

**SIDE SCAN PC
OPERATION MANUAL**
JW FISHERS MFG INC

rev 071211 USB



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SSS-100K PC SSS-600K PC SSS-100K/600K PC

SIDE SCAN SONAR

OPERATION AND MAINTENANCE MANUAL

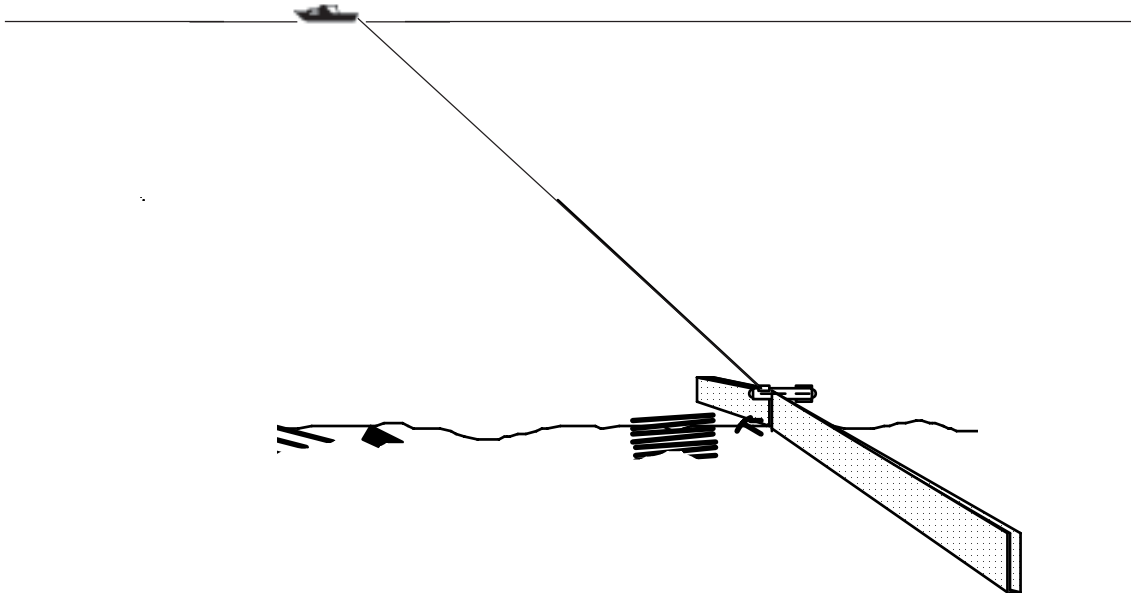


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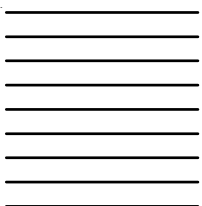
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DO NOT

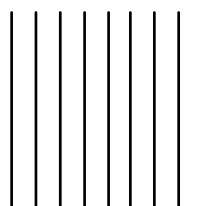
- Do not bend tow line around cleat or bend tow line sharply.
- Do not let Fish, Sonar Processor or PC sit in hot sun for prolonged periods.
- Do not pile tow cable on top of fish while fish is on-deck.
- Do not power up Sonar Processor until Computer has booted-up (Computer will not boot-up properly).
- 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 a wall mount power supply with an output of 12 vdc at 1,500 ma or more. The correct wall mount power supply is available from JW Fishers.

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.
- Loosen the thumbscrew (next to handle) one turn to prevent pressure buildup inside the Sonar Processor housing.
- Protect fish fins when fish is out of water. Insure lower fins are protected.
- Pile tow cable on-deck and sit fish on top of tow cable pile.
- Protect cable end connectors, keep them dry and out of water.
- For the best image, the Fish should be towed 10 - 15% of the Range Switch setting off the bottom (if operating in the 75 m range, the Fish should be towed 7.5-11 m off the bottom).
- Boat passes must be in a straight line or target printout will be distorted (curved).
- After searching an area in one direction, repeat the search pattern with a 90 deg shift in directions.



