



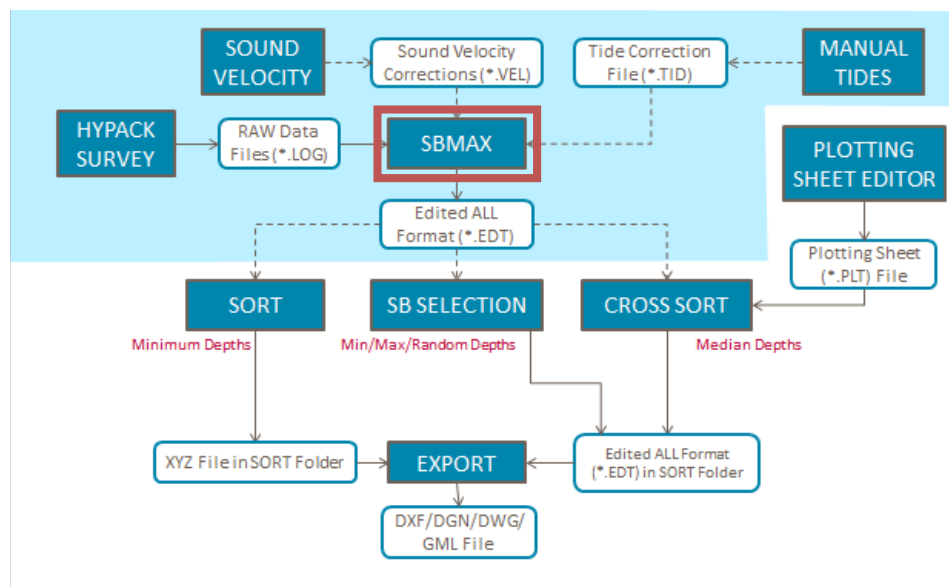
Flowcharts Hands On: SINGLE BEAM EDITOR

By Judy Bragg

The last issue of *Sounding Better!*, premiered the first of a 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. These steps may vary, depending on what kind of final product output you require; however, in most cases, the first step is to clean and correct your raw data.

In the May 2017 article, we looked at preparing tide and sound velocity corrections files that you can use to apply such corrections in the editing process. This article focuses on editing single beam data in the 32-bit SINGLE BEAM EDITOR.

FIGURE 1. Sample Flowcharts



The SINGLE BEAM EDITOR reads raw or edited sounding files containing single beam or dual frequency survey data. It applies tide and sound velocity corrections files to the soundings to find corrected depth or elevation.

The SINGLE BEAM EDITOR displays all measurements graphically and provides a number of editing methods. When editing is complete, the program saves the corrected and cleaned data in the HYPACK® proprietary ALL format for further work in the Sounding Selection and Final Product programs.

Hands On!

Download the Single Beam Processing project (<http://bit.ly/2w17X7C>) and follow along. In this example, we'll load the raw data, apply a tide corrections file, clean the data and save the edited data to Edited All format files in the project \Edit folder.

Before you begin your editing session, prepare as follows:

- **Set your geodetic parameters** in the GEODETIC PARAMETERS program. Typically they should match those of the survey.
- If you have not applied tide corrections during SURVEY, or want to apply new tide corrections, **create a Tide Corrections file** using the MANUAL TIDES or HARMONIC TIDES program. This project contains tide data imported from the NOAA website: NOAA Imp 070912_071212.TDX, which generates NOAA Imp 070912_071212.TID in the MANUAL TIDES program.
- **If necessary, create a Sound Velocity file** with your sound velocity cast data in the SOUND VELOCITY program. You can skip this step if you have set your echosounder to account for sound velocity before the survey. You can experiment with the SVProfile.VEL file included in the project folder.

