



## Flowcharts Hands On: Exporting Single Beam Contours from TIN MODEL

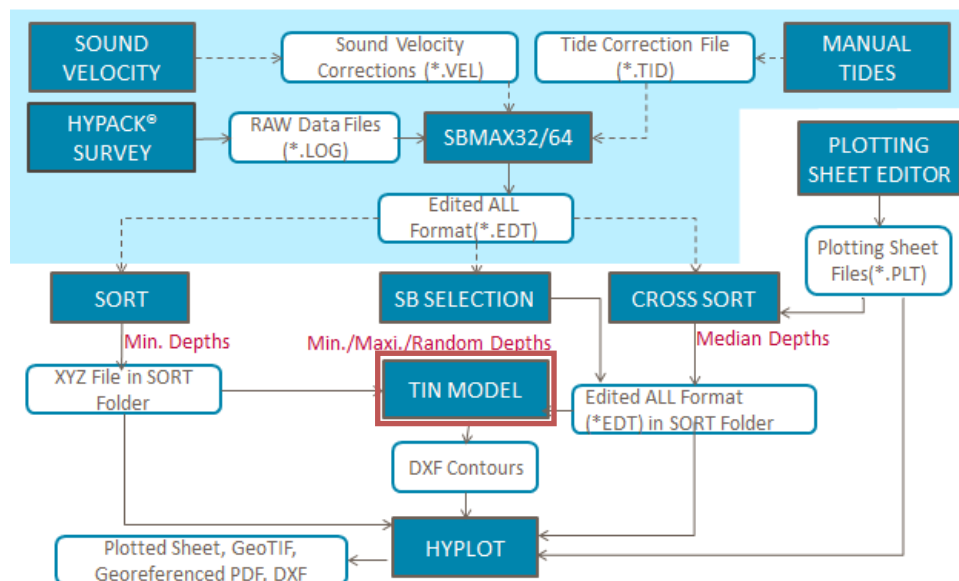
By Judy Bragg

This article continues our series of *Flowcharts Hands On* articles based on the Flowcharts found in the HYPACK® Help menu, and in the Appendix of the HYPACK® User Manual. The flowcharts are provided to guide you in processing your data.

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. We can now look at the Final Product modules.

The following flowchart shows the same processing steps described in earlier articles followed by the TIN MODEL module from which you can export a DXF contour chart file. TIN MODEL is the only HYPACK® module that generates contours from your edited data.

**FIGURE 1.** Exporting DXF Contour Charts from Single Beam Data



The TIN (Triangulated Irregular Network) MODEL program creates surface models from XYZ or XYZid sounding files, edited or sorted ALL format files, HS2X or filled matrix (\*.MTX) files. The program creates the surface by connecting adjacent data points in optimized triangles.

The Export DXF Format routine enables you to export contours of your data from the TIN model. The primary output is 2D Contours. These files can be used in HYPLOT or imported to other programs such as AutoCAD. All DXF output information is written in real-world coordinates.

- Tip:** For the best results in exporting contours, we recommend the following:
- **Use Sorted data to construct the TIN Model.** In single beam surveys, the contours become less jagged when you space the soundings out along the line. You should do some preliminary testing to see what sorting options work best in your project.
  - **Specify a Minimum Leg** appropriate to your line spacing. The Minimum Leg removes any contour segment shorter than the specified length, and connects the remaining vertices with straight segments. A larger the Minimum Leg without smoothing results in more jagged contours and a smaller file size.

- BEWARE!** If the Minimum Leg is too large, you can actually move a contour on the wrong side of a sounding. You may need to experiment a little to find a Minimum Leg distance that will provide you with pleasing contours which are also on the correct side of the soundings.
- **Use the Smooth option.** Smoothing evens the jagged edges in the contours by outputting a B-Spline anywhere the TIN leg is longer than the Minimum Leg specified.

Specifying a Minimum Leg with the Smoothing option counters the increased file size and speeds the generation of the DXF contours. (A Minimum Leg of zero creates a DXF file about eight times the size of the non-smoothed contours.)

## BUILDING THE TIN MODEL

1. **Start the TIN MODEL program.** Select FINAL PRODUCTS-TIN MODEL. The TIN MODEL shell appears.
2. **Select FILE-NEW.** The Initial Data dialog appears.

