



Dual Channel Singlebeam: Set Up and Processing

By Joe Burnett

ROSS Laboratories is probably the premier manufacturer of multiple transducer systems and recently they have put a new spin on an old premise. They have developed a new 'micro-sweep' system out of their compact 825B model, a standard dual frequency (low/high) singlebeam echosounder, and converted it into a single frequency (high/high or low/low) dual channel echosounder.

This conversion allowed them to add another transducer and collect two (2) singlebeam soundings, simultaneously, from one unit.

Systems such as this, are highly popular for increasing the density of coverage in shallow depth areas, without additional field time, while collecting the data.

This article will inform you on what peripheral devices will be required for this system, how to set it up in HYPACK® HARDWARE and process the data using the SINGLEBEAM EDITOR (SBMAX).

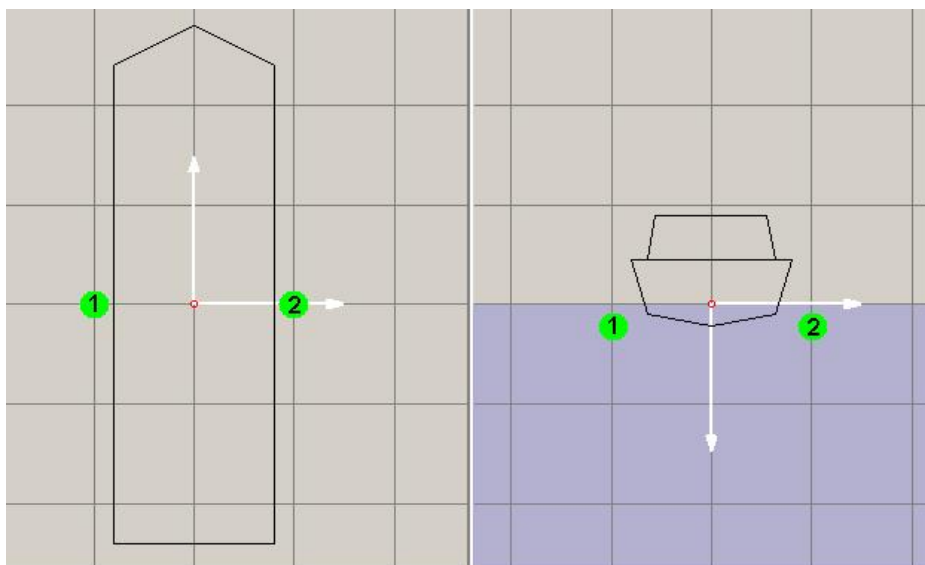


This will be the main focus of this article, the ability to setup, collect, and process a multiple transducer system, with *only* your HYPACK® Max licensed dongle.

REQUIRED AND SUPPORTING EQUIPMENT

More than likely, the two (2) transducers will be placed perpendicular to the keel of the vessel.

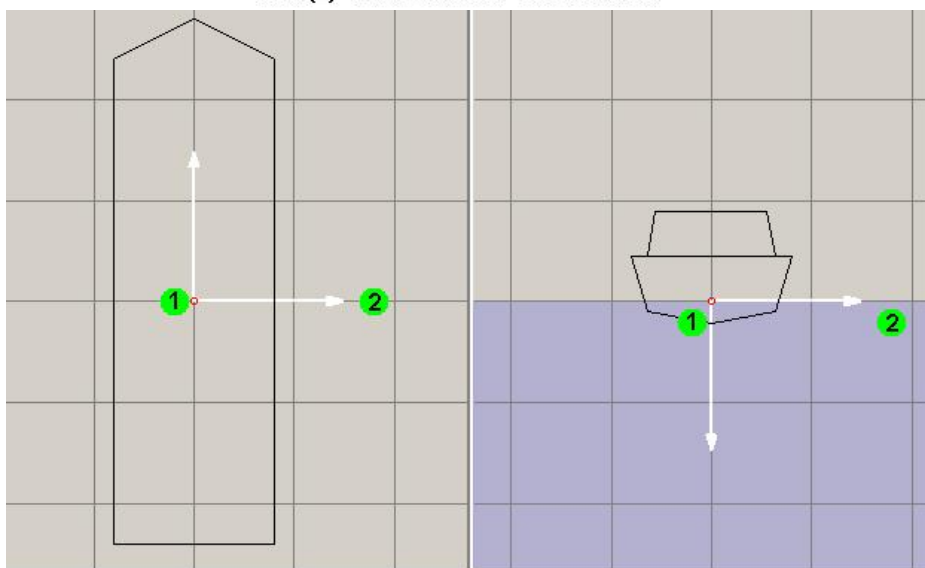
And will probably be configured in one of these two setups:



Two (2) Side-mounted Transducers

You will determine the spacing of the transducers; their separation, dependent upon the requirements of the survey.

Because this would be considered a multiple transducer echosounder, it will require a few extra pieces of equipment, not normally required for a simple singlebeam survey.



Original Hull-mounted Transducer, with Additional Side-mounted Transducer

These additional correctional devices will correct for heading, pitch, and roll, and in more dynamic surveying conditions, a heave compensating device will also be required.

There are several companies that manufacture these devices that are accurate enough for hydrographic surveying standards. Please consult your survey specifications for these required standards.

Once you have all of the required equipment and have installed it on your vessel, you are now ready to connect it to your HYPACK® data collection computer, and configure it in the HYPACK® HARDWARE program.

The typical equipment needed for this setup would consist of the following:

- 1) Dual Antenna DGPS System (Trimble SPS-461 or Hemisphere VS110)
- 2) Pitch and Roll Sensor (Honeywell HMR3000, Ocean Server 5000, etc.)
- 3) ROSS 825B Dual Channel Singlebeam

