SBP-1

Sub Bottom Profiler

OPERATION MANUAL

JW FISHERS MFG INC

rev 061915

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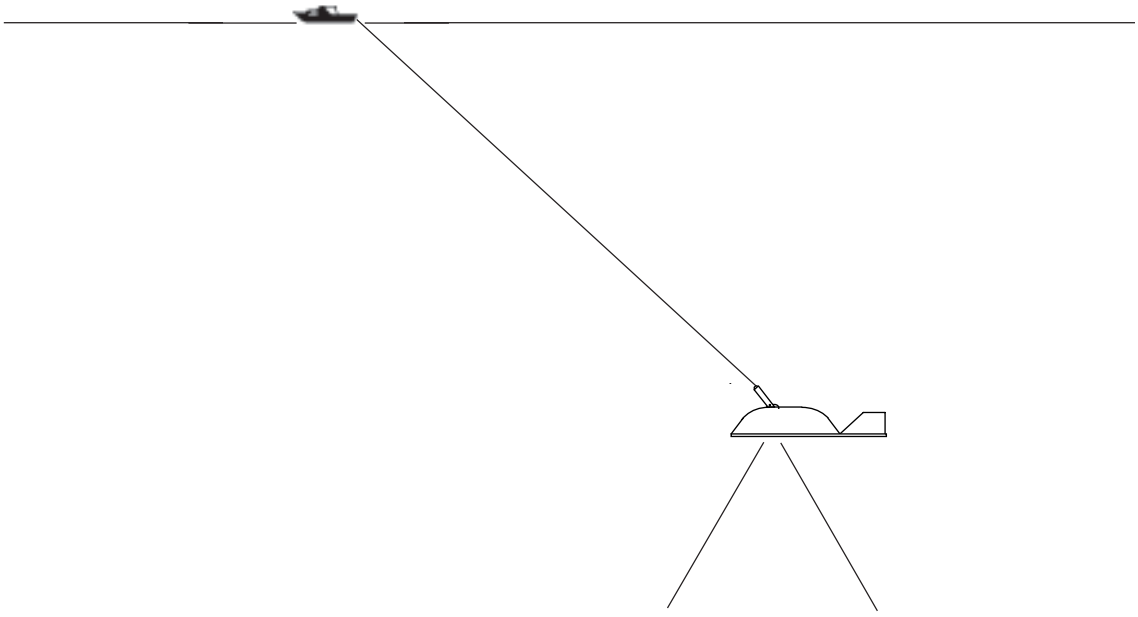
SBP-1

Sub Bottom Profiler

OPERATION AND MAINTENANCE MANUAL



JW FISHERS MFG INC
1953 COUNTY STREET
EAST TAUNTON, MA 02718

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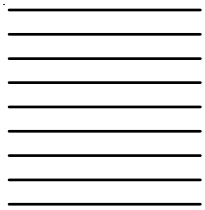
DO NOT

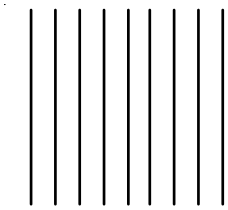
- Do not bend tow line around cleat or bend tow line sharply.
- Do not let Fish, Sonar Processor or PC sit in hot sun for prolonged periods.
- Do not pile tow cable on top of fish while fish is on-deck.
- Do not power up Sonar Processor until Computer has booted-up (Computer may not recognize Sonar Processor properly).
- Do not plug Sonar Processor into any voltage other than 12 vdc (12 v battery). If the available voltage supply is 120 vac or 220 vac, then use the included power supply with an output of 12 vdc at 4 Amps or more.
- Do not operate the vessel at a speed above 2 knots with the tow fish deployed using the pole mount.

DO

- Always turn off the power switch on the Sonar Processor before unplugging the power cord.
- To reduce outside electrical interference (noise on the sonar image), connect a wire from the "Water Ground" terminal on the Sonar Processor panel directly to a piece of metal that goes into the water.
- Protect fish fins when fish is out of water.
- Protect cable end connectors, keep them dry and out of water.
- For the best image, the fish should be towed 12-25ft (4-8 m) off the bottom.
- After searching an area in one direction, repeat the search pattern with a 90 deg shift in direction.



Area 1, first search



Area 1, second search

- Once a target is detected, verify image. Make several straight passes at different approaches (different angles).

SPECIFICATIONS

TOWFISH:

- Frequency ..... 10 kHz.
- Beamwidth ..... 30 degrees
- Pulse length ..... .1 to 1.5 ms (varies with range).
- Power Output ..... 300 watts.
- Max range ..... Up to 130 feet (40 meters) of bottom penetration.
- Max depth rating ..... 500 ft (150 m).
- Tow speed ..... 1-5 mph.

DIMENSIONS/WEIGHT:

- Sonar Processor ..... 9"Wx4"Hx6 7.5"D ..... 3 lbs.
- Cable ..... 0.375"x150'-1000' ..... 25/85 lbs.
- Tow Fish ..... 36"L x 24"W x 9"H ..... without ballast weight 30 lbs.
  ..... with ballast weight 40 lbs.

- Shipping boxes
  - Sonar Processor .....
  - Fish 150-1,000 ft ..... 40"Lx28Wx14"H ..... 127-215 lbs.

MATERIALS/COLOR:

- Sonar Processor ..... High impact plastic case , PVC, stainless/black.
- Fish ..... High impact PVC, epoxy, stainless/yellow.
- Cable ..... 8 conductors and 2 coax's with Kevlar strength member and urethane jacket/yellow.

OPTIONS

- JW Fishers Cable Management System (CMS-1 or CMS-2)
- Extra cable up to 1,000 ft.
- 1,000 ft. depth rated Tow Fish
- Waterproof cable connector at tow fish
- Splashproof "Ultra Bright" PC and Keyboard

File Size per hour of Recording

Range:

33ft (10m) 74mb
66ft (20m) 74mb
131ft (40m) 74mb
262ft (80m) 39mb
492ft (150m) 48mb
984ft (300m) 58mb

SONAR VIEW for Sub Bottom Profiler is a high performance software package designed specifically for JW Fishers Sub Bottom Profilers. The software can be loaded onto either a notebook or desktop PC.

SONAR VIEW MINIMUM SYSTEM REQUIREMENTS

If a computer was not purchased with the *SONAR VIEW for Sub Bottom Profiler* software, your computer must meet the following minimum requirements:

CPU: Intel or AMD. 600MHz

System memory: 128 Mb RAM
512 Mb Ram (minimum recommended for Windows XP)
2 Gb Ram (minimum recommended for Windows 7/8)

Video Card capable of:
32 Mb Video memory
16 bit color

Minimum Screen Area of 800 x 600 pixels

One available USB port for Sonar Processor
One available USB or Serial port for GPS

Windows XP or later

40 Mb of free disk space for program installation

Disk space for file recording:
SONAR VIEW uses up to 74 Mb per hour when recording in short ranges.

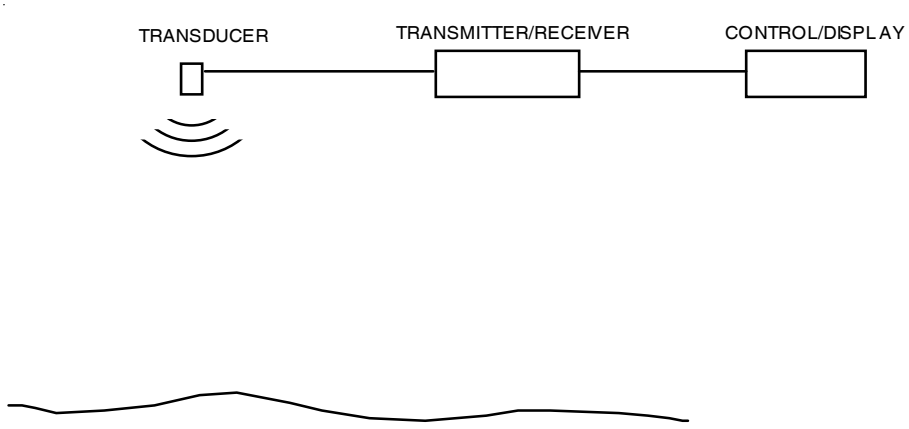
Optional:
CD or DVD burner for archiving files

SONAR BASICS

GENERAL

Sonar is the bouncing of an acoustic signal off a target and then measuring the time it takes to return - thus giving distance- and measuring the size or amplitude of the returned signal, thus showing hardness of the target.
Since we know the speed of sound in water is about 4800 ft. per second it is easy to determine the distance to a target by simply measuring the time it takes to make the round-trip and dividing by two. If we examine the size of the returned signal (amplitude) we can determine if the sonar signal hit a soft object (mud bottom) or a hard object (rocky bottom). The muddy bottom will absorb much of the signal with very little signal (echo) being returned. The rocky bottom will absorb very little of the signal and will reflect most of the signal back to the receiver. The rocky bottom produces a large echo which is called a hard return.

The acoustic signal is produced by a transducer. In actual operation, the transmitter generates an electrical pulse which is applied to the transducer. The transducer converts this pulse to a mechanical vibration which produces an oscillating pressure wave in the water thus forming a sound pulse. The pulse then travels away from the transducer until it strikes an object at which point some portion of the pulse is reflected back to the transducer as an echo.



When the echo returns to the transducer, the transducer is mechanically excited by the sound pressure wave and converts the vibration into an electrical signal. This signal is then detected and amplified by the receiver.

The control/display unit regulates the precise timing between the transmitter, receiver and display elements.

DEPTH SOUNDER

Depth sounders are a simple form of sonar. They send out a conical shape, high frequency energy pulse toward the bottom, listen for the return, calculate the time it took, and display the answer in feet (of depth). If your depth sounder has a display or a printout, a line will be drawn representing the bottom. Because the beam is so wide (15 to 30 deg) the beam will be on the object for a long time as you pass over it. As a result, even small objects appear to be quite large on the printout. Fish show up as large arcs on the display.

SCANNING SONAR

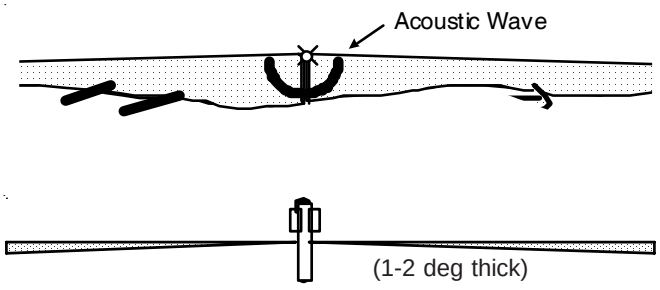
Scanning sonar refines the process by decreasing the beam width to a very narrow 2 deg by 40 deg fan shaped beam and significantly increasing the frequency of the signal (typically 600kHz range). The high frequency, very narrow fan shaped beam sweeps back and forth across the bottom and dramatically improves the detail of the objects on the bottom over the depth sounder printout. Not only can very small targets be detected but the details of the target can be seen.

SIDE SCAN SONAR

Side scan sonars utilize two sideward-looking transducers to produce a detailed image of the sea floor. The transducers are mounted on either side of a torpedo-shaped tow fish designed for stability. With the transducers mounted on the port and starboard side of the tow fish, a large swath of sea floor can be covered with each pass.

A narrow horizontal beam angle is required to obtain a high-resolution image. The narrow beam angle makes control of the beam direction very important, which would be difficult in rough seas if the transducer were mounted to the survey vessel. Thus the transducers are towed behind the boat where the effects of boat pitch, roll, etc. are minimized. Further, the towed body allows the sonar to be operated in any water depth so it can be close to the target, which produces the most detail. A side scan sonar display builds up its image by laying down successive scans of the sonar data producing a composite image.

The main features that distinguish side scan sonars from other forms of sonar are: sideways looking transducers, narrow beam, two channels, and towed transducers.

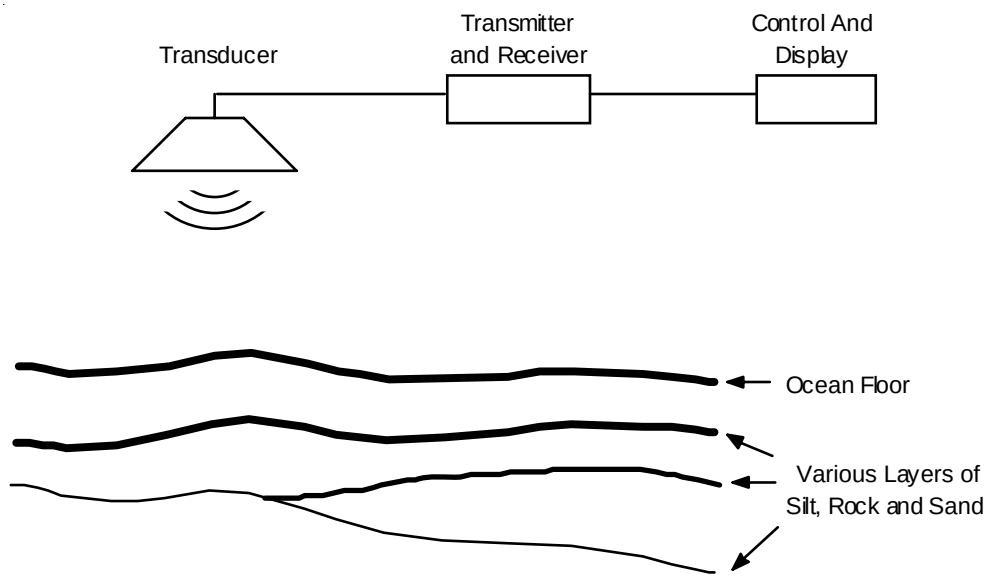


Top View of Acoustic Wave Path

SUB BOTTOM PROFILER

The main feature that distinguishes sub bottom profilers from other forms of sonar is the frequency of the transmitter and transducer. Frequencies of 50kHz to 1,200kHz and above are used for depth sounders, side scan sonar and scanning sonar. These high frequencies, while excellent for painting high resolution images of the ocean floor and it's features, cannot penetrate into the silt, sand and sediment to reveal the different layers of subsoil (strata) or to show any buried features such as pipe lines or wrecks. The low frequencies of sub bottom profilers (10kHz for the SBP-1) allow the sonar signal to penetrate deep into the ocean floor, up to 130 feet (40 meters) for the SBP-1.