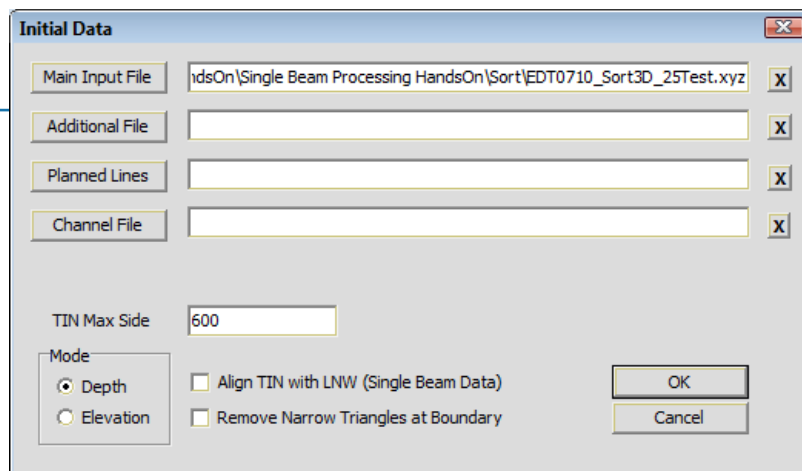
**FIGURE 2.** Creating a TIN Model from Single Beam Data—Initial Data Dialog

3. **Fill in the Initial Data dialog, click [OK]** and wait while the TIN is drawn to the screen. The Main Input File is the only input data file required to generate contours.

**To load multiple All or HS2X format files,** load a Catalog file

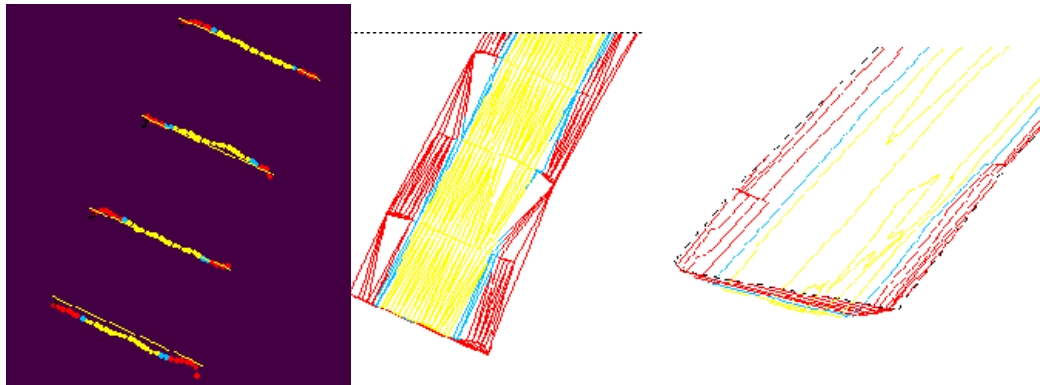
(\*LOG) that lists them. Typically, the editors and file selection programs generate LOG files corresponding to the RAW input LOG.

- **TIN Max Side** specifies the maximum allowable triangle leg distance. You should set this large enough so your data points connect, but not so large that points which have little relationship connect to each other.



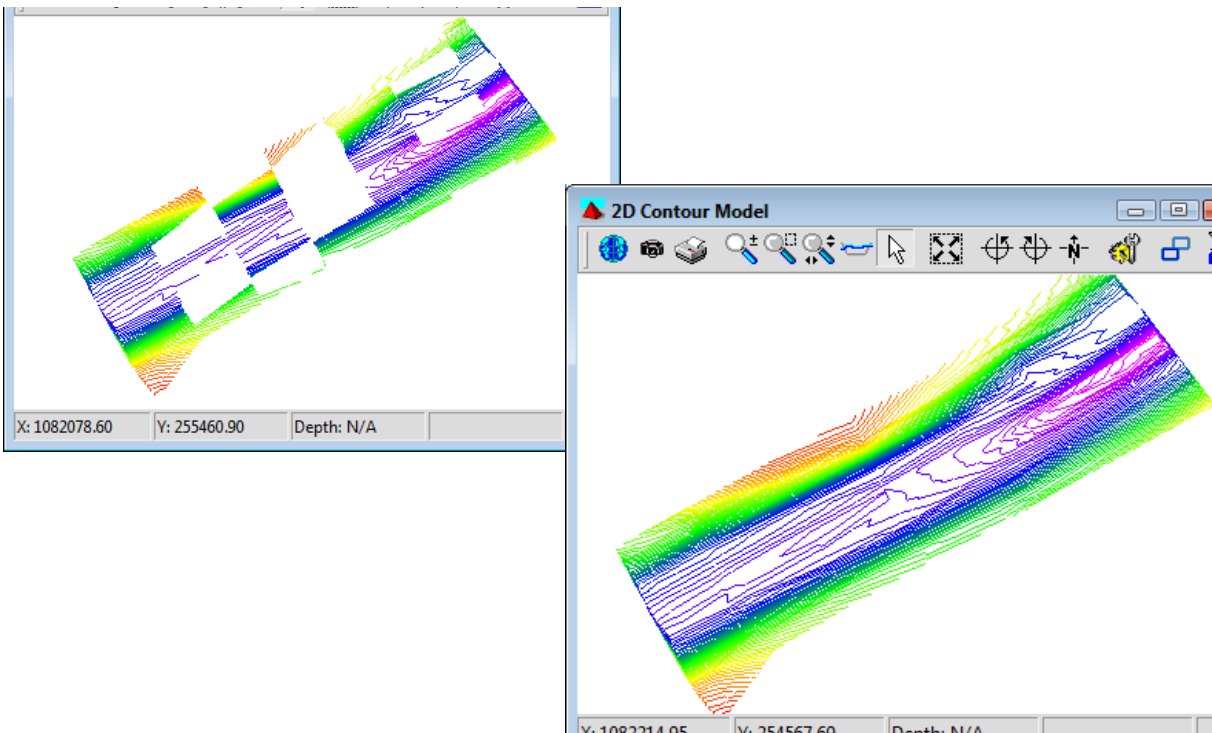
- Tip:** Start with about 150% of your line spacing.
- **Align TIN with LNW** is only helpful with single beam data when the survey lines are not perpendicular to the bottom contour. It uses a modified formula that prevents anomalies in the TIN surface caused by crooked track lines. These differences are probably most noticeable at the edges of the contour models.

