SNIPPETS: Everything you Wanted to Know About Them

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What are Snippets?

As the wavefront from the multibeam's transmit array propagates through the water column and finally strikes the seafloor, the multibeam first processes the bottom detection information for the bathymetry. It then looks at the fragments of backscatter data, that surround the bottom detection information, for each individual beam, their amplitude and their Reflectivity information. These 'fragments' of data are known as, snippets.

From this data, seafloor characterization and classification of the substrate and geomorphology can be derived.

That's about as 'technical' as I am going to get with this article. If you want further description information about Snippets, please contact the manufacturer of you system and have them give you the particulars. What I want to concentrate on, is how to collect it and process it, within HYPACK/HYSWEEP.

Collection of the Data

The Survey Computer

Collecting snippet data will require a pretty hefty computer, with plenty of hard drive memory and CPU speed.

From our HYSWEEP Interfacing Notes:

> "**Important Note !!** Say you are pinging 40 times per second in shallow water, using 512 beams at equal spacing and saving 300 snippet samples per beam (300 is the RESON default) and 2 bytes per sample. You will then try to collect 40 * 512 * 300 * 2 = 12,288,000 bytes per second or 0.74 GB / minute.
>
> "**NO!** The network will likely choke and even if it doesn't, this is too much for the GSF files used in snippet post processing. Reduce the number of samples in your Multibeam's Control software to 50 or less. If you ping at high rates in shallow water, then 25 pings per second, at 25 snippet samples per beam is reasonable. 25*512*25*2 = 640,000 bytes per second = 0.038 GB / minute."

Which Multibeam Systems collect Snippets ??

Currently, there are a few of multibeam manufacturers that can collect snippets data, but there are only two that HYPACK® has the capability of collecting, at this time:

- **RESON** with their 8101, 8125, 7101, and 7125 systems, and
- **R2Sonic** with their 2022 and 2024 systems.

How do I collect them??

First, within the controller software for your multibeam system, you *MUST* enable the Snippets function and output. These files will be used in conjunction with the HYPACK® (*.HSX and *.HS2) files to create the mosaic.

Reson Systems

In the RESON 81xx series, go to the BITE screen, and change the UDP Base as follows:

3.9.8 UDP Base

This item allows the operator to define the base UDP Port number for Ethernet communications. Enter the "base" UDP port number and the other required ports will be selected automatically. As an example: assume that the UDP base number "N" is 1028. Then, as shown below, N+1 = 1028+1 = 1029.

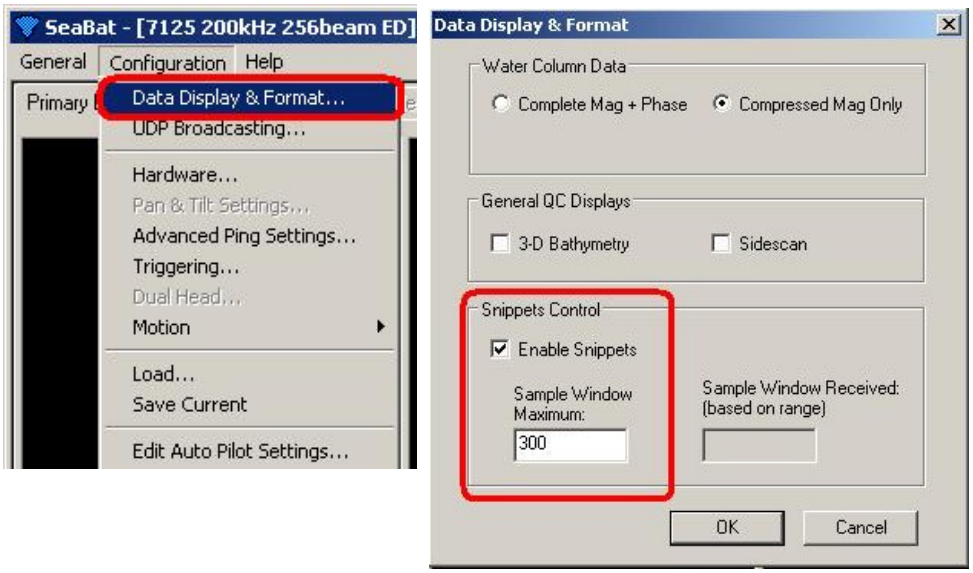
N+0	UDP_PORT_BATHY	Bathymetry data output
N+1	UDP_PORT_SIDESCAN	Sidescan data output
N+2	UDP_PORT_CONTROL	Remote control of menu items
N+3	UDP_PORT_ALARM	Status message output
N+4	UDP_PORT_SNAPSHOT	Snapshot data output
N+5	UDP_PORT_RAW	Special data output
N+6	UDP_PORT_SNIPPETS	Snippets data output
8100	UDP_PORT_DOWNLOAD	Firmware download input**