The SBP-1 Sub Bottom Profiler system operates by transmitting a low-frequency burst of acoustic energy from it's transducer, forming a sound wave directed at the ocean floor. Portions of the sound wave are reflected back to the transducer as the wave passes through the interfaces of the different layers of silt, sand and rock. The depth of the penetration is dependant on the acoustic absorption nature of the sub bottom strata.

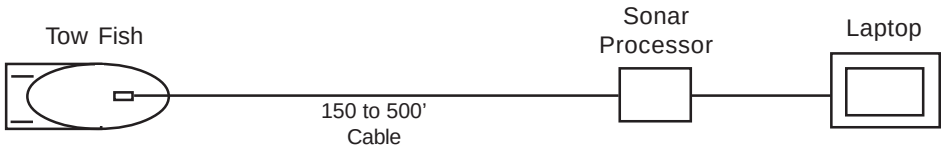


JW FISHERS SUB BOTTOM PROFILER

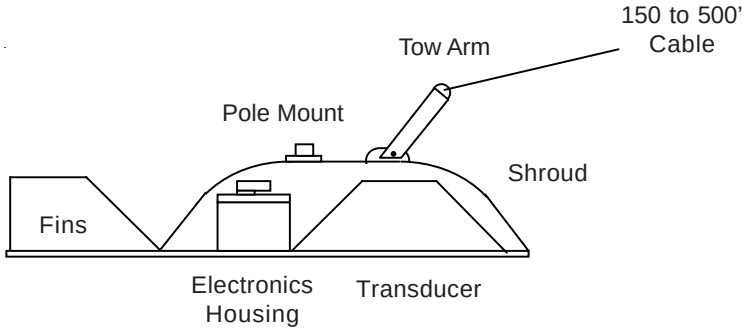
INTRODUCTION

Fishers SBP-1 Sub Bottom Profiler system consists of :

- Tow fish with 10kHz transducer.
- 150 ft tow cable, (up to 1,000 ft optional). Optional waterproof connector at towfish.
- Sonar Processor.
- Laptop or optional Ultra Bright Splashproof Computer.



Tow Fish:
The tow fish is constructed of high impact PVC. The fish is 36" long and 24" wide and 9” high. The fish weighs 30/40 lbs. A removable 10 lb. ballast weight is constructed of PVC filled with lead impregnated epoxy. The ballast weight is used when towing the tow fish by the cable and is removed when using the stationary pole mount. The fins are PVC and are screwed in-place (field replaceable). A waterproof compartment which houses the electronics is mounted under the shroud behind the transducer. The tow cable from the surface connects to the top of the tow arm. The cable is connected to the tow-arm, enters the fish and connects to the waterproof compartment.

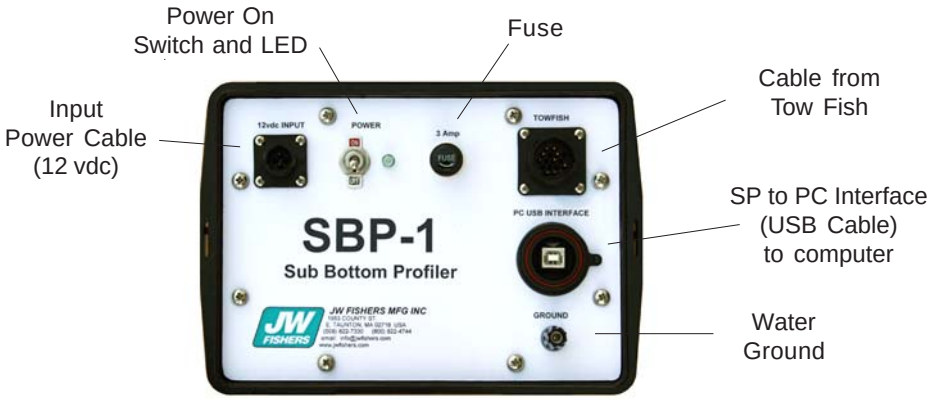


The function of the tow fish is to carry the transducer and the underwater electronics through the water. It is critical, for good images, that the fish tows stable through the water (stable, not perfectly straight). If the fish is towed cross-current (across a river) the fish will actually tow pointed slightly upstream. This is due to the water-flow pushing against the fins. This will not cause a problem with the image.

Tow Cable:
The tow cable consists of 8 single conductors, 2 coax cables and a Kevlar strength member inside a water-blocked urethane jacket. It is tough, durable, and highly abrasion resistant. Cable is available in 150 to 1,000' lengths.

Sonar Processor:
The Sonar Processor provides an interface between the Tow Fish and the computer. It receives the operational parameters from the PC and communicates them to the Fish. It receives sonar signals from the Fish, amplifies and digitizes them, and sends them to the computer using an integrated PC interface board. The Sonar Processor communicates with the PC using a standard USB cable.

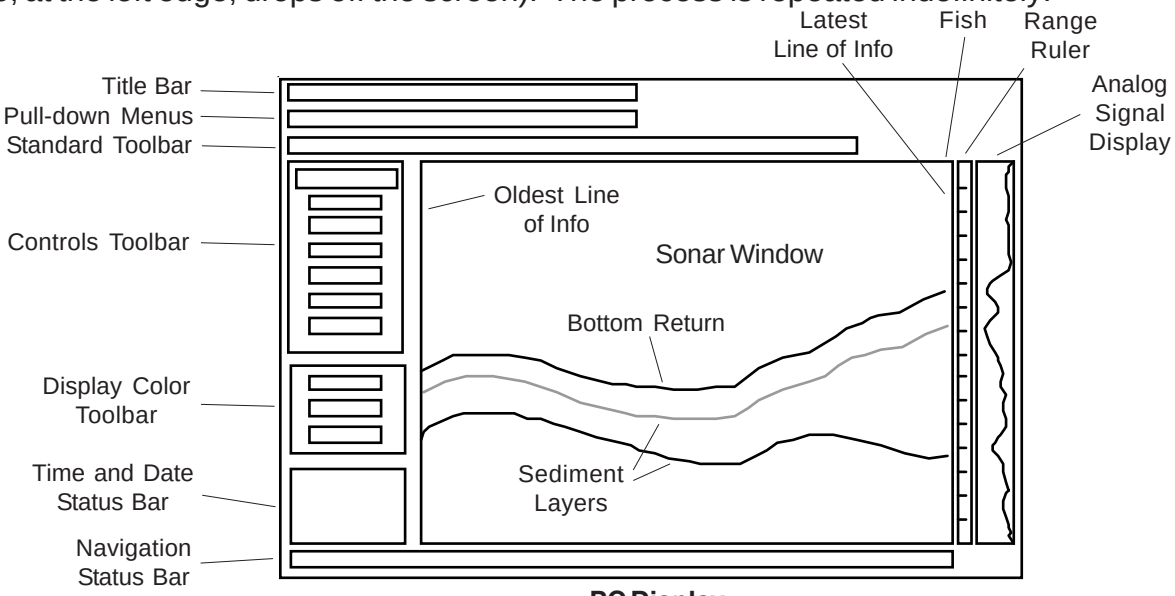
The Sonar Processor contains no operator adjustments, all adjustments are made in the PC software application.



Sonar Processor

Computer:
The Sonar Processor has an integrated interface board that converts the analog sonar signals to digital, and inputs the signal to the computer. The computer takes the digital signal, displays it, and stores it for future reference. The software has numerous Tool Bars and Pull Down menus for controlling the display. There is also communication from the Computer to the Fish which allow the operator to control different functions within the Fish. The Computer also receives the latest GPS data from the boat's GPS receiver so that the data from the Fish is matched to a GPS position for later reference.

To get the proper prospective of the information being displayed on the screen; imagine the fish at the top right corner of the screen, traveling to the right. The transmitted beam is traveling from the top to the bottom of the screen. The distance covered from the top to the bottom of the screen is dependent on the Range (10m, 20m, 80m, etc) and Delay settings. After each transmit pulse, all the information on the screen moves to the left and the new information is displayed in the right-most line (the oldest line, at the left edge, drops off the screen). The process is repeated indefinitely.

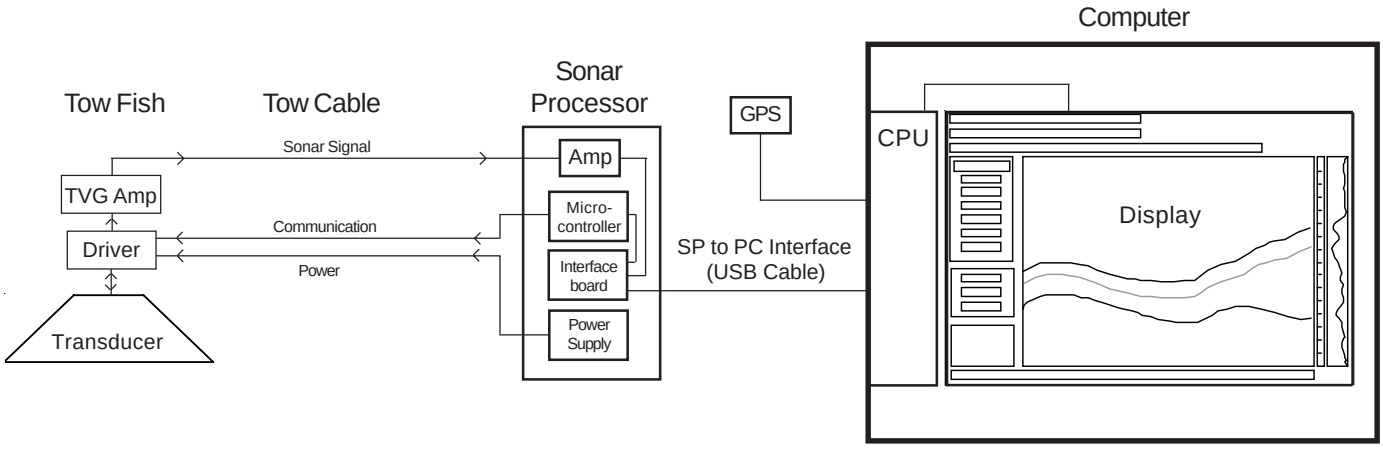


PC Display

JW FISHERS SUB BOTTOM PROFILER THEORY OF OPERATION

BLOCK DIAGRAM

The key to sub bottom profiler operation is to understand how it works. We will begin with an overall block diagram and then discuss the individual components.



When Record or Monitor Mode is selected, the computer (Central Processor Unit or CPU) scans the operator selected settings and sends the operating parameters to the tow fish. A short duration 300 watt pulse is generated by the Driver and sent to the Transducer. The transducer produces a 10kHz sound wave that travels to and penetrates the ocean floor below the fish. The amps in the fish listen to the transducer for returning echoes. As the sound wave reflects from the layers of sediment, echoes are continuously received by the transducers, amplified, and filtered by the amps in the fish. The first echo to be received is the reflection off the bottom directly below the fish.

The Tow Fish amps include the "time variable gain" (TVG) amplifiers. The TVG amps increase their gain over time to compensate for signal loss which occurs as the signal travels through the water and sediment. The TVG Gain setting is user selectable in the PC Software.

Following the TVG amps, a cable driver sends the signal up the tow cable to the Sonar Processor. The amp in the Sonar Processor compensates for losses due to variable tow cable lengths before sending the signal to the analog to digital (A/D) converter in the interface board.

The A/D Converter looks at the output of the amp circuit, and takes evenly spaced samples of the signal. The spacing between each sample is determined by the Range selected. A ‘trigger’ pulse, which is generated by the Driver in the fish, signals to the A/D that a new line of data has begun. The resulting digital data is transferred to the PC via the USB Interface.

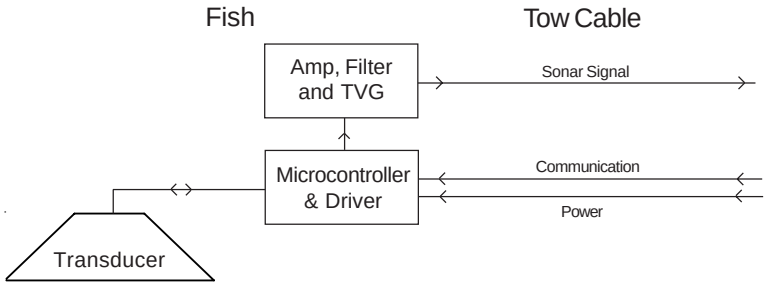
The Sonar Processor also contains the power supply which provides various voltages for the Tow Fish and Sonar Processor electronics.

The PC displays each line of new data on the right-hand edge of the screen. The previously received lines of data shift to the left. While the above displaying takes place, the Driver has sent another transmit pulse to the Transducer. This sequence repeats itself for as long as the sub bottom profiler is turned on. The data from each transmit pulse is displayed on the computer screen. How often we transmit depends on the Range selected.

The PC also displays and records the boat’s position, heading and speed from a connected GPS receiver. This data is recorded with the Sub Bottom data.

FISH ELECTRONICS

The fish contains an underwater housing for the electronics. The electronics consists of two circuit boards; the first contains the microcontroller, transducer driver and power supply circuits. The second board contains the amp, filter, TVG and cable driver circuits.

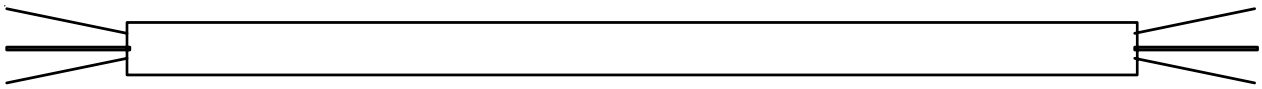


The operating parameters for Range and TVG are generated by the Computer. The information is sent down the tow cable where it is communicated to the microcontroller. The microcontroller triggers the transducer driver circuitry. The transducer driver generates the 300 watt power pulse to the transducer. The transducer generates the 10kHz sound wave that travels down from the bottom side of the fish. Echoes begin returning from the bottom and layers of sediment.

The returning echoes strike the transducer which produce the return electrical signals. The signals are amplified and filtered and then sent to the TVG amp. The TVG amp, set by the operator and controlled by the microcontroller, compensates for signal losses due to absorption and refraction of the signal as it travels greater distances through the water and sub bottom. The cable driver sends the signal up the tow cable to the Sonar Processor. Signals continue to be received and amplified until the next transmit pulse. The sequence is then repeated.

