

HYPACK Marine Search - Quick Start Guide

(Updated: 29 Dec 2015)

The HYPACK Marine Search software package is designed to take input from a GPS and a side scan. It allows for Mosaicking and targeting of the side scan data both in real time (Surveying) and in Post-Processing. The software allows you to work on a US State Plane projection (NAD-83) in feet, or a UTM project (worldwide) in meters. It only permits a fixed layback from the GPS antenna to the side scan towfish.

1. Installation

The HYPACK Marine Search program can be installed from a CD or by downloading the HYPACK_Marine_Search_Setup.exe file from the HYPACK website (www.hypack.com). After starting the installation program, you will see the following screen (right). Click on the “Install HYPACK® Marine Search” menu item to begin the installation.

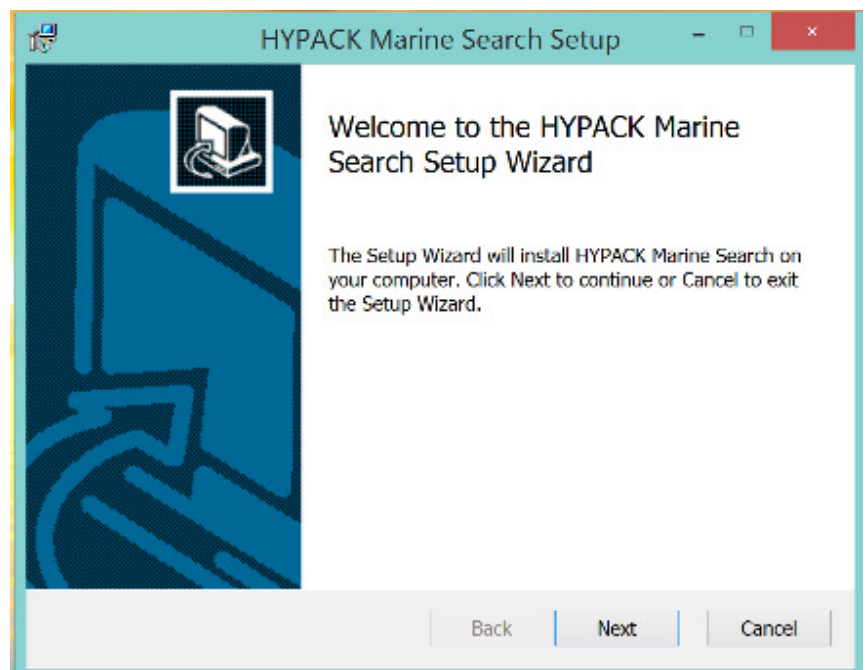


Figure 1 The main window of the installation routine.

Note: MARINE SEARCH requires Windows 7, 8 or 10 operating systems. It will not run properly under Windows XP.

The program will check your available memory on your hard drive to make sure there is enough space to install the package. If you have enough space, you'll see the window (right). Just click the "Next" button to continue the installation.

The next step is to review the HYPACK End-User License Agreement. Read it carefully. If you agree to the terms, click the "I accept the terms in the License Agreement" and click the "Next" button. If you don't agree to the terms, contact HYPACK Sales and arrange to return the software.



Figure 2 The End-User License Agreement Page.

On the next screen, you can select the folder where the software will be installed. It defaults to the C:\HYPACK 2015 Marine Search folder. We recommend you use this folder. If you have copies of HYPACK's other software installed on the computer, **DO NOT** install the HYPACK Marine Search package into those folders. (Typically HYPACK 20xx).

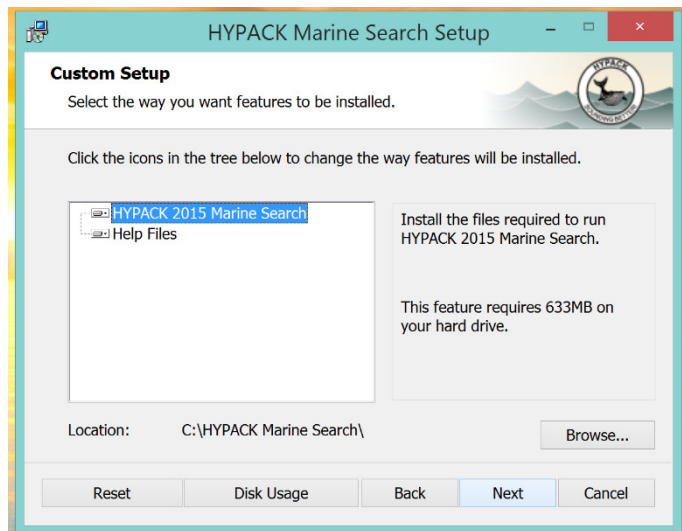


Figure 3 Selecting a Folder where the software will be installed.

You are now ready to install the software. Just click the Install button and the software will be copied onto your hard drive. This might take a couple of minutes.

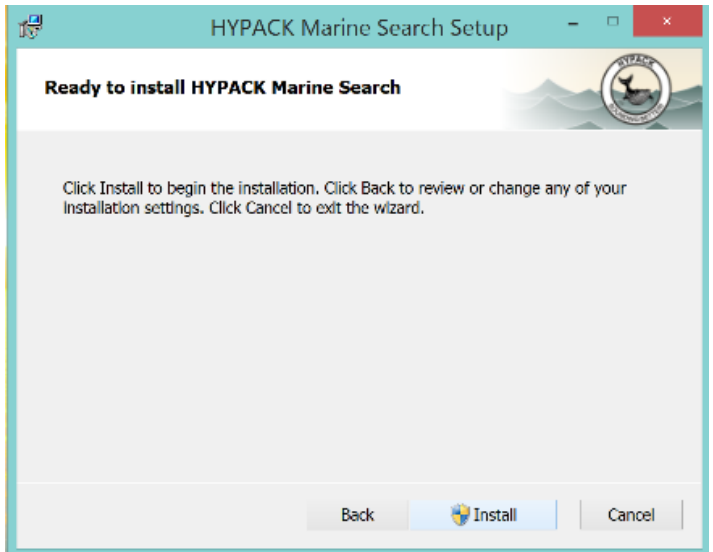


Figure 4 Tell it to Install!

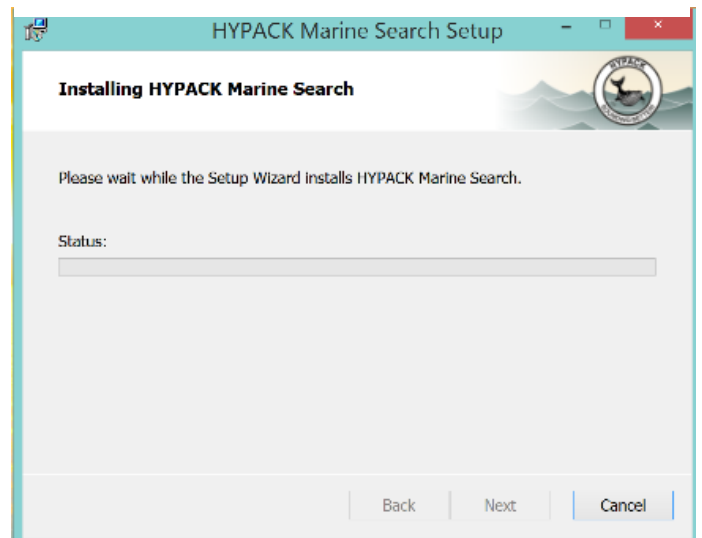


Figure 5 What you will see as it copies files to your hard drive.

When the installation has finished copying the files, you'll just need to hit the "Finish" button. You will then be returned to the main installation window. Just hit the "Exit" menu item (left hand side) and the Installation program will close.

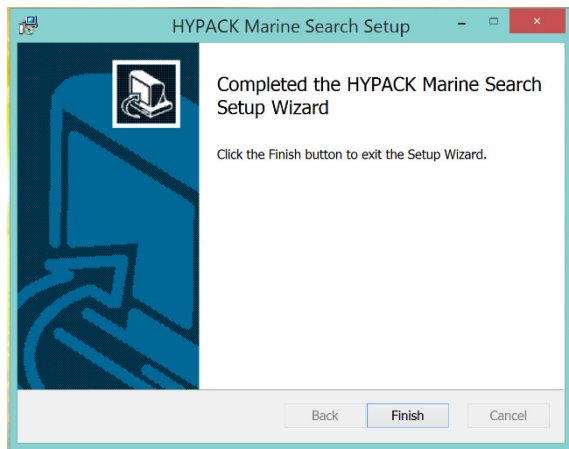


Figure 6 Hit the "Finish" button. You're done!

2. Starting the Program

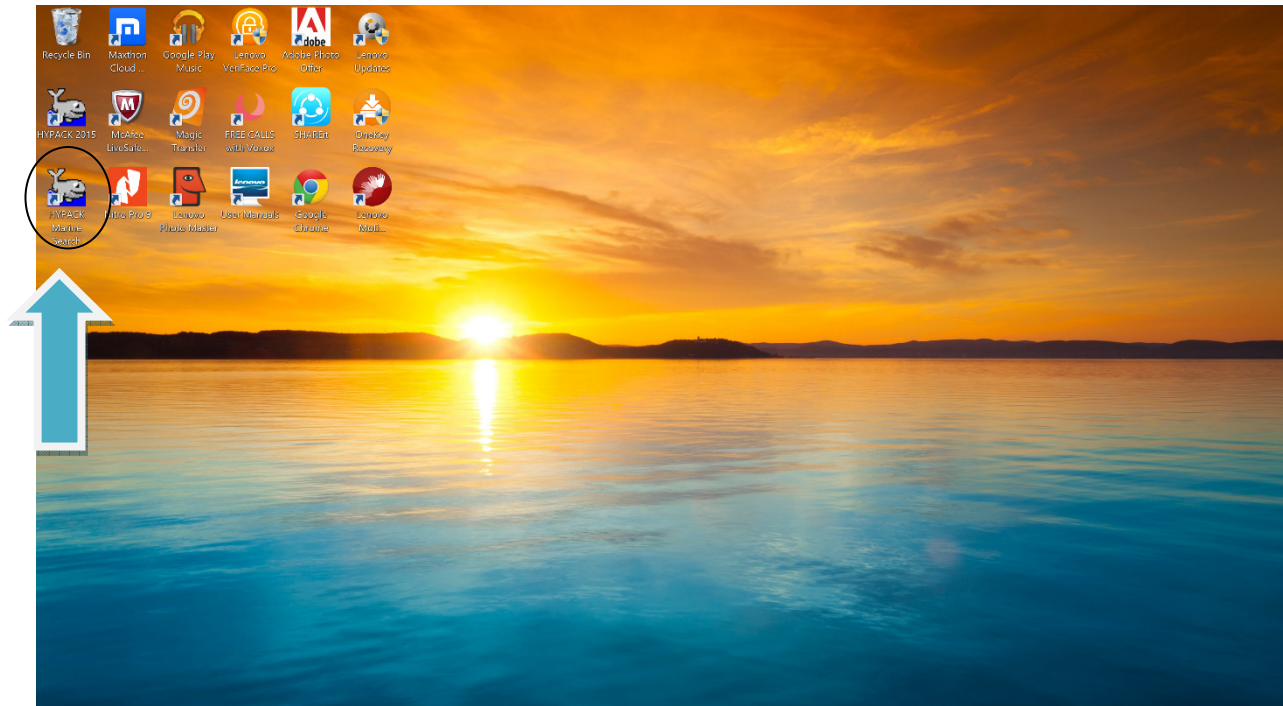
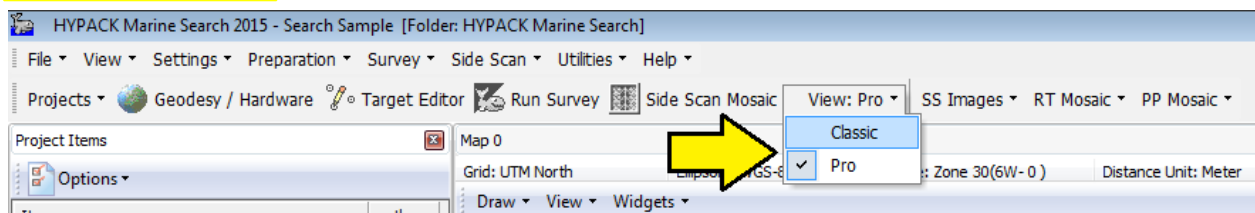


Figure 7 Starting the Program

After you have installed the software on your computer, it will create a desktop icon (the whale with “HYPACK Marine Search” text on the right hand side of the screen capture) and a sub-menu item (“HYPACK Marine Search”, located under a HYPACK 2016 Marine Search menu.) Just click on either one to launch the software.

If it is the first time you have started the package, it will load a default project. If you have previously created Survey Projects in the package, it will return the last Survey Project that you were working on and display any data on the screen.

You can switch back-and-forth from the “Pro” view and the simpler “Classic” view by clicking the View menu item.



3. Create a New Survey Project

Every time you begin a new Survey, you should create a new Project. HYPACK Marine Search allows you to name your project and will then store all of the information about that survey in the Project folder.

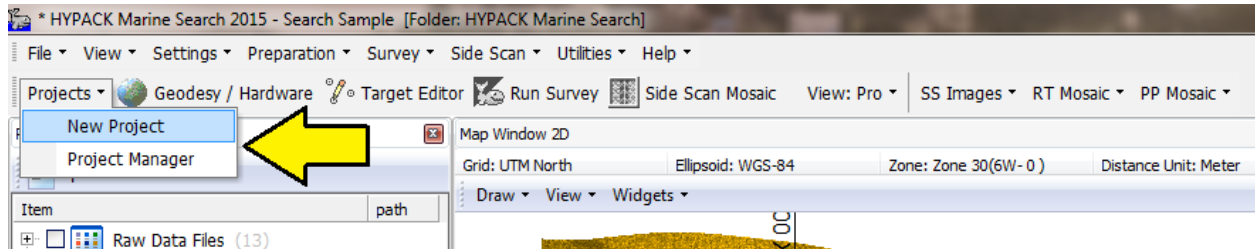


Figure 8 Creating a New Project

To create a New Project, click on the Projects drop down and then the “New Project” menu item as shown above. You will be asked to provide a name for the project and select the folder where to store the project.

For the project name, enter a name that will remind you of the location and the date of the survey.

For the Project Folder, we recommend you use the default Project Folder (HYPACK Marine Search). The software will create a new folder, using the Project Name that you provided in the specified location.

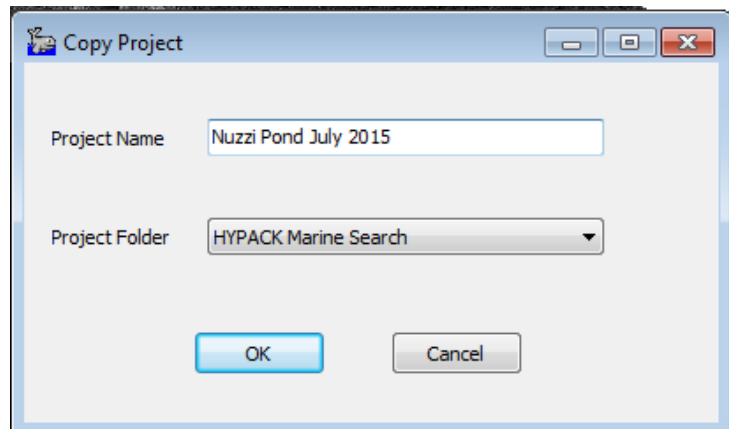


Figure 9 Naming your New Project

The layout of the main screen can be changed between “Pro” and “Classic” views. The “Classic” view devotes the entire window to the map view. The “Pro” view adds the Project List, where users can enable/disable files that are drawn in the map view.

