different layer for every 1, 2, 5 or 10 survey units of depth, or click [User-Defined] and enter your own depth ranges and layer names to the User-defined Range dialog.

Alternatively, the **Use HYPACK Color File** option sets layers based on the selected HYPACK® color file (project colors).



Tip: **Export Colored Soundings** color-codes the exported soundings according to the current project color settings. You can modify the colors through the standard Color Settings dialog. Click [Colors] to customize your sounding colors.

- **Creating layers by source file name:**
 - **From ALL or single beam HS2X format files**, you must first choose whether to create and name your layers according to each individual data file name or use the catalog file name.
 - **From XYZ files**, this option names a layer for each file (eg. MyFile.XYZ soundings export to the MyFile_xyz layer).

Text

In addition to Text Height and Angle Style, **Text Italic Angle** affects the amount of slant in italicized text. The results are *only visible in the CAD program*.

Flip Perpendicular: Available only for All or HS2Xformat files when the soundings are written perpendicular to line, this option rotates the text 180 degrees.

Sounding Style

Point Objects Only places a dot at the sounding position. In a DXF file, it appears as a dot. In a DGN file, it appears as a small ellipse.

Tip: Recommended if you want to export *unsorted* soundings since numeric depths will overlap.

Single Object Soundings and **Double Object Soundings** draw the sounding values with the decimal point at the sounding location. Select Double Object Soundings as they are more accurately positioned than the Single Object Soundings. (Use Single Object Soundings only for DGN v7, which does not support double objects.)

Cartographic Soundings centers the integer portion of the sounding at the sounding location and then writes a smaller, lower fraction. If this is not selected, the decimal point is centered on the sounding location. If the sounding is a negative value, the integer is underlined.

Tip: To more accurately position **Cartographic soundings** in your display, you should also select the Vector Soundings option.

Vector Soundings draws the soundings as a polyline instead of text. This option improves the precision of positioning the soundings in your display because it can better adjust for different fonts and export styles. When this option is selected without the Cartographic Soundings option, it places the decimal at the sounding location.

CAD TRACK LINE PARAMETERS

The Track Line Parameters sets labeling information for the event marks on the Track Lines layer.

FIGURE 9. *Track Line Parameters Window*

Select to label events by selecting either **Events** (Event Number) or **Time** in the Label Events field.

A **Circle Radius** greater than 0 draws a circle at that distance around each event.

Use Line Name as Layer Name exports the track line for each survey line to a separate chart layer and names the layers according to the survey line name. If this is not selected, all track lines are stored on one “Tracks” layer.

CAD Tracklines Parameters

Layer Name / Level No
Tracks

Text Height (ft)
10

Event Circle Radius (ft)
5

Text Angle Style
Perpendicular to Line 45

Label Events (Fix Marks)
Events

☐ Use line name as layer name

NOTE: This option is unavailable for DGN v7 output.

FIGURE 10. Sample DXF Charts in HYPACK®—Single Beam Colored Soundings (left), Track Lines with Events (right)

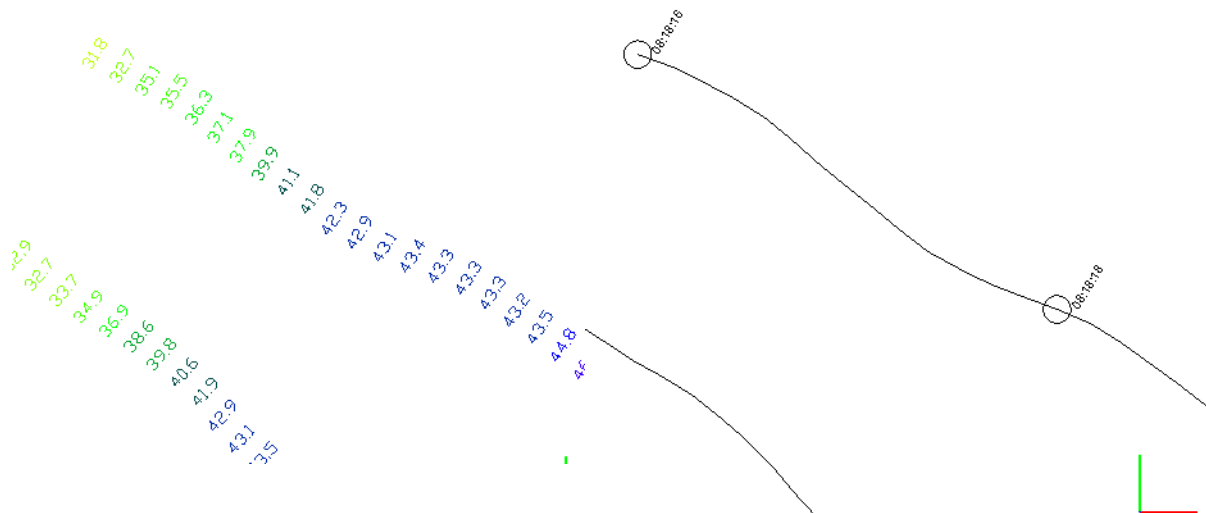
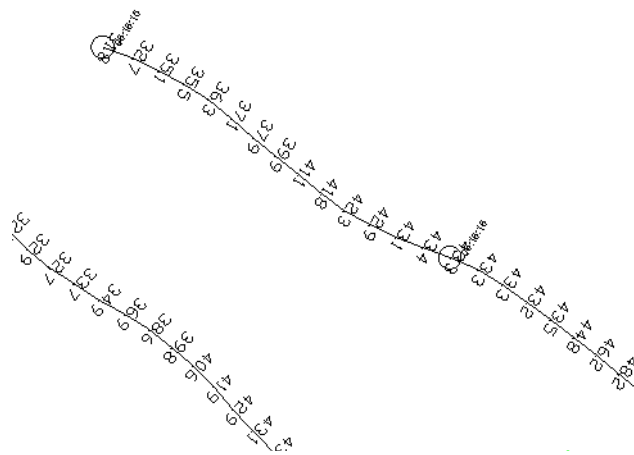


FIGURE 11. Sample DXF Charts in HYPACK®—Single Beam Track Lines with Events and Black, Flipped Soundings, Multibeam Sorted Average XYZ



MERGING SOUNDING FILES WITH OTHER PROJECT FILES

Once you've mastered exporting soundings and track lines, you should have a good understanding of the process for including other project files. Each feature type has a tab with feature-specific options. The following table provides a brief description of the choices available in addition to choosing layer names and standard text options:

TABLE 2. *Export Options for Project Files*

Feature Type	Options
Planned Lines	• Whether to label the planned lines. • Whether to export channel template information
Targets	• Number of target circles and their radius • Where the target label is placed relative to the target
Tics (Plotting Sheet Parameters)	• Whether to plot tics and/or the plotting sheet border • Distance between tics • Tic Size • Sheet sides to label with tics
Anchor Sweeps	When anchor sweeps are present (Anchors.DG2), an anchor symbol of user-defined size (survey units) appears at the anchor drop position.

Please check the HYPACK® User Manual or Help files for detailed explanations of each option.

Hands On!

Use the [Single Beam Processing project](#) to experiment with generating CAD charts using the EXPORT program. This article focuses on soundings and track lines. Once you have mastered these, including other project files is easy.

Use a sorted data file then use EXPORT to generate multiple files using different settings on the Soundings and Tracklines tabs.

Do the same with planned lines, targets and other project files. Compare the results in the HYPACK® Area Map and in your favorite CAD program.

Experiment until you have found suitable settings for your data and your required output.