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	SSS-100K.....	100 Khz.
	SSS-600K.....	600 Khz
	SSS-100K/600K Dual Frequency	100 Khz/600Khz User Selectable
• Beamwidth Hor/vert		1 deg/40 deg, tilted 10 deg downward.
• Pulse length1 ms.
• Power Output		1000 w per channel.
• Max range	100Khz	1800 ft per channel / 3600 ft tot.
		550 m per channel / 1100 m tot.
	600Khz	200 ft. per channel / 400 ft. tot.
		75 m per channel / 150 m tot.
- Max depth		500 ft (150 m).
- Tow speed		1-5 mph.

DIMENSIONS/WEIGHT:

• Sonar Processor	13"Wx10"Hx6"D	8 lbs.
• Cable75"x150'-500'	25/85 lbs.
• Fish	4"D x 62"L	35 lbs.
• Shipping boxes		
- Sonar Processor		
- Fish 150-1,000 ft	67"Lx16-25"Dx19-24"H	150-445 lbs.

MATERIALS/COLOR:

• Sonar Processor	High impact plastic case , PVC, stainless/black.
• Fish	High impact PVC, epoxy, stainless/yellow.
• Cable	10 conductor in polypropylene/yellow.

OPTIONS

- Extra cable up to 1,000 ft.
- 120 vac to 12 vdc wall power supply
- 220 vac transformer (Europe). Used with wall power supply above
- Splashproof "Ultra Bright" PC and Keyboard

File Size per hour of Recording

Range:

5m	455mb
10m	380mb
25m	182mb
50m	92mb
75m	65mb
100m	46mb
200m	24mb
300m	16mb
400m	12mb
500m	9mb
600m	2mb

SONAR VIEW is a high performance software package designed specifically for JW Fishers side scan sonars. 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 software, your computer must meet the following minimum requirements:

CPU: Intel or AMD. 600MHz

System memory: 128 Mb RAM
256 Mb Ram (minimum recommended for Windows XP)

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

Minimum Screen Area of 800 x 600 pixels (1024 x 768 recommended)

One available USB port

Windows 98 or later

40 Mb of free disk space for program installation

Disk space for file recording:
SONAR VIEW uses up to 500 Mb per hour when recording highest quality images in short ranges.

Optional:
CD or DVD burner for archiving files

Note: For the fastest scanning capability, shut down all other programs (including virus scan).

DETECTION RANGE CHART

TARGET SIZE	RECOMMENDED NORMAL "RANGE" SETTING FOR SEARCHING (you can always use a shorter range)	RECOMMENDED MAXIMUM "RANGE" SETTING FOR SEARCHING
Body	5 m. (16 ft)	10 m. (32 ft)
Lobster trap	5 m. (16 ft)	10 m. (32 ft)
55 gal drum	10 m. (32 ft)	25 m. (80 ft)
2 ft channel buoy and mooring	50 m. (160 ft)	75 m (245 ft)
12 ft aluminum canoe	50 m. (160 ft)	75 m (245 ft)
Large Prop (6' dia)	50 m. (160 ft)	75 m (245 ft)
Large anchor	50 m. (160 ft)	75 m (245 ft)
17 ft boat	75 m. (245 ft)	100 m (320 ft)
30 ft boat	100 m. (320 ft)	200 m. (650 ft)
Small plane	100 m. (320 ft)	200 m. (650 ft)
Helicopter	100 m. (320 ft)	200 m. (650 ft)
Small barge	200 m. (650 ft)	300 m (975 ft)
Tugboat	200 m. (650 ft)	300 m (975 ft)
75 ft boat	200 m. (650 ft)	300 m (975 ft)
Submarine (WWII)	200 m. (650 ft)	300 m (975 ft)
Destroyer	300 m. (975 ft)	400 m (1300 ft)
Battleship	400 m. (1300 ft)	500 m (1625 ft)
Queen Mary	500 m. (1625 ft)	600 m (1950 ft)

- Recommended boat speed of 1-3 kts for above chart.
- The distance shown is for one transducer.
- To determine actual swath coverage multiply range times two.
- The same chart is used for 100 or 600Khz, but the maximum range for 600Khz is about 75 m.