FIGURE 1. A Typical Configuration of the Equipment on the Boat

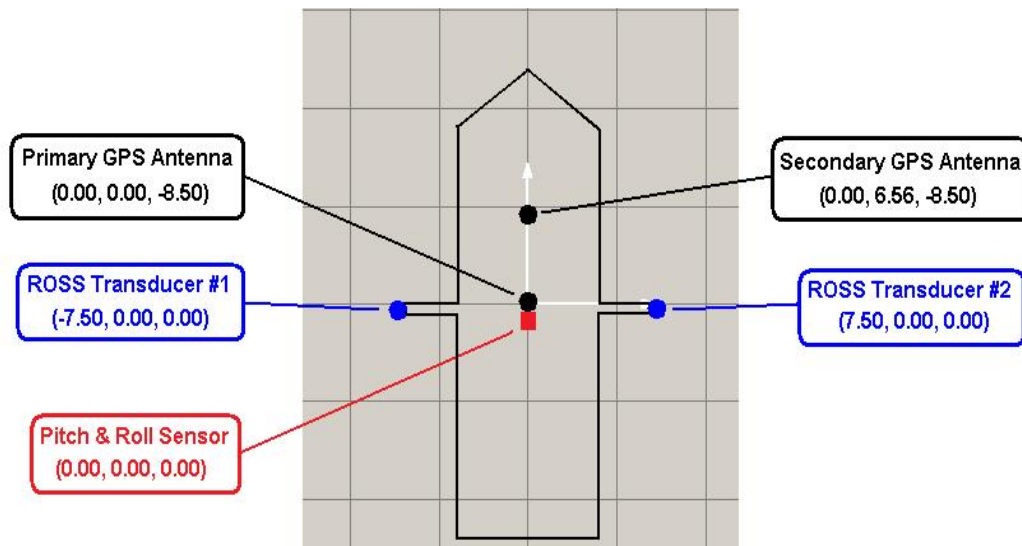
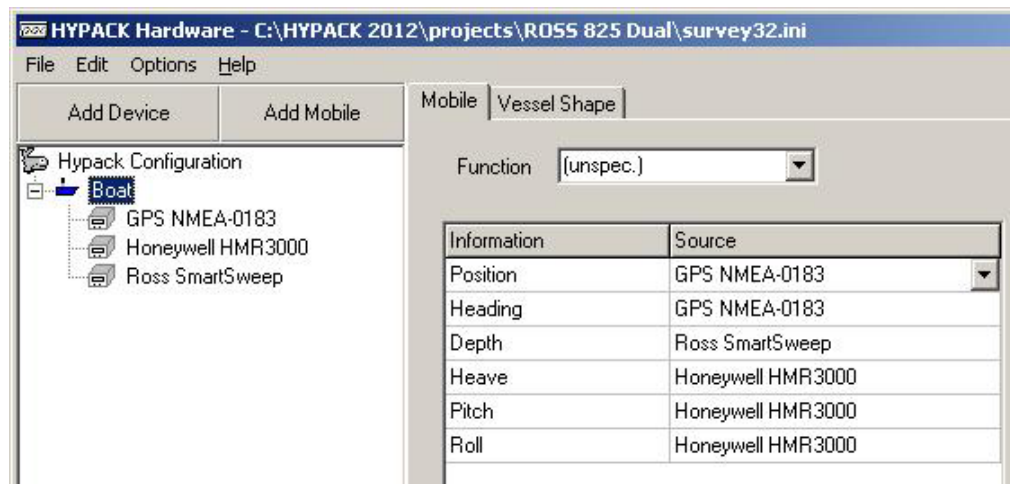


FIGURE 2. A Typical Configuration for this Equipment in HYPACK® HARDWARE



NOTE: Because the transducers are separated, and each one will have its own separate starboard and forward offsets, it is necessary to have an accurate heading sensor, in order to compensate for the lever arm corrections, for the positions of the soundings. This is why the dual antenna GPS is recommended. The flux-gate compass, which is built into the Honeywell and other heading sensors, may not have the accuracy that your survey requires and may also be influenced by large iron-based objects and structures such as other vessels, bridge piers, and quay walls.

In HYPACK® HARDWARE, be sure to enter the following, for each device similar to the following screen captures:

- **Functions**
- **Connection Parameters**
- **Setup Options**
- **Offsets**

FIGURE 3. GPS Device - GPS.dll

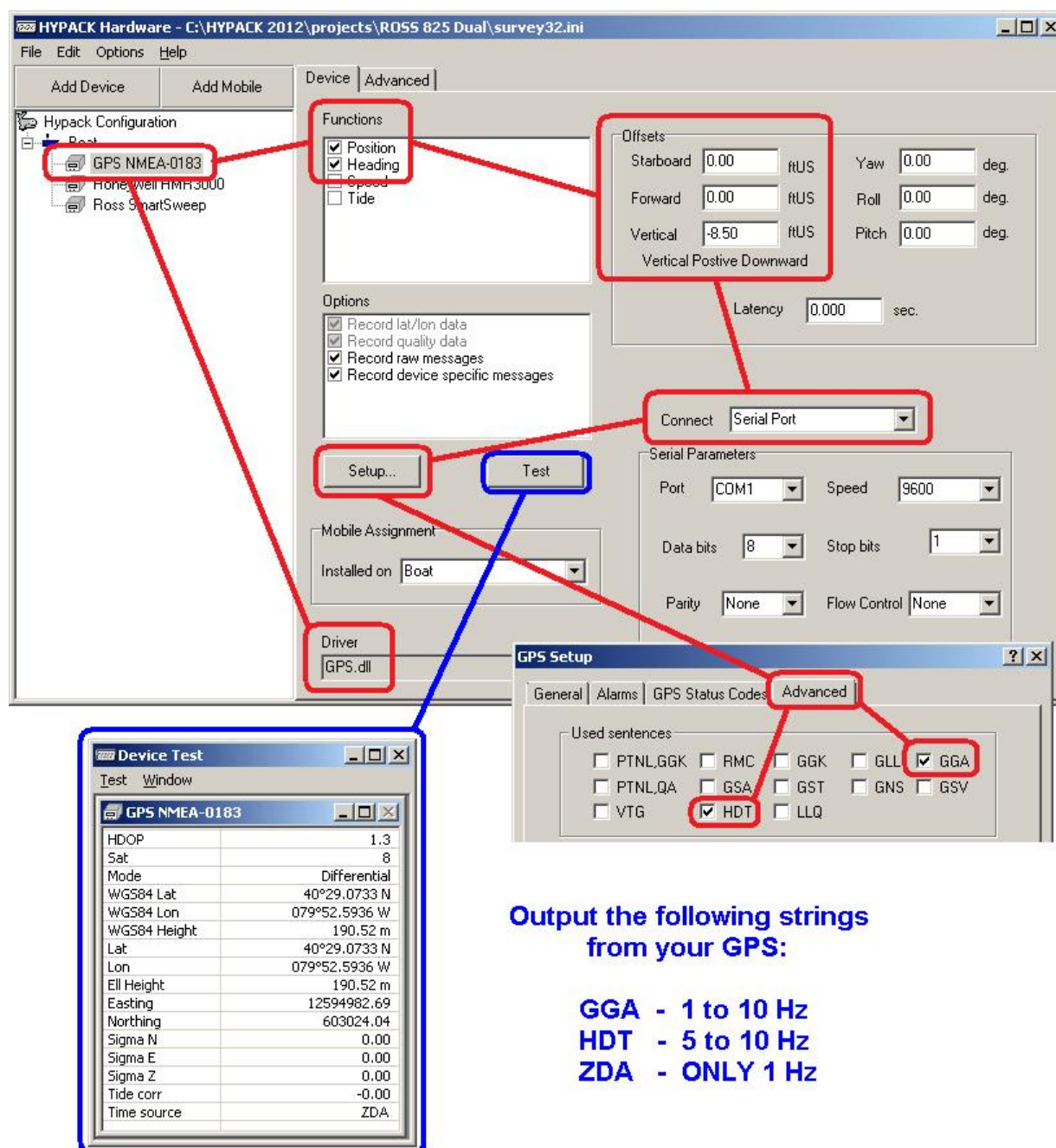