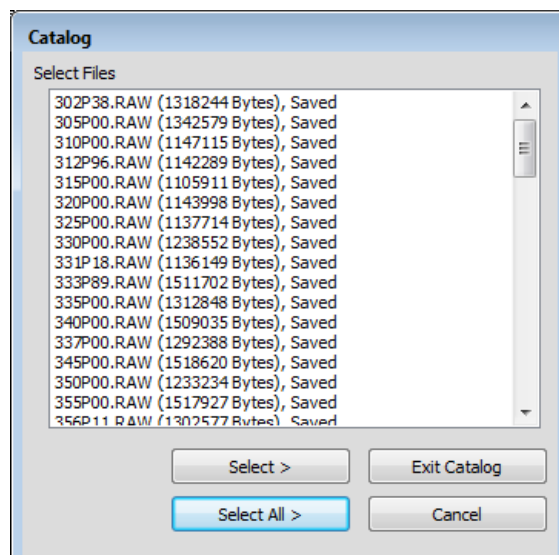
Now let's step through editing in the SINGLE BEAM EDITOR.

1. **Open the SINGLE BEAM EDITOR.** Select PROCESSING-SINGLE BEAM EDITOR or click the icon.
2. **Select your Soundings data.** For our purposes in this article, load raw soundings. You can select a Catalog file (*.LOG), which is a list of several data files, or a single data file.



If you select a LOG file, a Catalog dialog appears where you can select one or more files from the catalog.

FIGURE 2. Selecting Catalog Data



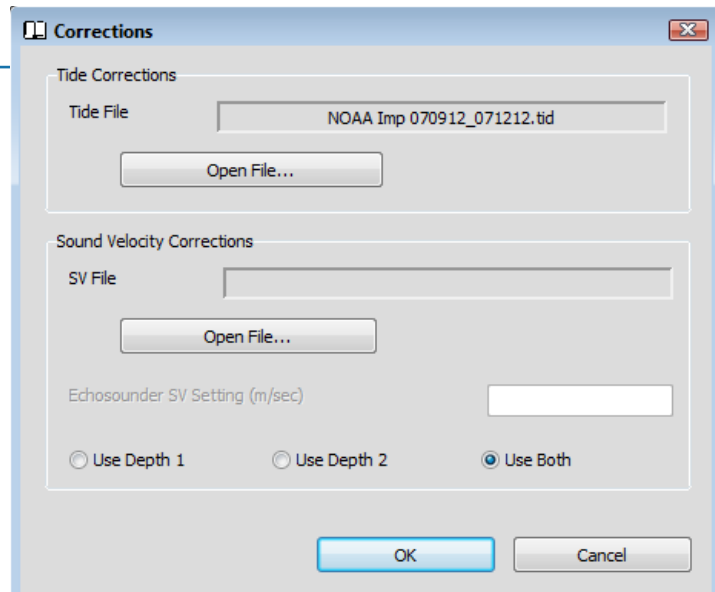
The Corrections dialog will appear next.

3. Enter your corrections.

FIGURE 3. Loading a Tide Corrections File

- If you are working with raw data and have not applied tide corrections during **SURVEY**, select a Tide Corrections (*.TID) file. In this project, you have two choices:

- **Enter the tide corrections file** provided. NOAA Imp 070912_071212.TID was generated in MANUAL TIDES by importing tide data for a range of days, which includes the survey period, from the NOAA website.



NOTE:NOTE: Remember, when you load tide corrections files, you override all other tide calculation methods.

- **Use tide data recorded during your survey.** Leave the Tide File field blank, and select the source of your tide corrections in the Selections tab of the Read Parameters dialog in the next step.
- **If you are working with raw data and have not applied sound velocity corrections during your survey**, select the sound velocity corrections (*.VEL) file that you want to apply to the data. In most shallow-water single beam surveys, the echosounder calibration compensates for sound velocity over the range of soundings. In this case, you don't need a sound velocity corrections file.

BEWARE! If you load a VEL file, when the sounder is already correcting the data, *you will double-correct the data.*

This project includes the SVProfile.VEL file for your experimentation.

4. Set your read parameters.

- In the **Selections** tab, select the source devices for each type of data. If you have more than one source of any type of data, select the source from which the program should read the data.

The sample data has two sources for tide corrections: the Applanix POS MV and "Manual Entry in Survey".