** this port is unaffected by the base UDP number.

With the RESON 7k series, start the 7k Control Center. (Select CONFIGURATION-DATA DISPLAY & FORMAT.)

- Enable Snippets
- Set Sample Maximum. 50 or less is recommended. 25 works well when pinging at high rates in shallow water.

FIGURE 1. *Configuring the Reson 7k Series Multibeam for Snippets*



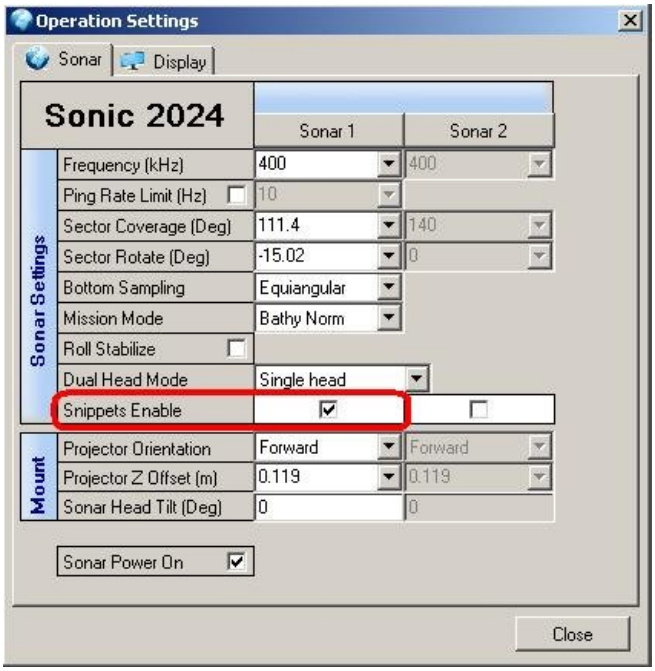
The RESON 7k series will now create (*.7k) files that will contain all the snippet data.

R2SONIC SYSTEMS

With the R2Sonic systems, start the Sonic Control 2000. (Select SETTINGS - SONAR SETTINGS.)

- Check Snippets Enable.

FIGURE 2. *Enabling R2Sonic Snippets*



The R2Sonic 2000 series will now create a (*.R2S) files that will contain all the snippet data.

Note: During collection in HYSWEEP®, the intensity waterfall display will show snippets instead of intensity.

PROCESSING SNIPPETS DATA IN HYPACK/HYSWEEP

Important: You *must* first process the *.HSX multibeam files in the HYSWEEP® EDITOR, and save them into HS2 and/or GSF files. The HYSWEEP® EDITOR applies corrections that may not have been applied during the survey and edits out bad data. The snippet data is then processed with the edited multibeam data in the GEOCODER™ program.

A new feature in HYPACK® 2011, is the ability to run the HS2 files in GEOCODER™, without having to create GSF files, separately. This is a simple trade-off, you do either of the following;

- **Use the HS2 files and their respective snippets files** (*.81x, *.7k, or *.R2S) in the same directory.
- **Create the GSF files**, which will combine and contain all of the multibeam and snippets data for each pair of files within one GSF file. This may be convenient, but will consume more data storage space on your computer because the same snippet data is stored in both the original snippet files and the GSF files.