**FIGURE 3.** Sample Files in TIN—Map View (left), TIN MODEL UnAligned Contours (center and right)



4. Click **[OK]** to generate the surface model.
5. **Confirm the model is properly constructed.** Select 2D MODELS-CONTOUR to see a preview of the contour output. Look for blank areas where there should be data (Figure 6).
6. **If the model is incomplete, return to the Initial Data dialog, adjust your settings and build a new model.**

**FIGURE 4.** Single Beam TIN Model—Incomplete 2D Contour Model (left) shows empty areas where there should be data as in the complete model (right)



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## EXPORTING DXF CONTOURS FROM YOUR TIN MODEL

When the TIN model is complete, you are ready to generate your DXF contour chart.

1. **Select EXPORT-DXF.**
2. **Set the options for the export file.**

**FIGURE 5.** DXF Export Window

- **Output File** names the exported DXF data. Most packages require DXF files to have a \*.DXF extension. Click [Output File] and enter the file name to get the expected folder location.
- **Export:** The TIN MODEL program can export both 2D and 3D DXF files. Since our purpose is plotting the contours, we'll choose 2D Contours.
- The Minimum Leg.

**Tip:** Start with a value equal to about 15% of the spacing between planned lines.

- **Minimum Area** removes contours forming closed polygons smaller than the user-defined area (square survey units).
- **Contours** creates contour lines according to the specifications in the contour attributes.
- **Solid Area** creates color-filled contours.

If both the Contours and Solid Area options are selected, TIN MODEL overlays contour lines on color-filled contours.

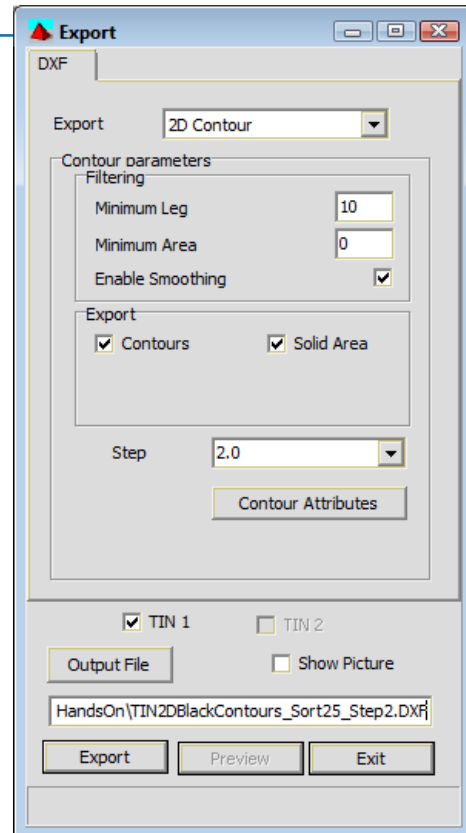
- **Step** enables you to specify a regular contour interval. You can select a value from the drop-down menu or enter another value.