Tip: You can perform another editing session with a different device combination and compare the results if you wish. To avoid overwriting the results of the first session, select FILE-SAVE OPTIONS and set an alternate file naming scheme for the second session.

FIGURE 4. Read Parameters—Selections Tab

The screenshot shows the 'Read Parameters' dialog box with the 'Selections' tab selected. The dialog has a title bar with a close button. Below the title bar are five tabs: 'Selections', 'Offsets', 'Survey Info', 'Presort', and 'GPS Pre-Filter', with 'Selections' being the active tab. The main area contains several sections: 'Devices' with dropdowns for 'Echosounder' (Odom CV3 MK3) and 'Navigation' (Applanix POS M V Network); 'Heading' with a dropdown for 'Applanix POS M V Network'; 'Tide' with a dropdown for 'Applanix POS M V Network'; 'Depth Conversion' with a dropdown for 'No Conversion'; and 'Other' with five checkboxes: 'Snap to Line', 'Ignore Depth Records Before First Event', 'Ignore Planned Line Information', 'Ignore Echogram', and 'Invert Tide Values'.

- In the **Offsets** tab, the offsets for the selected device are displayed as they were configured during your survey. If they are incorrect, enter them as they should have been during survey. These offsets are applied only to the edited data; *they do not affect the raw data*.

FIGURE 5. Read Parameters—Offsets Tab

The screenshot shows the 'Read Parameters' dialog box with the 'Offsets' tab selected. The 'Selections' tab is now inactive. The main area features a dropdown menu at the top showing 'Applanix POS M V Network'. Below this is a table of offsets, all set to 0.00:

Starboard	0.00
Forward	0.00
Vertical	0.00
Yaw	0.00
Pitch	0.00
Roll	0.00
Latency	0.00

- The **Survey Information** tab displays some basic project information entered in HYPACK® SURVEY. You can add or modify this information here to be stored in the header of the edited files.

FIGURE 6. Read Parameters—Survey Info

The screenshot shows the 'Read Parameters' dialog box with the 'Survey Info' tab selected. The 'Start Line Time and Date' section has a time field set to '10:53:42' and a date field set to '07/10/2012'. Below this, there are six input fields arranged in two columns: 'Project' (JERRY WALLACE MASTER), 'Area' (empty), 'Boat' (JERRY WALLACE), 'Surveyor' (empty), 'Projection' (TME), and 'Ellipsoid' (WGS-84).

- The **Presort** option is a way of reducing the amount of data you have to edit in the EDITOR program. If you want to thin your data, *we recommend using one of the sounding selection programs after you finish editing your data.*

FIGURE 7. Read Parameters—Presort

The screenshot shows the 'Read Parameters' dialog box with the 'Presort' tab selected. It contains three sections of options: 1. 'No Presort' (selected) and 'Yes, All Data'. 2. 'Yes, Except Events'. 3. 'Basis' section with 'Time Elapsed', 'Distance Along Line', 'Number of Samples' (selected), and an 'Increment' field set to '1000.0'. 4. 'Selection' section with 'First Depth' (selected), 'Maximum Depth', 'Minimum Depth', and 'Average Depth'.

- The **GPS Pre-filter** Tab options enable you to omit position and RTK tide data as it is read into the SINGLE BEAM EDITOR. Any data that does not meet the criteria set in this tab will be edited out for you before anything is displayed in the data windows.
 - **When positions are deleted from the interior of the line**, new positions are interpolated and depths are not lost.
 - **When positions are deleted from the ends of a line**, depth data is lost.

FIGURE 8. Read Parameters—GPS Prefilter

The screenshot shows the 'Read Parameters' dialog box with the 'GPS Pre-Filter' tab selected. The dialog has five tabs: 'Selections', 'Offsets', 'Survey Info', 'Presort', 'GPS Pre-Filter', and 'Advanced'. The 'GPS Pre-Filter' tab contains two sections: 'Positions' and 'Tides'. Each section has three checkboxes and corresponding input fields.