TOW CABLE

The 150' to 1000' tow cable consists of 8 individual conductors, 2 coax's and a Kevlar strength member inside a water-blocked urethane jacket. It is tough, durable, and highly abrasion resistant. The 8 individual conductors are used for sending communications signals and operating voltages to the fish. One coax is used to send the return echo signal from the fish to the Sonar Processor. The second coax is used to send a trigger pulse from the fish to the Sonar Processor.



Computer

The system will run on a Laptop, Desktop, or on JW Fishers optional “Splash Proof” computer. The “Splash Proof” is a ruggedized computer system that is built into an Underwater Kinetics case. All connections to the Splash Proof PC are o-ring sealed maintaining water-resistance and allowing for continued operation on rainy days and rough water conditions. It utilizes a 10" Ultra Bright” display which makes the display much easier to see on a bright sunny day. A splash proof keyboard with an integrated touchpad is included.

Optional Ultra Bright Computer in Splash Proof Case

OPERATOR SETTINGS AND CONTROLS

THE HARDWARE

Sonar Processor Box - The control panel of the Sonar Processor Box contains:

- **POWER INPUT** - The input power for the Sonar Processor is 12 volts dc. A power cable is supplied with the sub bottom profiler system. One end of the cable connects to the Sonar Processor. The end with red (+) and black (-) alligator clips connects to a 12 volt battery. A 120/240 vac to 12 vdc power supply is also included.

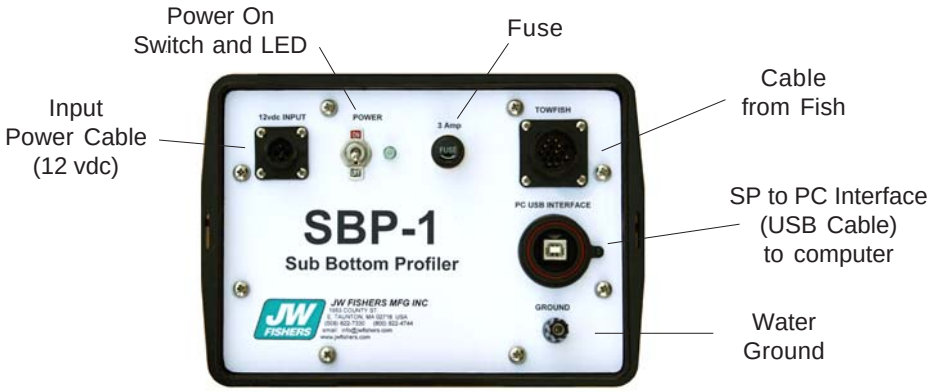
- **POWER ON SWITCH and LED** - When switched to the ON position power is applied to the processor's electronics and the green LED is illuminated. If the cable to the tow fish is connected (it should be before power is turned on) then power is also sent to the "downstairs" electronics in the fish.

- **FUSE** - The system is protected by a standard 3 Amp fuse.

- **TOW FISH CONNECTOR** - The cable from the tow fish is attached to this connector.

- **SP to PC INTERFACE** - A splash proof USB cable connects the Sonar Processor box to the PC. The cable plugs into any available USB port at the computer. (Note: It is best to use the same USB port every time you operate). The Sonar Processor receives the operating parameters from the PC that are user selected from the *SONAR VIEW for Sub Bottom Profiler* software. The digitized sonar signal is sent from the Sonar Processor to be stored and displayed by the PC.

- **WATER GROUND** - To reduce outside electrical interference (noise on the sonar image), connect a wire (provided) from the "Water Ground" terminal on the Sonar Processor panel directly to a piece of metal that goes into the water.

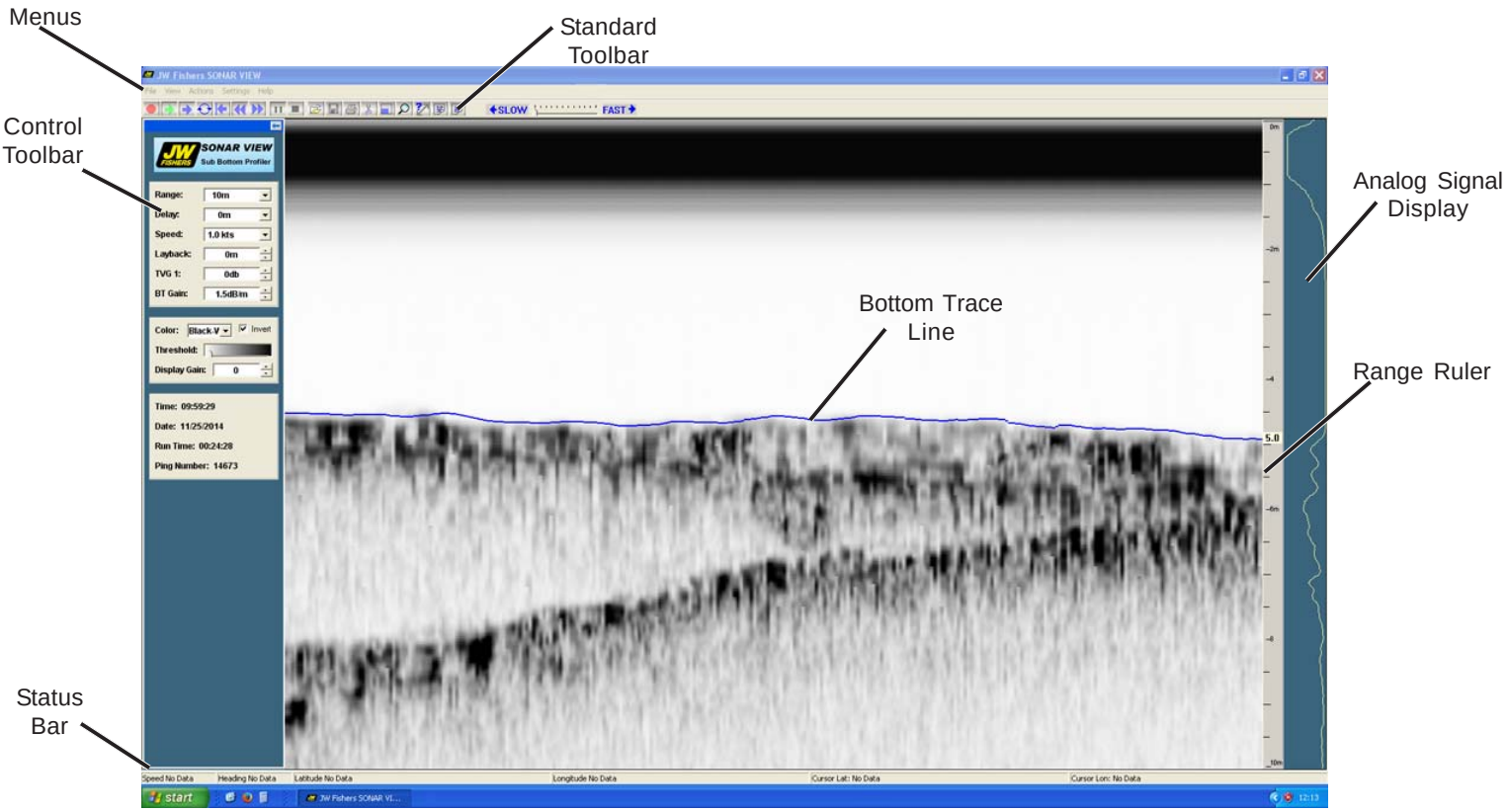


Sonar Processor

OPERATOR SETTINGS AND CONTROLS (Continued) -

THE SOFTWARE

The operator controls are located in tool bars on the screen.



TOP MENUS

There are 5 pull-down menus: **File, View, Actions, Settings** and **Help**. The selections available under each heading are:

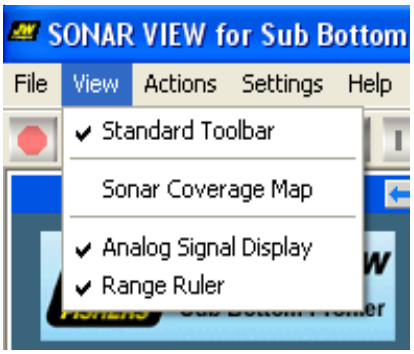
File:

- **Record new file** - Records a new sonar file. (Note: Pressing the "F1" key will also record a new sonar file)
- **Open file for playback** - Open an existing sonar file.
- **Record highlights to new file** - Records a portion of the existing sonar file to a new file. See page 25 for more details.
- **Save screen as a picture** - Saves the image on the sonar screen as a Bitmap file.
- **Print Screen** - Prints the sonar image shown on the monitor.
- **Print Preview** - Shows how the image will look when it is printed.
- **Print Set up** - Allows the operator to select the printer and various printing options such as paper size and orientation of the image on the page.
- **Exit -** closes the SONAR VIEW program.

OPERATOR SETTINGS AND CONTROLS (continued)

TOP MENUS (continued)

View:

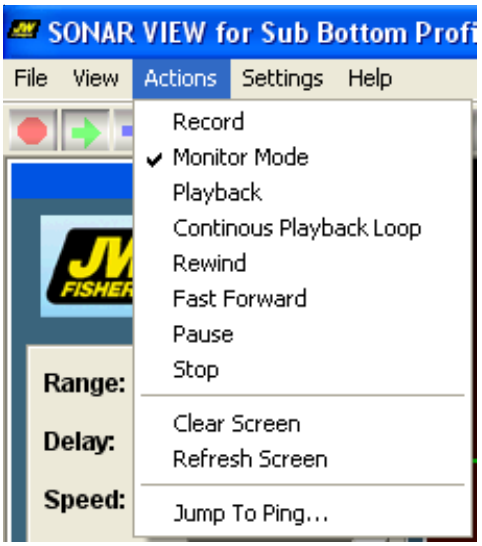


Select items to show on the display.

- **Standard Toolbar** - Displays icons for various tools at the top of the screen, directly below the Pull-down Menus.
- **Sonar Coverage Map** - Shows the optional sonar coverage mapping window.
- **Analog Signal Display** - An analog graphic located at the far right side of the screen shows the amplitude and intensity of the sonar signal after all TVG and amplification. This display should be observed while adjusting the TVG and BT Gain settings.
- **Range Ruler** - Displays a ruler on the right side of the screen which allow the operator to easily determine the distance between the tow fish, the ocean floor and sediment layers.

Actions:

The commands shown under the Actions pull-down menu duplicate many of the commands shown on the Standard Tool bar.

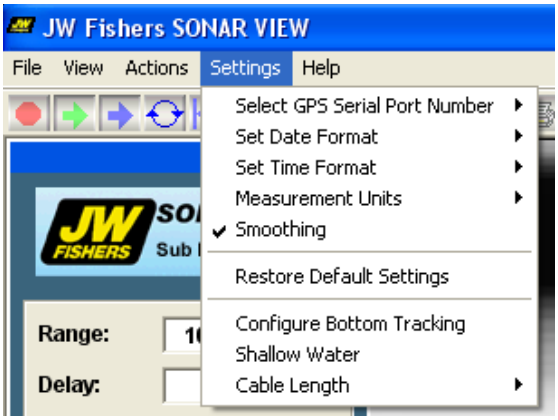


- **Record** - Selecting this command operates the sonar and saves the data to a file.
- **Monitor Mode** - Selecting this command operates the sonar without saving the data to a file.
- **Playback** - Used to playback a previously recorded file.
- **Continuous Playback Loop** - Continuously repeats the playback of a recorded file.
- **Rewind** - Rewind a recorded file.
- **Fast Forward** - Speeds up the playback of a recorded file.
- **Pause** - Freezes the motion of the sonar image on the screen (only used when playing back recorded files).
- **Stop** - Stops the recording or play back of a file.
- **Clear Screen** - Clears sonar image from screen.
- **Refresh Screen -** renews the image shown on the monitor.
- **Jump to Ping... -** used to skip directly to a specific ping number during playback.

OPERATOR SETTINGS AND CONTROLS (continued)

TOP MENUS (continued)

Settings:



- **Select GPS Serial Port number** - The setting tells the Sonar View Software which port on the PC to monitor for GPS position information
- **Set Date Format** - The operator can choose either: month/ day/ year or day/month/year. The date is displayed in the Settings Tool bar and is recorded with the sonar data.
- **Set Time Format** - The operator can choose either a 12 hour or 24 hour time format. The time is displayed in the Settings Tool bar and is recorded with the sonar data.
- **Measurement Units** - Allows the operator to select Imperial or Metric measurement units.
- **Smoothing** - The default setting for this function is "always on". It smooths the transition between lines of sonar data, enhancing the image shown on the display.
- **Restore Default Settings** - Returns settings to the original factory default settings.
- **Configure Bottom Tracking -** opens the Bottom Tracking setup window. Refer to page 22 for complete bottom tracking instructions.
- **Shallow Water -** select when operating the SBP in water depths of less than 3 meters. The transmit power and receive sensitivity are significantly reduced. In most cases, TVG settings must be increased.
- **Cable Length -** Allows the operator to choose the closest correct tow cable length. This setting adjusts a gain stage in the control box to compensate for the wide range of available cable lengths. When the "Auto" setting is selected, the PC will automatically calculate the towcable length.

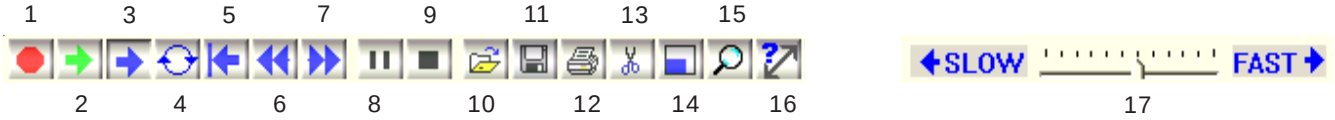
Help:

- **Help Topics** - Refers you to Operators Manual for help. Company contact information is provided.
- **About SONAR VIEW** - Software revision information is provided.