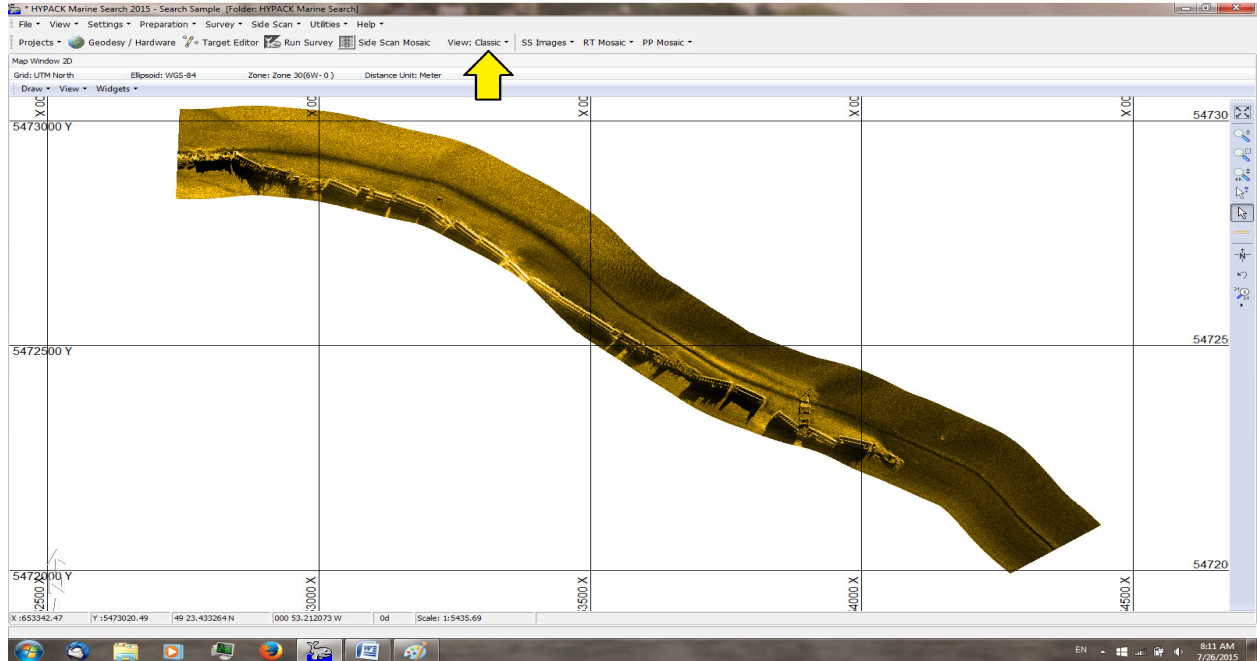


Figure 10 Classic View

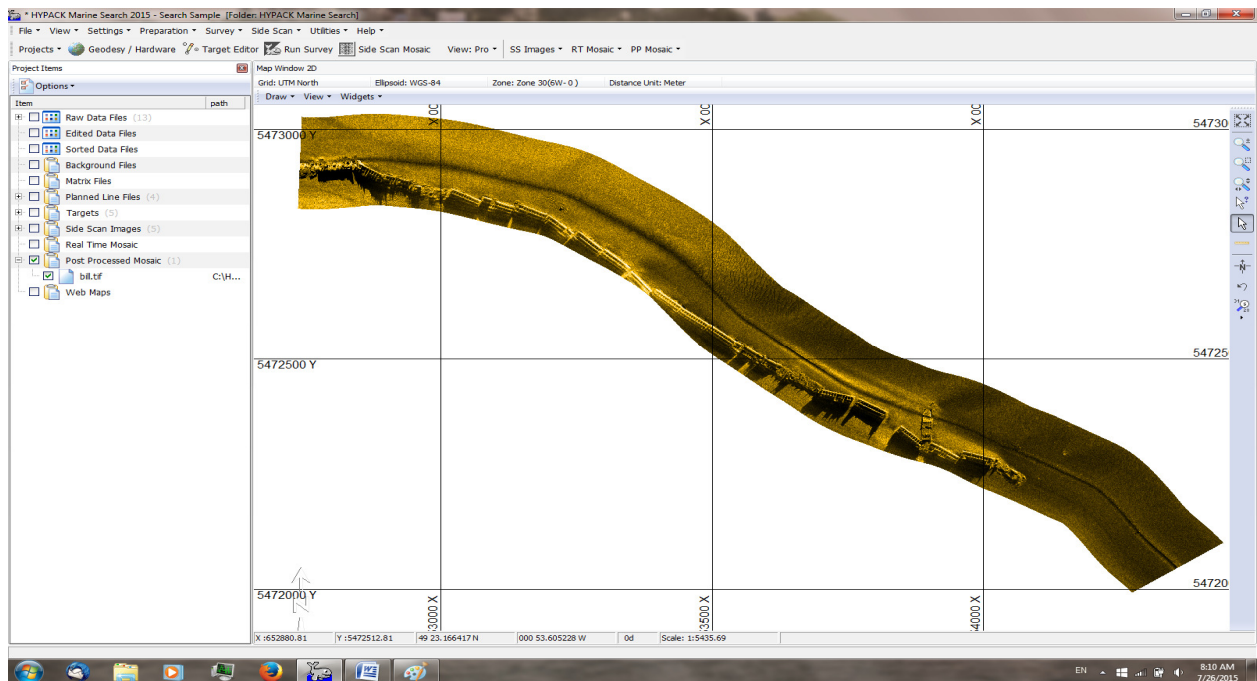
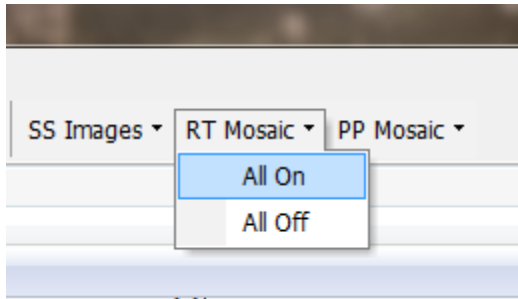


Figure 11 Pro View



You can quickly turn images and mosaics on/off by using the menu items at the top-right of the main window.

Figure 12 Turning Images On/Off

SS Images: When creating targets, you can capture an image of the target. The images can be georeferenced (meaning you know the exact location of the image) and displayed in the main window.

RT Mosaics: These are the Real Time (RT) Mosaics created by the SURVEY program. Their resolution will be slightly less than those created in the post-processing program.

PP Mosaics: These are the Post Processed (PP) Mosaics.

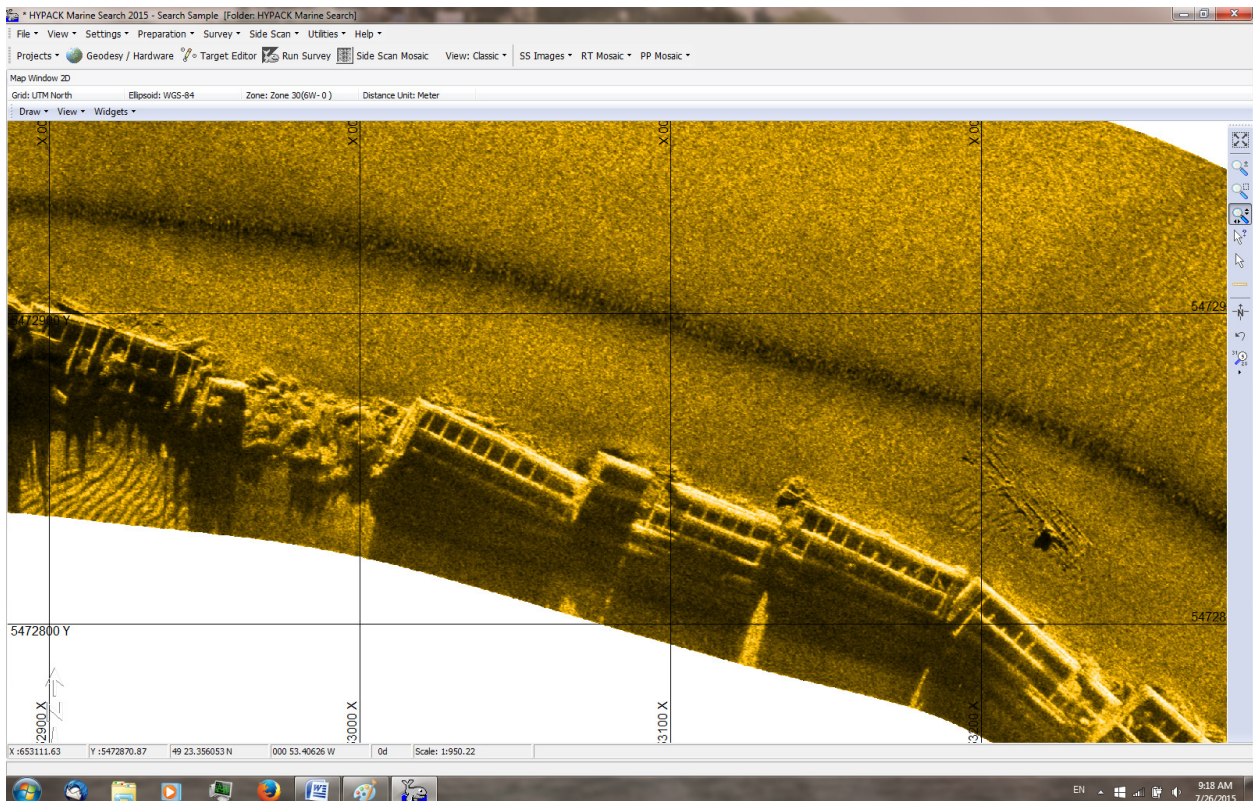


Figure 13 Display of a Post Processed Mosaic in MARINE SEARCH.

4. Geodesy and Hardware

HYPACK Marine Search has a combined “Geodesy/Hardware” program that is used to tell the software what projection grid you are working on, what equipment you have, how is the equipment connected to the computer and where is it located.

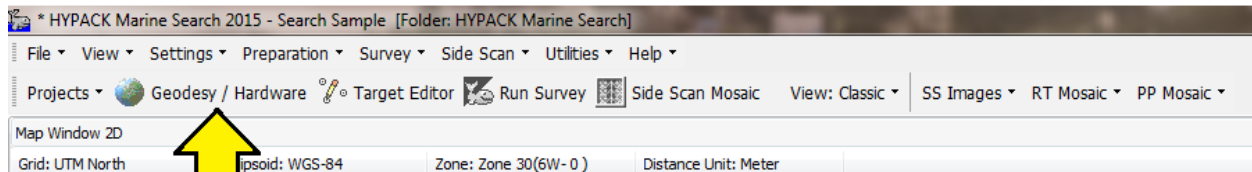


Figure 14 Accessing Hardware/Geodesy

You can launch the “Geodesy/Hardware” program by clicking on the highlighted menu item (above). The “Geodesy and Hardware Settings” window (below) will appear.

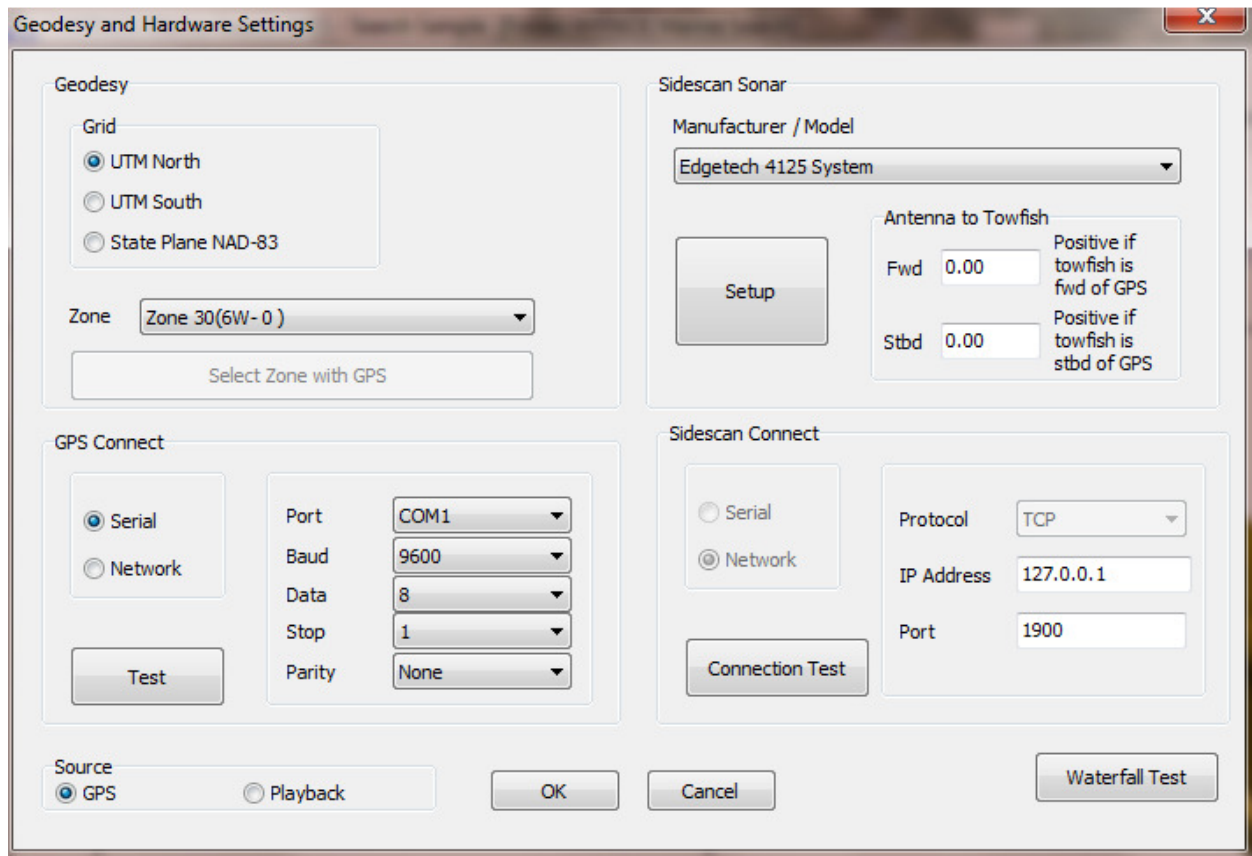


Figure 15 The Geodesy and Hardware Settings window.

