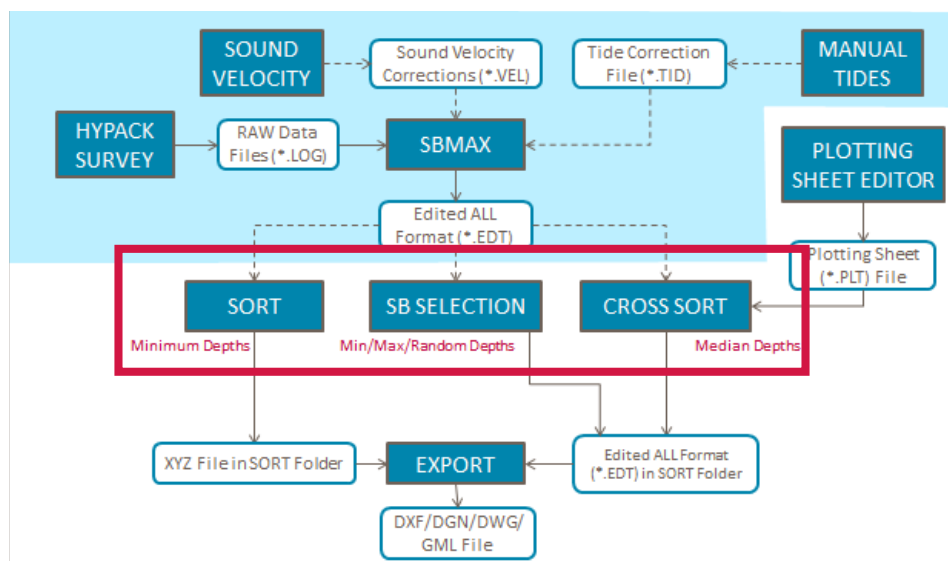




Flowcharts Hands On: Single Beam Sounding Selection

Continuing 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.

FIGURE 1. Sample Flowcharts



Before you decide which sounding selection method you will use, you should first consider what type of data you need for your final product.

Program	Input Files
CROSS SECTIONS AND VOLUMES	Edited All files from the SINGLE BEAM EDITOR
HYPLOT-Track lines	Edited All files from the SINGLE BEAM EDITOR

Program	Input Files
HYPLOT–Soundings	Sorted files from a sounding selection routine
EXPORT	Edited or sorted files

You must choose a sounding selection method that outputs your required file format, but there are several secondary considerations. The following table compares the sounding selection methods with regard to these other considerations.

TABLE 2. *Comparison of Sounding Selection Methods*

Method	SB SELECTION	SORT	CROSS SORT
Input file Type	ALL (Edited)	ALL (Edited) XYZ	ALL (Edited)
Output File Type	ALL (Edited) Shoalest depths or at fixed spacing	ASCII XYZ Shoalest Depths:	ALL (Sorted) Random Depths
Other Files Needed	None	None	Plotting Sheet (* .PLT)
Plot Results Perpendicular to Planned Line	Yes	Yes, to the nearest active survey line.	Yes
Guaranteed No Overwrites in Plotting	With spacing sufficient for font plotted.	Yes	Yes
Sounding Selection	- Distance - Minimum & Maximum	Minimum Only	Biased toward Minimum
Speed	Fast	Slow	Fast
Maintains Sounding Location	Yes	Yes	Yes
Pleasing to the Eye	Yes	No	Yes