OPERATOR SETTINGS AND CONTROLS (continued)

TOOLBARS:

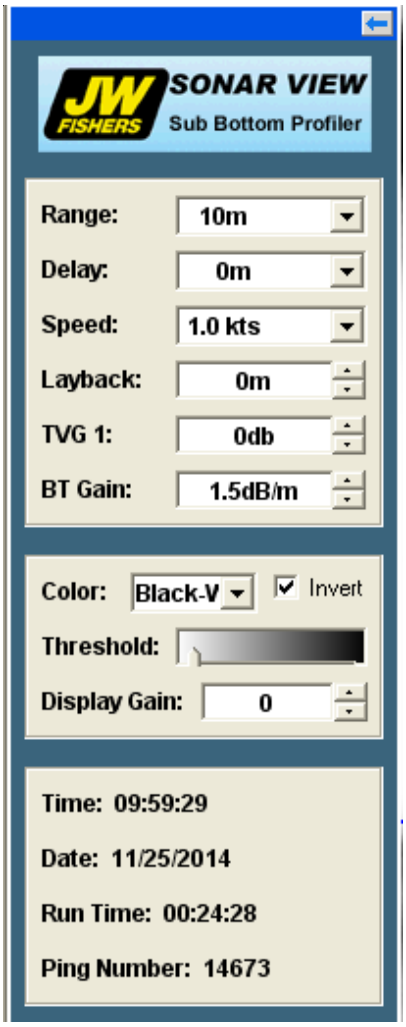
Standard Toolbar- icons for standard tool bar commands are shown at the top of the sonar screen when “Standard Toolbar” is selected under VIEW at the top of the sonar screen.



1 - Records new file (Note: Pressing the “F1” key on the keyboard also records a new file.)
2 - Monitor mode, only real time viewing of the sonar image with no recording of data.
3 - Playback - Used to playback a previously recorded file.
4 - Continuous Playback Loop - Continuously repeats the playback of a recorded file.
5 - Jump to the beginning of the file
6 - Rewind. - Rewind a recorded file (file is viewable while rewinding)
7 - Fast Forward - Fast Forward a recorded file (file is viewable while Fast Forwarding)
8 - Pause.
9 - Stop - Stop playing a recorded file. Stop Pinging while in Monitor Mode.
10 - Opens a recorded file for playback.
11 - Saves screen as Bitmap picture.
12- Print Screen - opens Print dialog box for your PC’s printer and prints a screen shot.
13 - Record Highlights (see pg 25)
14 - Sonar Coverage Map - shows the optional sonar coverage map window
15 - Zoom - enlarges object (see page 24).
16 - Measure Size - sizes the object (see page 24)
17 - Playback Speed Slider - Controls the playback speed of a previously recorded file (slider is only shown during playback)

OPERATOR SETTINGS AND CONTROLS (continued)

TOOLBARS: (CONTINUED)



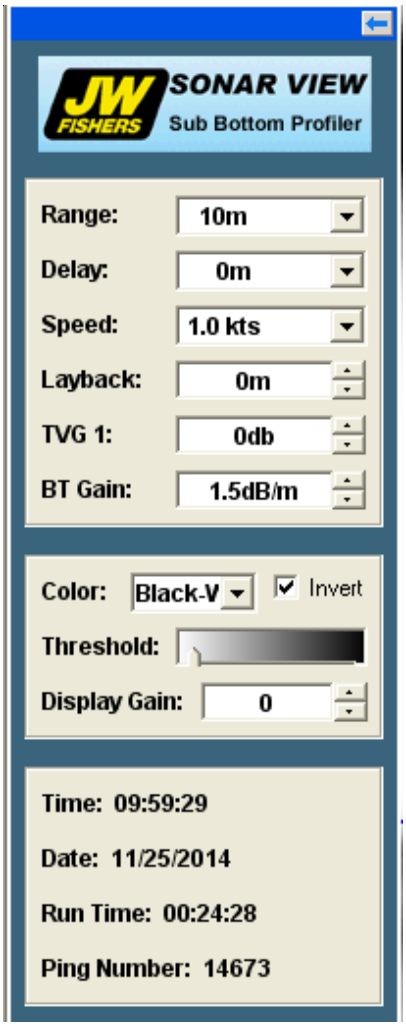
Controls Toolbar - Shown at the left side of the sonar screen. The operator adjustable controls are:

- **Range** - The following ranges are available(shown in meters): 10,20,40,80,150, and 300
- **Delay** - Commonly called water column removal, it delays displaying the image for 1-50 meters (operator selectable). Eliminates the displayed image for the period of time that the signal takes to reach the bottom. (See page 23)
- **Speed** - a boat speed from 1 to 5 knots can be selected, or select Auto Speed. If Auto Speed is selected, the speed from the GPS will be displayed in the Boat Speed box. Auto Speed compensates for boat speeds of 1/2 to 5 knots. Speeds less than 1/2 knot or greater than 5 knots result in image distortion. Low boat speeds produce the best images.
- **Layback**- (Tow Fish Layback) The GPS position captured by Sonar View is the position of the GPS antenna. The tow fish layback control allows the operator to enter the distance between the GPS antenna and the towfish, resulting in more accurate target (cursor) position calculations. Layback is stored as part of the Sonar image file.
- **TVG 1** - Selects the fixed amount of Time Variable Gain that is applied to the signal by the amplifiers in the towfish. The signal is recorded with this gain applied. Any value from 0 to 75dB can be selected. An Auto setting is also available, an appropriate value will be chosen by the Sonar View software.
- **BT Gain** - This feature adds additional TVG gain starting at, and below, the depth determined by the Bottom Tracking. This setting, and it's resulting increase in signal strength, is not recorded. It can be adjusted during recording and readjusted during playback. Any value from 0 to 5.0dB, in 0.05dB steps can be selected. An Auto setting is also available, an appropriate value will be chosen by the Sonar View software.
- **Color** - there are seven different color schemes are available. The color shade farthest to the left is displayed with low amplitude signal returns and the color shade farthest to the right for strong returns.
- **Invert** - Inverts the selected color scheme effectively doubling the number of color choices
- **Threshold** - Changes the overall baseline of the returned signal so that even the smallest signal is visible on the monitor. Threshold is adjusted by clicking on the slider at the bottom of the color bar. Position the slider below the shade that will be used to represent a zero signal level.
- **Display Gain** - Increases or decreases the overall strength of the sonar signal shown on the monitor. The shade of the colors on the screen change as the gain changes. The gain can be adjusted from -10 to +10 in one digit increments. This control should be set to "0" when recording and adjusted only during Playback.

(continued)

Controls Toolbar (continued)

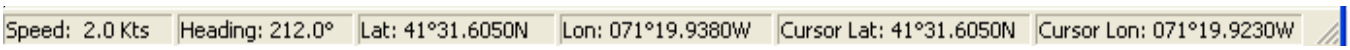
- **Time** - In Record or Monitor mode, displays the current time. In Playback mode, displays the time at which the currently displayed line of data was recorded.
- **Date** - In Record or Monitor mode, displays the current date. In Playback mode, displays the date on which the recording was made. The present date is recorded with each line of data.
- **Run Time** - In Record or Playback mode, displays the elapse time from the beginning of the current file. In Monitor mode, displays the elapse time since Monitor mode was entered.
- **Ping Number** - Displays the number of the current data line being displayed at the far right edge of the display. The data lines are numbered sequentially, beginning at '0' whenever a new Record file is initiated or when the Monitor mode is entered.
- **Show/Hide Controls Toolbar** - Clicking the blue arrow () at the top right of the controls toolbar will shrink the Controls toolbar leaving more screen area to display the sonar image. Clicking any portion of the minimized controls toolbar will restore it to full size.



STATUS BAR: Shown at the bottom of the sonar screen. The following information is displayed:

- **Speed** - Displays the boat's speed when a GPS is connected.
- **Heading** - Displays the boat's compass heading when a GPS is connected.
- **Lat and Lon** - Displays the boat's position coordinates when a GPS is connected.
- **Cursor Lat and Lon** - Displays the calculated coordinates of the sonar data pointed to by the cursor. The calculations for the Cursor Lat and Lon includes the value entered in the 'Layback' box.

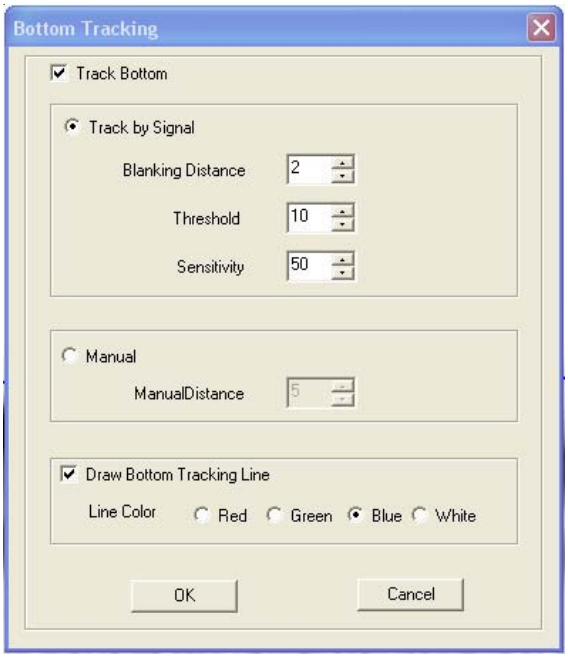
Note: All position data is displayed in degrees, minutes and decimal minutes format.



BOTTOM TRACKING

The Bottom Tracking tool calculates the depth of water beneath the tow fish. When Bottom Tracking is active, the current Distance Off Bottom is displayed in a moving box within the Range Ruler. The Distance Off Bottom value is also used by the software to trigger the starting point of the Bottom Triggered Gain (BT Gain). The bottom tracking tool also allows the user to manually set a fixed Distance off Bottom.

1. Select: Settings Menu -> Configure Bottom Tracking.



Bottom Tracking Window

2. Check 'Track Bottom'.
3. Select "Track By Signal" .
4. "Blanking Distance" sets the point which Sonar View starts looking for the bottom return. This skips past transducer transmitting, propeller wash, and close surface returns. 2 meters is a good starting point.
5. The "Threshold" control (0-100%) determines the minimum intensity signal used to calculate the bottom return. 20% is a good starting point.
6. The "Sensitivity" (0-50) sets how sensitive the bottom tracking algorithm is to detecting bottom, higher numbers increase sensitivity. Be aware, if the Sensitivity is set too high, debris floating in the water column may result in false readings, too low and it may not detect bottom at all. 40 is a good starting point.
7. Check "Draw Bottom Tracking Line" to display the bottom tracking line of the image. Select the "Line Color" to be displayed, choose a line color that will contrast the current signal color set.
8. The Bottom Tracking can also be set to a fixed distance by selecting 'Manual Distance' and scrolling to the desired value. This option should only be used if the bottom cannot be reliably tracked using 'Track By Signal'. For example, excess debris in the water column can cause errors in the signal tracking. Entering the distance manually, to a value determined by viewing the bottom return next to the Range Ruler, will allow the BT Gain to function correctly.

DELAY

Also commonly called ‘water column removal’ or ‘shift’. Generally, the fish is towed 4 to 8 meters off the bottom. If bottom conditions (trees, debris, etc) do not allow the fish to be towed close to the bottom or if the fish is attached to the boat using the pole mount, then a significant amount of display space may be wasted displaying the water column that exists between the tow fish and the ocean floor.

Example: If bottom conditions require the fish to be towed 10 m off the bottom, and we are operating in the 20 m Range position, then the top half of the display will be blank (displaying the ‘water column’). The ocean floor is printed in the middle of the display, with only 10 meters of the sub bottom strata occupying the bottom half of the display.

By setting the ‘Delay’ to a value of 10 meters, in the above example, the ocean floor would shift to the top of the display and 20 meters of sub bottom would be displayed. Another option would be to set the Range to 10m and the Delay to 10m; the first 10 meters of sub bottom will fill the display, allowing greater detail to be shown.

Using a combination of tow fish height, Range and Delay settings allows the display to be optimized for most tow conditions. Keep in mind that the best result will always be obtained by operating the tow fish close to the bottom.

ZOOM

To zoom in on an area:

1. Use the Standard toolbar zoom button ()
   a. Click on the zoom button.
   b. Click on the object you want to enlarge

To Zoom in on a larger area:

   a. Move the cursor to the top corner of the area you want to zoom on.
   b. Press and hold the left mouse button.
   c. Drag the cursor to bottom corner of the area you want to zoom.
   d. Release the left mouse button
   e. Zoom window will display the enlarged area.

2. Keyboard shortcut
   a. Move mouse pointer to top corner of the area you want to zoom.
   b. Press and Hold Ctrl Key on keyboard.
   c. Press and hold Left Mouse button.
   d. Drag the cursor over to bottom corner of the area you want to zoom in on.
   e. While still holding Ctrl key, release Left Mouse button.
   f. The Zoom window displays with the area enlarged.

The ping number and coordinates of the center of the zoom area are displayed in the area next to the file menu.

The size of objects in the zoom window can be measured as follows:

   a. Move the cursor to the top of the object you want to measure.
   b. Press and hold the left mouse button
   c. Drag the cursor to the bottom of the object you want to measure.
   d. Release the left mouse button.

In the upper left corner of the Zoom window is a “File” pull-down menu.
The options under the file pull-down menu are:

- Print zoom window
- Print setup
- Print Preview
- Save window as picture

MEASURE SIZE

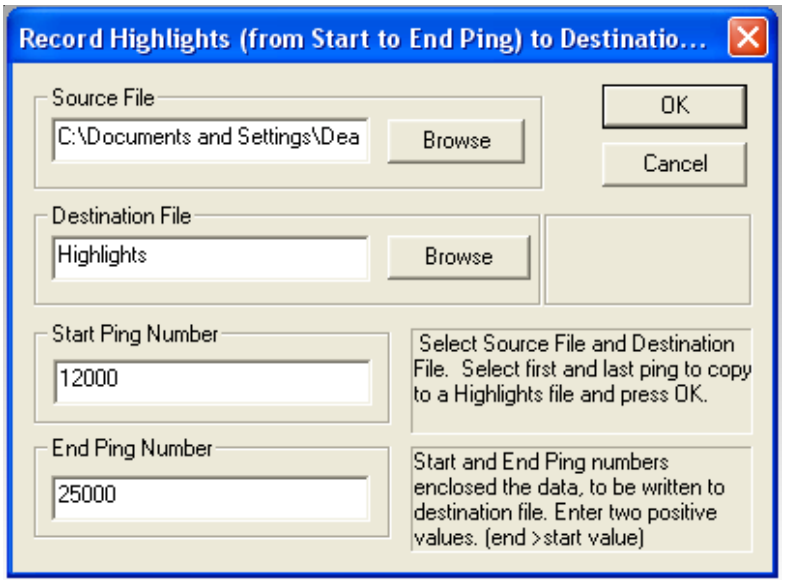
There are two ways to determine the size of a object:

1. Use the Standard toolbar size button
   a. Click on the Measure Size button ()
   b. Move the cursor to the top of the object you want to measure.
   c. Press and hold the left mouse button
   d. Drag the cursor to the bottom of the object you want to measure.
   e. Release the left mouse button.
   f. The size of the object is displayed in the Title bar of the sonar window.
2. Use the keyboard shortcut
   a. Move mouse pointer to top of the object you want to measure.
   b. Press and Hold Shift Key on keyboard.
   c. Press and hold Left Mouse button.
   d. Drag the cursor over the bottom of the object you want to measure.
   e. While still holding Shift Key, release Left Mouse button.
   f. The Size of the object displays to the right of the menus at the top of the Sonar View window

RECORD HIGHLIGHTS (under the **File** menu)

Allows the operator to create a new, smaller file containing any size portion of another previously recorded file.