Geodesy: The HYPACK Marine Search program needs you to select a mapping projection. It uses this information to go from WGS-84 Latitude/Longitude to X-Y coordinates. There are three choices:

- UTM North (Northern Hemisphere)
- UTM South (Southern Hemisphere)
- State Plane NAD-83 (USA)

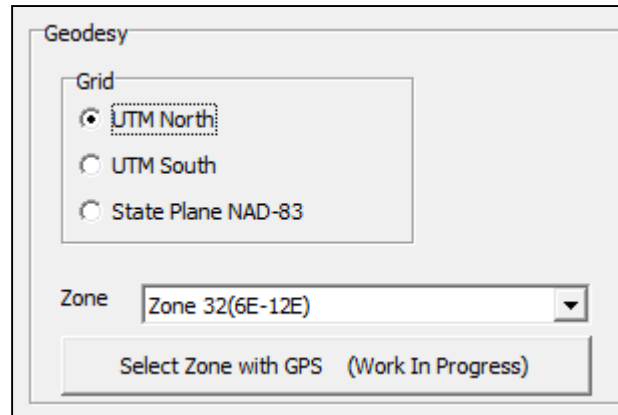


Figure 16 Selecting your Projection.

If you select UTM North or UTM South, you will then have to select the proper UTM Zone. The world is divided into zones that span 6° of longitude. So, you have to have some idea of the longitude of your survey area. You can get this info from your GPS. If your GPS says the longitude is 7° 12.1365' E, we would select UTM Zone 32, which spans from 6° E to 12° E.

If you select State Plane NAD-83, you will be asked to select the appropriate State Plane zone. The Zone listing will be populated with all available zones. Just use the drop down list and select you zone.

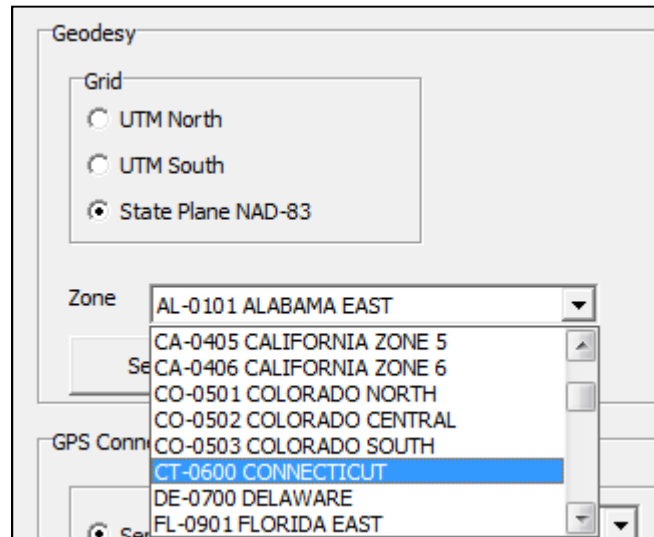


Figure 17 Selecting a State Plane Zone (USA)

If you want to operate on a projection other than UTM or NAD-83, you will need a HYPACK SURVEY and not a HYPACK Marine Search License.

GPS: We need to know how your GPS is connected to the computer. It can be either a Network connection, or an RS-232 serial connection. If you have a serial connection, you will need to specify the Serial Port (COM1, COM2, etc.) the Baud Rate, Data Bits, Stop Bits and Parity settings.

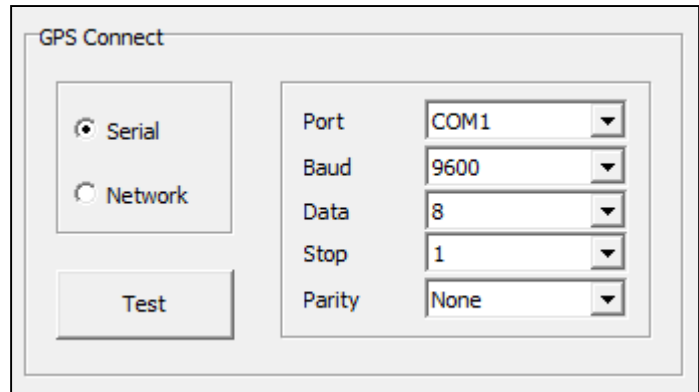


Figure 18 Serial Connection Settings.

If your GPS has a network connection, you will have to specify if your device uses a TCP/IP or UDP connection. Depending on your selection, you will then have to enter an IP address for the GPS and the Port number. You'll have to check your GPS manual for the correct settings.

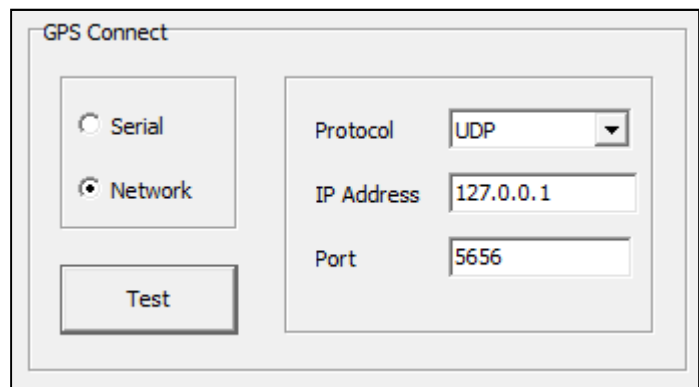


Figure 19 Network Connection Settings

For either a Serial or Network connection, you can click the "Test" button to check the communications with the GPS and to center the map in the main window to your current position.

The Serial test opens a window that shows the raw messages as they are received. The Network Connection window allows you to "Ping Device" and "UDP Connect". When you "Ping" a device, it checks to see if there is a physical connection between your computer and the GPS (at the specified IP address). If successful, you can then "UDP Connect" and see if the NMEA sentences are being properly received.

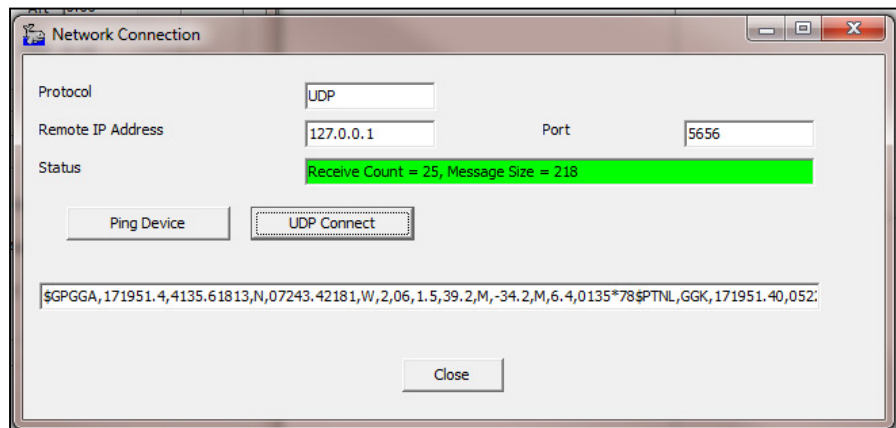


Figure 20 Testing the Network Connection to a GPS

For the GPS datagrams, we would like to have the following sentences transmitted to the HYPACK computer:

- \$GPGGA (1 to 10Hz): This will give the latitude, longitude of the GPS antenna, the differential status, the HDOP and number of satellites.
- \$GPHDT (1 to 10Hz): If your GPS has a directional antenna, this sentence will give us the vessel heading.
- \$GPVTG (1 to 10Hz): This sentence provides the Course Over Ground and Speed Over Ground. If we don't have heading information, HYPACK S&R will use the Course Over Ground to orient the vessel. That's not always a good thing. If you have cross-currents, the heading will not be equal to the course over ground and your side scan data will be skewed.

Side Scan: In this frame, you will specify what type of Side Scan sonar you are using, check it's "Setup" parameters and specify where the towfish is located relative to the GPS antenna.

The following side scans are all available for use in HYPACK MARINE SEARCH:

- Benthos C3D
- Benthos 162x
- CMAX CM2 (Serial)
- CMAX CM2 (USB)
- Edgetech 272
- Edgetech 4100 Series
- Edgetech 4125
- Edgetech 4200 Series
- Edgetech 4300 Series
- Edgetech 4600/6500 Series
- GeoAcoustics Digital Side Scan
- GeoAcoustics Geoswath
- Imagenex Sportscan
- Imagenex Yellow Fin
- Innomar SES
- Klein 3000

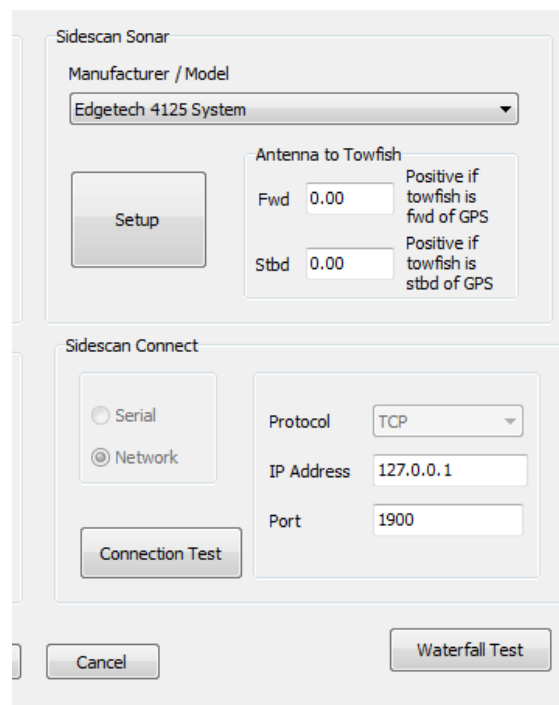


Figure 21 Selecting your Side Scan System.

- Klein 3900
- Klein 5000
- Klein 3500 Hydroscan
- Kongsberg Pulsar
- MarineSonic Sea Scan
- MarineSonic Sea Scan HDS
- MarineSonic Sea Scan ARC Explorer
- Mesotech MS100
- Sonartech Sonarbeam S-150
- Tritech 450
- Tritech 990
- Tritech Sea King

The “Setup” button in the Side Scan Sonar frame allows you to set certain parameters for your sonar. Each sonar has a slightly different “Setup” window. Some sonars do not have a “Setup” window. For details on your sonar, refer to the “SideScan Interfacing.PDF” located in the ..\Help folder under the folder where you installed HYPACK Marine Search 2015.

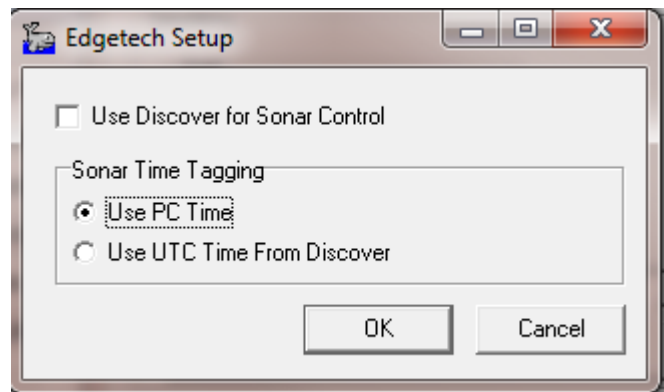
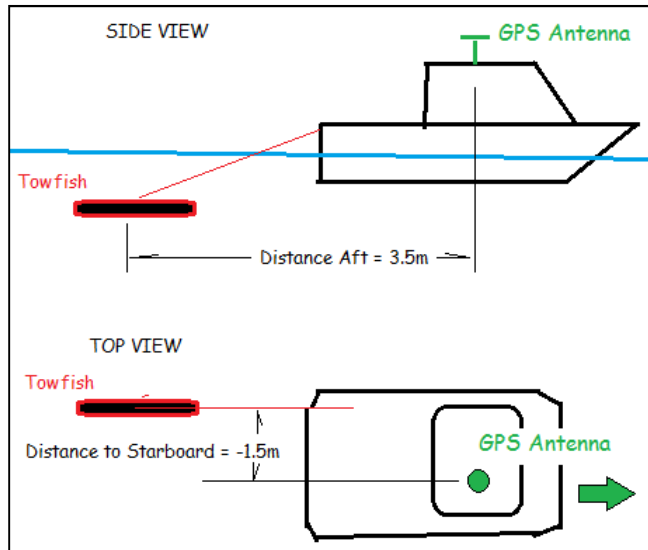


Figure 22 Setup window for the Edgetech 4125.

Position of Side Scan Towfish Relative to GPS Antenna: We need to know where the side scan towfish is located relative to the GPS antenna. You can enter the distances the towfish is “Forward” (ahead of the GPS antenna) and “Stbd” of the GPS Antenna. If the towfish is “aft” of the GPS antenna, the Fwd Offset will be a negative number.



For the example (left), the towfish is 3.5m “aft” of the GPS antenna and -1.5m “Stbd” (or starboard) of the GPS antenna. The offsets would be entered as seen below.

Figure 23 Antenna to Towfish Offset

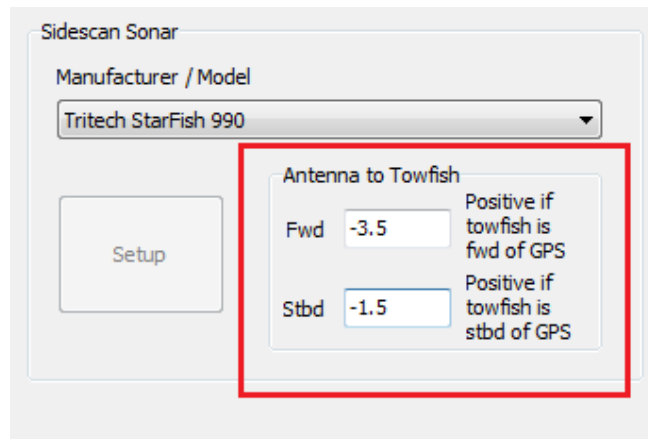
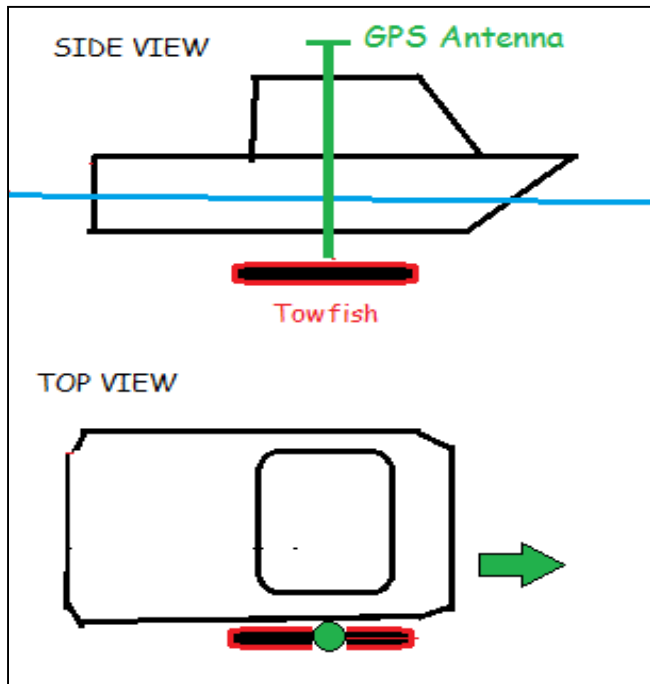


Figure 24 Antenna to Towfish Settings



For the 2nd example, the towfish is mounted directly below the GPS antenna. The Aft and Stbd offsets would both be set to 0.0.