Section	Parameter	Value
Positions	Accepted GPS Modes	4
	Minimum Number of Satellites	4
	Maximum HDOP	3.0
Tides	Accepted GPS Modes	4
	Minimum Number of Satellites	0
	Maximum HDOP	0.0

- The **Advanced** Tab in the Read Parameters dialog provides an opportunity to set preferences for RTK Water Level processing and Motion Reference Unit (MRU) options. We recommend that you use neither or both RTK and MRU settings. If you have a Motion Sensor, apply the corrections to your data then, since you are applying corrections for heave, remove the heave from your tide data by selecting one of the RTK options.

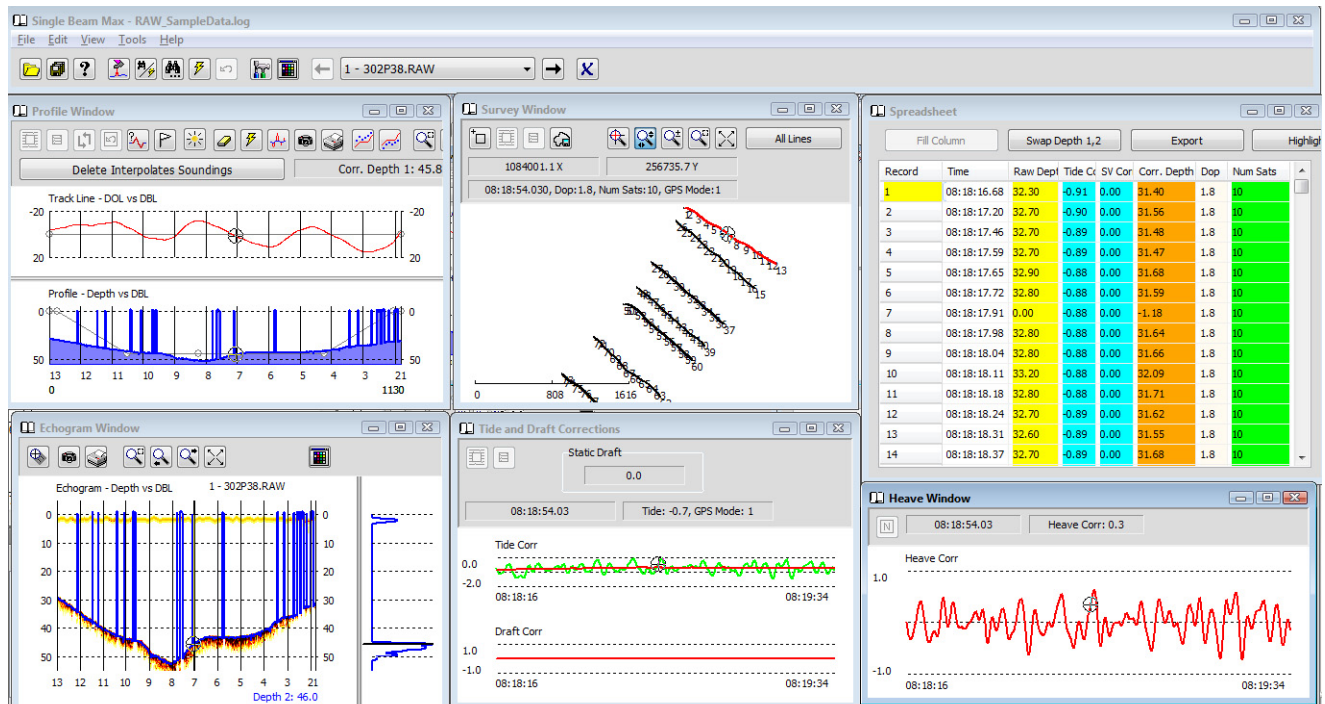
FIGURE 9. Read Parameters—Advanced

The screenshot shows the 'Read Parameters' dialog box with the 'Advanced' tab selected. The dialog has five tabs: 'Selections', 'Offsets', 'Survey Info', 'Presort', 'GPS Pre-Filter', and 'Advanced'. The 'Advanced' tab contains three main sections: 'RTK GPS', 'MRU', and 'POSPac'. Each section has several checkboxes and input fields.