The above chart shows the recommended Range settings for different size targets when doing a general search. Once a target is detected, the Range setting would be reduced and closer passes to the target would be made and at different angles. The closer passes, at shorter Range settings, produce the best pictures. More detail is shown on the computer screen when operating in the short ranges.

The above recommended ranges are conservative. A 75' boat (recommended range 200 m) could be picked-up at 300 m. But if you were on the 300 m range, and the boat was being seen from an end view, and the boat was laying on its side, it is very possible that the resultant image would not be recognizable as a boat.

CHART EXAMPLE:

If the target you are looking for is similar in size to a 30 ft boat, you would search in the 100 m range (or less). Each pass would cover a 200 m (1,300 ft) swath. Once an area is covered, it is recommended that it be recovered at a 90 deg angle to the first set of passes. This is to insure the target is not missed due to poor target orientation on the first set of passes. Once the target is picked-up, the Range should be set to 50 m. The search boat would make passes approximately 25 m from the target. The target would be printed in the center of the screen for the appropriate channel. The passes should be made at different angles in an attempt to get the best image. All passes must be made in a straight line to insure printout is not distorted.

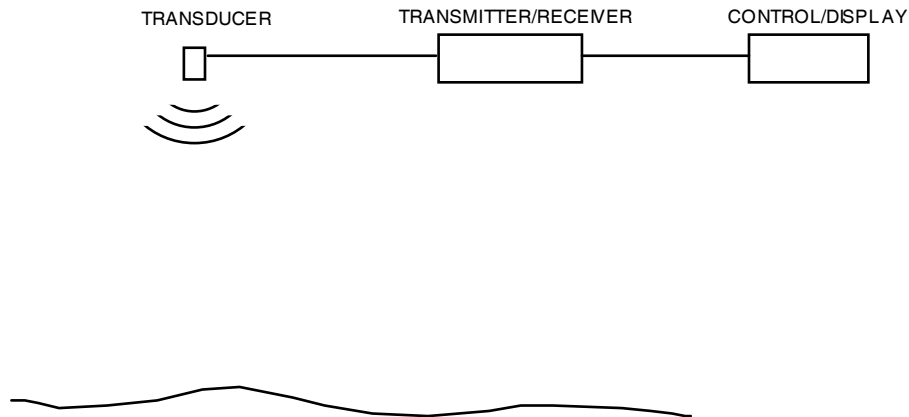
SONAR BASICS

GENERAL

Sonar is the bouncing of a 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 the speed of sound in water is 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 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 and then sweeps the beam back and forth across the bottom to paint the picture; a big improvement over the depth sounder printout for bottom detail. The problem is that the transducer is mounted on the bottom of the boat and it is subject to the pitch and roll of the boat. Even the smallest movement of the boat results in the transmitted signal hitting in a different area than the previous scan. The printed results reflect this "jumping around" movement and make interpretation difficult on all but the most obvious targets.

SIDE SCAN SONAR BASICS

SIDE SCAN SONAR

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

Sideways look:

Originally, sonars 'looked' straight down and were used to measure bottom depth or locate large objects resting on the bottom. During the 1950's researchers turned the transducers on their sides and began looking at the series of echoes that returned from the bottom rather than a single echo from a discrete target. The problem was that the beam was so wide that resolution was very poor.

Narrow Beam:

A narrow horizontal beam angle is required to obtain a high resolution picture of the sea floor.

Two Channels:

Side scan sonars look to both sides of the survey vessel. Not only does this double the effective coverage area, but there are economic gains to be had as both channels can share a common controller, tow fish etc.