FIGURE 4. Pitch and Roll Sensor - HHPR.dll or similar

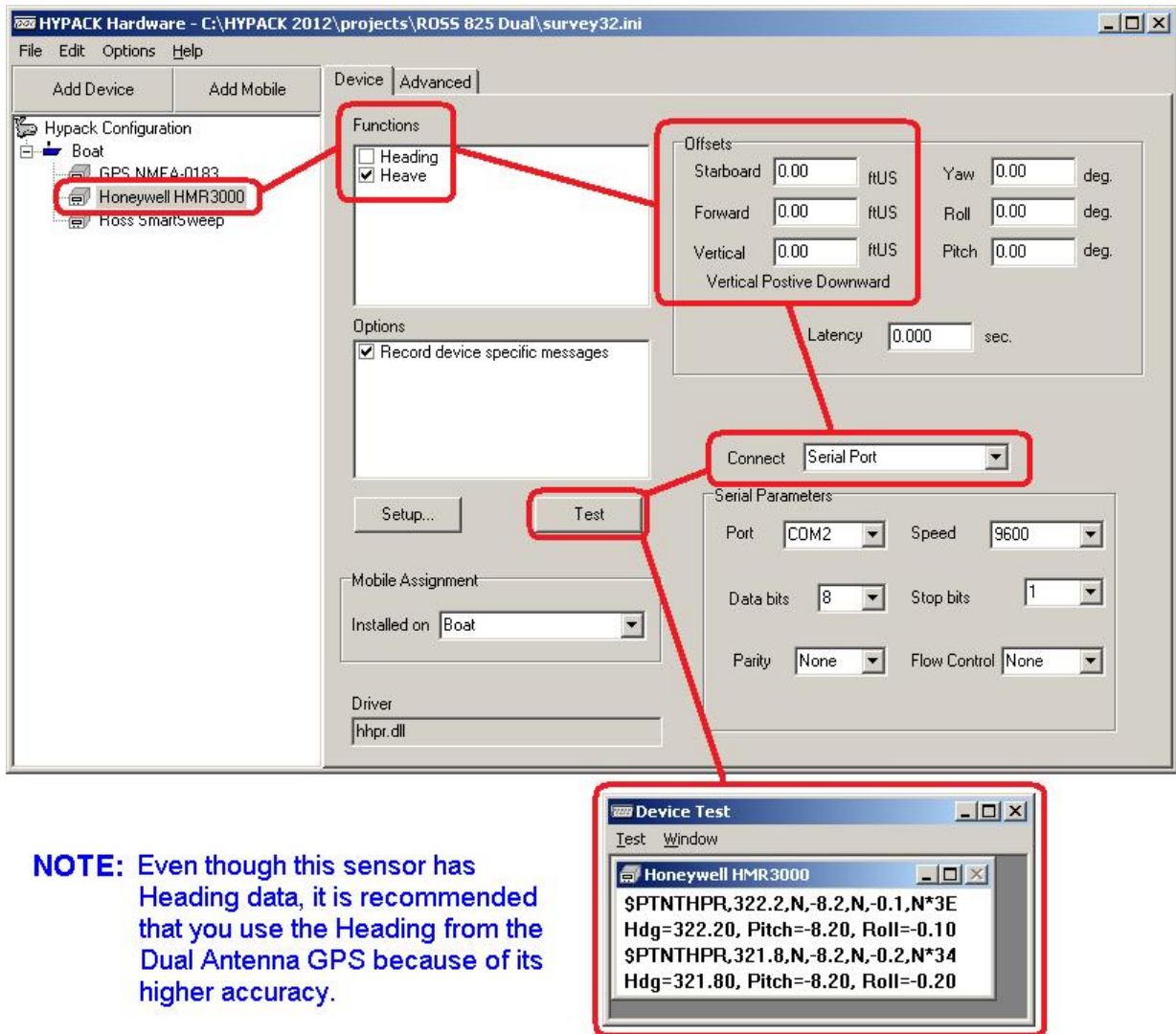
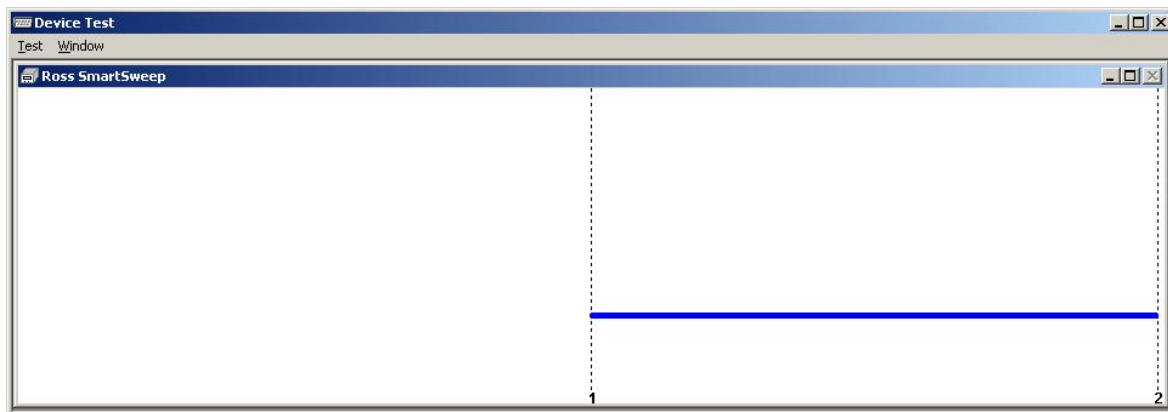
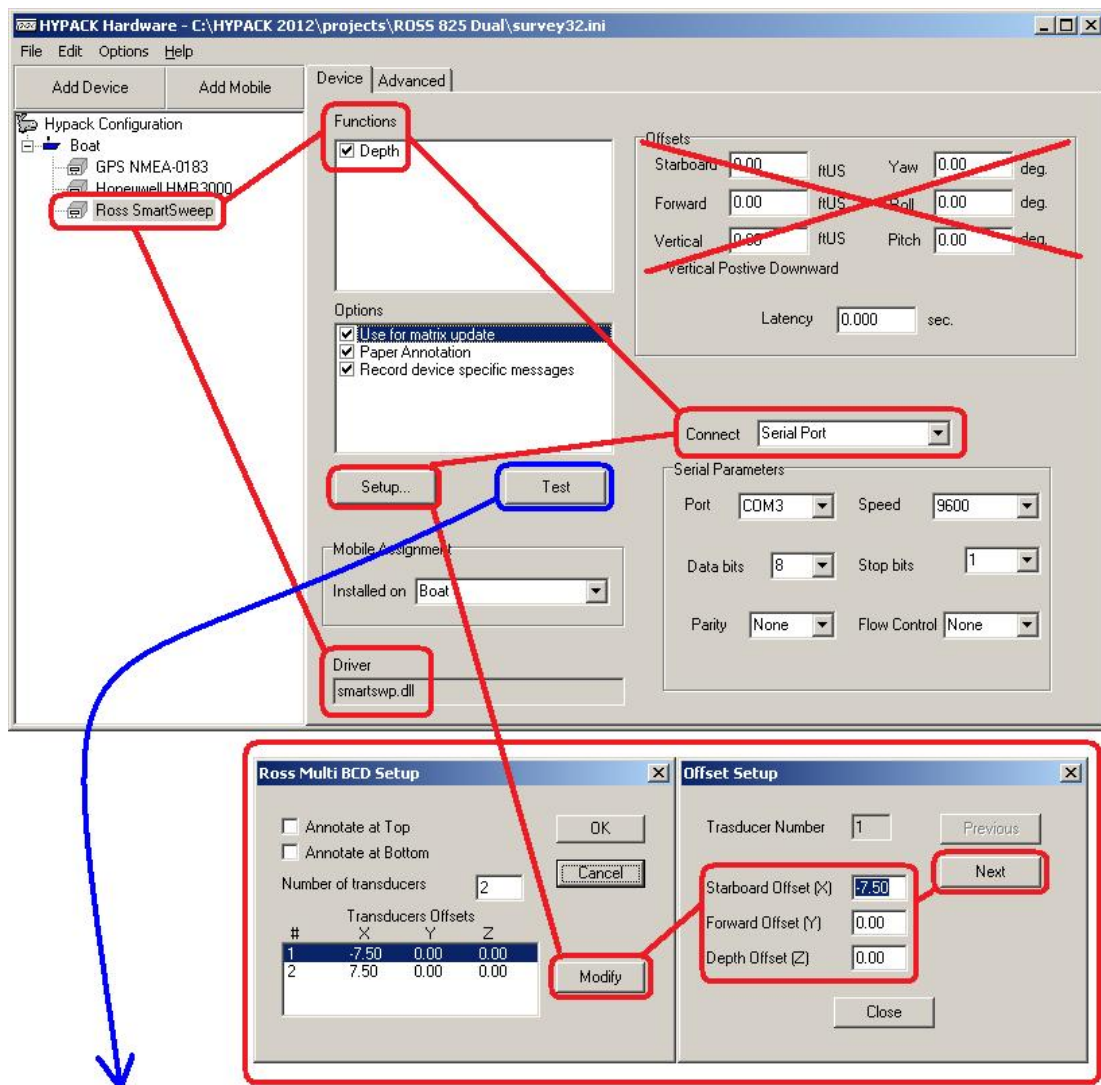