1. Select "**Record Highlights**" from the "**File**" pull down menu. The "**Record Highlights to Destination**" box opens.
2. Select the source file location in the "**Source file"** box.
3. Select the destination file location in the "**Destination file**" box.
4. Select the ping number to begin record from in the "**Start Ping Number**" box.
5. Select the ping number to end recording at in the "**End Ping Number**" box.
6. Click mouse on **OK** when selections are complete.



SONAR VIEW for Sub Bottom Profiler SOFTWARE INSTALLATION

Before connecting the Sub Bottom Profiler system to your PC for the first time it is necessary to install the JW Fishers *SONAR VIEW for Sub Bottom Profiler* software, the required hardware drivers, and configure your PC for use with your JW Fishers Sub Bottom Profiler system. Follow the instructions on the next five pages to complete this process.

If you have purchased a complete Sub Bottom Profiler system (including the computer) from JW Fishers then the Sonar View software and related hardware have already been installed, configured and field tested. You can skip the installation instructions and go directly to **"Connecting the Cables"** on page 32.

IMPORTANT INFORMATION:

Before proceeding to the hardware and software installation, optimize the performance of your PC. To optimize the performance of your computer for running SONAR VIEW software, it is recommended that the user not allow MS Windows to control the performance of the computer. Instead the user should set up the computer for best performance.

TO SET YOUR COMPUTER FOR BEST PERFORMANCE DO THE FOLLOWING:

(Windows 8)

1. Press the Windows Key and 'X' at the same time. Select "Control Panel" from the menu that appears.
2. From the control panel window select "Hardware and Sound".
3. Next select "Power Options".
4. From the menu on the left select "Create a Power Plan".
5. When prompted choose to create a plan based on "High Performance", click Next.
6. Set "Turn off Display" and "Put Computer to Sleep" to never for "On Battery" and also for "Plugged in."
7. Click the "Create" button.
8. Return to the main Control panel window.
9. Select "Appearance and Personalization".
10. Select "Personalization".
11. Locate and choose "Screen Saver" choose "None".
12. The settings are now complete. Close the control panel.

(Windows 7)

1. Click on the Windows START button on the lower left corner of the screen.
2. Click on "Control Panel"
3. Double click on "SYSTEM AND SECURITY"
4. Click on "SYSTEM" (Right side list)
5. Click on "ADVANCED SYSTEMS SETTINGS" (Left side menu)
6. In the "PERFORMANCE" section select "SETTINGS"
7. Under "SETTINGS" select "Adjust for best performance"
8. For laptop - configure power management settings for optimum performance regardless of power source (AC or battery) .

(Windows XP)

1. Click on the Windows START button on the lower left corner of the screen.

2. Click on “Control Panel”

3. Double click on “SYSTEM”

4. Under System Properties select the Advanced Tab

5. In the “PERFORMANCE” section select “SETTINGS”

6. Under “SETTINGS” select “Adjust for best performance”

7. For laptop - configure power management settings for optimum performance regardless of power source (AC or battery).

When the sonar is actively scanning, you may not touch the PC for quite some time. To prevent the Screen Saver from activating, or the PC going into “Sleep Mode”, set the Power Management settings as shown below

TO DISABLE SCREEN SAVERS AND CONFIGURE POWER MANAGEMENT SETTINGS DO THE FOLLOWING:

8. Click on the Windows START button on the lower left corner of the screen.

9. Click on “Control Panel”

10. Double click on “DISPLAY”

11. Click the “SCREEN SAVER” tab

12. Choose “None” from the list of available Screen Savers

13. Click on the “POWER” button

14. Set “Turn off Monitor”, “Turn off Hard Disks”, etc. to NEVER

SONAR VIEW for Sub Bottom Profiler SOFTWARE INSTALLATION

Operation of the *SONAR VIEW for Sub Bottom Profiler* software requires three software programs to be installed on the PC. The installation CD will automatically launch the hardware driver and sonar software installation programs. The first program, InstaCal, is required for the PC to control the integrated Interface board (analog to digital board). The second program is a USB to Serial Driver. This program is required for the PC to communicate with a serial GPS. *SONAR VIEW for Sub Bottom Profiler* is the actual operating software. All Software must be installed before the Sonar Processor is connected to the computer with the included splash proof USB cable.

***Do not connect the USB cable from the Sonar Processor to your PC at this time. You will be prompted to do so later in this installation.**

1. Start PC

2. Insert *SONAR VIEW for Sub Bottom Profiler* Installation CD into CD or DVD drive.

3. The JW Fishers *SONAR VIEW for Sub Bottom Profiler* banner should appear. If it does, Skip to step 5

4. If the *SONAR VIEW for Sub Bottom Profiler* banner box does not open within 60 seconds, the installation can be performed from Windows Explorer.

   A. Open Windows Explorer from the Start / Programs menu.
   B. Select JWF – *SONAR VIEW for Sub Bottom Profiler* . Click on Setup.exe. This will start the installation program.

5. The 'InstaCal for Windows' program will automatically install.

6. After the InstaCal installation is complete, The' FTDI CDM Drivers' installer opens. Click 'Extract' to continue.

7. The ' Welcome to the Device Driver Installation Wizard' box will appear. Click 'Next' to continue.

8. The FTDI drivers will now install. When the status indicates "Ready to use" click 'Finish" to complete this step.

9. The 'Welcome to JW Fishers *SONAR VIEW for Sub Bottom Profiler* Setup Wizard' box opens. Click 'Next' to continue.

10. The customer information box opens "Enter your name, and organization, then Click 'Next'.

11. The 'Activate Coverage Map' box opens.
    - If you purchased the Sonar Coverage Map option, Enter the Unlock Code provided by JW Fishers
    - If you did not purchase the Sonar Coverage Map option, leave the Unlock Code field empty

12. Click 'Next'.

SONAR VIEW for Sub Bottom Profiler SOFTWARE INSTALLATION IS CONTINUED ON NEXT PAGE

SONAR VIEW for Sub Bottom Profiler **SOFTWARE INSTALLATION** (CONTINUED)

13. The "Select Installation Folder' box opens. The default folder is the Program Files (x86) typically located on the C:\ drive. This should only be changed if either the Windows or Program Files folder is not located on the C:\ drive. Click 'Next'.

14. The 'Confirm Installation' box opens. Click 'Next'.

15. The *SONAR VIEW for Sub Bottom Profiler* software installation will complete. Click 'Close' in the 'Installation Complete' box.

16. A message box will appear stating 'You must restart your computer for the configuration changes made by JW Fishers *SONAR VIEW for Sub Bottom Profiler* to take effect. Click on 'Yes, I want to restart my computer now' and 'OK' to complete the InstaCal installation.

17. Remove the Installation CD from the drive now.

18. While the PC is rebooting, follow the instructions in the Sonar Processor cover to cable and power up the Sonar Processor.

***Do not connect the USB cable from the Sonar Processor into your PC at this time.**

19. Once Windows is fully loaded, the Sonar Processor is fully cabled and the power is ON, connect the USB cable from the Sonar Processor to the PC.

SONAR VIEW for Sub Bottom Profiler **SOFTWARE INSTALLATION IS CONTINUED ON NEXT PAGE**

The first time you connect the Sonar Processor SP to PC Interface (USB Cable), Windows will automatically install the device drivers. Allow about 1 minute for this process to complete.

InstaCal program - Interface board configuration and calibration

Before the *SONAR VIEW for Sub Bottom Profiler* can be used for the first time, the InstaCal program must be run to configure the Interface board which is integrated into the Sonar Processor. This program must also be run whenever the Sonar Processor is used with a different PC. The SP to PC interface (USB Cable) must be connected before running this program.

1. Press the Windows Key and 'X' at the same time. Select "Search" from the menu that appears.

2. Type "InstaCal" into the search box.

3. The InstaCal program Icon should show below the search box, click the icon to launch the InstaCal program.

4. When the InstaCal software starts a 'Plug and Play Board Detection' window should open.

5. 'USB-204' should show in the 'Plug and Play Board Detection' window. Click 'OK'

6. Board #0 - USB-204' should show in the board list window.

7. Exit the InstaCal program.

THE HARDWARE AND SOFTWARE INSTALLATION IS NOW COMPLETE.

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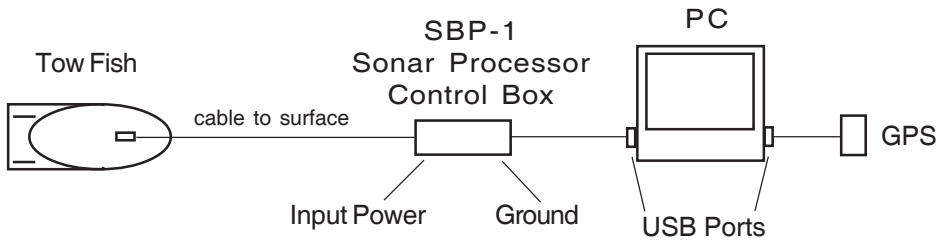
CONNECTING THE CABLES

The drawing below shows the cable connections between the sub bottom tow fish, the Sonar Processor, the boat's GPS system, and the PC. A description and picture of each of the Interface cables is shown below.



1. Attach the Tow Fish Cable to the Sonar Processor

2. Connect power to the system components -

   Sonar Processor:
   The Sonar Processor requires 12 volts dc. A separate battery that is not connected to the boat's electrical system should be used to power the Sonar Processor. If only AC power is available, the sonar processor can be powered by the supplied ac power supply, which converts 100-240vac to 12vdc.

   If you are using the optional Splash proof ultrabright PC:
   The optional Splash proof ultrabright PC requires 12 volts dc. You should power the Splash proof PC from the same 12 volt battery used to power the Sonar Processor. If only AC power is available, the Splash proof PC can be powered by the supplied ac power supply, which converts 100-240vac to 12vdc.

   If you are using a laptop PC:
   The laptop PC should be powered by the internal rechargeable battery. If the internal rechargeable battery is low you can power the laptop computer from 120 volts ac or 230vac using the AC Power Supply included with the computer . An optional travel charger is available that allows you to power the laptop directly from the 12vdc battery (this also recharges the internal battery).

3. Connect Water Ground:
   To reduce outside electrical interference (noise on the sonar image), connect a wire (included) from the "Ground" terminal on the Sonar Processor panel directly to a piece of metal that goes into the water.

4. Boot the PC into Windows. Wait until Windows is fully loaded before continuing.

5. Connect the Sonar Processor PC USB Interface cable to an open USB port on the PC (Shown at right).

6. Wait 10 seconds for Windows to register the Sonar Processor.

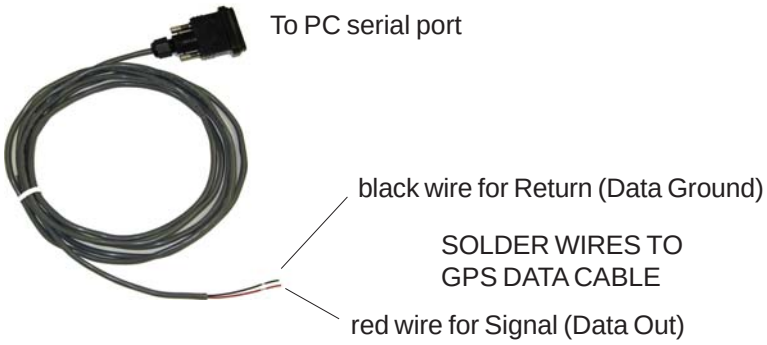
SP to PC Interface
Splash Proof USB Cable

CONNECTING THE CABLES (continued)

7. Connect the data cable from a GPS receiver to an open USB or serial port on the PC. See page 36 for information about configuring the GPS.

If the data cable for your GPS has a 9 pin “D” connector on the end (for a PC serial port), it will connect directly to an available serial port on the PC.

If the data cable for your GPS has bare wire leads on the end, you will need to splice the appropriate wires to the cable shown below. If your GPS did not come with a data cable, one can be obtained from the GPS retailer or manufacturer. There are usually a variety of cables available, many also include connections for an external power source for the GPS. We recommend using an external power source as using the GPS with the data output consumes a set of small batteries in a few hours.



OPERATION

Over the next few pages we will cover operation the Sub Bottom Profiler. We will begin with “Sample Playback” where the user will playback a prerecorded file and then do an actual scan “in the water” Sample Recording.

For the sample Playback the computer with the loaded *SONAR VIEW for Sub Bottom Profiler* software is needed. A sample file is provided as part of the software.

For the Sample Recording, a complete “cabled up” system is required: Fish, Sonar Processor, and Computer with loaded Sonar View software (your GPS is optional). For your first time out pick an easy body of water. The ideal location would be in a calm body of water 20 to 30 feet deep with a known bottom composition. It could be in a lake, slow moving river, or in a harbor or a bay area of the ocean.

SAMPLE PLAYBACK

It is recommended that before beginning use of the PC sub bottom profiler, the operator practice playing back the sample file(s) in the program. This will help familiarize the operator with some of the system features. To playback a sample file follow the steps below.

1. Open the *SONAR VIEW for Sub Bottom Profiler* program. Under the File heading on the toolbar click Open. Select the sample file from the sample file stored on the hard disk. The default location of the sample files is: Program Files(x86)\JW Fishers\SONAR VIEW for Sub Bottom Profiler\Sample Data Files
2. Click the Playback button on the toolbar on the top of the screen. The Playback button is the single blue arrow pointing to the right. The saved file will begin to play.
3. Using the toolbar on the left of the screen, click on the invert color button and note how the sonar image changes.
4. Change the selection on the colors menu next to the COLOR button, and note how the sonar image changes.
5. When playing back files clicking the mouse on the Fast Forward or Rewind buttons on the toolbar will fast advance or reverse the file playback.
   - Click the Rewind button on the toolbar on the top of the screen. The Rewind button is the double blue arrowhead pointing to the left. The double blue arrowhead with the line in front is the Rewind to beginning of file button. Using the Rewind button the operator can rewind the file being played to any point on the recorded file. Click the Stop button when the file is rewound to the desired place (The Stop button is the black square.). Click the Playback button to continue playing the file.