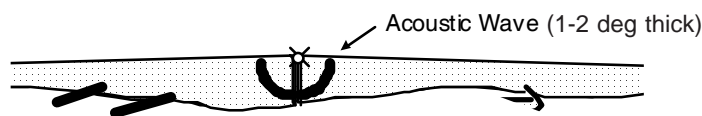
Towed Transducer:

The narrow beam angle makes control of the beam direction very important which would be difficult in rough sea if the transducer were mounted to the survey vessel. Thus the transducer is 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.

PC Monitor:

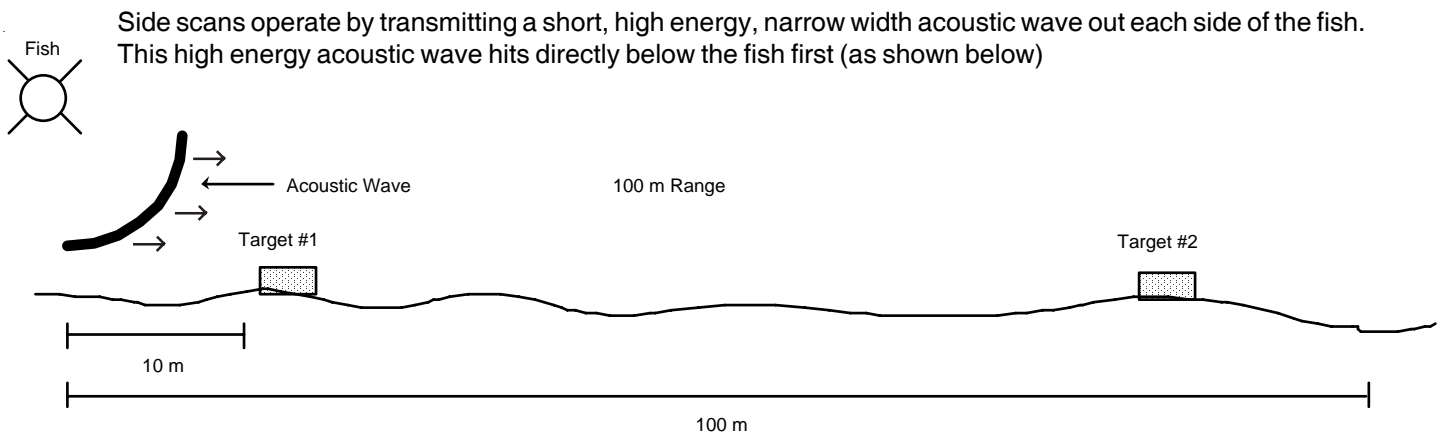
A side scan sonar display builds up its image by laying down successive scans of the sonar image producing a composite image.

To achieve high-resolution, side scan reduces the beam width to a narrow 1 to 2 deg, and the transducer is mounted on a towed fish designed for stability. Waves and a rocking boat have very little impact on the resultant printout. The result of the narrow beam, a rock stable transducer, and a display, is a high-resolution image with surprising details of the bottom.