FIGURE 5. ROSS Dual Channel Singlebeam - SMARTSWP.dll

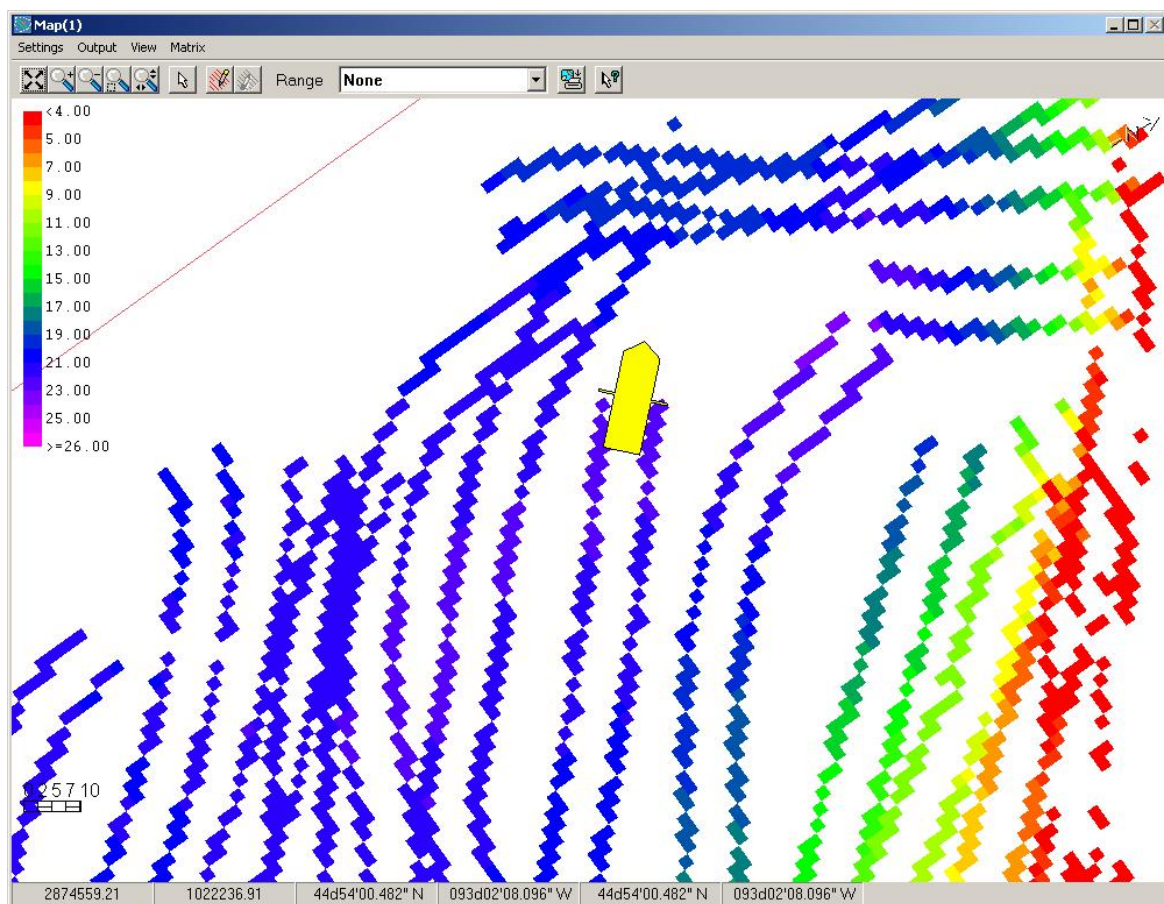


Once all of the devices have been configured and tested in the HYPACK® HARDWARE program, you are now ready to start the HYPACK® SURVEY program.

NOTE: In the ROSS Smart Sweep driver, an important setting that is recommended is the 'Use for matrix update' option. By creating a matrix around your survey area, you can 'paint' the location of all the soundings that you have collected, in real-time, with a color-coded depth scheme. This will, not only show you the density of the data collected, but assist the boat operator in avoiding hazards by displaying the areas where 'shoals' are located.

SURVEY PROGRAM

This is what it would look like in the HYPACK® SURVEY Area Map:



Once the data has been collected, it's time to process.....

SBMAX SINGLE BEAM EDITOR

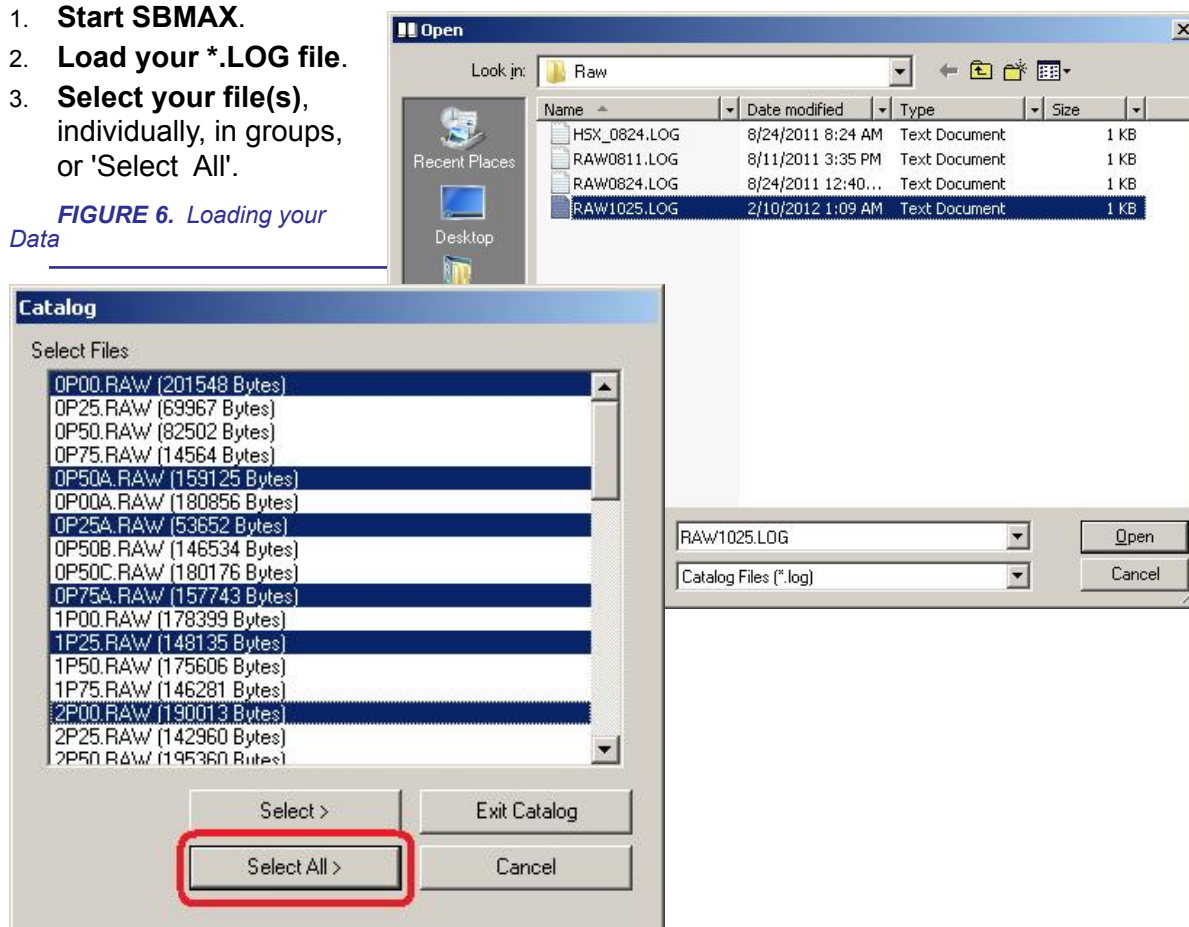
Yep, that's right..... we're going to edit the multiple transducer data in the SINGLEBEAM EDITOR. We'll just call it the "Poor Man's Editor".

By editing in the SINGLE BEAM EDITOR, it saves you from having to purchase a HYSWEEP® license to process your multiple transducer data, but there is a price to pay to accomplish this. The SINGLE BEAM EDITOR can only process *one* single frequency transducer, at a time. Therefore, you will have to process the same file once for each transducer. (With 2 transducers, edit the same file twice, 5 transducers, edit the same file 5 times, etc.) So..... what's your time worth ????

Here are the steps to processing your multiple transducer data in the SINGLE BEAM EDITOR (SBMax):

1. **Start SBMAX.**
2. **Load your *.LOG file.**
3. **Select your file(s),** individually, in groups, or 'Select All'.