SORT

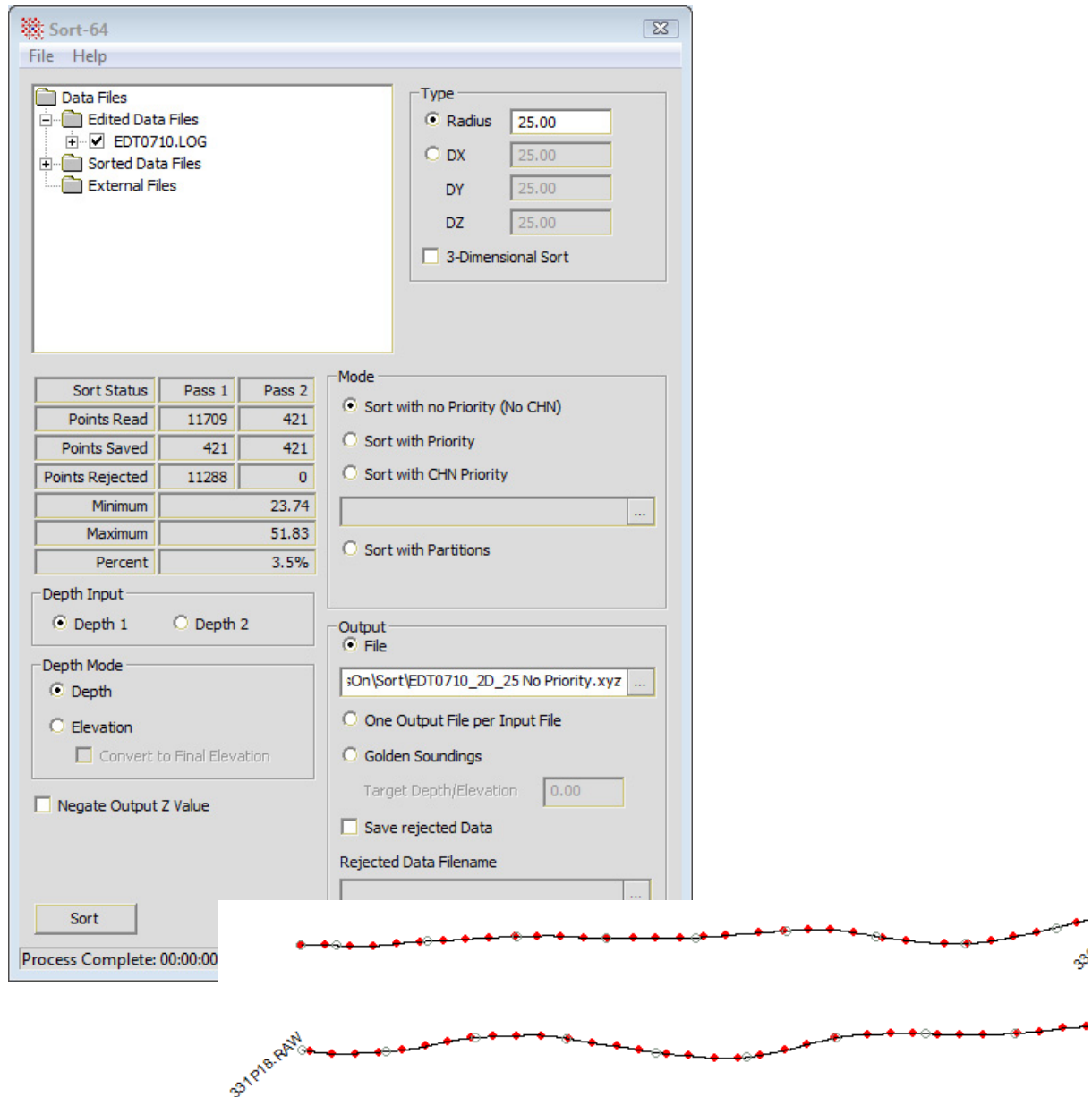
The SORT program thins data while it guarantees the minimum soundings at their proper locations. It looks for the minimum sounding, saves it and eliminates any data point that is within the user-specified distance. It then repeats the process until all points in the file have been saved or eliminated.

SORT reads individual files or catalogs of single beam HYPACK® ALL, HS2X, or XYZ format files, and saves the final results to an XYZ file, stored by default in the project Sort folder. You may sort based only on horizontal positioning (2D sort) for cartographic selection, or based

on both horizontal and vertical (3D sort) for 3-dimensional data displays, particularly with vertical surfaces.

The following figure shows a 2-dimensional sort where no two soundings in the output data set are closer than 25 survey units.

FIGURE 2. SORT—SORT Dialog and Output Results



- **Type** is the basis for the SORT program to eliminate conflicting data points. Select the sort type and specify the Protection Values.

Tip: Normally, Radius is preferred. DX-DY is preferable if you have long numbers, such as magnetometer data where you want to reserve a larger space in one direction than the other.