   - Click the Fast Forward button on the toolbar on the top of the screen. The Fast Forward button is the double blue arrowheads pointing to the right. When the file is advanced to the desired place, click the Stop button and then the Playback button to continue reviewing the file.

6. To measure a target on the screen click the measure button on the toolbar (see page 24). Click the mouse arrow on one end the target and while the mouse button down, move the mouse arrow to the other end of the target and release the mouse button. The size of the target will be displayed at the top of the display, to the right of the menus
7. Try using other buttons on the toolbar and note their effect on the sonar image. Some buttons cannot be used with recorded files such as the Range, Delay, Boat Speed and TVG Gain. These parameters were set when the file was originally recorded and can not be changed during playback mode. Controls that can be adjusted during playback are Color, BT Gain, and Threshold.
8. Select, under the View menu, Analog Signal Display. Observe the displayed analog signal that is the result of the TVG adjustments.

When you are comfortable with the controls during playback it's time for an "in water test". Sample Recording is next.

SAMPLE RECORDING

CONFIGURING YOUR GPS

When you run the *SONAR VIEW for Sub Bottom Profiler* software for the first time it will be necessary to configure the software to open the correct COM (serial) port for GPS communications. To select the COM (serial) port number that the software will use:

1. Follow the instruction on the Sonar Processor Box cover to cable and power up the Sub Bottom Profiler system. Connect the GPS to the computer using an available serial port or the supplied USB to Serial converter. Launch the *SONAR VIEW for Sub Bottom Profiler* application.
2. Open the "Settings Menu" and select "Select GPS Serial Port Number"
3. If only one COM port is shown, select the listed COM port. The GPS data should appear in the lower status bar after a short delay.

4a. Hardware COM ports are typically listed as COM1 or COM2. Select the appropriate port.

4b. If you are using a USB to Serial Converter and only one COM port is shown, select the listed port.

4c. If you are using a USB to Serial Converter and more than one COM port is shown,

   i. Write down the list of available ports then close the SONAR VIEW for Sub Bottom Profiler application.
   ii. Disconnect the USB to serial Converter; launch the SONAR VIEW for Sub Bottom Profiler.
   iii. Open the "Settings Menu" and select "Select GPS Serial Port Number". Compare the listed COM Ports with the written list. The missing port is the correct port.
   iv. Close the SONAR VIEW for Sub Bottom Profiler application.
   v. Connect the USB to serial Converter, launch the SONAR VIEW for Sub Bottom Profiler.
   vi. Select the appropriate port from the "Select GPS Serial Port Number" menu.

5. Close all open windows.

If GPS data is displayed in the lower status bar no further configuration is required for the GPS

If you were unable to locate the correct COM port or GPS data is *NOT* displayed in the lower status bar, refer to Advanced GPS Configuration on page 44.

SAMPLE RECORDING

The ideal location for the first "in the water" tow test is in a calm body of water 20 to 30 foot deep. It could be in a lake, slow moving river, in a harbor, or a bay area of the ocean.

Running the Sub Bottom Profiler is a full time operation, at least during the learning phase. It is recommended that one person run the boat while the other operates the SBP.

Unless you have JW Fishers Ultra Bright “Splash Proof” PC, viewing a computer display on a bright sunny day can be very difficult. Also operating out of an open boat, with splashing water and spray, could cause serious damage to the computer. Take the necessary precautions to protect the computer.

Install the tow arm on the fish, it will not tow correctly without it.

Cable up the system (follow instructions on page 32 or on the inside cover of the Sonar Processor) and apply 12 vdc to the Sonar Processor (120 vac power from ship power, or from a small gas generator set, can be used with the 120/240 vac to 12 vdc wall charger). Do not power up the Sonar Processor at this time (Computer **must be powered** up and running first).

1) Power up the computer.

2) With the boat underway 1-3 kts, lower the fish over the side. Let out enough cable so that the fish is about half way down to the bottom. Position the cable so that it is not running next to the motor (electrical noise from the ignition). Be careful not to run the cable near the boat’s propeller. In shallow water avoid towing the fish in the path of the prop wash.

   If you are operating in shallow water, less than 5 meters, it may be easier to use the pole mount with the tow fish mounted to a fixed position on the boat See page 46 for information about using the pole mount.

3) Power up the Sonar Processor **after** the computer has booted up (the computer will not properly recognize the Sonar Processor if the Sonar Processor is powered up first).

4) Connect the GPS to an available serial port or USB port using the supplied USB to Serial converter

If you have problems or questions at any time please fax, call, or email the factory

Proceed to the next page for the software operating instructions

SAMPLE RECORDING (continued)

The procedure below provides an example on how to record a file and will step you through some of the recording options. The complete system needs to be cabled up and ready to go.

1. Open the SONAR VIEW for Sub Bottom Profiler application. The software will automatically enter Monitor Mode. Monitor Mode will allow you to view the sub bottom data without recording it. Recording will come later (step 8).

2. In the 'Settings' menu, select 'Cable Length'. Select the value that is closest to the length of your tow fish cable.

3. Select a scan range under "Range" on the control toolbar at the left of the screen. There are 6 range settings between 10 and 300 meters. Longer range settings can be used if the fish must be towed from closer to the surface or pole mounted from the boat in deep water. Shorter ranges settings produce higher resolution images and are recommended when the tow fish can be towed reasonably close to the bottom. For most applications, a Range setting of 20 or 40 meters will give the best result. If the water depth is unknown, a longer range can be used at first to help locate the bottom. See page 23 for a detailed explanation of combining "Range" with "Delay" settings.

4. Select a Boat Speed under "Boat Speed" on the control toolbar. The boat speed selected should be close to the actual speed of the boat (for correct aspect ratio of the image on the display). When towing, the slower the actual boat tow speed (1-3 kts.) the better the image. If the GPS connected to the computer outputs a speed, select "AUTO" from the boat speed box on the screen. When available, "Auto Speed" from the GPS will give the best results.

5. Select a color palette under "Colors" on the left toolbar. The color combinations allow the sonar image to be displayed in various shades of colors. The best color is a matter of operator preference although at times a sonar image can appear to be more distinct in one particular color. For this exercise select Bronze from the Colors list. A zero return will display black and the hardest return will display white. The water column (distance off bottom) will be black (no signal return) with this Color selected. Selecting 'Invert' reverses the color scheme.

6. Make a preliminary setting of the TVG. Start with a setting of 30dB. Once the bottom is found and the fish tow depth and Range setting are established, the TVG setting can be fine tuned.

   While making the TVG adjustments, observe the Analog Signal Display on the right side of the display (see page 16 for location). When the TVG is properly adjusted, the strongest return signal will cause the Analog Signal to just reach it's maximum possible value. For this adjustment, disregard the strong signal at the top of the screen, it is the transmit pulse.

   Note: When recording, it is important to have the TVG properly adjusted. If a file is recorded with the TVG set too high, causing the signal to "saturate" the amplifier, detail lost in the saturated portion of the image cannot be recovered in playback. It would be preferable to have the TVG set slightly too low than too high; in Playback, the image can be fine tuned using the BT Gain and Screen Gain settings.

   Note: If you are operating in very shallow water, less than 2 meters, reduce the transmit power by selecting "Shallow Water" in the "Settings" pull-down menu. Increase the TVG value.

SAMPLE RECORDING (continued)

7. From the Settings menu, select 'Configure Bottom Tracking' (see page 22). Select 'Track Bottom'. Select 'Track by Signal'. Set the 'Blanking Distance' to 2, 'Threshold' to 20, and 'Sensitivity' to 40. Select 'Draw Bottom Tracking Line' and choose a 'Line Color'. These values will provide a good starting point for accurate bottom tracking. The Bottom Tracking feature provides the value displayed as 'Distance Off Bottom'. It also sets the starting point for the 'Bottom Triggered Gain', a software TVG that allows adjustment to the display of the sub bottom portion of the image.

8. Set the 'BT Gain' (Bottom Triggered Gain). This feature adds additional TVG gain starting at, and below, the depth determined by the Bottom Tracking. This setting, and it's resulting increase in signal strength, is not recorded. It can be adjusted during recording and readjusted during playback. A setting of 0.5 to 1.0dB is a good starting point.

9. SONAR VIEW is now ready to begin displaying and recording sonar data. To record a new file you can:
    1. Click the red button on the Standard Toolbar

--OR--

    2. Select "Record New File" under the "File" pull down menu on the top toolbar (or Press the "F1" key.)

The "Record New File" dialog will open. Sonar View automatically suggests a file name based on the current date. You can use the auto file name or enter your own file name and select a location to store the file. The sonar data will be displayed on the PC monitor and recorded to the hard drive. When the file size reaches 200 Mb a message box stating "File size exceeds 200 Mb" will be displayed. When this occurs It is recommended that a new file be started.

While the sonar data is being recorded the settings can be changed at any time. Select a new Range setting, color scheme, etc. and note the change in the sonar image. Raise and lower the tow fish

Once the file has been recorded, play it back to view the results. Experiment with the file by changing the settings and noting the results on the displayed image.

NOTES:

• It is recommended that several hours be set aside for making test runs at known targets. Your skills at running the SBP and interpreting the display will improve dramatically with 3-4 hours of making passes in areas of known depth and bottom composition..

• Recorded data can be copied to a thumb drive, CD or DVD for transport for archiving. Sonar View can **NOT** playback data that is stored on a thumb drive, CD or DVD. To playback data from a thumb drive, CD or DVD, you must first copy the data from the thumb drive, CD or DVD to the PC's hard drive, and then use Sonar View to playback the data from the hard drive.

If you have problems or questions at any time please fax, call, or email the factory

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Troubleshooting

Problem: Mouse Cursor jumps randomly on the screen

As soon a NMEA-0183 GPS is connected to PC Mouser cursor jumps all over screen. This is caused when Microsoft Windows mistakenly classifies a NMEA-0183 GPS as a “Microsoft Serial Ball Point” device.

Solution:

1. Create the problem by booting the PC with a GPS connected.
2. Once Windows is fully loaded, disconnect the GPS
3. Open Device Manager by pressing the Windows Key and ‘X’ at the same time and selecting “Device Manager from the menu that appears
4. Locate the “Microsoft Serial Ball Point” device under “Mice and Other Pointing Devices”
5. RIGHT mouse click on the “Microsoft Serial Ball Point” device
6. Select “DISABLE” from the pop-up menu that appears.
7. A message will appear stating “Disabling the device will cause it to stop functioning”
8. Click the “YES” button.
9. Close all open Windows then reconnect the GPS to confirm the problem is resolved.

Troubleshooting (continued)

Problem: "A Required Interface Board Was Not Found" message

JW Fishers Sonar systems use an interface board to capture the analog sonar signal and convert it to digital data which the software can then process. The driver software for this interface board is installed as part of the JW Fishers Sonar application installation process. After the JW Fishers Sonar application installation process is completed and before the sonar system is run for the first time, a program to configure the interface board must be run. This program must also be run whenever the Sonar Processor is used with a different PC.

USB Systems:

The SP to PC Interface (USB) Cable must be connected to the Sonar Processor and PC

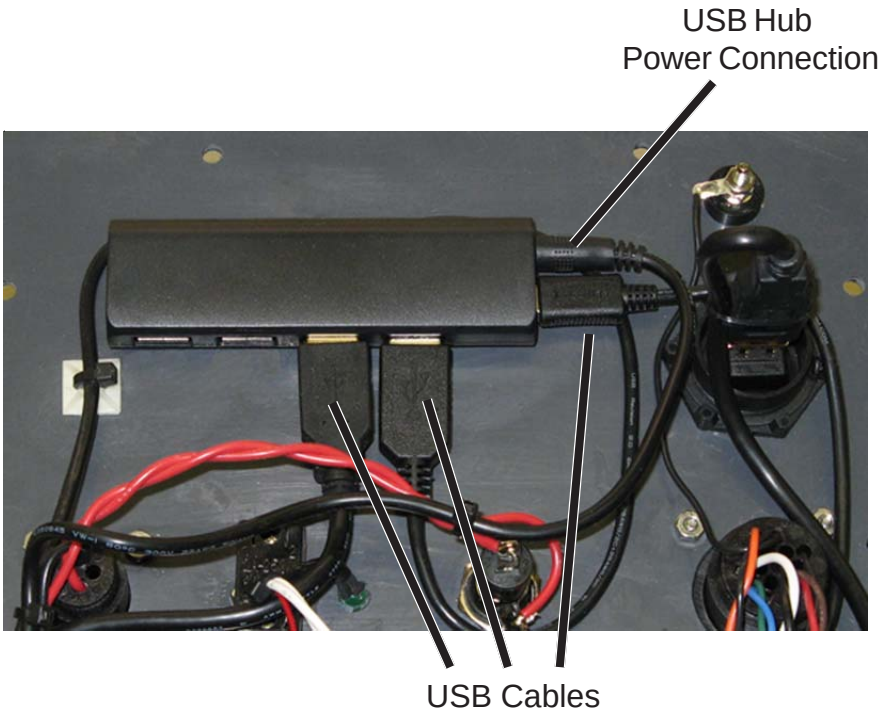
1. From the Start menu select Programs / Measurement Computing / InstaCal.
2. The InstaCal software starts.
3. A 'Plug and Play Board Detection' window should open. USB-204 should show in the window. Click 'OK'
4. 'Board #0 - USB-204' should show in the board list window.
5. Exit the InstaCal program.

If InstaCal reports "USB-204 with serial #xxxxx is stored in CB.CFG but has not been detected...", click the "CANCEL" button and follow the instructions on the next page to reseat the USB cables inside of the Sonar Processor box.