Section	Parameter	Value
RTK GPS	Recalculate RTK Tides Using Project Geodesy	☐
	RTK Tide Method	☒
	Average Tide Data to Remove Heave (Recommended)	☒
	Averaging Period (Seconds)	30
	Merge Tide Data with Heave	☐
MRU	Experimental Method	☐
	Depth Below Transducer	☒
	Depth Below Surface	☐
	Apply Heave Correction	☒
	Apply Pitch and Roll Corrections	☒
POSPac	Remove Heave Drift	☐
	Beam Angle (Degrees)	3
Post-Processed GPS Correction	Use Post-Processed GPS Correction File	☐

When the editor has loaded the data according to your instructions, the displays should look something like this:

FIGURE 10. Raw Data in the SINGLE BEAM EDITOR



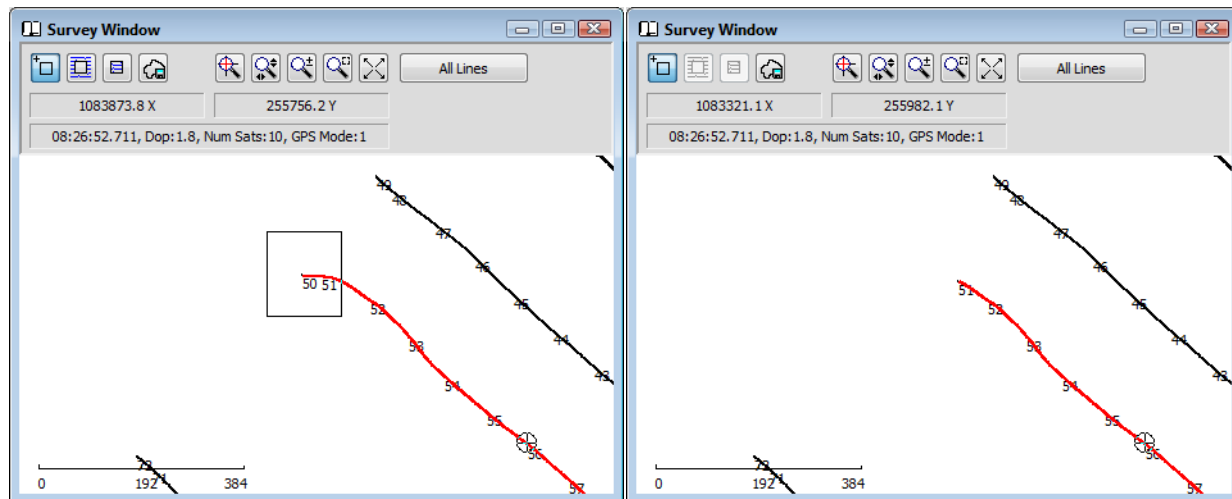
Tip: Use options in the View menu to configure the windows displayed. VIEW-TILE WINDOWS initiates an attempt to arrange the open windows neatly. You can always position and resize each window manually.

- Examine and edit track lines.** In the Survey window, use the editing tools to remove bad positioning.

In this example, the track lines generally look good. Line 315P00.RAW has a prominent curve on the end that may indicate a bad start to the survey line, which you may choose to remove. You can also remove position spikes that indicate a bad GPS reading.