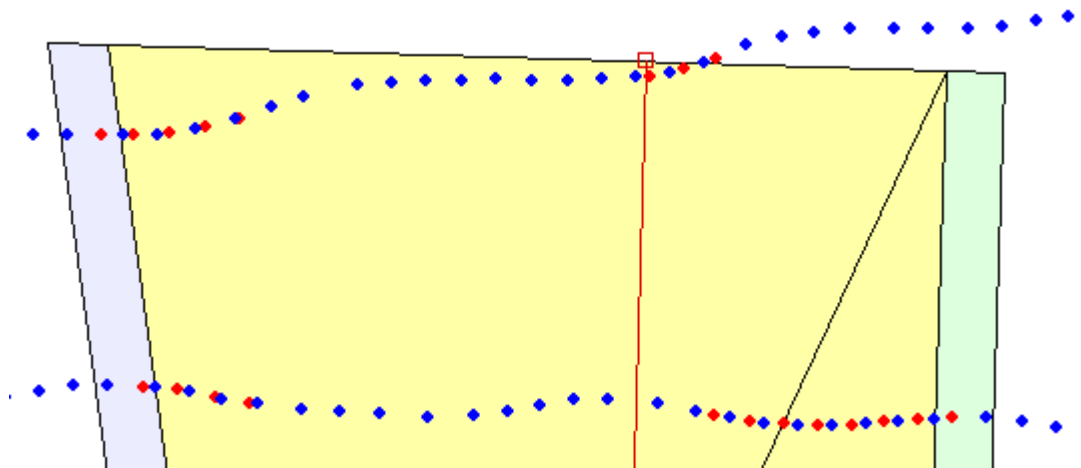
- In a **Radius** type sort, the program eliminates any other data record that is within the radial distance in any direction, of the accepted point. The 3-dimensional sort method is particularly useful where your data set has steep slopes or vertical walls.
- In the **XY** type sort, it eliminates any point that is closer in Easting than the DX distance or closer in Northing than the DY distance. This 2-dimensional sort method is particularly useful if you are sorting large values, such as magnetometer data, where you may need more space in one direction than the other for plotting purposes.
- **Modes:** SORT provides four sort modes that can help customize your sort according to your data set and your project goals.
 - **Sort with no Priority (No CHN)** sorts the data by input file. *If you select the File output option*, it then sorts the results again to get the overlapping data from other lines.
 - **Sort with Priority** allows you to give selected files priority over others in the context of the SORT routine. The files that have priority are sorted first. Then, *if you select the File output option*, when compared to other non-priority data, priority data is kept regardless of the comparison result.

NOTE: If you choose the One File Per Input Line output option, the program sorts and saves one line at a time and the results will be the same as sorting with no priority. It does not guarantee the specified space between soundings of different lines.

To mark data files with priority right-click on them in the Data Files list and select Priority from the right-click menu. Priority file names appear in red.

- **SORT with CHN Priority** assigns priority to the soundings that fall within the boundaries of any flat surfaces in a specified Advanced Channel file (*.CHN).
To enter the CHN file for comparison, click the corresponding [...] and browse for the correct channel file.

FIGURE 3. *No Priority (red) vs CHN (blue)—Sounding choices at the toe lines and end of channel affect several subsequent sounding selections in each line.*



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- **Sort with Partitions** divides the data set and sorts each portion individually. In each partition, it looks for the minimum sounding in two or three dimensions according to the options you set in the dialog. It saves this sounding to a temporary file and eliminates any data point that is within a user-specified distance. It then repeats the process until all points in the file have been saved to the temporary file or eliminated. When all data is sorted, the program merges the results.
This option is designed to manage computer resources and facilitate sort speed for larger data sets.

Hands On!

Use the [Single Beam Processing_HandsOn](#) project and experiment with different options then compare the results.

Tip: To easily compare output results, color the soundings by file and assign different colors to the output file or files from each trial:

- **To set HYPACK® to color by file**, open the Soundings tab of the HYPACK® Control Panel and select Color By File as your Color option.
- **To assign a color to a file or group of files**, select them in the Project Items list, then right-click and select Set Color. A Color selection dialog appears where you can choose a color and click [OK]. When the Color By File option is selected, the Project Items list and the area map display each file in its assigned color.