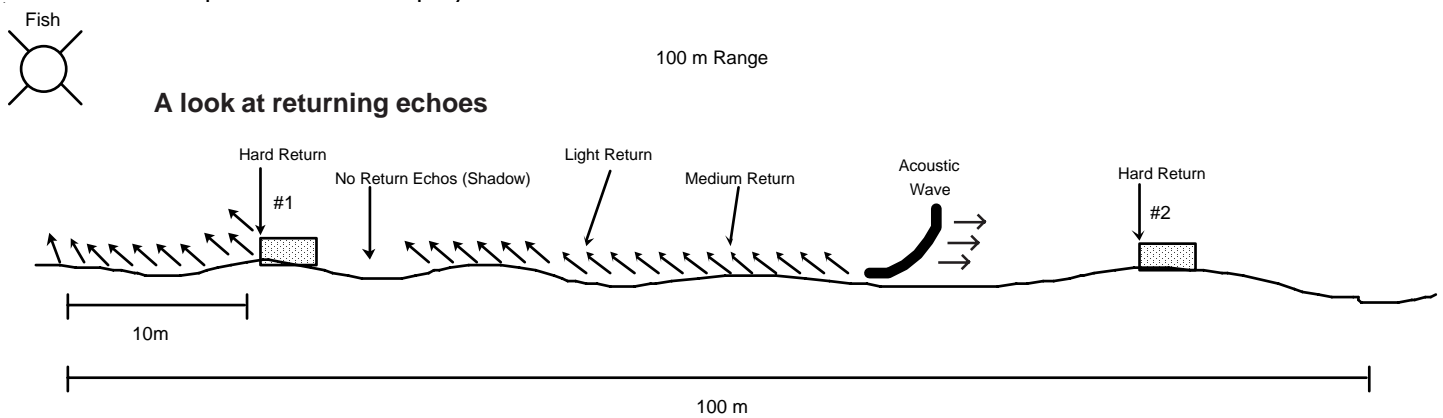


Operating frequencies of SSS are generally 50 KHz, 100 KHz, or 600 KHz (higher frequencies are available, but they have very limited range). The 50 KHz units have excellent long range (2000 ft+), but not very good resolution. The 100 KHz units have good long range (1800 ft), and good resolution. The 600 KHz units have limited range (400 ft), but excellent resolution. The 100 KHz side scan sonar is the best overall general purpose unit, and the most popular in use today. The SSS-100K is a 100 KHz system. The SSS-600K is a 600KHz system that offers significant increased resolution and is ideal for Police and Rescue Units (ideal for body recovery). The SSS-100K/600K is a dual frequency system that allows the operator to choose the best frequency for each application.





As the pulse continues to sweep across the bottom, away from the fish, echoes continuously return to the transducer (see below). The Sonar Processor takes evenly spaced samples of the echo returns (for each side) which are processed and displayed.

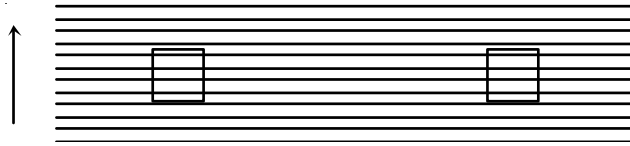


The larger the amplitude of the return (echo), the greater change of color on the display. The harder the object (rocks, metal, etc), the larger the returned echo. The angle of the bottom surface and target angles also impact the amplitude of the return signal. The left side of target #1 and #2 will produce a larger (harder) return echo than the top area. When the acoustic wave hits the top of target #1 and #2 will produce a larger (harder) return echo than the top area. When the bottom slopes away and down from the fish, only light echo's return from the bottom. When the bottom slopes upward, medium echo returns are received. If a hard target is positioned on a down or on a up-sloping bottom, a hard return will result from the target.

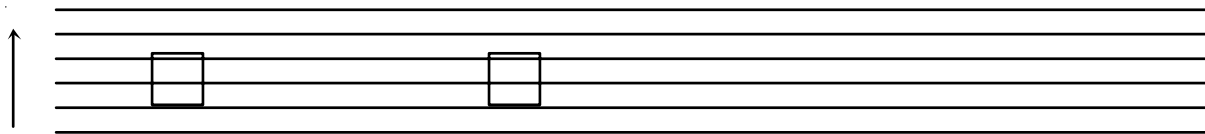
If a target is up "off the bottom", as is target #1 and #2, then there will be an area directly behind the target that will be blocked from the acoustic wave. No echo returns will be received from that area by the fish. When displaying this area, the display will show a no signal color. This area on the display is called the target's "shadow".

Each displayed line (one pulse out of the transducer) is 1/2 the screen width wide. The amplitude of the returned echo samples, during one line, determines the color for each point along the line. When the line is completed on the display, the display point moves to the next position and the transducer sends out another pulse.