It's your choice. Either will work, as we have seen no significant difference in the mosaics that we have created, with either combination of files.

Once you have you have processed your multibeam files, you are ready to run them thru GEOCODER™.

1. **Launch GEOCODER™**.

FIGURE 3. *Launching GEOCODER™*

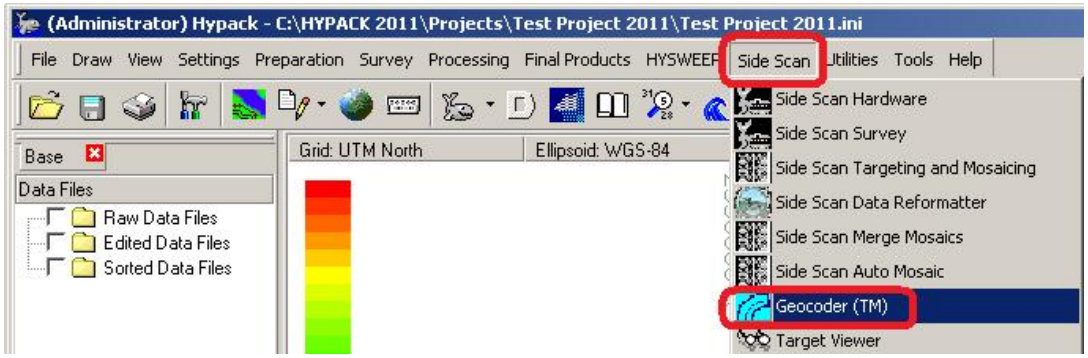
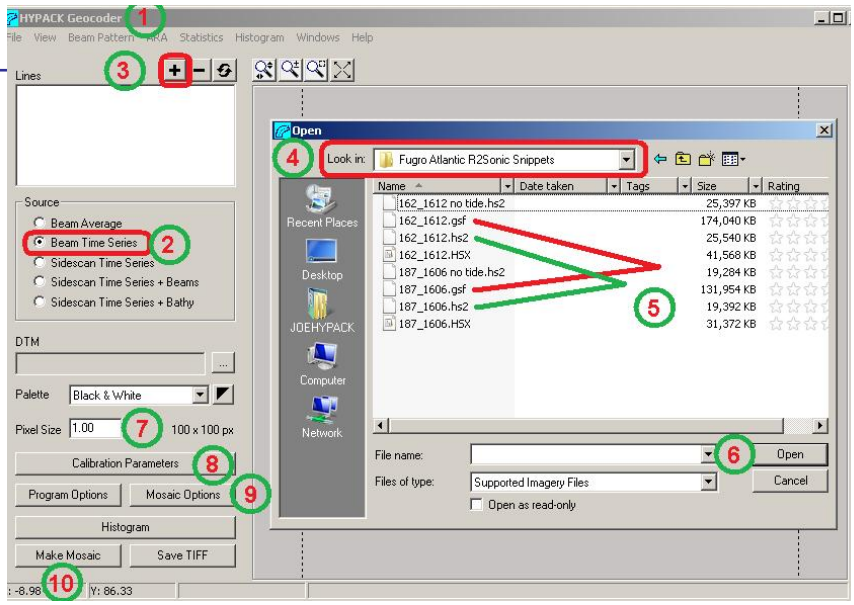
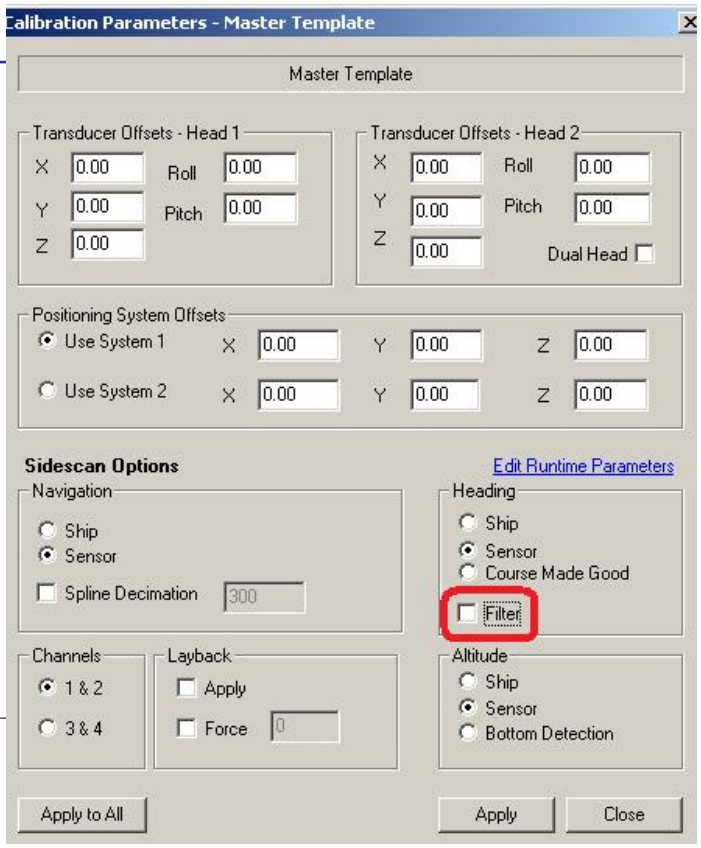