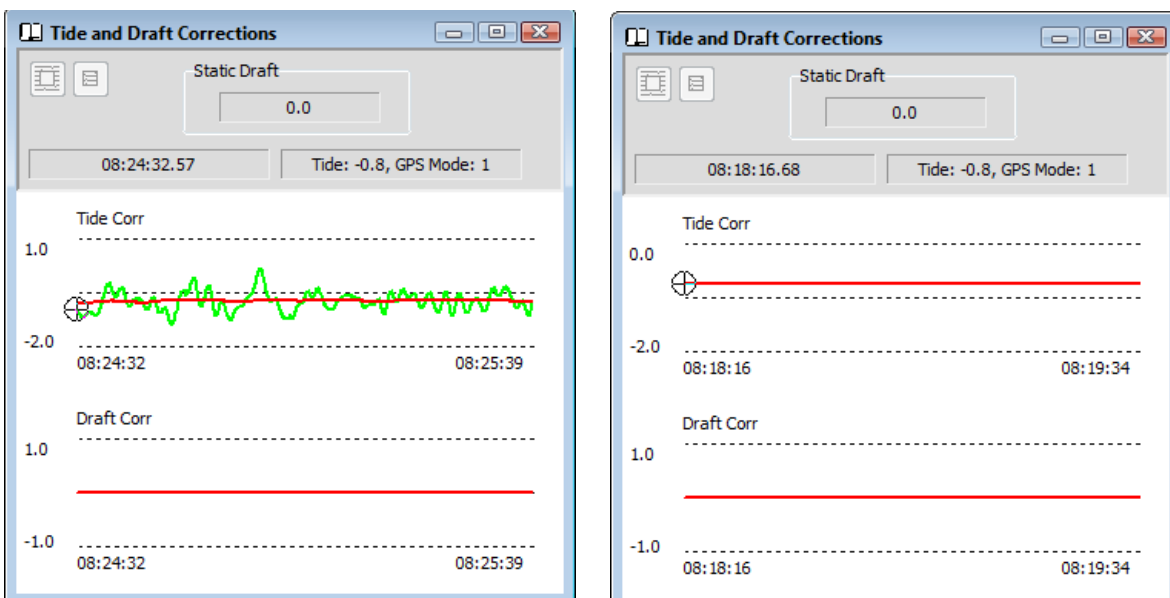
- **When positions are deleted from interior of line**, new positions are interpolated and depths are not lost.
- **When positions are deleted from the ends of a line**, depth data is lost.

FIGURE 11. Block Editing the 315P00 Track Line—Before (left) and After (right)



6. **Examine and edit corrections.** In the Survey window, use the editing tools to remove bad positioning.
 - **If you chose the POS MV as your tide source**, the Tide graph shows the raw POS MV tide corrections (green) as well as the tide corrections calculated based on your instructions in the Advanced tab of the Read Parameters (red). RTK tides might also need block editing to remove areas where you lost your Fixed RTK mode.
 - **If you chose the Manual Entry in Survey option**, the tide graph shows only the tide corrections entered by your helmsman during the survey so the graph will be flat or nearly so, as tide normally doesn't change much over the time it takes to run a line.
 - **If you entered the tide corrections file**, it would likewise be flat.

FIGURE 12. Tide Corrections in the Tide and Draft Window—POS MV (left), Manual Entry or Tide File (right)

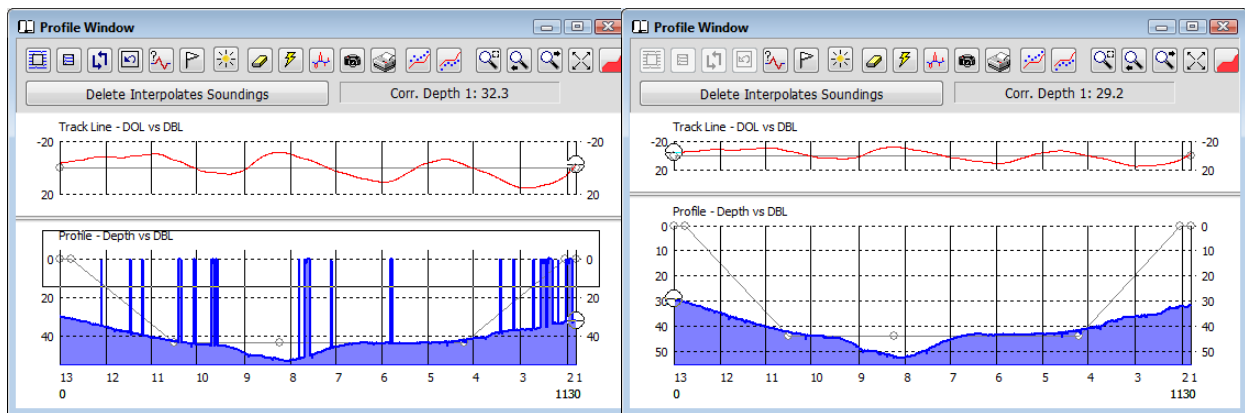


7. **Graphically examine the soundings.** Remove bad soundings in each survey line until you have edited all of your data. The SINGLE BEAM EDITOR provides a selection of editing tools with which to remove a single point, multiple points inside or outside, above or below a user-defined location.