Figure 25 Towfish under GPS Antenna

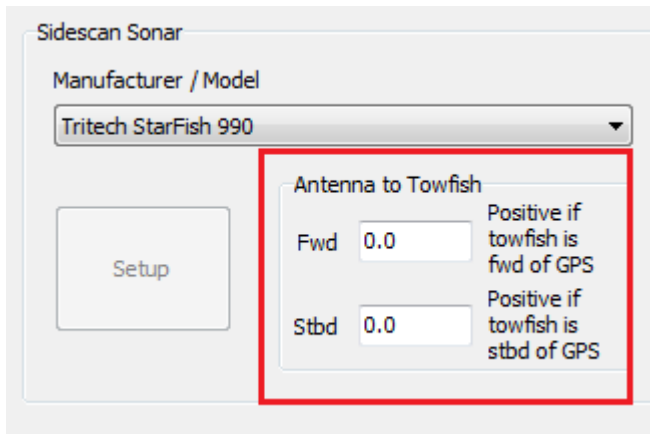


Figure 26 Towfish under GPS Settings

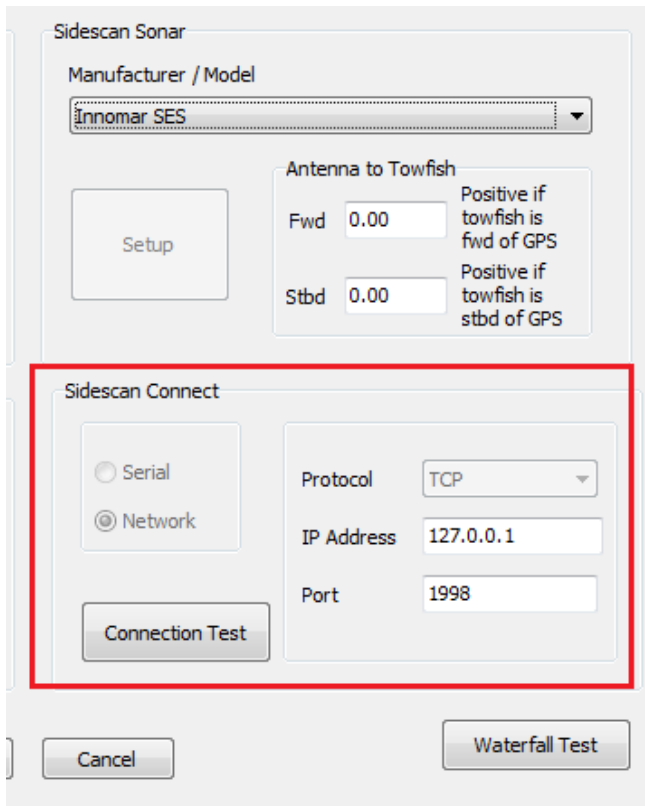


Figure 27 Side Scan Connection

Side Scan Connection: In the bottom-righthand frame of the Geodesy and Hardware Settings window, tell the program how the side scan is connected to the survey computer. The connection parameters required will change automatically, depending on the type of side scan sonar you have selected.

Some sonars have a network connection that will require an IP address and Port number. Other sonars have a network connection that requires just a Port number. Other sonars have a USB connection that does not have any parameters.

Check out the settings of your sonar in the **Sidescan Interfacing.PDF** document located in the ..\Help folder of your HYPACK Marine Search installation folder.

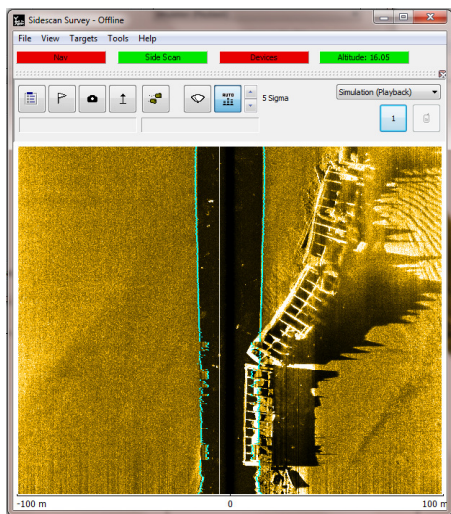


Figure 28 Waterfall Display

Waterfall Test: The “Waterfall Test” button (lower left) will open the SIDE SCAN SURVEY program and can be used to make sure the connections to the side scan are correct.

Once you exit the Geodesy and Hardware Settings window, those settings become the default settings and will be copied any time you create a new survey project.

If you do not get this window and cannot see the side scan waterfall, you need to troubleshoot the connections and hardware configuration!

If you are on a State Plane grid, your offsets will be entered in feet. If you are on a UTM grid, your offsets will be entered in meters.

5. SURVEYING

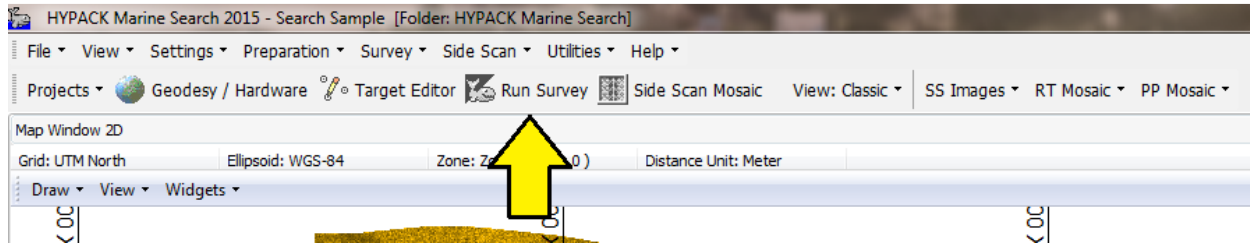


Figure 29 Starting the SURVEY program.

After you have run the Geodesy/Hardware program, you can start the SURVEY program by clicking on the “Run Survey” menu item, shown above. The SURVEY program will establish communication with your GPS and Side Scan and then open up the Area Map window and Side Scan Waterfall windows shown below.

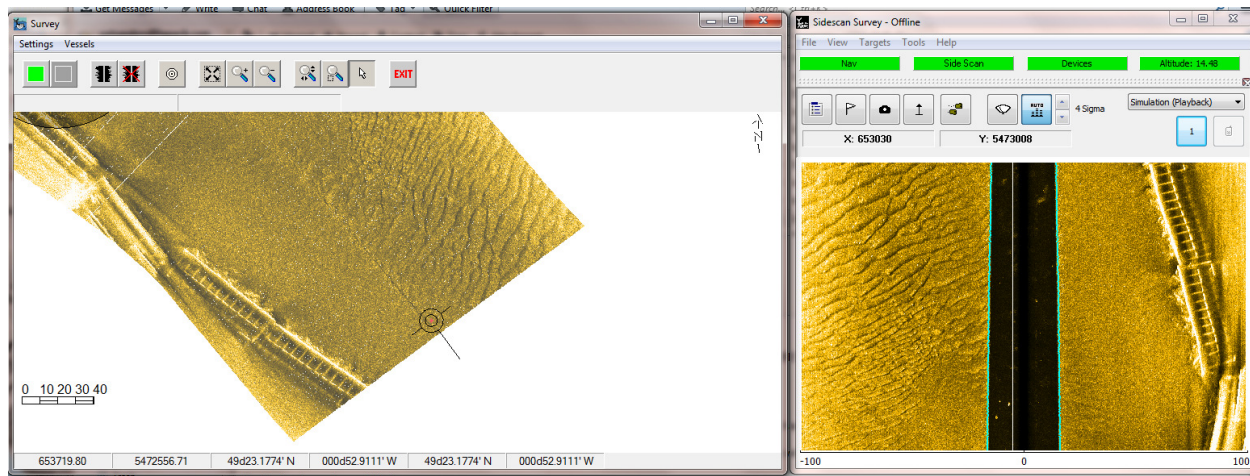


Figure 30 Marine Search SURVEY Program.

If you have created a search pattern of planned lines, a Left-Right Indicator window will also appear.

The Map Window shows the position of the GPS antenna and the side scan real time mosaic. It can also display background files (maps, aerial photos, etc.) in a variety of formats.

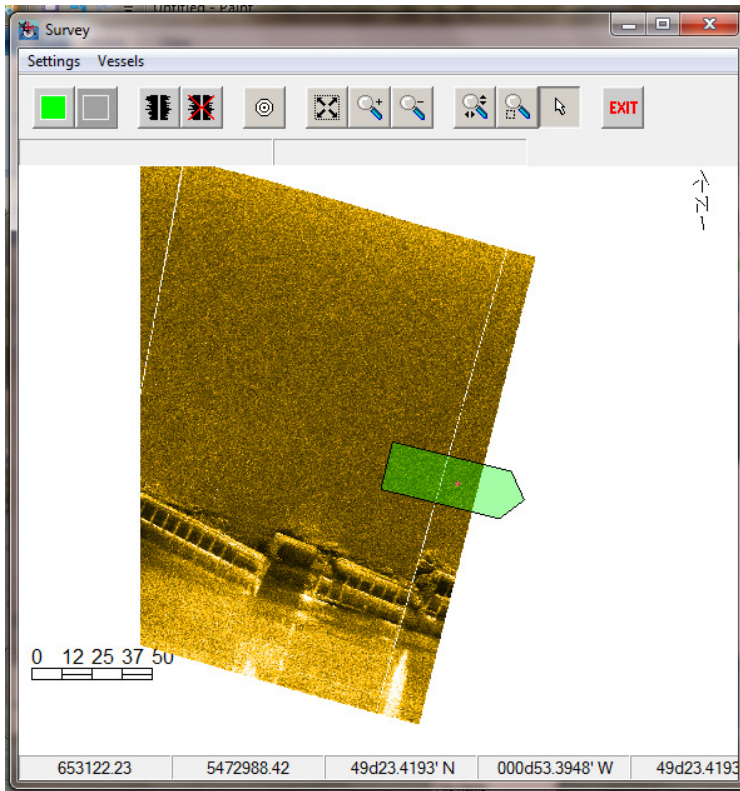


Figure 32 SURVEY's Map Window

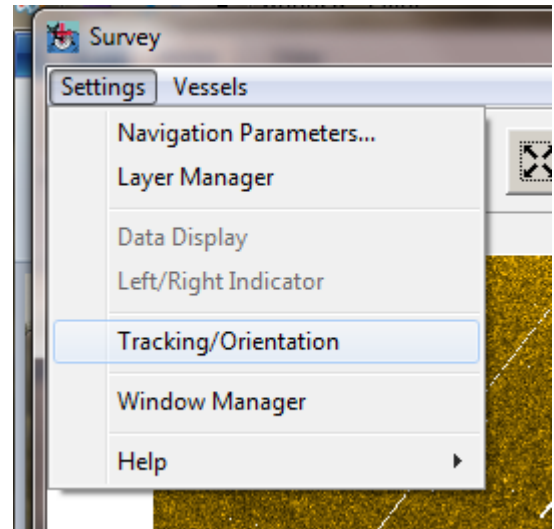


Figure 33 Survey Settings

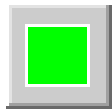
By clicking on the Settings menu item, the user can access the following options:

Navigation Parameters	Settings on how the program steps through the planned survey lines and automatically starts collecting data.
Toggle Tracking	A shortcut (CNTL-Z) to change the tracking mode.
Layer Manager	This is where you go to turn different chart objects on and off, or to change the order in which they are drawn.
Data Display	Configure the list of items in the Data Display window.
Left-Right Indicator	Change the settings for the Left-Right Indicator window. (Only present if there are planned lines!)
Window Manager	Tile your windows!



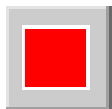
Figure 34 Survey Icons

The SURVEY window contains the primary menu items, along with icons that allow you to quickly Start Logging, End Logging and access the Side Scan real time mosaic parameters.



Start Logging: This tells SURVEY to save the position and sidescan data to a file. Saving your data allows you to do targeting and Mosaicking in post-processing. The real time mosaic can be configured to only be generated when you are Logging data.

You can only make a post-processed mosaic if you log data.



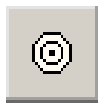
End Logging: This tells SURVEY to stop logging and closes the current data file. It turns red only if you have started logging.



Side Scan Configuration: This icon opens up the Side Scan Settings window where you can set the parameters for the real time mosaic. There is more about the Side Scan Configuration window below.



Clear Side Scan: This icon will erase all of the real time mosaics. Be careful with this one!



Quick Target: Will mark a target when you left-click on the screen. (You can also mark a target at any time with the normal cursor by double-clicking on the screen.)



Zoom Extents, Zoom In, Zoom Out, Pan (click and drag after selecting tool), Zoom Window and the Normal Cursor.



Exit: Closes the SURVEY program and returns you to the MARINE SEARCH main program.

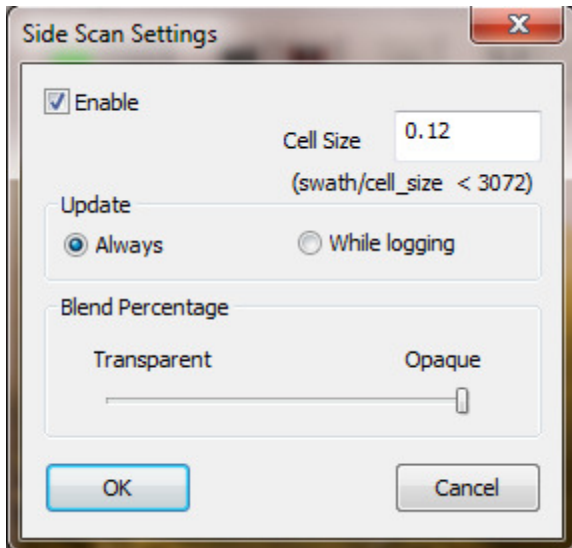


Figure 35 Side Scan Settings

Side Scan Configuration: The Side Scan Settings window is where you go to change the options for the real time side scan mosaic. You access it by clicking on the Side Scan Config icon.

Enable: Check this “On” to start drawing the real time sidescan mosaic.

Cell Size: The real time mosaic is a series of GeoTIF images. The Cell Size is the distance per pixel of the real time mosaic. It defaults to 0.15m per pixel for metric grids and 0.50’ per pixel for foot grids. For high resolution sonars, you will probably want to reduce these values.

If your cell size is too small, a message box will appear instructing you to increase the Cell Size. This message won’t go away until you have an appropriate cell size.

Update: You can have the SURVEY program update the real time mosaic “Always” or only “While Logging”. If “While Logging” is selected, it will only update the mosaic after you have clicked the “Start Logging” icon. It will then stop updating the mosaic when you click the “Stop Logging” icon.

Transparency: When set to “Opaque”, you won’t be able to see anything underneath the real time mosaic as it draws. As you move the slider to the left, the real time mosaic will become more transparent.