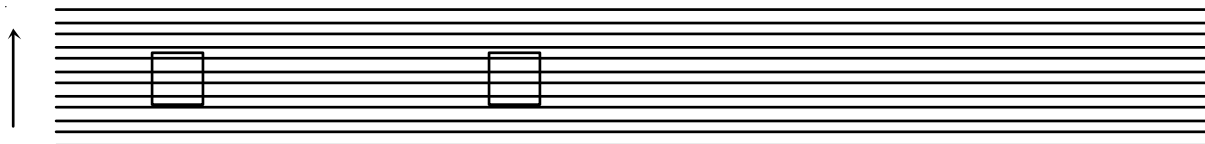
As the fish is towed through the water it sends out an acoustic wave and listens for returned waves. How often it sends out a acoustic wave depends on the Range setting. The figure below shows a top view of a series of 12 waves sent out from a passing fish (arrow). Since the Range and boat speed is known, the distances can easily be figured.



In the figure below, we doubled the Range Switch setting from 25 m to 50 m. The boat speed stayed the same. We are now covering twice the scan distance (left to right), which requires twice the time for each acoustic wave. The distance between each acoustic wave is doubled, which results in less samples of the target and therefore less resolution. The target will be displayed at one-half the vertical height.



In the figure below, we left the Range Switch setting at 50 m, but cut the boat speed in half. The result is that we get the same resolution as the top figure while covering twice the scan distance.



Boat speed is important, slower boat speeds produce the highest resolution images.

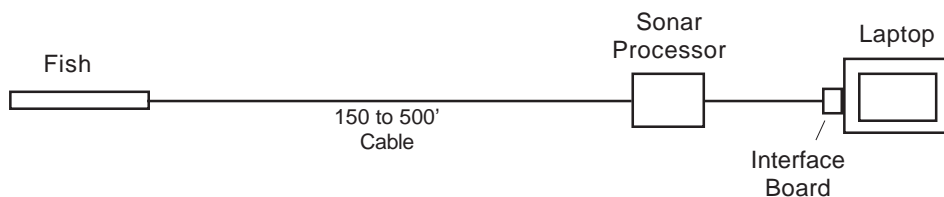
Note: Ideal towing speed is 1 knot. Sonar View software offers manual and automatic boat speed correction to compensate, but not without loss of overall resolution, for faster than ideal boat speeds. Sonar View will display properly proportioned images for boat speed of 1 to 5 knots with manual correction or 1/2 to 5 knots using the automatic setting. Faster tow speeds will result in images that are vertically compressed. Slower tow speeds will result in images that are vertically stretched.

JW FISHERS SIDE SCAN SONAR

INTRODUCTION

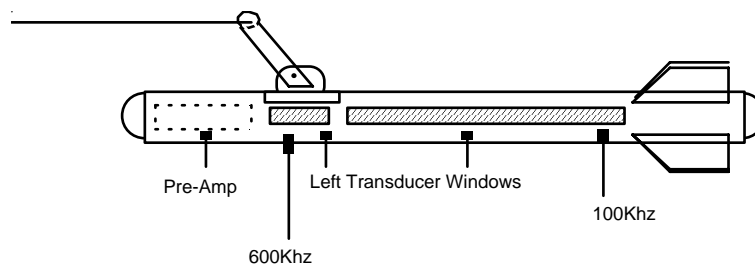
Fishers basic Side Scan PC system consists of :

- Tow fish with two 100Khz, 1 deg by 40 deg transducers (if SSS-100K).
- Tow fish with two 600Khz, 1 deg by 40 deg transducers (if SSS-600K)
- Tow fish with two 100Khz and two 600Khz, 1 deg by 40 deg transducers (if SSS-100K/600K)
- 150 ft to 500 ft tow cable.
- Sonar Processor.
- Laptop or optional Ultra Bright Splashproof Computer.



Tow Fish:

The tow fish is constructed of high impact PVC. The fish is 62" long and 4 1/2" in dia. The fish weighs 35 lbs. The nose cone is lead impregnated epoxy for negative ballast. The tail cone is epoxy without lead. The fins are PVC and are glued and screwed in-place (field replaceable). There are slots on each side of the fish for the transducers. The front area of the fish contains a removable waterproof compartment which houses the electronics for the transducers. The cable from the surface connects to the top of the tow arm. The cable is connected to the side of the tow-arm and enters the fish and connects to the waterproof compartment.