FIGURE 4. *GEOCODER™ Interface*



2. **Select Beam Time Series**. (#2)
3. **Load your HS2 or GSF file(s)**. (#3)
   a. Locate directory with files. (#4)
   b. Select files for mosaic. (#5)
   c. Click [Open] to load.(#6)
4. **Select resolution of mosaic**. This will be in the geodesy units of the project. (#7)
5. **Set the Calibration Parameters.** (#8)

FIGURE 5. The Filter Check Box Only Applies to Towed Devices.

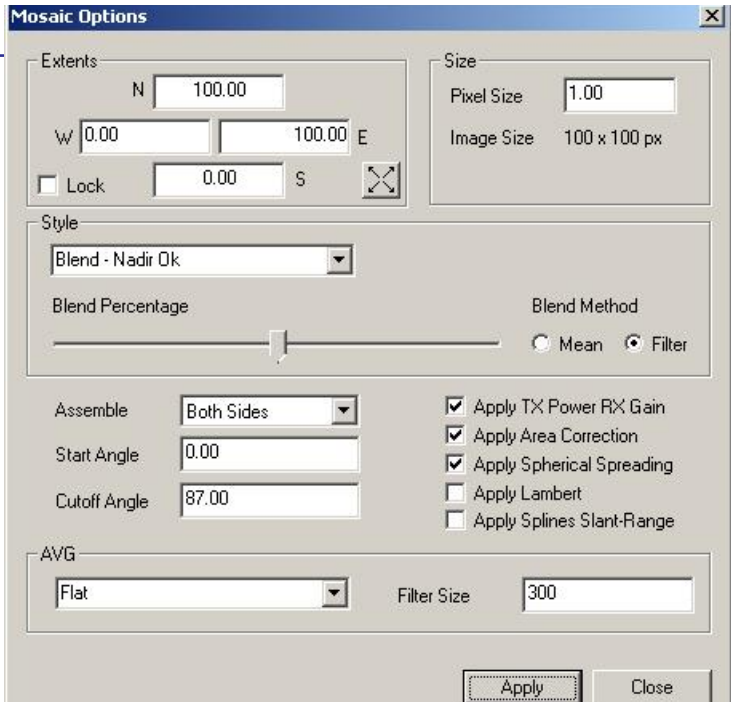


a. **Click [Calibration Parameters].**
b. **Be sure that the "Filter" box is left unchecked**. As you have no doubt collected your multibeam data with a very accurate heading sensor, there is no need to 'filter' or 'smooth' the heading data, as might be needed for a towed side scan.
c. **Click [Apply], then [Close].**

6. **If you have loaded a DTM** (digital terrain model in the form of an XYZ file or MTX file)**, set your Mosaic Options. (#9)**

Note: Typically, one would not use a DTM with snippets. However, if you use a DTM, be aware that it may have a lower resolution than your snippet data and this will degrade the resolution of your imagery. DTM's can also put boundary limits on your imagery.