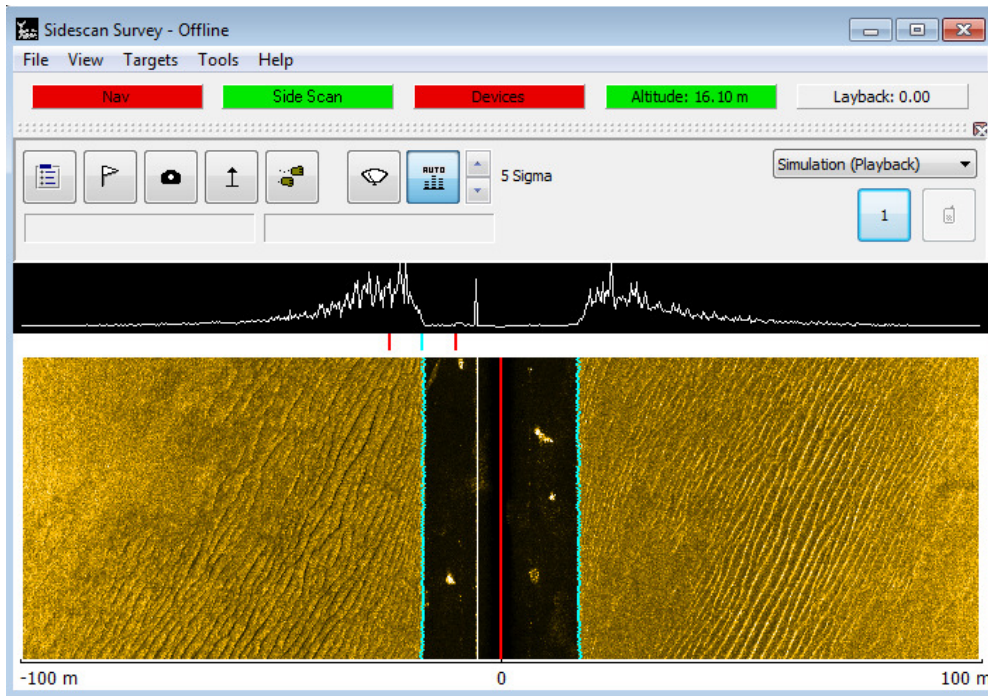


Figure 36 Sidescan Waterfall window

The Sidescan waterfall window shows the time series sidescan data. By right-clicking on the waterfall, the user can access several options. The same options are available as icons along the top of the window.

The icons along the top of the waterfall have the following functions



Sidescan Controls: Opens the Sidescan Control window where there are several options to enhance the waterfall display and to configure the bottom track and set the colors.



Sidescan Signal: Opens the Sidescan Signal window that shows the raw intensities and the TVG settings.

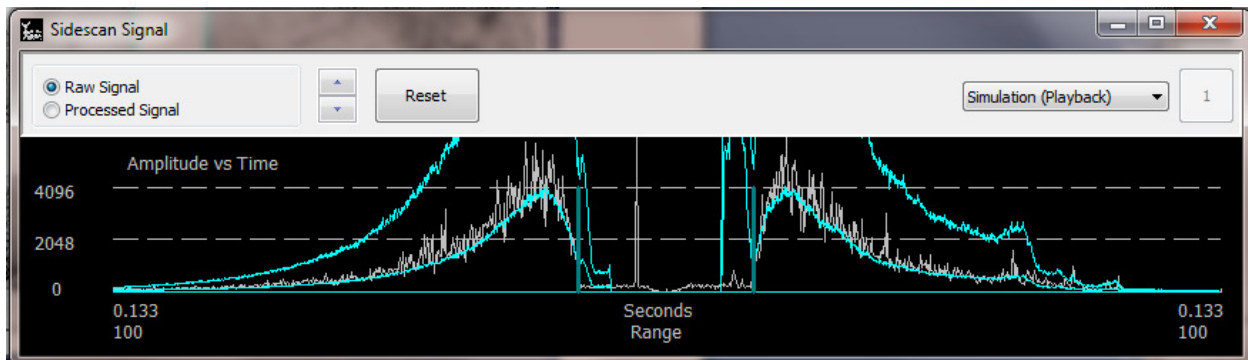


Figure 37 Side Scan Signal window.



Capture Image: When selected, allows you to click-and-drag a rectangle in the waterfall window and save it to a TIF or JPG file.



Height Measurement: Click on a target and determine the height above the surrounding bottom. More information is below.



Set Altitude for Bottom Tracking: Used to fix the towfish altitude above the bottom when there is no information from the towfish.



Speed Compensation: Adjusts the speed of the waterfall to the speed of the vessel.



Toggle TVG Mode: Clicking the icon toggles the TVG mode between the different options. The Up/Down arrows adjust the Sigma value, which is the magnitude of the TVG adjustment.



Figure 38 Height Measurement Window

Height Measurement window: To analyze a potential target in the Height Measurement window, select the tool by clicking on the icon and then left-click on the object. The Height Measurement window will open. There are 3 “sliders” (vertical bars). Place #1 on the first return. Place #2 on the peak of the object. Place #3 on the back of the shadow. The height of the object above the bottom and the horizontal range to the object are calculated (assuming a flat bottom). You can then click the “Target” button to save the information to the Target Database.

Side Scan Controls: You can access the Sidescan controls by right-clicking on the Sidescan Waterfall or by clicking the icon along the top of the Sidescan Waterfall window.

Sidescan Controls – Color: There are different palettes that can be used. The side scan imagery is color coded based on the palette selected and the intensity of the acoustic signal. The color palette can be “Inverted”. Instead of white = low intensity, black = high intensity, it flips the palette so that white = high intensity, black = low intensity. The overall brightness and contrast of the palette can also be adjusted by moving the sliders.

Sidescan Controls – Gain: The basic gain can be used to shift the intensities of an entire channel (port or starboard or both) up or down. TVG stands for Time Varied Gain. It is used to balance the intensities across a channel.

For beginners, we would recommend they use the AutoTVG with a Sensitivity = 7.

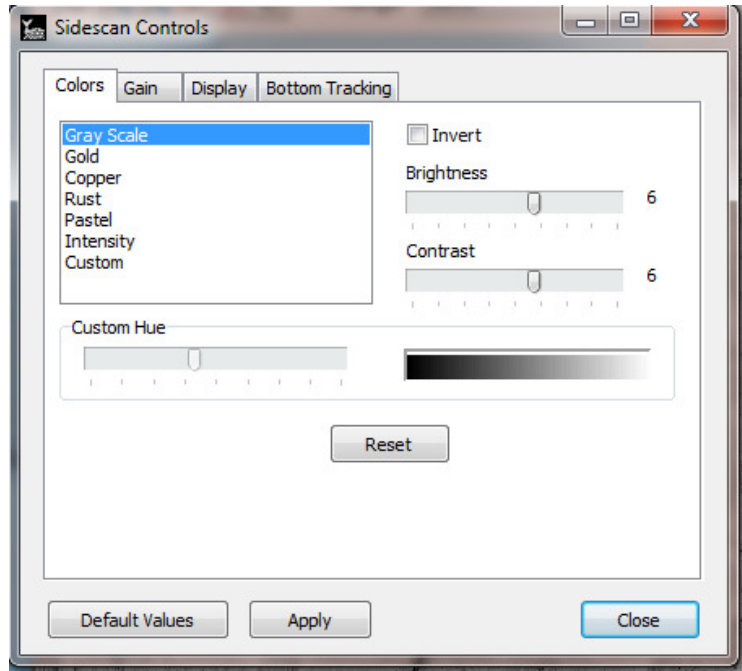


Figure 39 Sidescan Controls - Colors

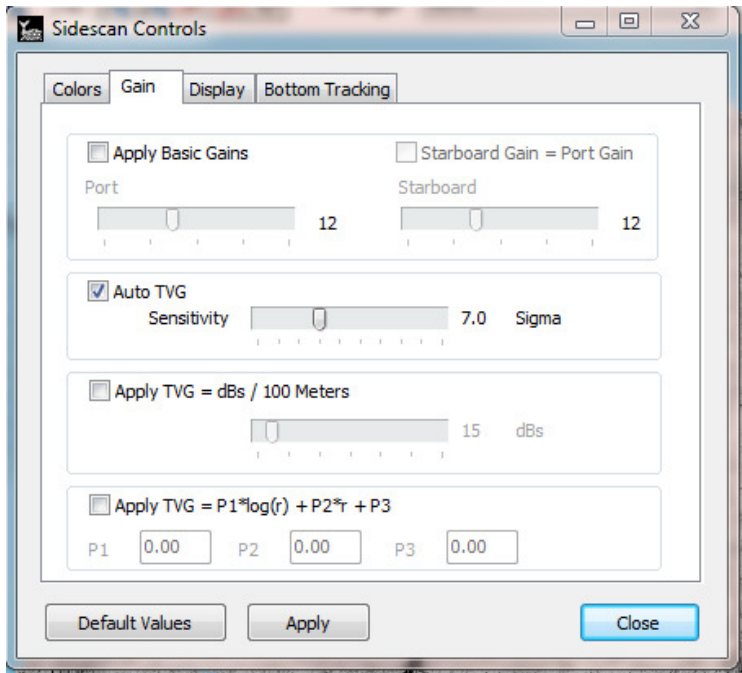


Figure 40 Sidescan Controls - Gain

Sidescan Controls – Display:

Remove the water column: If selected, it shows the sidescan data corrected for slant ranges. This is dangerous as you lose the indication of how high the towfish is above the bottom. It is not recommended for normal operations.

Show Bottom Tracking: This enables a blue line to show the current bottom track on the port/starboard channel. It is recommended.

Draw Center Line: Draws a red line at the time of each ping.

Show Signal Graph: Inserts the side scan signal window into the top of the graph.

Show HYSCAN Bottom Track Slider: This shows the current track detection with the blue marker (below) and the bottom track gate in red markers. It searches between the red markers to find the bottom.

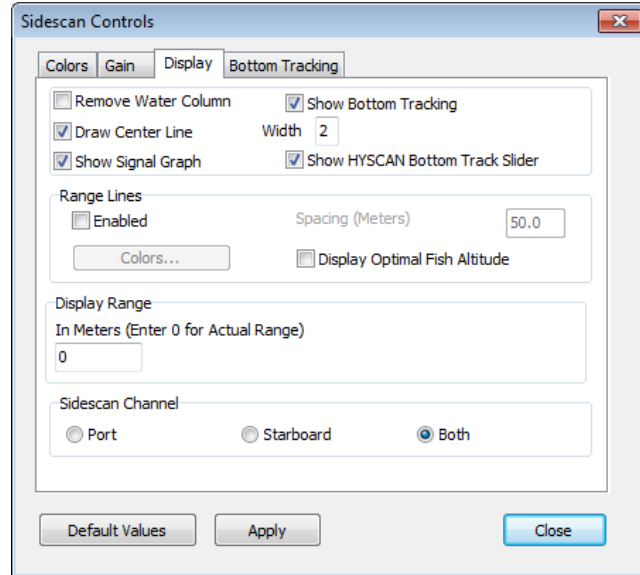
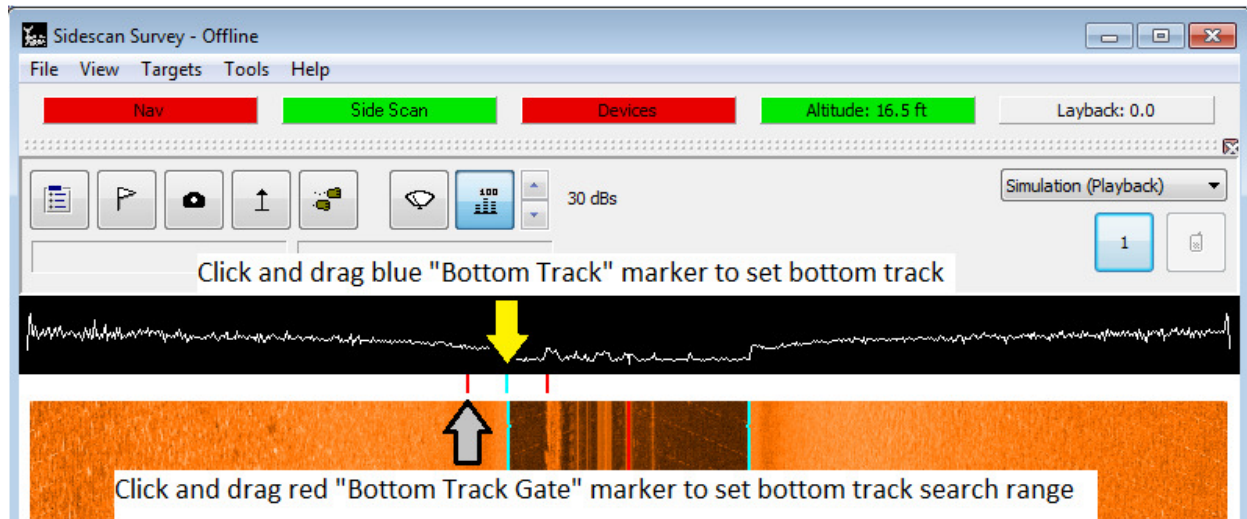


Figure 41 Sidescan Controls - Display



Range Lines: Can be used to draw reference range lines on the waterfall.

Display Range: Can be used to limit the data displayed. For example, the sidescan might be set to scan 100m, but you only wish to view 50m. The SURVEY program will still log all of the sidescan data for post-processing. It is only for display.

Sidescan Channel: You can display both channels (recommended), or just the port or starboard channel.

Sidescan Controls – Bottom Tracking:

If you sidescan has a function to determine the bottom track and it can be passed into SURVEY, select “Use Fish Sensor”.

If you want SURVEY to detect the bottom, select “Use HYSCAN Bottom Tracking”. The Blanking, Gate Size and Sensitivity settings can then be adjusted to lock onto the bottom.

If you want to fix the bottom track at a defined depth, select “No Bottom Tracking”.

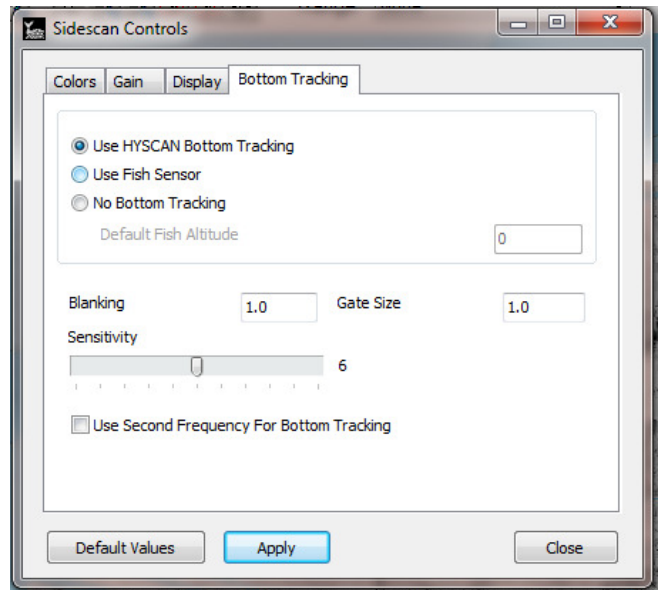


Figure 42 Sidescan Controls - Bottom Tracking

Main Sidescan Window: Alarms

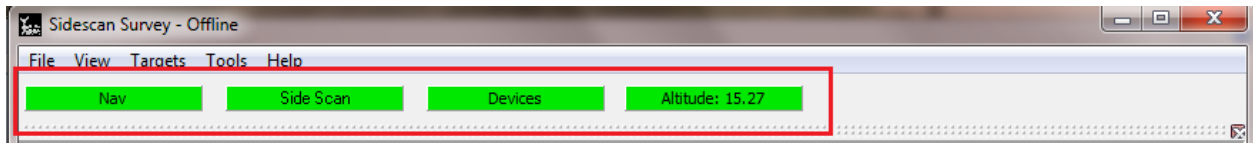


Figure 43 Sidescan - Alarms

The green text boxes are “Alarm Indicators”. If there is an error in the GPS or Side Scan system, they will turn “Yellow” (caution) or “Red” (no good). You can left-click on the Alarm Indicators to see what caused the alarm.