SB SELECTION

SB SELECTION enables you to extract a subset of an edited All format data set for the purpose of plotting. Soundings are selected based on distance, the highs and lows of your data set, or both. The program reads individual All format files or a LOG file containing them, then generates a new set of All format files containing only the selected soundings and stores it in the project \Sort folder. The program defaults to the same root name for the output files, but you may change the catalog file name. This process *does not change the original data set*.

With the settings in the following figure, the program exports one sounding every 25 survey units from each line to a new set of All format files.

FIGURE 4. SB SELECTION—Point Every 25 Survey Units

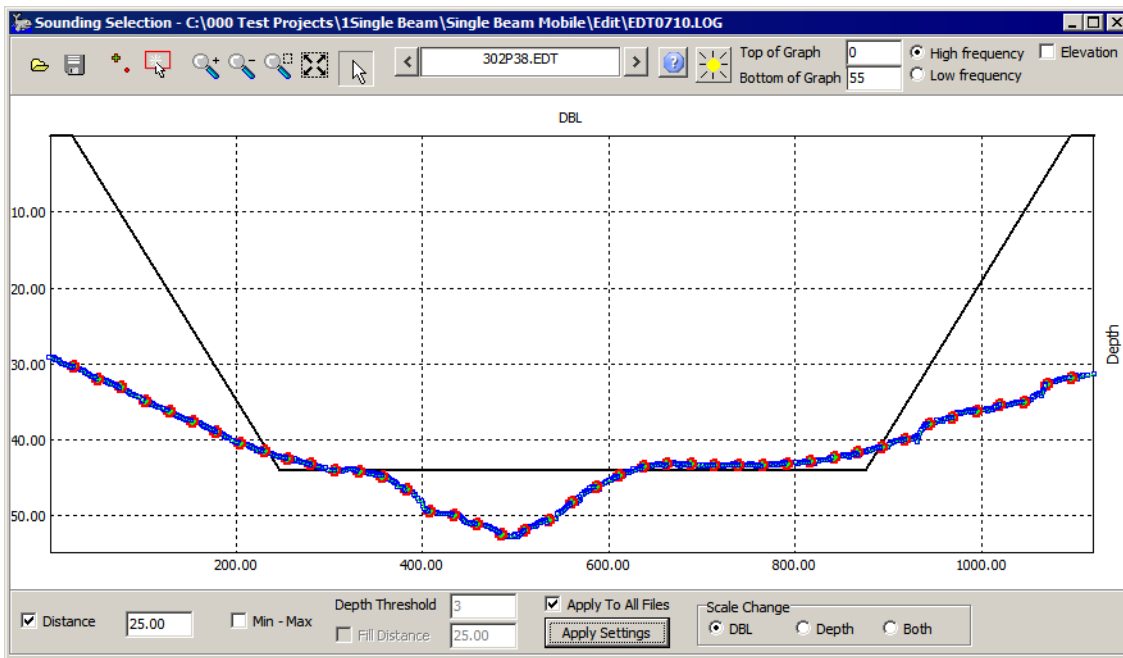
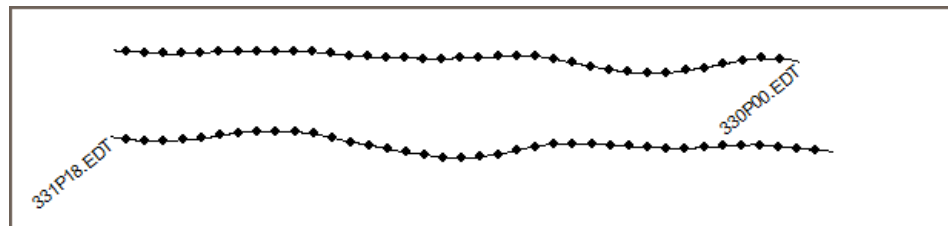
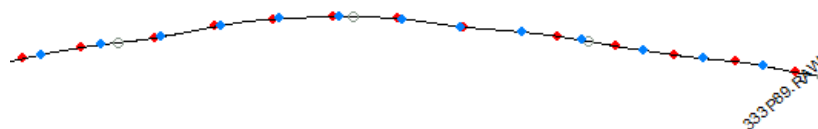