**To specify uneven intervals**, select **Custom** and enter a space-delimited list of depths in the Custom Levels field provided.

**Color Scheme** creates a contour line at each level specified in the project colors.

- **Show Picture:** The DXF Export dialog expands and draws a small preview of your chart as it is generated. This feature makes the process significantly.

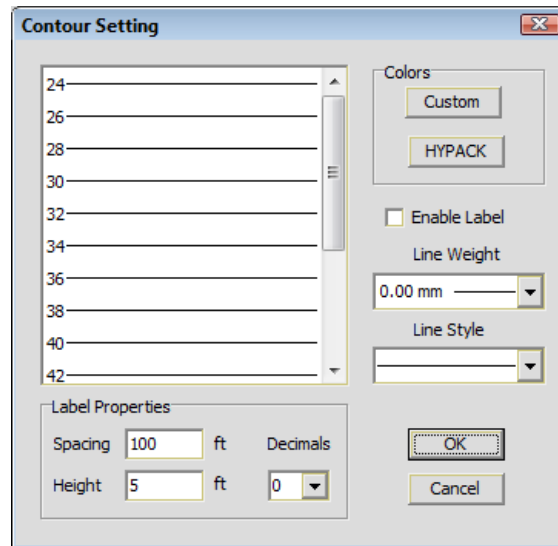
3. **Configure your contour attributes.** (Optional)
  - a. **Click [Contour Attributes].** The default contour attributes generate 0.0mm solid, black contours with no labels. In the Contour Settings dialog you can configure labels and line color, weight and style.
  - b. **Select one or more lines on the left, then set their display attributes:** the size (survey units) and resolution of the labels; and the color, weight and type of the contour lines. Use HYPACK® project colors or customize something else.



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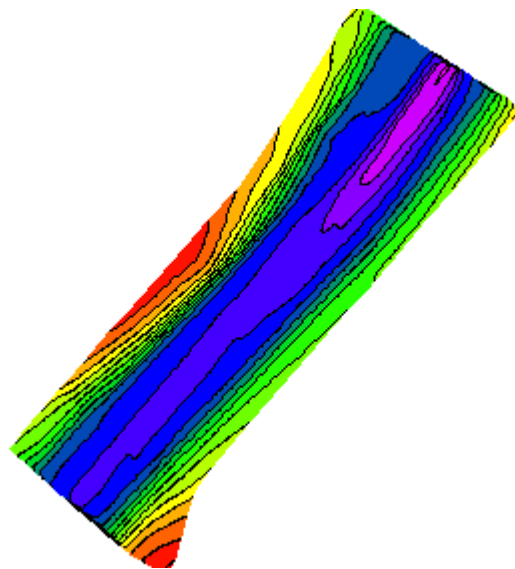
**Tip:** When you generate contour lines with contour fills, keep in mind the fills always use project colors. Use one or more contrasting colors to make them easily visible.

**FIGURE 6.** Contour Attributes



- c. Click **[OK]** to return to the Export dialog.
  - 4. **Name your Output file.** Click **[Output File]**, enter a name and click **[Save]**.
  - 5. **Click [Export]** to begin the export process. TIN MODEL creates the DXF file or golden sounding lines to your specifications. If you have not selected the Show Picture option, you can also see modeling progress in the status bar. When the model is complete **[Preview]** becomes enabled.
- [Preview]** provides a larger preview of the results. Another window appears with a display of the generated chart, and zoom and pan tools with which you can more closely examine your export results without leaving the TIN MODEL program.

**FIGURE 7.** Single Beam Filled Contours with Black Contour Lines



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6. Click **[Exit]** close the Export dialog.

The exported file is ready to display as a chart in HYPLOT or any other HYPACK® module that supports DXF charts, or to export to your favorite CAD program.

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## **HANDS ON EXPERIENCE**

### **Hands On!**

Download the Single Beam Processing project (<http://bit.ly/2wl7X7C>) and follow along. In this article, we have output 2D DXF Contour files that we can then use in the HYPLOT plotting sheets.

Using the test project, make a plotting sheet file in the PLOTTING EDITOR. Take note of where you place the corner with the circle corner. It will print at the bottom left of your plot.

In TIN MODEL, experiment with the different options in the Export DXF dialog: Try different combinations of the Minimum Leg and Smoothing options to see how they affect the output file (the contours and the file size). Export Contours using different step intervals and attributes.

Export contour lines together with solid contours and see what Contour Attributes you think look best.

**FIGURE 8.** Single Beam—Lines (left), Solid (right)