When you delete a sounding, the program can delete or interpolate the data according to the “Delete Interpolates Soundings”/”Delete Removes Soundings” button below the icon bar.

- a. **In the Profile window, scroll through the survey lines** by using the arrow buttons on the shell and check the data.

FIGURE 13. Block Editing Soundings—Before (left) and After (right)



- b. **Set your Search and Filter Options (Ctrl + F).** These criteria are used to search out cells with data outside of user-defined limits.

Tip: When you check the Show Active Filters option in the View Options dialog (F9), a yellow ‘X’ marks all soundings that would be removed with your current filter settings.

FIGURE 14. Checking Filtered Points in the Profile Window

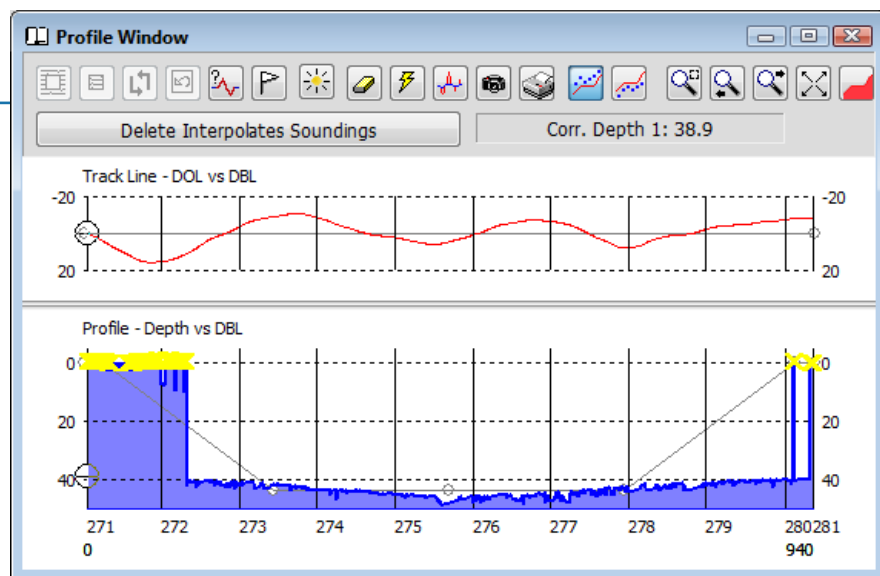


FIGURE 15. Search and Filter Options

- c. **Use the Search and Filter feature to find and evaluate any stray points.** You can evaluate each instance yourself and edit, if you think it's necessary, or instruct the SINGLE BEAM EDITOR to delete all points outside the filter limits.

Take care when you apply filters. There are two very similar looking icons (with or without the underscore line). Check the tool tip!

- **To filter all currently loaded data**, click the Filter All icon in the SINGLE BEAM EDITOR toolbar. The SINGLE BEAM EDITOR automatically deletes all points outside the limits from all of the selected data files.



NOTE: *Take care with this option.* You could easily filter out good data as in the line shown in Figure 14.

- **To filter only the line currently displayed**, click the Filter Line icon in the Profile window.
- **To filter only a select area of the line currently displayed**, use your cursor in the Profile display to draw a box around the area where you want to apply the filters then click the Filter Line icon.



If you get unintended results, use the Undo icon to reverse the operation.



8. **Save the final edited data.** FILE-SAVE will save the data in All format, by default, to a file with the same root name in the project \Edit folder.
9. **Exit the SINGLE BEAM EDITOR** by selecting FILE-EXIT.