FIGURE 6. Loading your Data

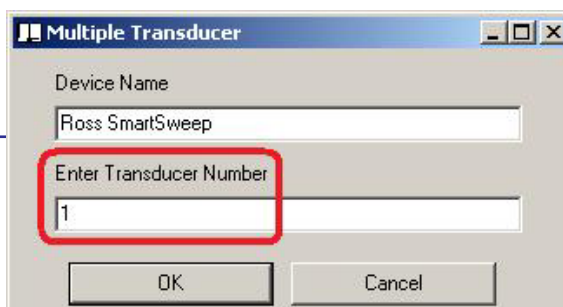


Here's where the FUN begins:

4. **Enter the Transducer # that you want to process in this session.**

FIGURE 7. Entering the Transducer Number

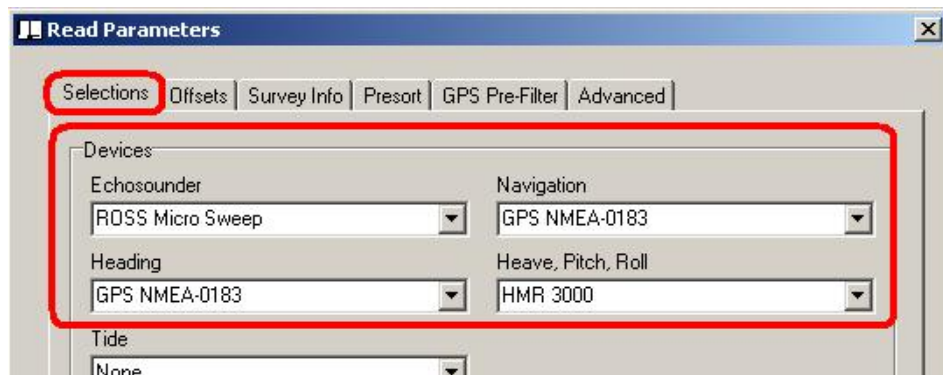
5. **In the 'Corrections' window, open the appropriate Tide and SV (Sound Velocity) files.**



Note: Be sure to Enter the SV that was used in the Echosounder, so that it can be incorporated into the calculations, if it differs from the SV Profile Cast.

6. In the **Selections** tab of the 'Read Parameters' window, select the appropriate devices.

FIGURE 8.



7. **Select the 'Offsets' Tab.**

- Select each Device.
- Verify that the Offsets are correct,
- Modify, if necessary.

All of the selected files will now load into the editor.

8. **Edit each file**, just as you would a normal singlebeam file.

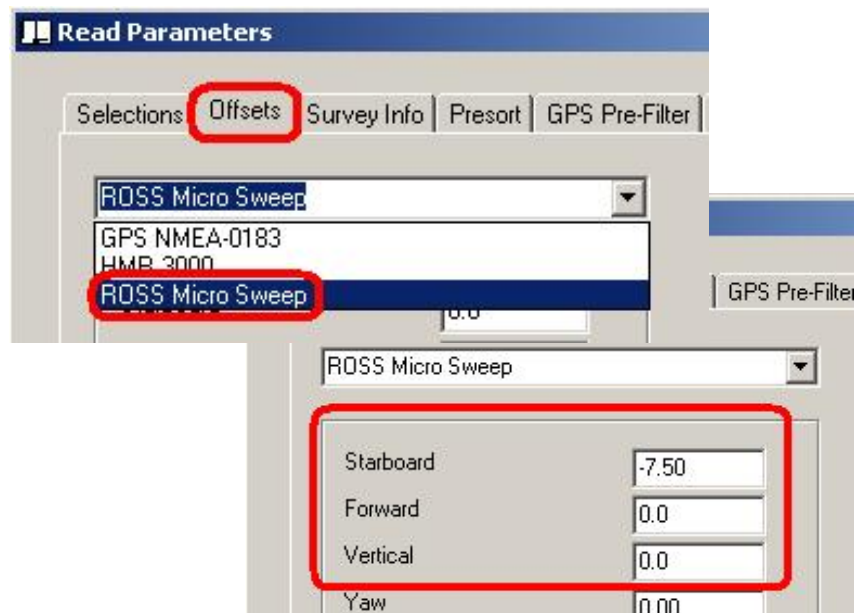
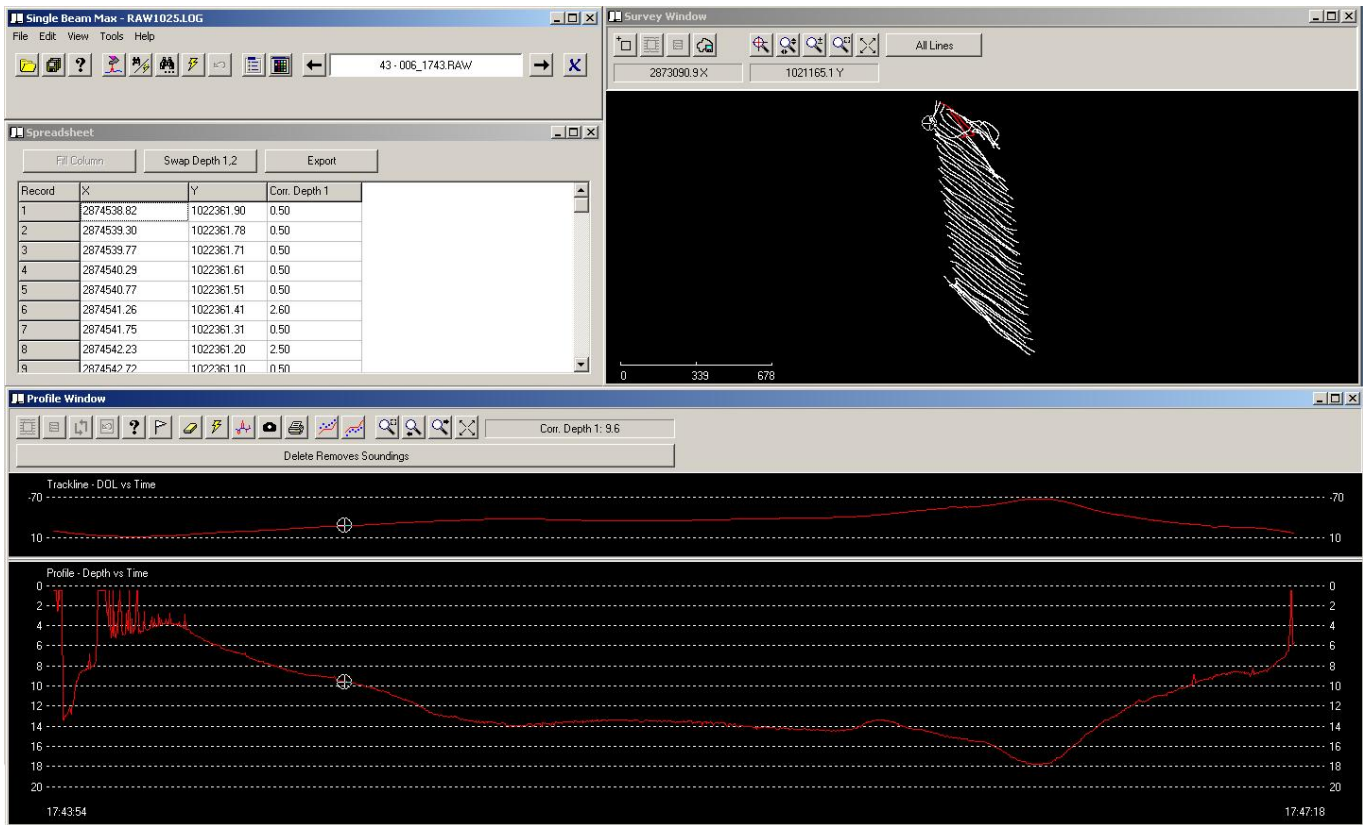