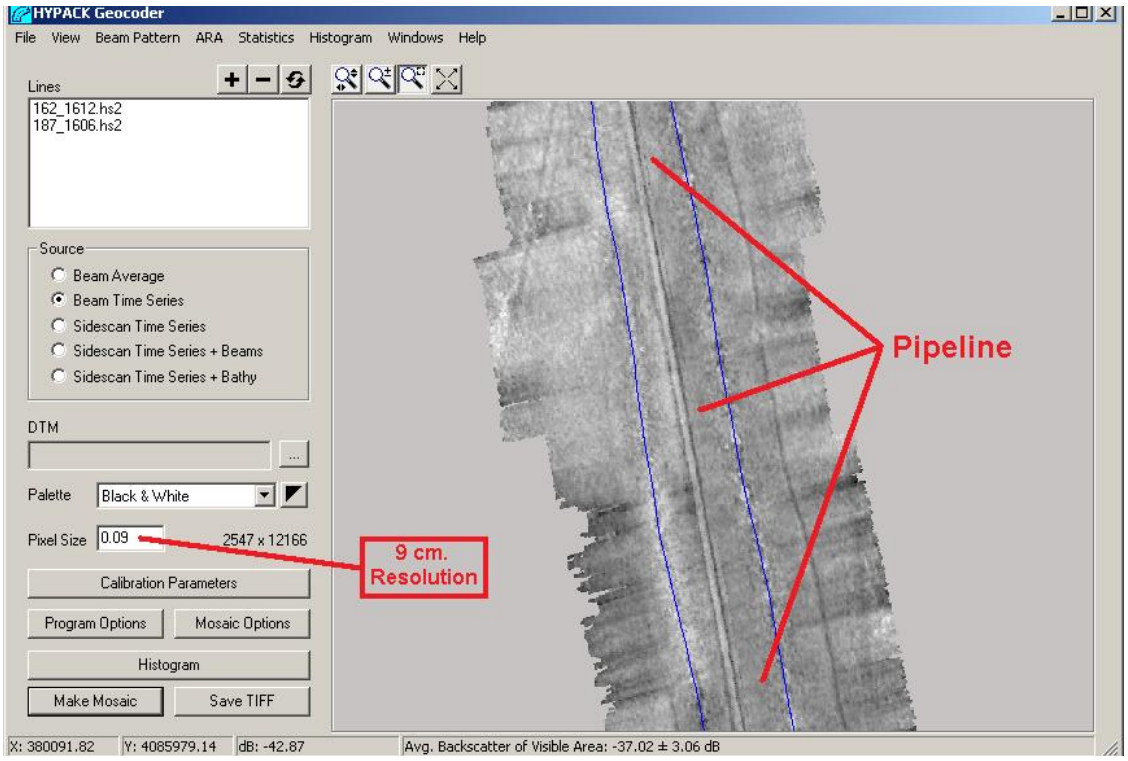
FIGURE 6. Mosaic Options



a. **Click [Mosaic Options].**
b. **Set the AVG Filter to "Trend".**
c. **Click [Apply], then [Close]**.

7. **Click [Make Mosaic]**. GEOCODER™ will now take the loaded files and, one-by-one, plot them on the screen.

FIGURE 7. *GEOCODER™ Draws a Preview of the Mosaic.*



8. **If you are satisfied with the resolution and mosaic, save the mosaic.** Click [Save TIFF]. This will create a geo-referenced TIFF image, that can be loaded into HYPACK® as a chart file, or any other 3rd party program (eg.Google Earth™) that can read geo-referenced TIFF files.

FIGURE 8. *Naming your TIFF Output*