FIGURE 5. SB Selection Results



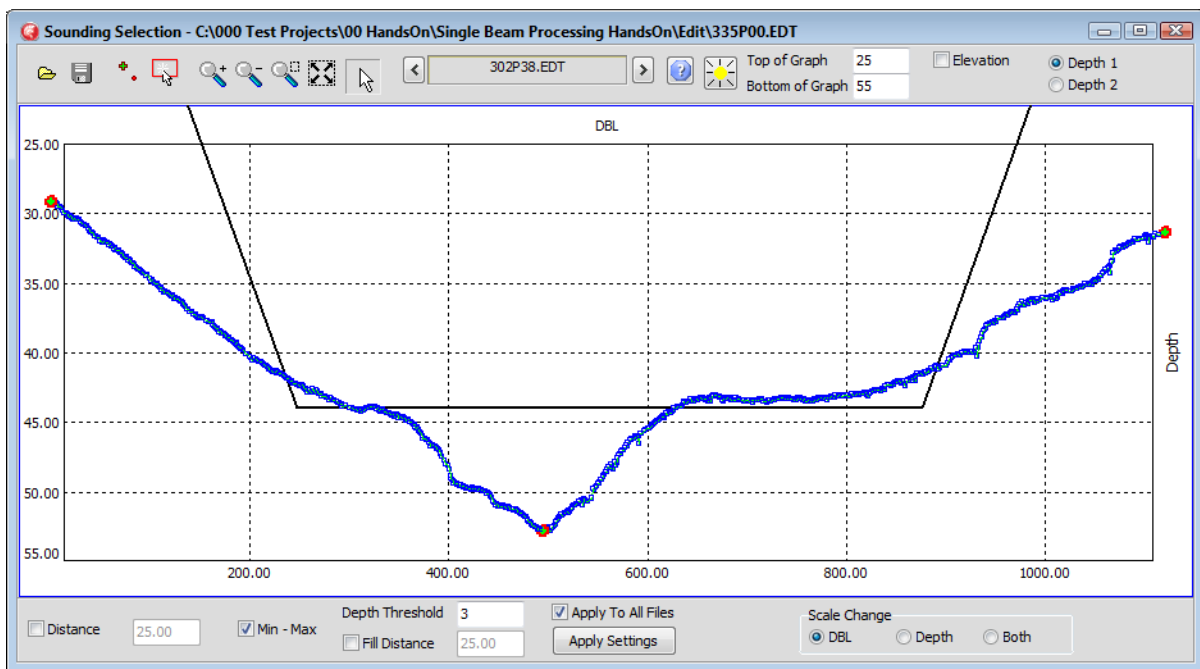
You can see that the results are very similar to the SORT results; however, the soundings are more evenly spaced than those from SORT. In the following figure, the blue soundings from SB SELECTION are evenly spaced, while spacing between the red soundings from SORT varies.