Side Scan System Settings:

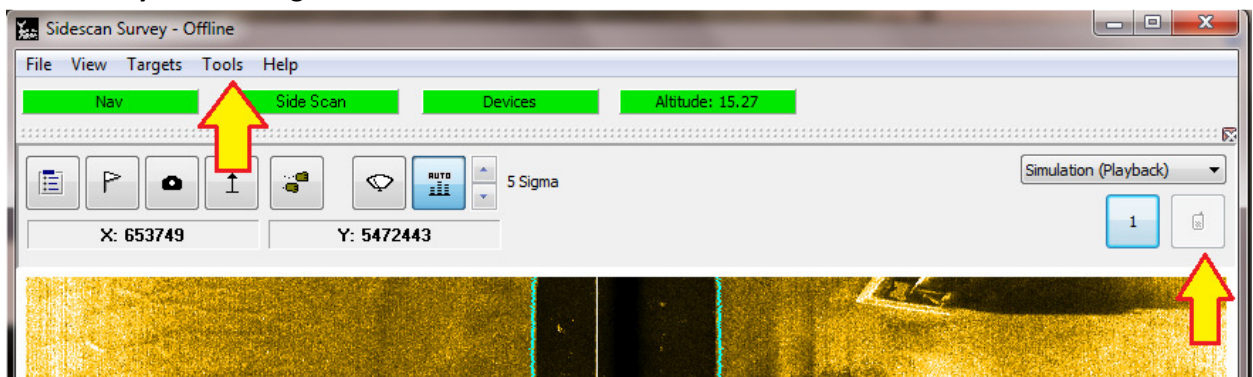


Figure 44 Accessing Sidescan System Settings

You can get to the settings for each side scan system by clicking the “Tools” menu or the system icon (right side). The settings allows you to set the range scale for most systems, along with the frequency for certain systems. It also allows you to start/stop pinging for certain systems.

Targeting: A “Target” can obtain position, height above the bottom, length and width measurements, and a graphic image of the object. The available information will depend where the target was marked.

Objects of interest can be saved into the Target Data base at any time by:

- Double-clicking on the object in the Map window
- Double-clicking on the object in the Sidescan Waterfall Window.
- Selecting the Height Measurement Tool in the Sidescan Waterfall Window and clicking on the object.

When you mark a target by double-clicking on it in the Side Scan Waterfall window, the target will appear in a special “Targets” window.

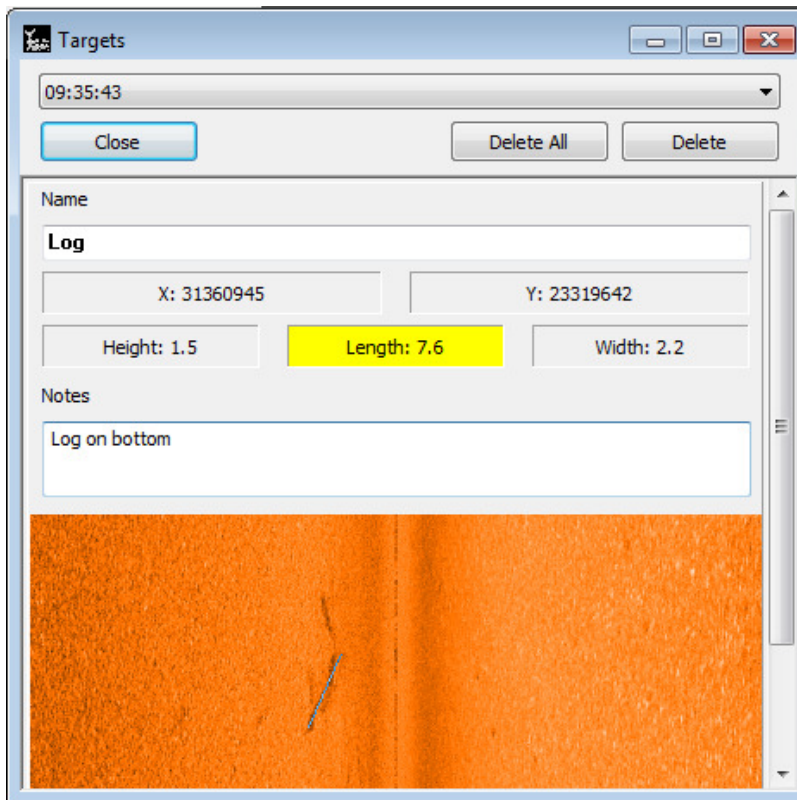


Figure 45 Targets window

You can make measurements of the object in this window by first clicking in the “Height”, “Length” or “Width” text boxes. Then, click and drag on the image. For Height (above bottom), click on the peak of the return and drag outward to the back of the shadow. For Length, click on one end of the object and drag to the far end. For Width, click and drag across the item, but do not include the shadow area. You can also change the name of the target (it defaults to the time) and enter notes regarding the target.

All of this information is saved to the Target database of the project. You can examine this info from the Target Viewer window, or by examining the Target database.

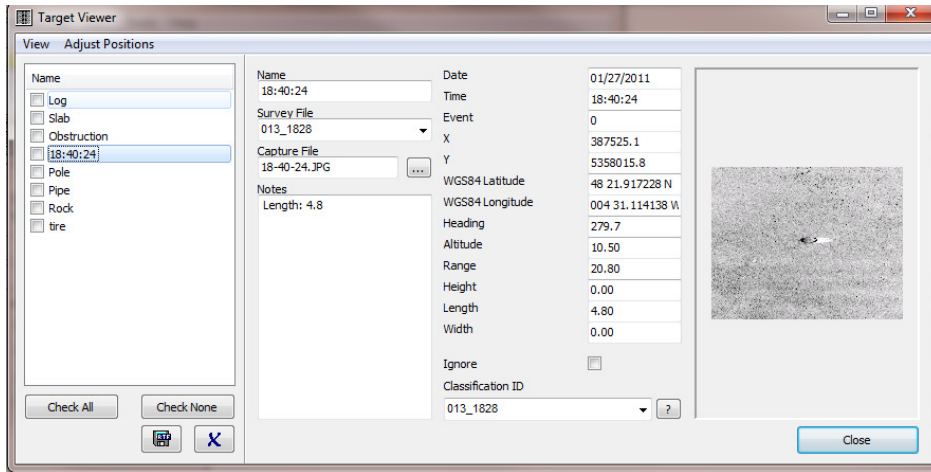


Figure 46 Target Viewer from Side Scan Mosaic program.

6. Mosaicking

The Mosaicking program included in HYPACK's Marine Search package allows you to perform targeting in post-processing and to generate a sidescan mosaic. A mosaic is a plan view of your sidescan data in GeoTIF format.

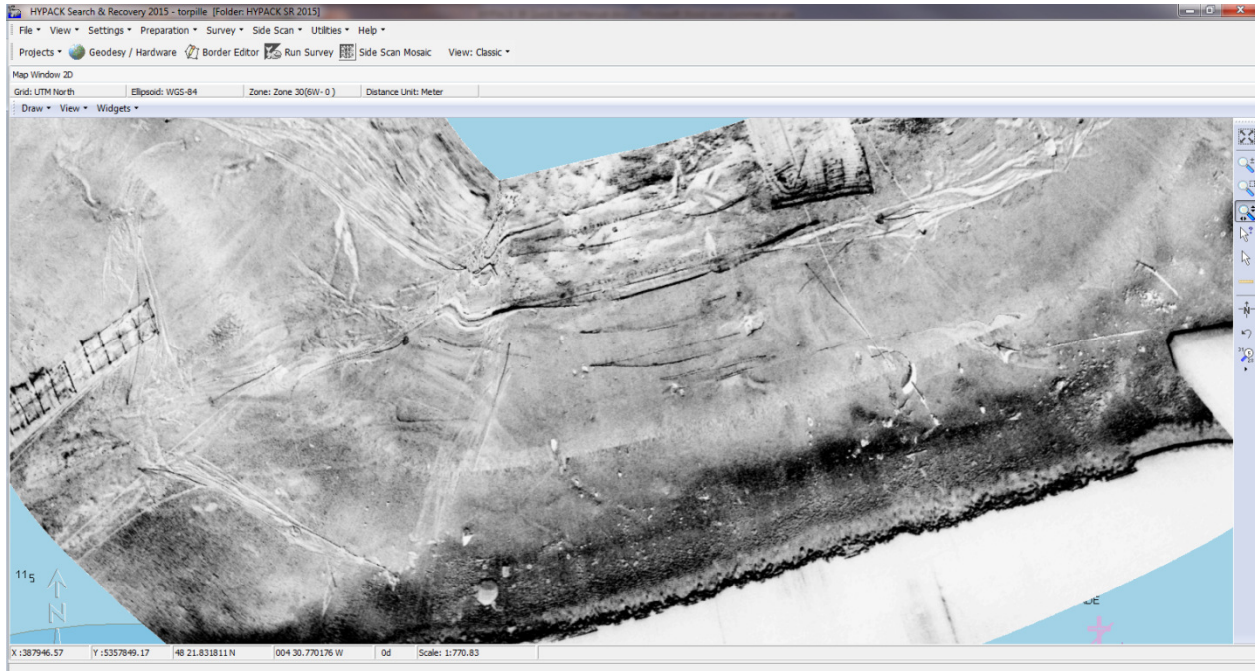


Figure 47 Sample mosaic made from Side Scan data

The keys to a good mosaic are:

- An accurate, smooth bottom detection.
- Good positioning.
- Smooth heading

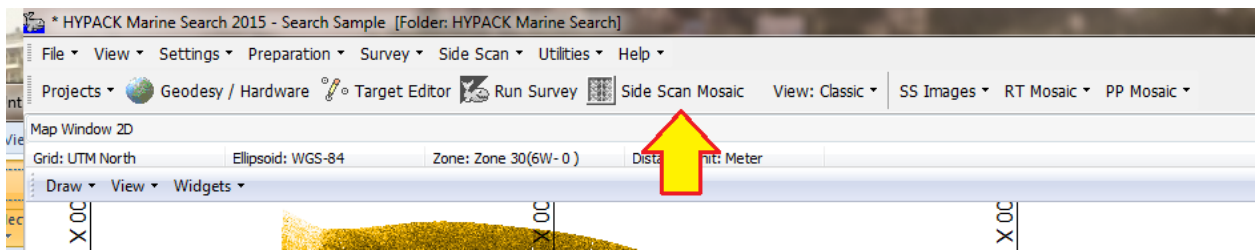


Figure 48 Starting the Side Scan Mosaic program.

You can start the Side Scan Mosaic program by clicking on the menu item (above).

After starting the program, the Side Scan Mosaic window will appear, along with blank Towfish Altitude, Heading and Trackline windows as shown below.

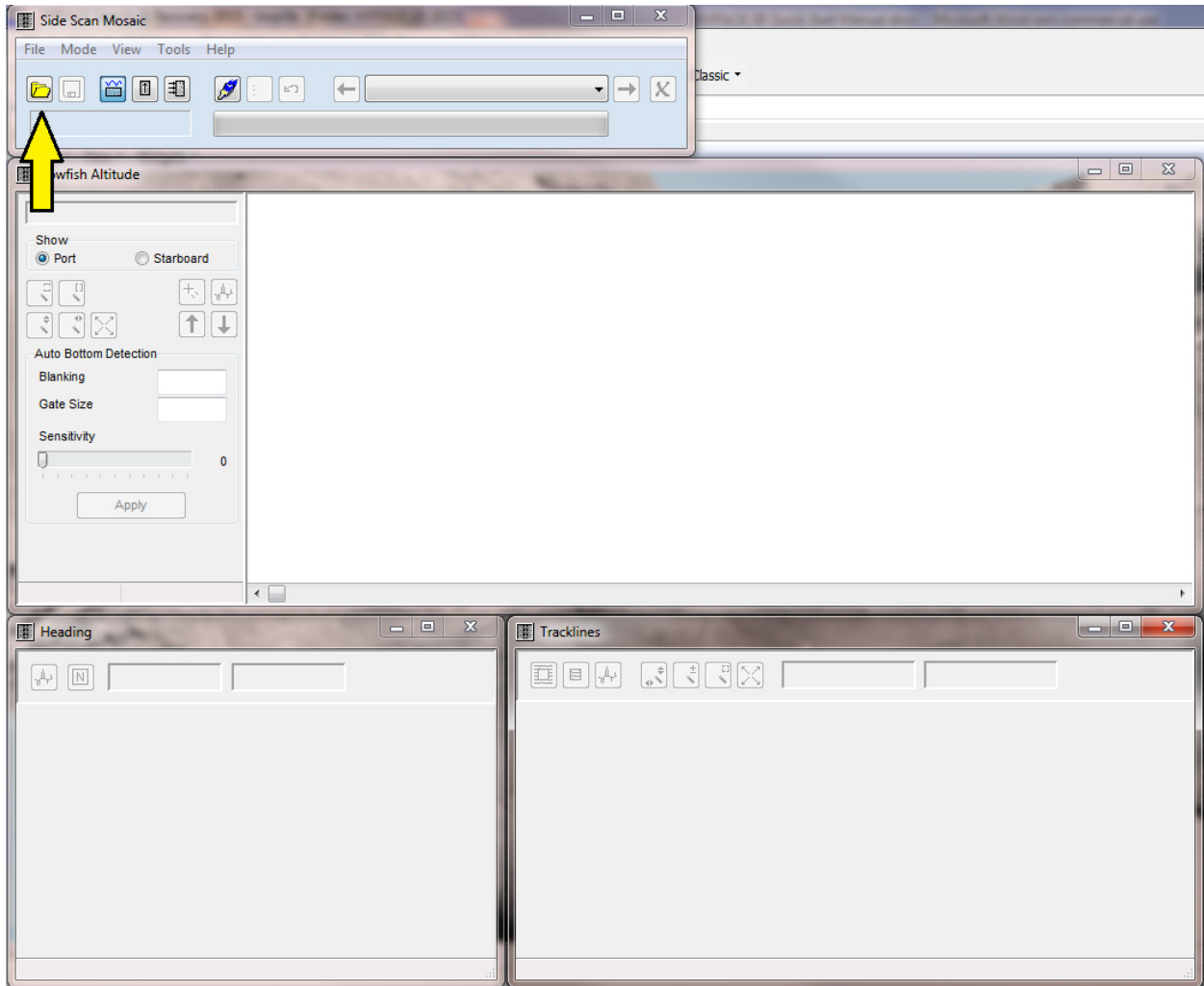


Figure 49 Phase 1 Windows Before Data Files are Entered.

Input your Files: Click the “File Open” icon (yellow arrow, above) to input a list of data files to be used for Mosaicking and/or targeting. The SURVEY program stores the side scan and position data into *.HSX files. Every day, it creates a Catalog (*.LOG) file that has a list of all *.HSX files collected during the day. You can enter a *.LOG file and select some/all files, or individual *.HSX files. The HSX files and their Catalog file will be in the ..\Raw folder of your project.

If you enter a Catalog (*.LOG) file, you can then select all of the files or individual files from a Catalog window that will pop up.