FIGURE 9. Editing Your Data in SBMax

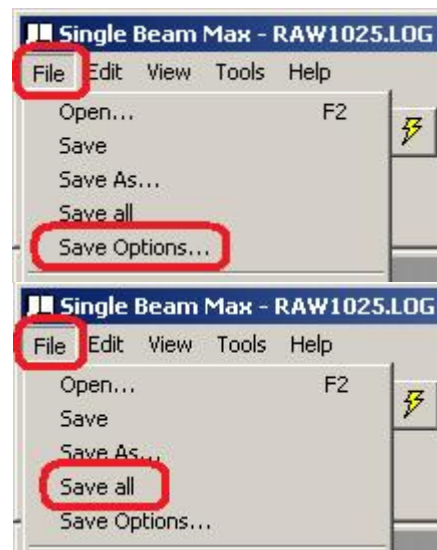


Reminder: When Editing your Multiple Transducer data in SBMAX, you still have all the functions and features, that you would normally have when editing normal Singlebeam data.

9. **Select FILE-SAVE OPTIONS.**
10. **Enter an extension that will distinguish these files** as the edited files for the specific transducer # that you are editing and click 'OK'.

11. **Select FILE-SAVE ALL** or click on the  button.

12. **Select FILE - OPEN** or 'F2' or .
13. **Repeat Steps 3 thru 11** until editing and saving is complete.



In conclusion, if these procedures fit within your budget and time schedule, you are now ready to go and collect, survey, and process your multiple transducer data, in HYPACK® Max.

However, if you are under a time constraint, and need to get your data out quicker than what these procedures take, you would be better suited to purchase the HYSWEEP® licenses so you could collect and process in the HYSWEEP® SURVEY and MBMax (HYSWEEP® EDITOR) programs.

CONVERTING YOUR EDITED DATA TO XYZ FORMAT

Use whatever program (SORT, MAPPER, SB SELECTION, or TIN MODEL) that you normally use to create your final XYZ files.

Shortcut: A feature that I often use to create my final XYZ files resides within the Spreadsheet window of the SBMAX program. Once I have completed processing all the 'bad data points' from my *.RAW files (Step 8 above), I will configure the Spreadsheet window, in this fashion:

1. **Right-click on the spreadsheet and select 'View Options...'**

FIGURE 10. Opening the Spreadsheet View Options Dialog

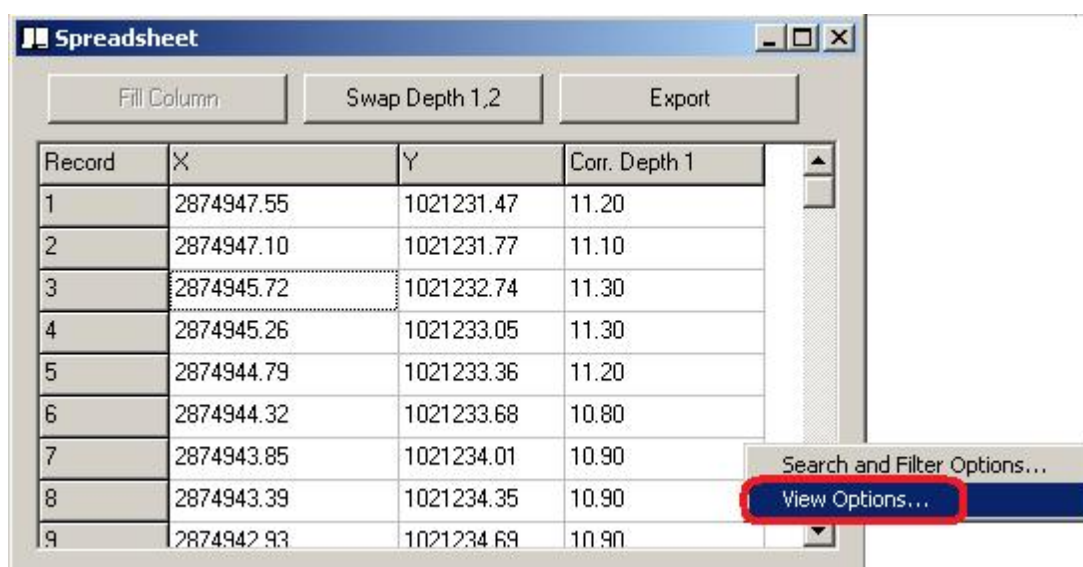
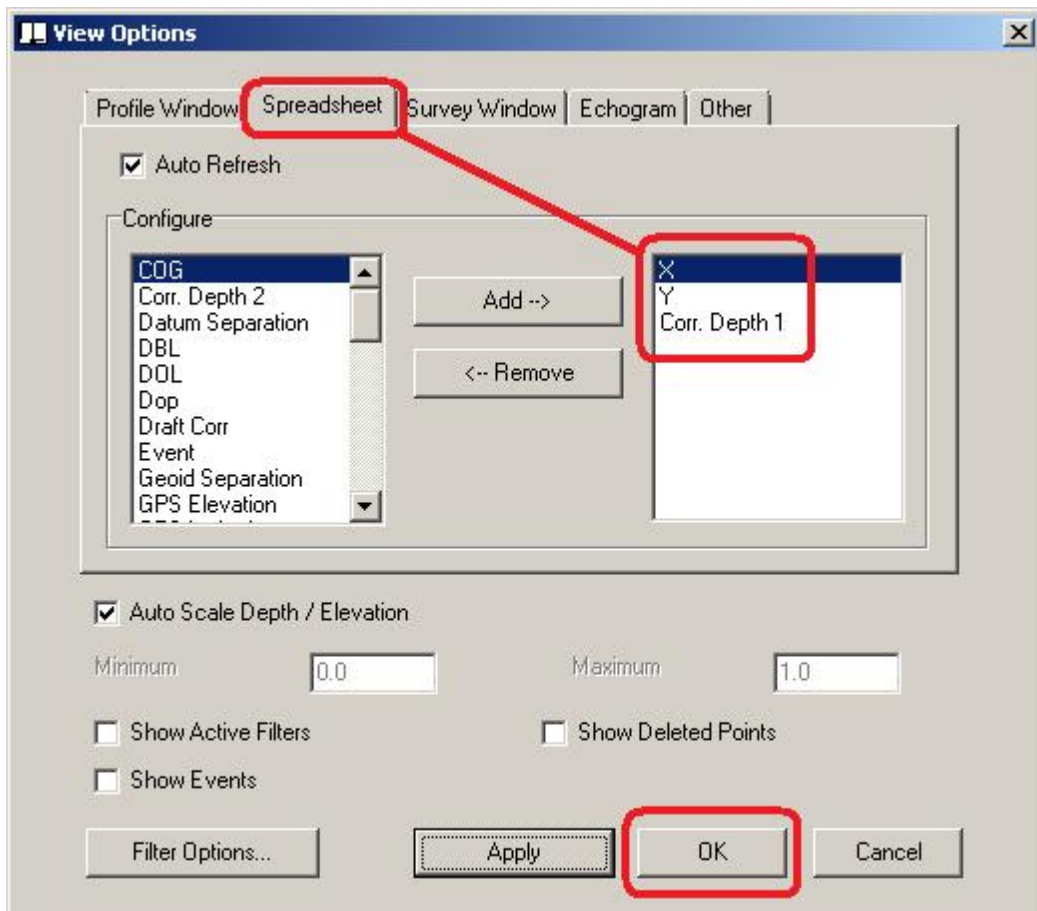