FIGURE 6. SORT vs SB SELECTION



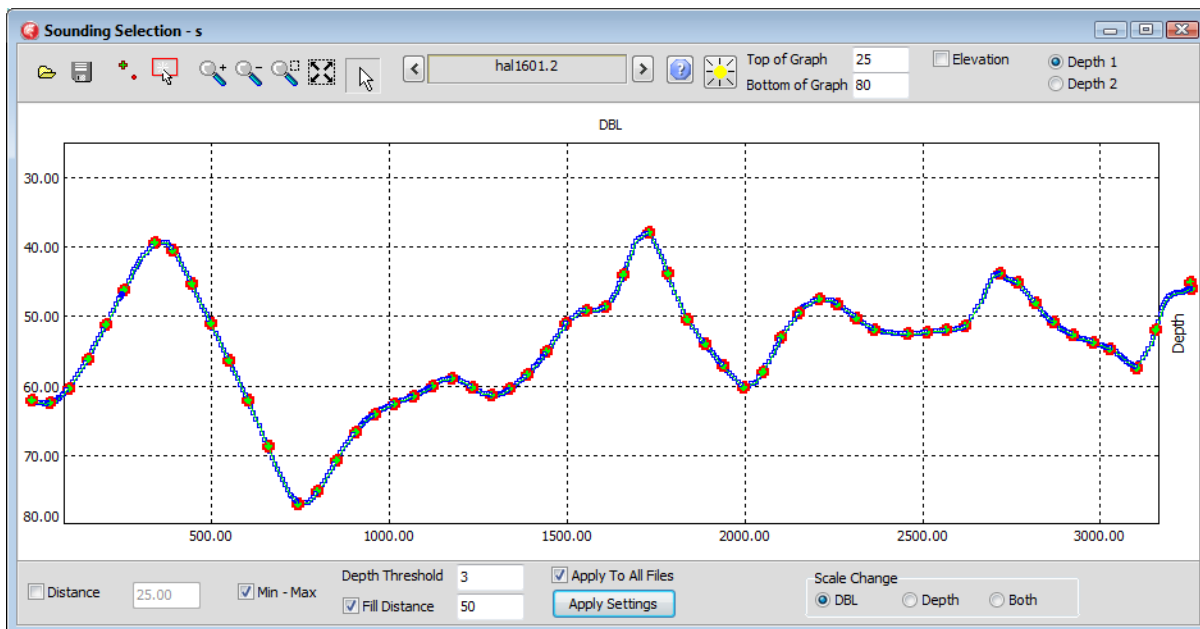
SB SELECTION can also output soundings showing the high and low points in a data set where the change in depth is greater than the user-defined threshold. The data in the Single Beam Processing project is rather unremarkable in this regard.

FIGURE 7. SB SELECTION—Minimum and Maximum with Threshold at Default 3



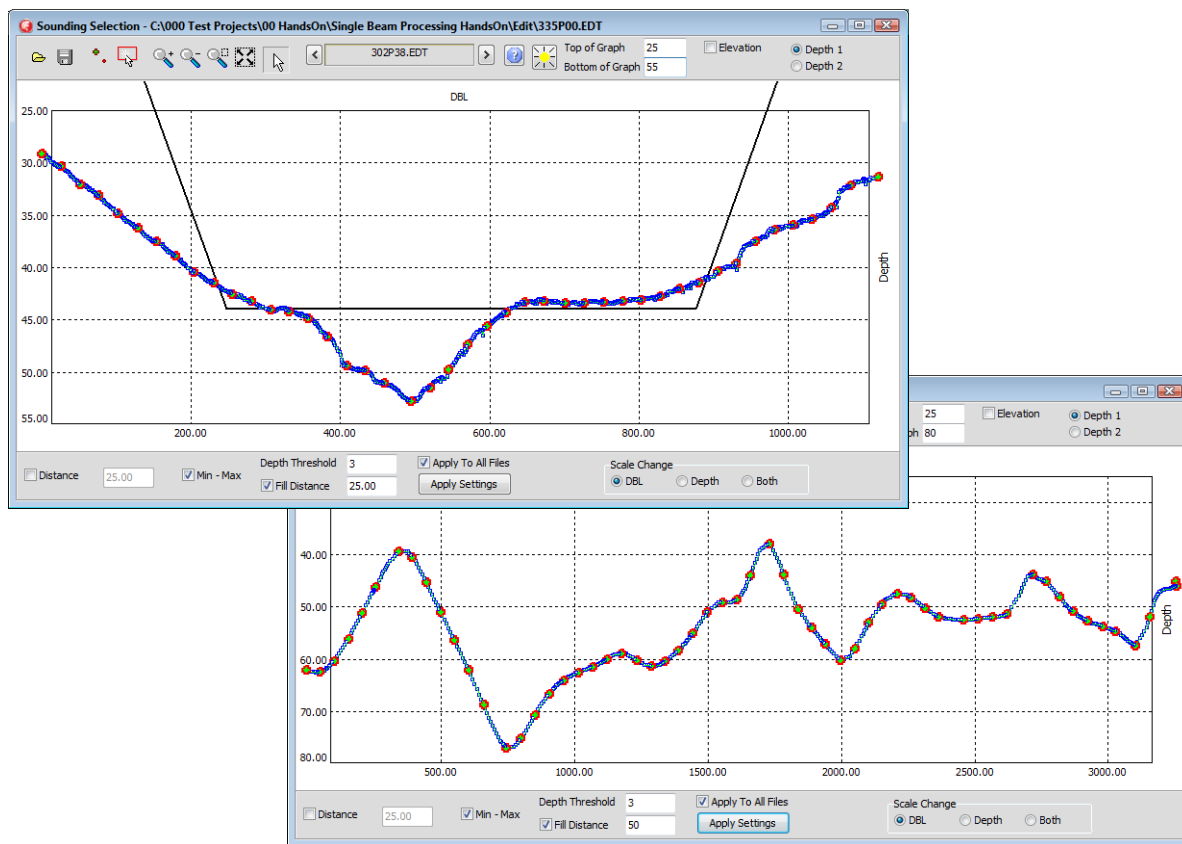
Try using some data from the Halifax project, which is included in your HYPACK® install. It has more distinctive highs and lows.