Reseating the USB Cables Inside of the Sonar Processor

1. Disconnect the Sonar Processor USB cable from the computer.
2. Disconnect power from the Sonar Processor.
3. Remove the eight (8) silver screws from the perimeter of control panel and carefully lift the panel up towards the sonar processor cover .
4. One at a time, disconnect and reconnect each of the ends of the USB cables shown in the photograph below. There is a USB hub mounted to the control panel. Disconnect and reconnect each of the (3) USB and (1) power connections to the USB HUB.
5. Lower the panel, reconnect power then reconnect the USB Cable to the computer and retest the system. Once you have confirmed the problem is resolved, secure the control panel using the silver screws removed in step #3

View of USB Hub



APPENDIX A

Advanced GPS Configuration

The SBP accepts standard NMEA 0183 information obtained from a PC connected GPS or Loran C receiver to display your boat's heading and position (Latitude and Longitude). For most GPS systems you will need to enable the data output, select a version of NMEA 0183 to output and select the output's baud rate (data speed). These selections are usually made through your receiver's Setup menu. Please refer to your GPS or Loran C users manual for detailed instruction.

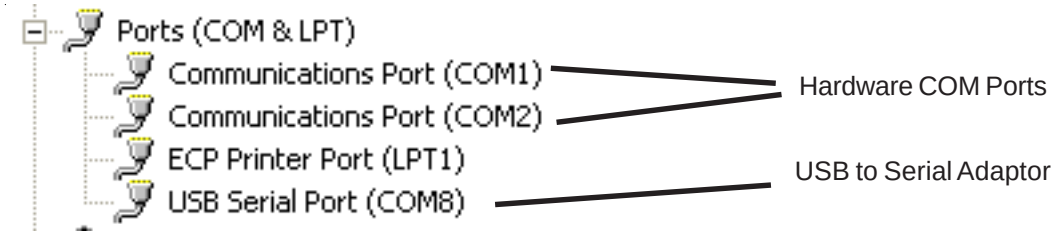
NMEA 0183 Standard version – The NMEA 0183 interface standard has evolved to accommodate new technologies in communications for marine navigation. As a result, most GPS receivers offer a choice of which NMEA 0183 revision is sent to its data output. The SBP can obtain the boats position and heading and speed information from a variety of data sentences available in many of the revisions. The sentences SONAR VIEW recognizes are GLL, GGA, VTG and RMC. It is usually best to select the latest revision. If, after selecting a revision, either the position or heading is missing, try selecting another revision.

Baud rate – The SBP uses the industry standard speed of 4800 baud for the NMEA 0183 interface. If your receiver offers a selection of alternate baud rates, select 4800.

If you were unable to locate the correct COM (serial) port:

If you were unable to locate the correct COM (serial) port using the procedure on page 36, below are advanced instructions for locating the appropriate COM (serial) port.

1. Connect the USB to Serial Converter to the Computer and connect the GPS to the USB to Serial converter.
2. Press the Windows Key and 'X' at the same time. Select "Device Manager" from the menu that appears.
3. In the Device Manager window a list of your computers hardware will be shown. Click on the '+' symbol next to 'Ports (Com & LPT)'. If this is not shown, make sure the Sonar Processor power is ON and the Sonar Processor is connected to the PC with a USB Cable.
6. After clicking on 'Ports (Com & LPT), one or more items will be shown. Look for the item that refers to your USB to Serial Adapter, it will be something like 'USB Serial Com Port (COM8)' . Note which COM port number has been assigned to the USB to Serial Adapter.



7. Close all open windows.
8. Follow the instructions on page 36 to select the correct COM port in the *SONAR VIEW for Sub Bottom Profiler* software

APPENDIX B

KEYBOARD SHORTCUTS

- Record New File **F1**
- Quick Save Main Screen As Picture **F2**
- Quick Save Zoom Window As Picture **F3**
- Open file for Playback ..... **CTRL + 'O'**
- Print Screen ..... **CTRL + 'P'**

- Zoom ..... **CTRL + Left Mouse Btn**
  .....Press and hold CTRL
  .....Click Left Mouse on object to enlarge

  To Zoom in on a larger area:
  .....Press and hold CTRL + Left Mouse Button
  .....Drag the cursor from the top left corner to the bottom right corner of the area you want to enlarge
  .....While still holding CTRL, release the Left Mouse Button

- Measure Size ..... **SHIFT + Left Mouse Btn**
  .....Press and hold SHIFT + Left Mouse Button,
  .....Drag the cursor across the object you wish to measure
  .....While still holding SHIFT, release the Left Mouse Button
  .....The size of the object is shown in the Sonar Window Title Bar

KEYBOARD SHORTCUTS FOR OPTIONAL SONAR COVERAGE MAP

- Zoom In ..... **'+'**
- Zoom Out ..... **'-'**
- Center Map On Boat Position ..... **'C'**
- Shift Map Center ..... **Arrow Keys**
- Shift Map Center North ..... **'U'**
- Shift Map Center South ..... **'D'**
- Shift Map Center East ..... **'R'**
- Shift Map Center West ..... **'L'**
- Maximize Window or Restore to Previous size **F11**
- Measure Distance ..... **SHIFT + Left Mouse Btn**
  .....Press and hold SHIFT + Left Mouse Button,
  .....Drag the cursor across the distance you wish to measure
  .....While still holding SHIFT, release the Left Mouse Button
  .....The size of the object is shown in the Map Window Title Bar

APPENDIX C

Pole Mounting the Tow Fish

For shallow water operations, pole mounting the tow fish to the vessel may be preferable to towing. The pole mount should only be used when the water condition is calm. Remove the tow fish from the water when traveling to and from the search area. While the tow fish is deployed in the water, the vessel speed should not exceed a few knots.

The tow fish is equipped with a flange for coupling to a standard 1 3/8" (outside diameter) galvanized fence pipe, supplied by the user. A 3/8" clevis pin and clip is supplied to secure the pipe to the flange.

A 3/8" hole to accommodate the clevis pin must be drilled through the pipe. Insert the pipe fully into the flange. Mark the center of the front and rear holes on the pipe. Use a punch to make indentations on the marks. Start the hole by drilling with a small diameter drill bits, working up to a final size of 3/8".

When using the pole mount, the ballast weight is not used. Remove the 3 thumb screws that secure the ballast weight to the front of the tow fish. Store the weight and thumb screws for use on the next towing operation. The tow fish will not tow correctly from the cable without the weight installed!

There are two bolts that secure the tow arm to the tow point on the top of the shroud. If desired, the upper bolt can be removed, allowing the tow arm to pivot into a vertical position. The tow cable can be secured to the pipe and vessel for added safety.

Mounting Location:
When pole mounting the tow fish to the vessel, it is important to chose the best location to insure optimum performance. Avoid mounting the tow fish in a location where it would be subject to excess vibration or turbulent water.

Choose a location near the midpoint along the length of the vessel. This location will insure the least amount of up and down movement caused by swells and waves.

Mount the tow fish on the side of the vessel where the propeller blades are normally moving downwards. In this location, pressure waves from the props are directed down and away from the tow fish. Generally, the tow fish should be mounted a few feet from the side of a small boat, more for larger vessel.

The tow fish should be mounted deep enough into the water such that the top of the tow fish shroud never breaks the surface of the water.

The tow fish should be mounted so that the base of the tow fish is parallel with the surface of the water and the front of the tow fish is pointing in the direction of travel.

Each vessel’s mounting requirement is different. It is the operator’s responsibility to see that a safe and secure mount is constructed.

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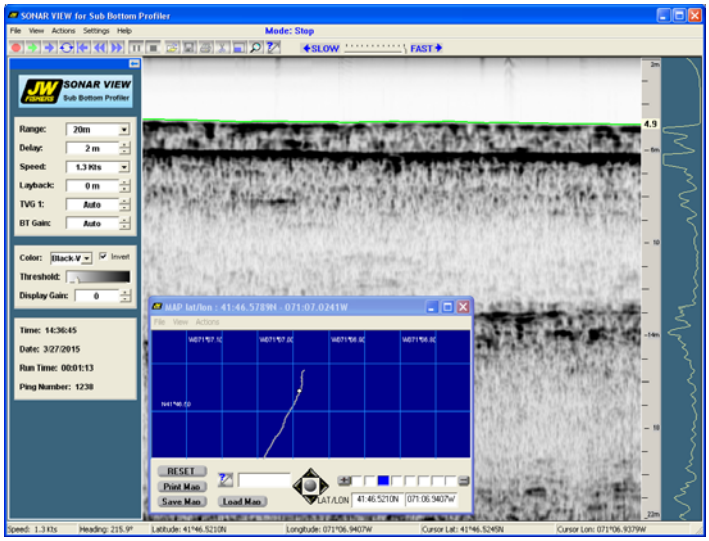
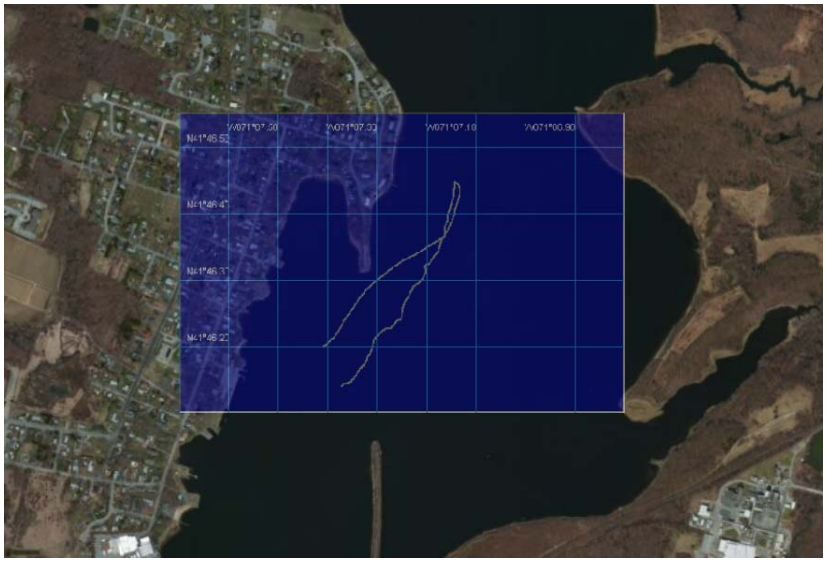
SBP Sonar Coverage Map
(option - can be purchased anytime)

Call or email factory (see below) to purchase and activate



Sonar Coverage Map is in a separate resizable window



Sonar Coverage Map can be exported and overlaid on other mapping programs

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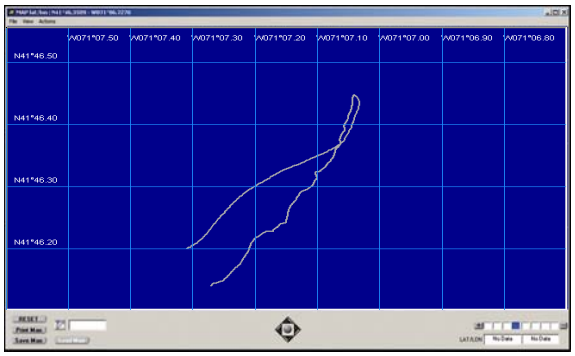
Sub Bottom Profiler Coverage Map (option - can be purchased anytime)

The SBP Coverage Map uses GPS or Loran information to generate a map representing the ground covered when scanning with your JWF Sub Bottom Profiler. This coverage map allows thorough scanning of an area.



Sub Bottom Profiler Sonar Map Window

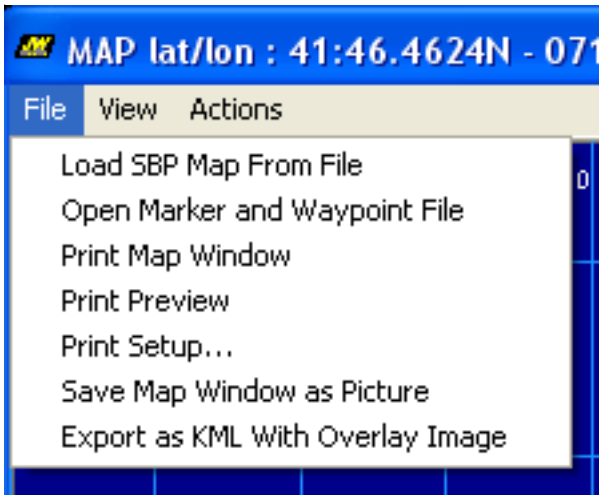
The coverage map has a variety of tools to make the job easier.

- Ground covered by the SBP is shown.
- Two different types of navigational aid markers can be placed on the coverage map window. Markers showing user defined waypoints and general purpose markers aid in navigation and relocating previously scanned targets.
- Waypoint and general purpose marker location information can be defined during operation or imported from a stored text file.
- Waypoint and general purpose marker location information can be edited during operation.
- A compass-type window displays the range and bearing to a selected navigational aid marker.
- A measurement tool allows quick distance measurements.
- If survey data is stored in several different files, you can play back the files consecutively and the map will retain the previous file's coverage information, allowing the area that has been scanned for the entire job to be displayed on one map.
- The coverage map can be easily cleared at any time during operation providing a clean slate to start fresh scans.
- The latitude and longitude of the mouse cursor are displayed in the title area of the coverage map window.
- A tool bar with commonly used controls is displayed in the lower portion of the coverage map window. This toolbar is automatically hidden if the map window size is reduced too much, allowing the window to be dedicated to displaying the coverage map. These toolbar controls are still accessible through the map window menu.

- The current Boat latitude and longitude are displayed in the lower right corner of the coverage map window.
- The map grid lines are labeled in Latitude and Longitude, defining the current view area
- The current viewing area can easily be changed to a variety of different “Zoom Levels”
- The map window can be shifted left, right, up, or down from the current boat position. This allows you to view previously scanned areas or markers that are outside of the current view.
- The map window can be printed or saved as a bitmap image.

Menus:

There are three pull down menus in the Sonar Coverage Map window. FILE, VIEW, and ACTIONS. The selections available under each heading are:



File:

Load SBP Coverage Map From File – Opens and displays a Sonar Coverage Map Data File.

Open Marker and Waypoint File – Opens a properly formatted file containing information on navigational aid markers and waypoints.

Print Map Window – Prints the map window as shown on the monitor.

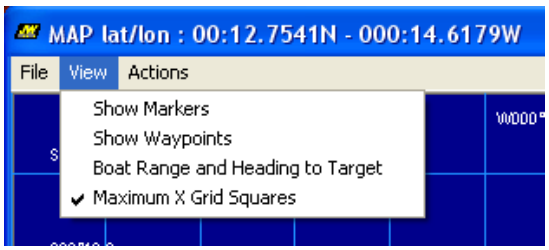
Print Preview – Shows how the image will look when printed.