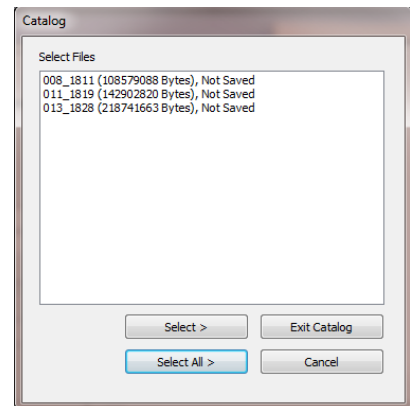


Figure 50 File Selection

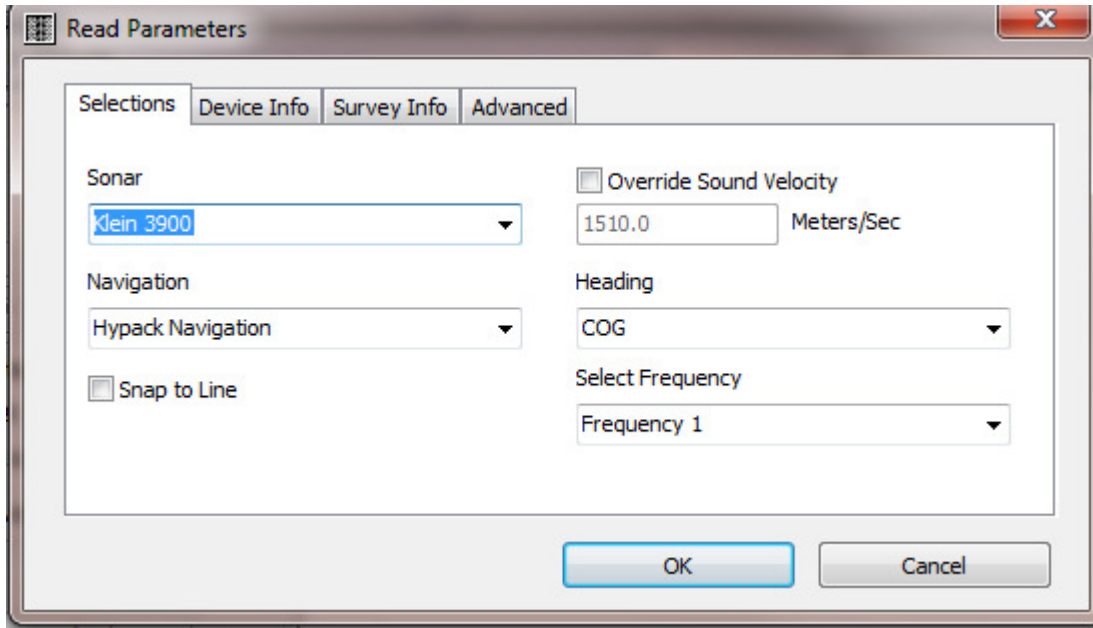


Figure 51 Mosaic: Read Parameters Window

After entering your files, the Read Parameters window will appear. For the Marine Search program, select your Side Scan (it will be the only one available) and “HYPACK Navigation” as the Navigation device. For heading, there will be several options, including COG (Course Over Ground), Towfish (if the towfish has a heading sensor), and HYPACK Navigation (if your GPS has a directional antenna). Experiment with your data to see which one gives you the best result.

The Advanced Tab allows you to automatically smooth the bottom track and heading. It’s recommended you first manually do these operations to better understand what is happening before going to Auto.

Towfish Altitude Window

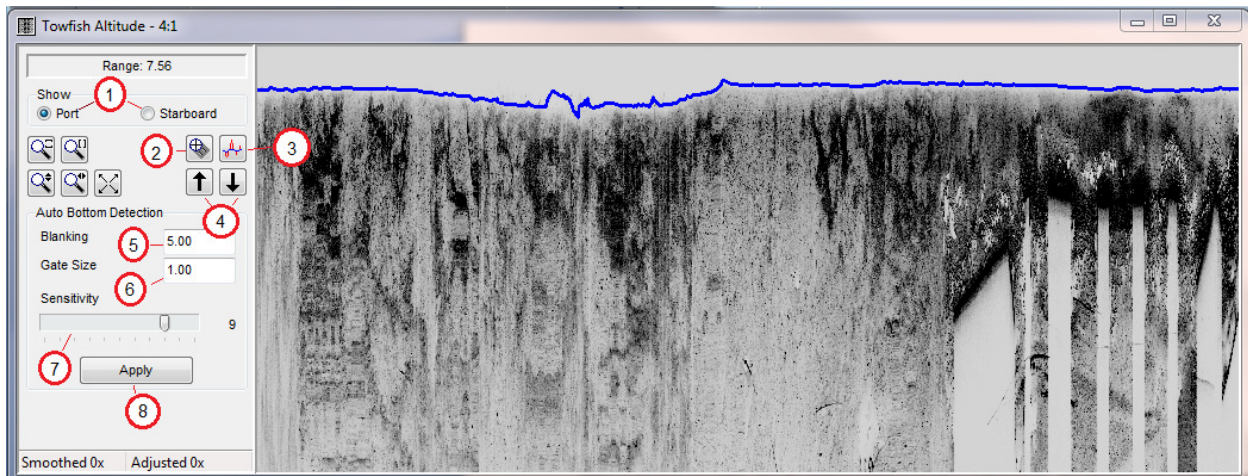


Figure 52 Towfish Altitude Window

The Towfish Altitude window shows either the port or starboard side scan data with the current bottom detection shown as a blue line.

- 1) The user can display either the port or starboard channel. There is one bottom detect for both channels. If it does not match between the two channels, then your towfish is not flying level.
- 2) Digitizing tool. Select the tool. Digitize the bottom as you like. Then release the tool and the bottom track will redraw using your digitizing.
- 3) Smoothing tool. This can be used to smooth the bottom track. Use it a little bit, but not a lot!
- 4) Adjustment Up/Down tools. These can be used to shift the entire bottom track up or down 1%. You can eliminate the black line beneath your mosaic by dropping the bottom track down 1% or 2%.
- 5) 6) 7) 8): Bottom Track Detection Settings: If there is not a bottom track line, or you are unhappy with the existing bottom track line, you can use the Blanking (5), Gate Size (6) and Sensitivity (7) settings to automatically detect the bottom. The Blanking tells the program to ignore all signal down to this depth. If everything is 8m deep or deeper, then I'll blank down to 7m. The Gate Size is how fast the bottom track can change vertically second. I leave it set to 1.0 except in extreme cases. The sensitivity sets the level of intensity at which the bottom is classified. Try it with a couple of different settings. Click the Apply (8) button when you want to re-detect the bottom. You may have to manually digitize in some areas.

Heading and Tracklines Windows:

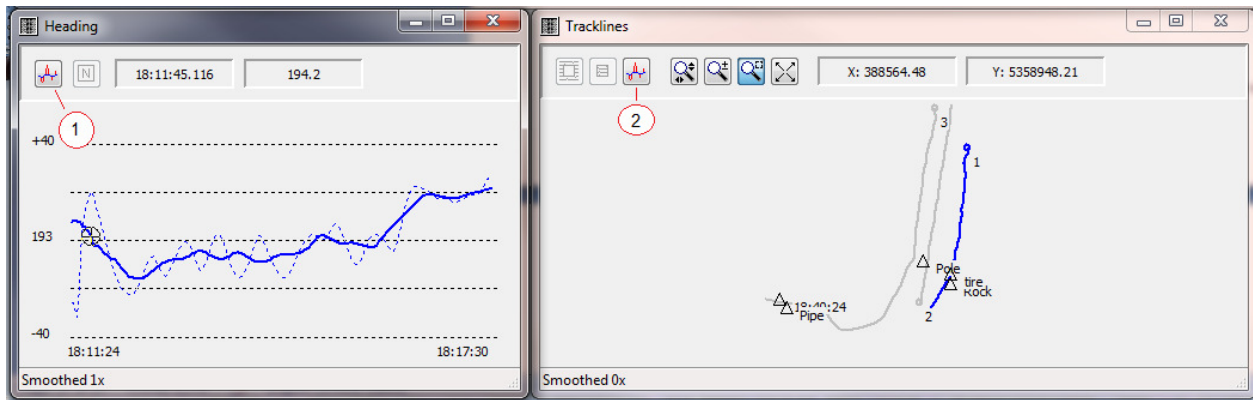


Figure 53 Heading and Trackline Windows

The heading window (left) and the tracklines window (right) shows the heading and path of the towfish.

1) Heading Smoothing tool: This smooths the heading of the towfish. A little smoothing (once) is a good thing. A lot of smoothing (3 or more) is not a good thing. Too much smoothing can alter the positions of objects on the outside of the side scan swath.

2) Tracking Smooth tool: This smooths the trackline (path) of the towfish. Once again, a little smoothing is good, while a lot is not so good. Your GPS trackline does not usually require much smoothing, if any.

Mosaic Main Window:

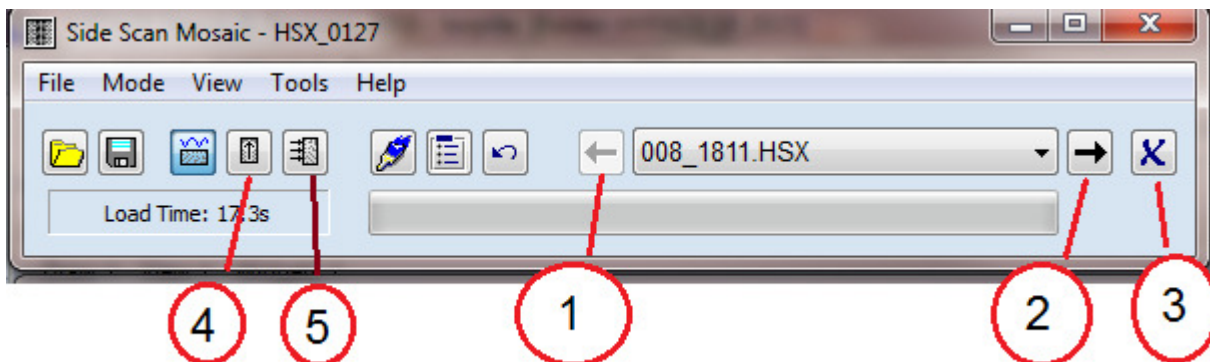


Figure 54 Main Mosaic Window Controls

Step through your survey lines and examine the bottom track, heading and trackline for each file.

- 1) This arrow takes you backwards through the lines.
- 2) This arrow takes you forward through the lines.
- 3) This "X" removes the current HSX file from the list.

Once you have reviewed all of the files you can then go to either Phase 2 (Targeting) by hitting the icon (4) or to Phase 3 (Mosaicking) by hitting the icon (5).

Mosaicking (Phase 3)

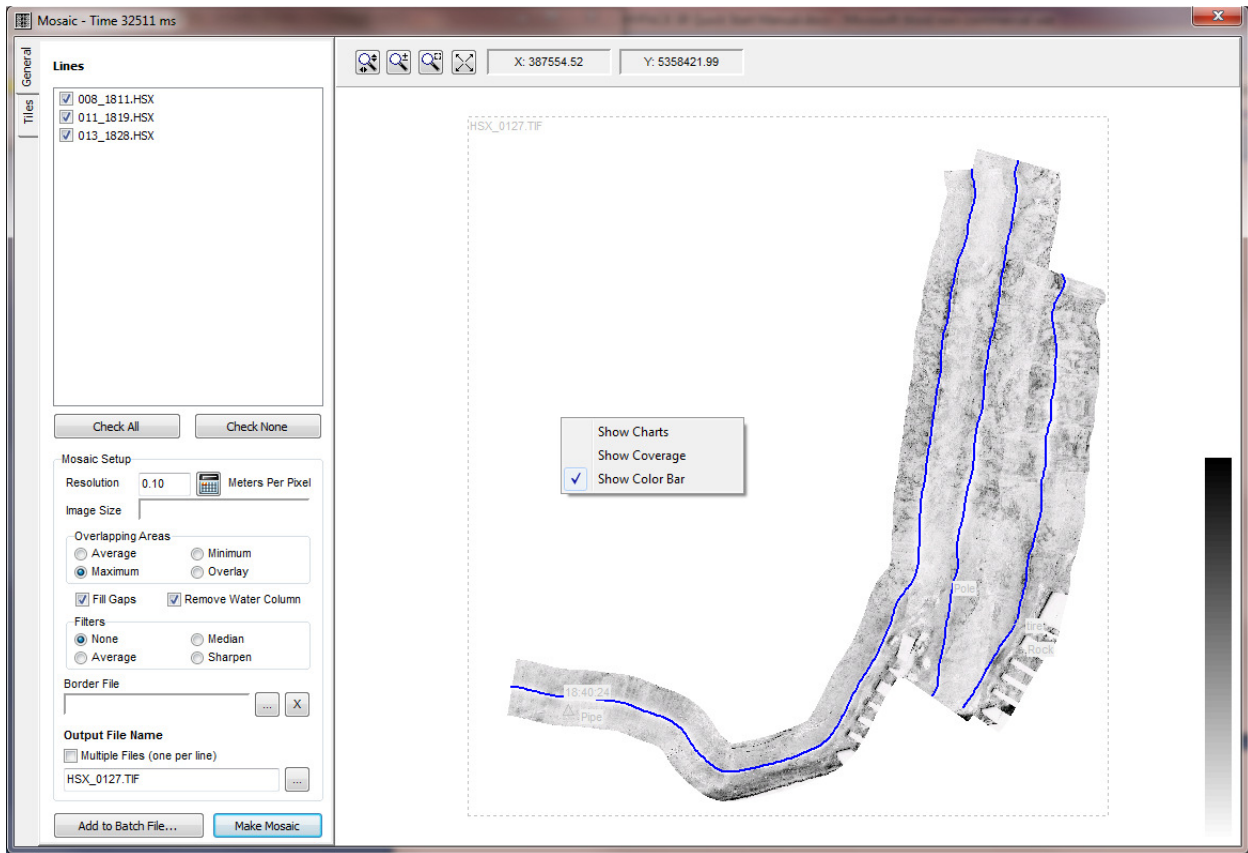


Figure 55 Mosaicking.

The Mosaic window allows you to select the lines to be used in the mosaic, set the distance per pixel, set the Mosaicking parameters and then generate and review the mosaic.

A mosaic is saved as a GeoTIF file. This is a picture file where we know the location of each pixel. It allows us to draw it in the Marine Search main window where we can lay it over top of your charts or background files. It can also be imported into CAD/GIS packages or inserted into Documents as a part of final reports.