FIGURE 8. SB SELECTION—Minimum and Maximum with Threshold at Default 3—Halifax Data



In either case, you can add a Fill Distance to mark soundings at even intervals on the segments between the minimum and maximum points.

FIGURE 9. Min/Max with a Fill Distance—Single Beam Processing Project (top), Halifax (bottom)



Hands On!

Use the [Single Beam Processing_HandsOn](#) project and experiment with different options then compare the results. How do your SB SELECTION results compare to SORT?

CROSS SORT

The CROSS SORT program can sort a single catalog or two catalogs of edited All format files, giving precedence to one set of soundings over the other. It was originally intended for use where a set of cross check lines was to be combined with normal survey lines. Precedence would be given to the cross check lines where the two sets of data overlapped.

The CROSS SORT program requires a plotting sheet and a user-defined size for the plotted soundings. This defaults to 2mm. The plotting sheet is sub-divided into cells just larger than the sounding size (high resolution). CROSS SORT first goes through the catalog file that you have given priority assigning one sounding per cell until they are filled. If there is a second catalog, the process is then repeated for that set of files. The results are saved to sorted ALL format files where the soundings are as close as possible without overwriting in a plot with soundings at your specified size. (You can increase the spacing slightly by selecting a lower

resolution in the drop-down next to the sounding size option.) The sorted All files that had priority use an SR1 extension, while the others use and SR2 extension.

NOTE:Your survey units in the geodetic parameters must be either meters or US survey feet.

Hands On!

You can use the [Single Beam Processing_HandsOn](#) project in CROSS SORT, but it has no (optional) longitudinal lines. The result is closely packed soundings on each line.

To see how Cross Sort gives priority to one set of lines over another, use the [CrossSort_HandsOn](#) project. Compare the results when you give priority to Cross or Longitudinal lines.

FIGURE 10. CROSS SORT

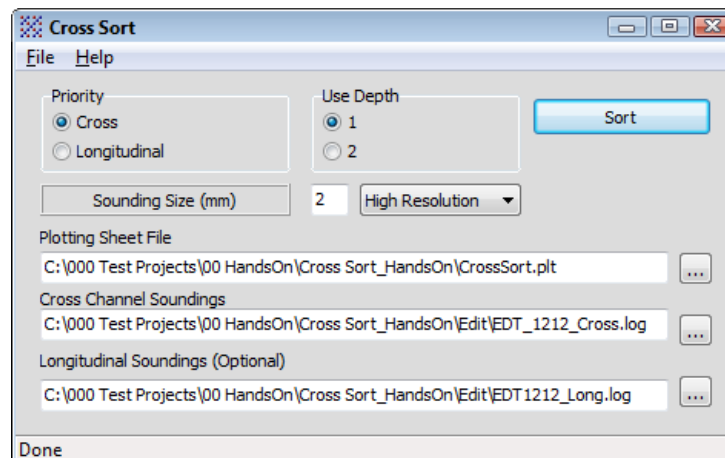


FIGURE 11. CROSS SORT—Before (left) and After (right with Cross line (blue) priority).