Print Setup – Allows the operator to select the printer and various options such as the paper size and orientation of the image on the page.

Save Map Window as Picture - Saves the image of the Sonar Coverage Map window as a bitmap file.

Export As KML With Overlay Image - Saves the Sonar Coverage Map as a bitmap image and generates a KML file which allows the sonar coverage map to be overlaid in mapping programs such as Google Earth and ArcGIS Explorer.

View:



Show Markers

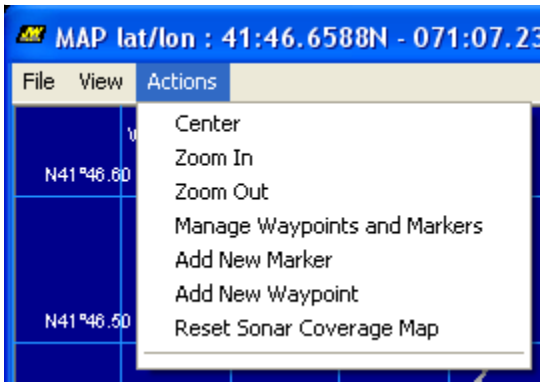
Show Waypoints –

Selects whether or not to display Markers and Waypoints on the Map

Boat Range and Heading to Target - Opens the Boat Range and Heading to Target Window.

Maximum X Grid Squares – When this option is selected, the coverage map window shows the maximum area allowed by the current zoom level. When this option is not selected, the Sonar Coverage Map displays only a small portion of the maximum area allowed by the current zoom level. Resizing the window (larger) shows a greater area.

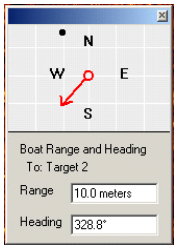
Actions:



Center – Centers the Coverage map on the current boat position.
Zoom In – Increases the current zoom level
Zoom Out – Increases the current zoom level.
Manage Waypoints and Markers – Opens a control that allows the Select which Waypoints and Markers to display on the Map and edit existing Waypoints and Markers.
Add New Marker – New window is displayed for making a new Marker
Add New Waypoint – New window is displayed for making a new Waypoint
Reset Sonar Coverage Map – Clears all previous sonar coverage information from the Map.

Tools:

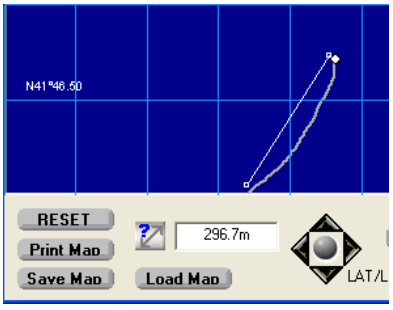
There are variety of tools available to assist in navigation and scanning targets



Range and Bearing to Target – This tool window shows the operator the range and bearing to a target. Selecting targets is accomplished by simply clicking on a navigational aid marker.

Measurement Tool – This tool allows the operator to measure distances on the coverage map. To measure a distance:

1. Click on the Measure Distance button ( )
2. Move the cursor to the starting point of the distance you want to measure.
3. Press and hold the left mouse button
4. Drag the cursor to the end point of the distance you want to measure.
5. Release the left mouse button
6. The distance is displayed in the box next to the Measure Distance button.



ToolBar:

A tool bar with commonly used controls is displayed in the lower portion of the coverage map window. This toolbar is automatically hidden if the map window size is reduced too much, allowing the window to be dedicated to displaying the coverage map. These toolbar controls are still accessible through the map window menu.

Reset:

Clears all previous sonar coverage information from the Map.

Print Map:

Prints the map window as shown on the monitor.

Zoom Level "+":

Increases the current zoom level.

Zoom Level "-":

Decreases the current zoom level. (Note: The zoom level can be changed by clicking the box of desired zoom level)

Save Map:

Saves the image on the Sonar Coverage Map window as a bitmap file.

Load Map:

Opens and displays a Sonar Coverage Map Data File

Center:

Centers the Coverage Map on the current boat position.

Shift:

Clicking any of the "Arrows" shifts the center point of the sonar coverage map up, down, left, or right.

Current Boat Coordinates:

The current boat coordinates are displayed in the lower corner right of the toolbar.

Navigational Aid Markers (part of map option - can be purchased anytime)

Two different types of navigational aid markers can be placed on the coverage map window to assist in planning and performing survey or search operations. Markers showing user defined waypoints, and general purpose markers, aid in navigation and relocating previously scanned targets. Waypoint and general purpose marker location information can be defined during operation or imported from a stored text file. In addition, waypoint and general purpose marker location information can be edited during operation.

1. Waypoints are used to help define routing paths for navigation.

Waypoint Marker

2. General purpose markers can be used to show locations that are not navigation points or previously scanned targets. They can be used to mark the location of: moorings, structures, “Last Seen Point”, etc.

General Purpose Marker

Defining Navigational Waypoints and Markers (part of map option - can be purchased anytime)

Waypoints and markers can be defined two different ways.

1. Waypoints, and general purpose markers can be entered into properly formatted text file and imported into Sonar View's coverage map.

2. Using an interactive tool window, waypoints, and general purpose markers can be added during operation.

Entering waypoints and general purpose marker location into a text file

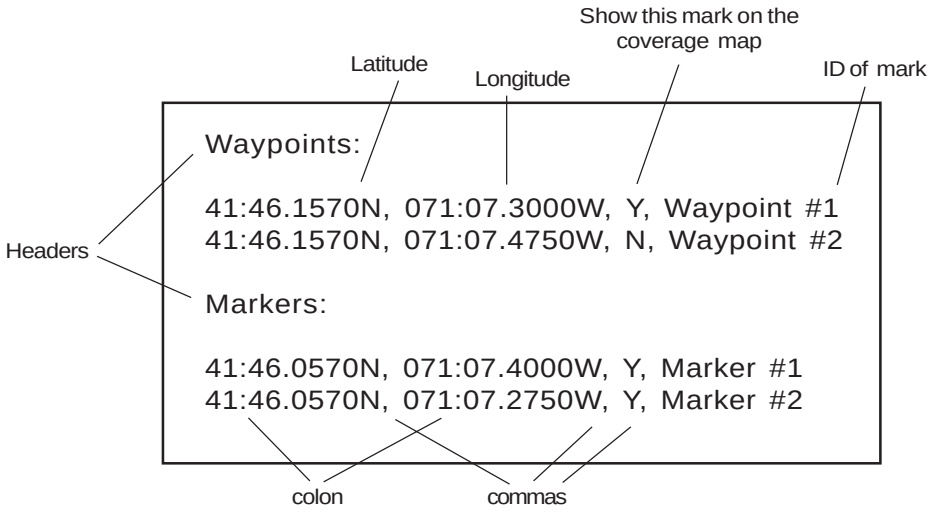
- Use a text editor such as Notepad.
- The text file must be stored as an ASCII text file with the ".txt" extension
- The file text must be formatted as such:
    - Latitude and longitude are formatted degrees, decimal minutes (DD : MM.MMMM)
    - The sentence structure is:

    Latitude, Longitude, Show Marker/Waypoint (Y or N), ID Text

    - Colons (:) must be used to separate degrees and Minutes.
    - Commas (,) must be used to separate each fields.\
    - The list of waypoints must have the header "Waypoints:" (The headers are what the software used to determine what kind of marker to place)
    - The list of general purpose markers must have the header "Markers:" (The headers are what the software used to determine what kind of marker to place)

    *Note: A sample text file can be found in the "JW Fishers\Sonar View\Sample Data Files" folder.

Sample File:



Creating Navigational Aid Markers During Operation

1. From the coverage map “Actions” menu, select “Add Waypoint” or “Add Marker”. The interactive tool window will appear.

Window for creating Waypoints and Markers

2. This window allows you to define a navigational aid marker in two ways.
   a. You can key in the ID and coordinates of where to place the new marker in the latitude and longitude boxes of the tool window.

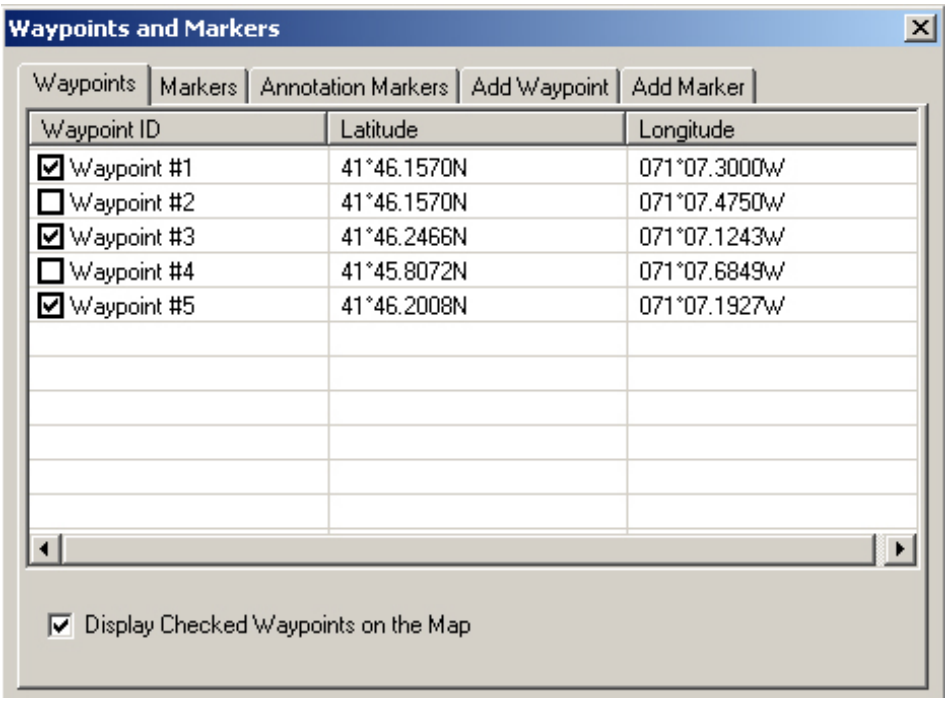
   —OR—

   b. You can:
      i. Click the “Select Coordinates with Mouse” button.
      ii. Move the mouse cursor to the coordinates of where to place the new mark
      iii. Click the left mouse button.
      iv. Key the ID for the new mark into the tool window.
      v. Click “OK” on the tool window.

   Once navigational aid markers have been created, you will be prompted to save the list as a text file.

Editing Navigational Aid Markers During Operation

Navigational aid markers can be edited during operation by selecting the coverage map "Actions" menu item, "Manage Waypoints and Markers". The following tool window will appear. Click the tab of the marker type you wish to view or edit.



Window for Editing Navigational Markers

- Selecting "Display Checked Waypoints (Markers) on the Map" will display all of the waypoint or (markers), that are checked off, on the coverage map.

- Double clicking any item text with the mouse will highlight the text, allowing you to edit the item.

Export Sonar Coverage Map as KML With Overlay Image

This feature saves the Sonar Coverage Map as a bitmap image and generates a KML file which allows the sonar coverage map to be overlaid in mapping programs such as Google Earth and ArcGIS Explorer.

To export a map:

1. Load the Sonar Coverage map you wish to export by playing back the file or using the Load SBP Coverage Map from file menu item.
2. Open the “File” menu and choose “Export Sonar Coverage Map as KML With Overlay Image”
3. You will be prompted to choose a file name and location to save the KML and image files. After entering the file name and location, click the “Save” button.

To view the Sonar Coverage map in Google Earth:

1. Launch the Google Earth application.
2. Select ”Open” from the Google Earth “File” menu.
3. Locate and open the KML file which you exported from Sonar View.
4. Google Earth will Automatically “Fly” to the Sonar Coverage Area.
5. Refer to Google Earth “Help” for instructions on adjusting the transparency of the overlay image.

To view the Sonar Coverage map in ESRI ArcGIS Explorer:

1. Launch the ArcGIS Explorer application.
2. Select ”Add Content” from the ArcGIS Explorer toolbar A menu will appear.
3. Choose “KML files” -> KML Files...” from the menu.
4. Locate and open the KML file which you exported from Sonar View.
5. ArcGIS Explorer will Automatically “Fly” to the Sonar Coverage Area.
5. Refer to ArcGIS Explorer “Help” for instructions on adjusting the transparency of the overlay image.

*** NOTE:** When transferring the overlay to a different PC, both the KML file and bitmap image must be transfered.

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MAINTENANCE

Your Sub Bottom Profiler was designed to be maintenance free. The fish, sonar processor, and cable are constructed of corrosion resistant materials. When operating in salt water, it is good policy to rinse off the fish in fresh water, including the underside horn area prior to storage Use a garden hose directed into the vent holes to flush out the area under the shroud. The transducer (black cylinder mounted in horn of the bottom side of the fish) should be kept clean (soap and water) and protected from damage. The equipment should be stored in a cool, dry place. Do not allow equipment to sit in the hot sun.

LIMITED WARRANTY

Your Sub Bottom Profiler underwent constant inspection during assembly to insure many years of trouble free performance. The system is warranted for TWO FULL YEARS from the date of purchase. During this period the SBP will be repaired free of charge should a failure occur due to materials or workmanship under normal use.

The warranty does not cover lost fish, broken cables, or damage due to dropping or general misuse. The warranty covers JW Fishers equipment only. JW Fishers will not be liable outside of the remedies stated above.

Should service be required, write or phone us explaining the nature of the problem. Most problems can be isolated over the phone and correct replacement parts sent to you. The system is field repairable at the board level. Do not attempt to troubleshoot or repair the board. We will swap boards; we will not send out schematics or parts for the boards.

RETURNING EQUIPMENT FOR REPAIR

If your SBP should need service, please call, fax, write, or e-mail: info@jwfishers.com, phone (508) 822-7330, or fax (508) 880-8949 the factory for instructions. We do not require authorization for the return of equipment. If you have a problem with your sonar and would like to have it checked out and repaired at the factory, simply pack it well and return it with a brief note describing the problem. Customer covers shipping cost to JW Fishers. If the repairs are covered by our two year warranty JW Fishers will pay return shipping.

Be sure to include your return address and telephone number on the note. When returning equipment from outside of the US, to avoid Custom problems when arriving in the USA, contact the factory for specific instructions regarding shipping.

Contact the factory for instructions should you encounter any problems.

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