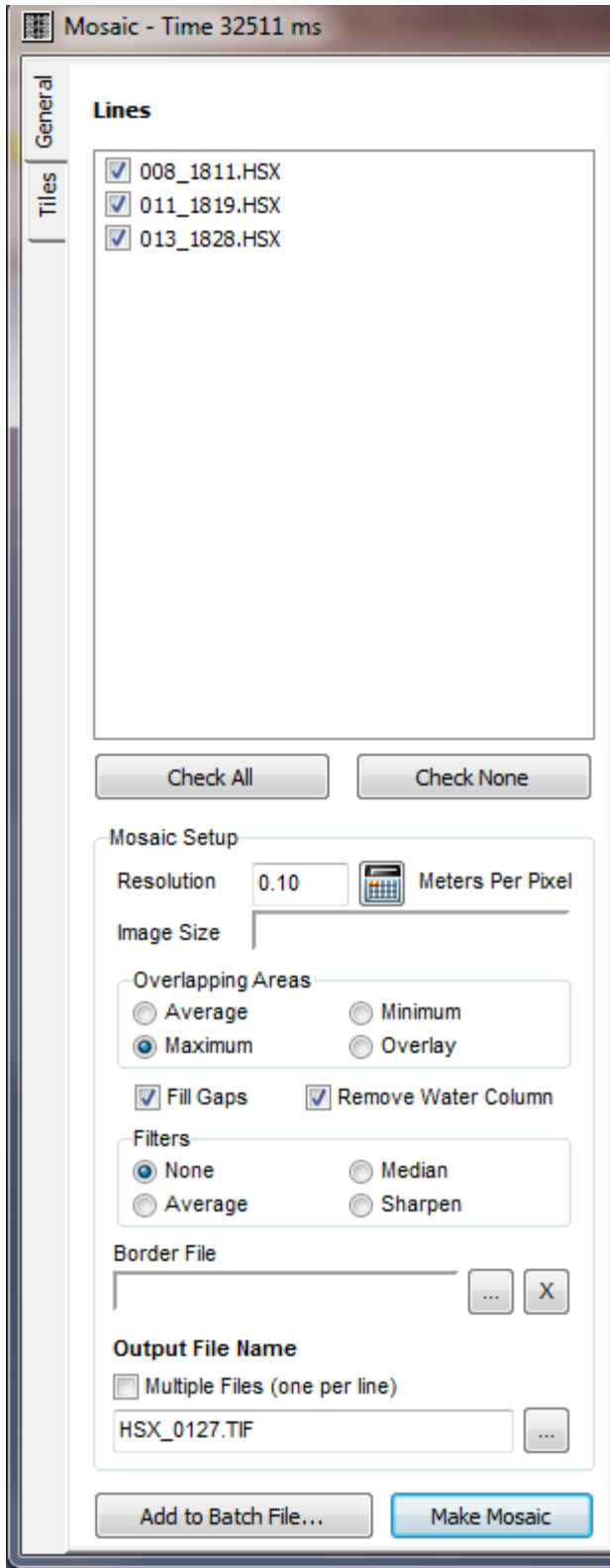


Figure 56 Mosaic Settings

Files: In the top section, you will see a list of your HSX files. You can enable/disable them by clicking in the checkbox area. Disabled files will not be used to generate the mosaic.

Resolution: This is the meters per pixel (metric grids) or feet per pixel (foot grids) of your mosaic. The maximum resolution is usually a function of the frequency of your sidescan. The higher the frequency, the higher the resolution you can obtain. By clicking on the “Calculator” icon, you can access the resolution calculator to determine the best resolution you can expect to achieve.

Overlapping Areas: This determines how the mosaic is generated in areas where the sidescan swath overlaps the adjacent swaths. We recommend “Maximum”.

Fill Gaps: This will attempt to create a solid mosaic through areas where you don’t have any scan data, such as the outside of turns. We recommend it “Enabled”.

Remove Water Column: Yes!

Filters: There are some imaging filters that might improve the resulting mosaic. We suggest you try different filters to see the results.

Border File: You can limit the mosaic to the area just inside a Border file. You create a border file in the Border Editor from the main Program window.

Multiple Files (one per line): This creates a separate GeoTIF file for each survey line. The alternative is to create a single mosaic that contains all of your survey data.

Filename: Check on the “...” box and enter a

filename. The program automatically adds *.TIF as the extension. You should save the *.TIF in your Project folder, as the main program will then automatically find it after you exit the program.

Targeting:

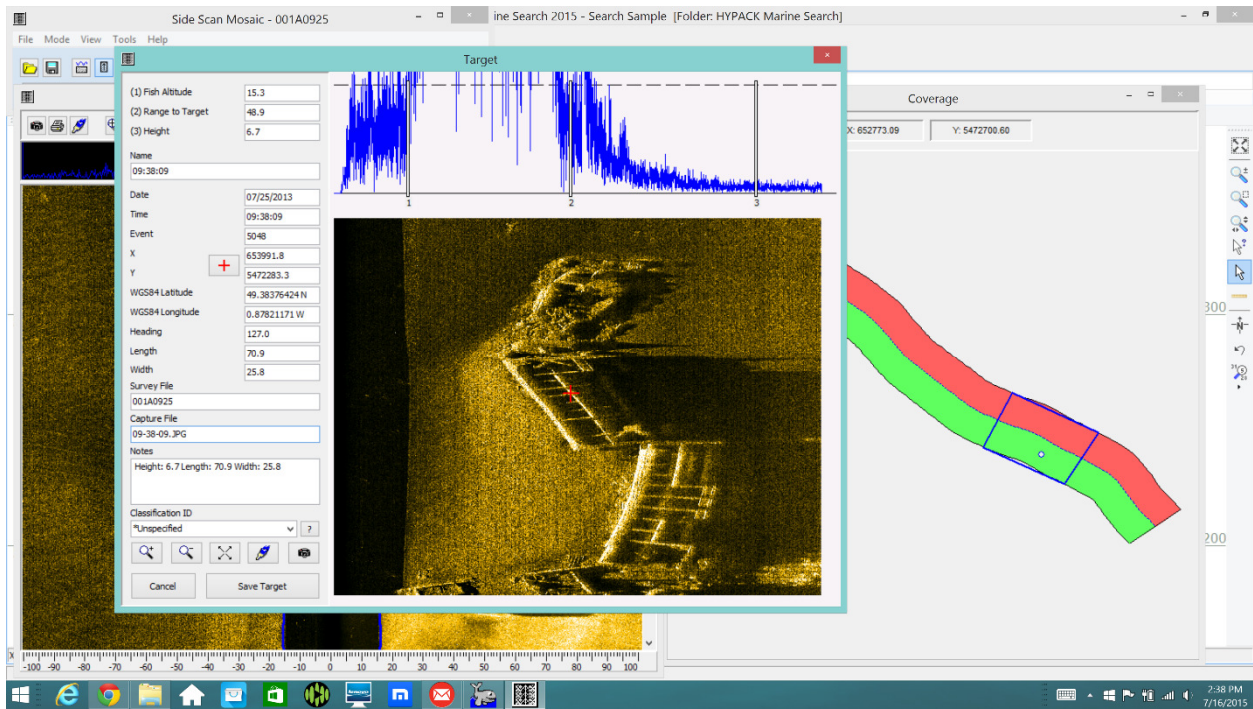


Figure 57 Targeting Window

In Phase 2 (Targeting), you will see the Coverage window (left) and the Scan View window (right). The blue box in the Coverage window shows the extents of the data in the waterfall window.

You can look for interesting objects in the waterfall window and mark them as a “Target” by using either the Quick Mark tool (1) or by double clicking on the object.

Quick Mark tool: Select the tool by double clicking on the icon (1). Then Click-and-Drag an area around the object. The entire rectangle will be saved as the JPG associated with the target. A target marker will then appear on the Scan View and Coverage windows at the center of the rectangle.

Double-Click Target: Double click on an object in the Scan View window. The object will then be drawn in the Targeting window.

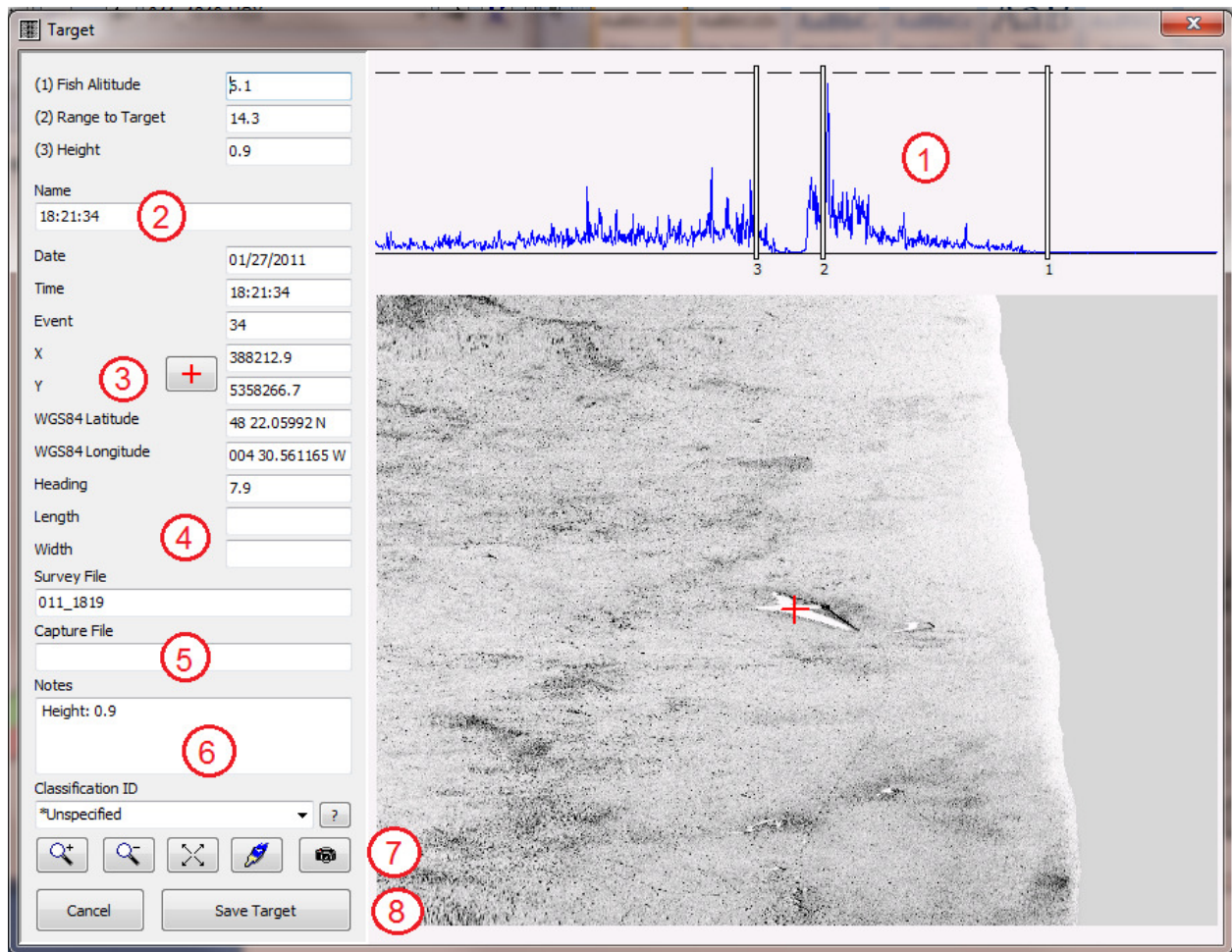


Figure 58 Target Window from Phase 2.

- 1) Determine the Height of the Target above the surrounding bottom and the horizontal distance from the towfish by setting Slider #1 to the first return, Slider #2 to the peak of the return and Slider #3 to the back of the shadow.
- 2) Change the name of the target. It defaults to the time. You can change it to “Rock”, “Debris”, etc.
- 3) Change the position associated with the target. Click on the icon (red plus), the left click on the image.
- 4) Measure the length and width of the object. Click in the text box, then click and drag on the image to measure.
- 5) 7) Capture an Image. Click the camera icon (7). Then click and drag on the image. The extents of your rectangle will be saved to a JPG and saved with the target information to the target database. The name of the JPG will appear in the text box (5).

6) Notes: Enter any notes you think are helpful.

8) Save Target: This saves the target info to the Target Database. The target database can be viewed at any time using the Target Viewer in the main menu of the Mosaicking program.

After you save the target, you will be returned to the Stage 2 (Targeting) Coverage and Scan View windows. The target you have just marked will have a box and label.

7. Target Viewer

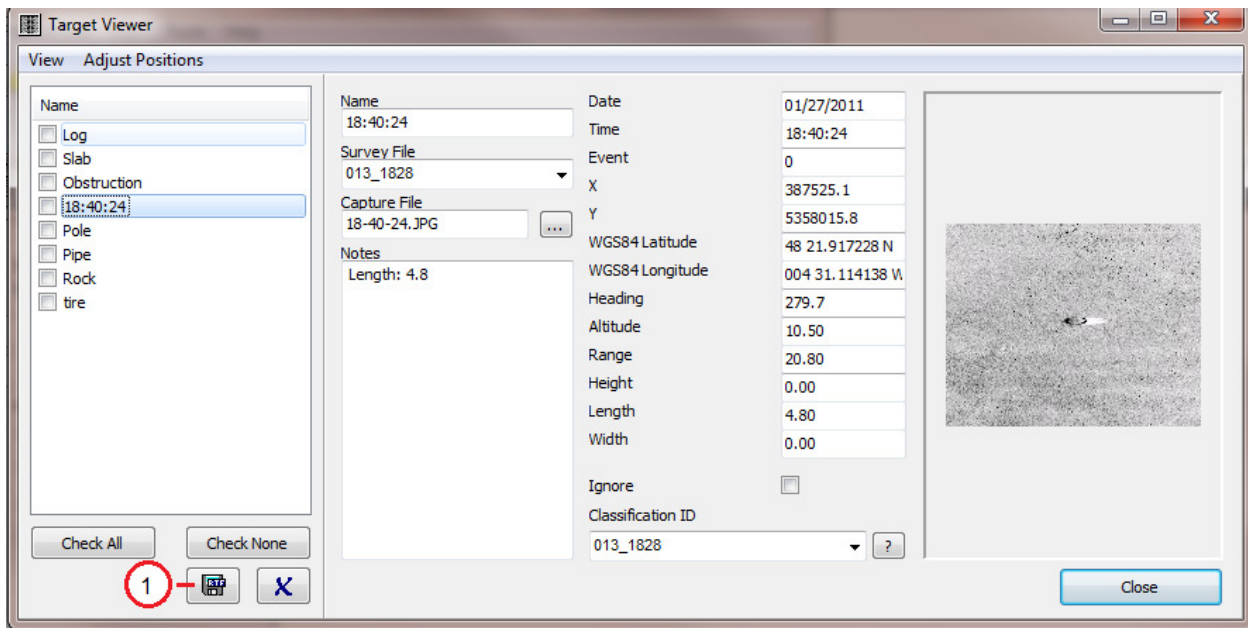


Figure 59 Target Viewer in Mosaic Program

The TARGET VIEWER is built into the Mosaic program. From the main menu, click “Tools – Target Viewer.” The program defaults to show just the targets you have marked in the Mosaicking program. However, you can go to View – Options, go to the Target Groups tab and tell it to include targets you marked during Survey.

1) To export your targets to *.RTF (Rich Text Format), click the icon (1). You’ll be asked to provide a name for the file. The RTF file can be read into Microsoft Word. Each target has its own page, with all of the details and the graphic associated with the target (if available).

Name	Date	01/27/2011
Log	Time	18:17:19
Survey File	Event	0
008_1811	X	1276545.4
Capture File	Y	5410292.0
18-17-19.JPG	WGS84 Latitude	48.36502830d N
	WGS84 Longitude	7.49136517d E
	Heading	213.6
	Fish Altitude	8.40
	Range to Target	26.0
	Height Above Bottom	0.0
	Length	9.9
	Width	1.4

Notes	Length: 9.9 Width: 1.4
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Figure 60 Sample page from RTF Report