FIGURE 11. Configuring the Spreadsheet to Show XYZ Data



2. Click the 'Export' button on the Spreadsheet window.
3. Select the 'Single File' option.
4. Select the Format Options that best fit your needs.
5. Click [OK].
6. Select the directory in which to store the file.
7. Enter the File Name.

Note: It will 'automatically' Save the file with the *.txt extension. (Currently, this is the *only* extension allowed.)

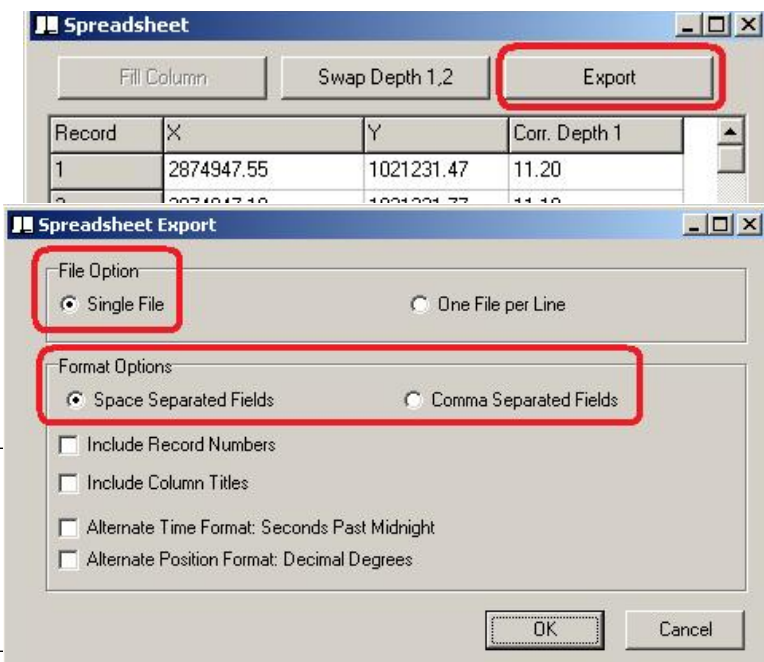
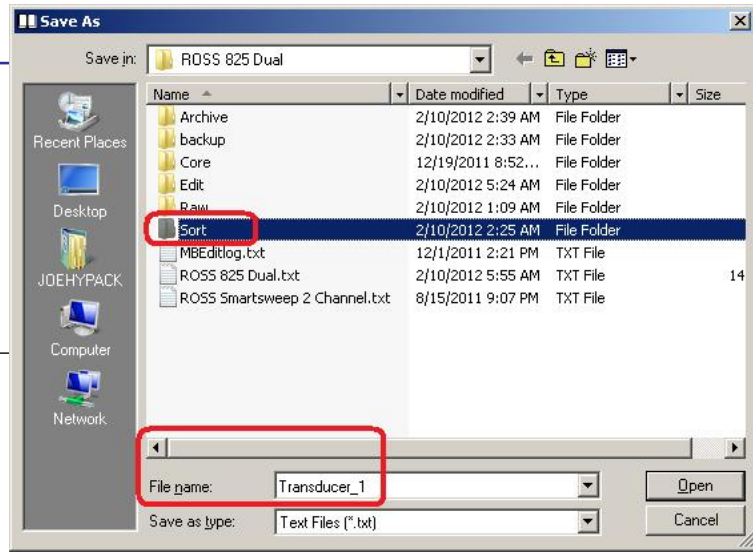


FIGURE 12. Setting the File Name and Save Location

Once the Spreadsheet is set up, simply perform the procedures on this page after you edit the data for each transducer and you will have the XYZ files saved for each transducer.

Note: You will then have to use Windows® Explorer to change the extension of each file from *.txt to *.XYZ.



I believe a new feature to perform this operation, will be forthcoming, as an update for the 2012 version of HYPACK®.