The function of the fish is to carry the transducers and the underwater electronics through the water. It is critical, for good printouts, 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 printout. The printout is effected when the fish is not stable while under tow.

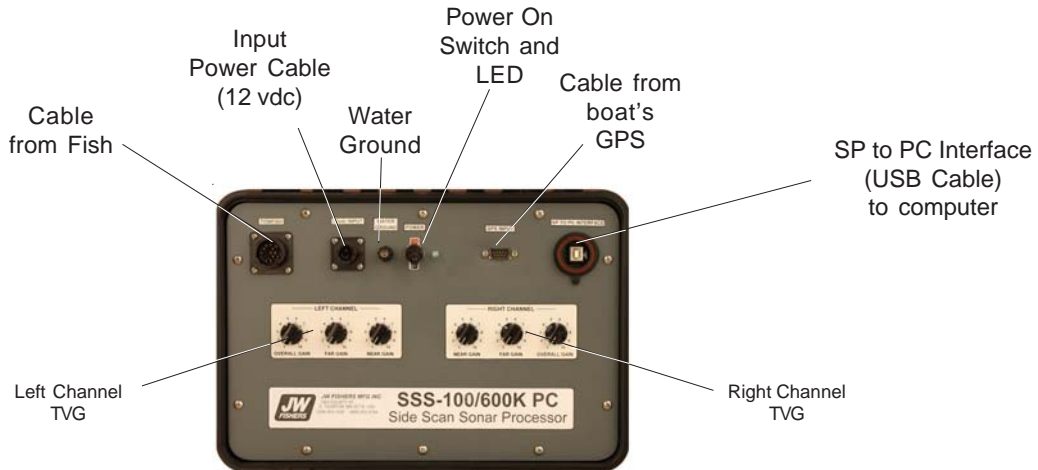
Tow Cable:

The tow cable consists of three electrical cables inside of a hollow-core polypropylene rope. It is tough, durable, and highly abrasion resistant. Cable is available in 150 to 500' lengths.

Sonar Processor:

The Sonar Processor provides an interface between the Fish and the computer. It receives signals from the Fish, amplifies them, and sends them to the computer using an integrated PC interface board. The Sonar Processor also receives the latest GPS data from the boat's GPS receiver and forwards the data to the computer so that the data from the Fish is matched to a GPS position for later reference.

The Sonar Processor contains two sets of operator amplifier adjustments, the Left and Right Channel TVG, to allow precise control of the signals from the Fish.

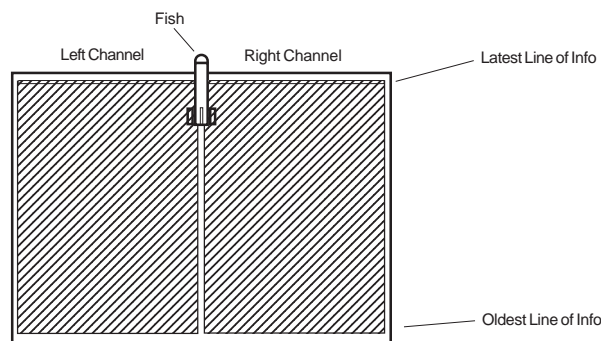


Sonar Processor

Computer:

The Sonar Processor has an integrated interface board that converts the analog 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 communications from the Computer to the Fish which allow the operator to control different functions within the Fish.

To get the proper perspective of the information being displayed on the screen; picture the fish in the center, and at the top of the screen. The transmitted beam is traveling from the center of the screen out to each edge of the display. The distance covered from the center of the page to the edge is dependent on the Range setting (5m, 10m, 25m, 50m, etc). After each transmit pulse, all the information on the screen moves down one line and the new information is displayed in the top line (the oldest line, at the bottom, drops off the screen). The process is repeated indefinitely.

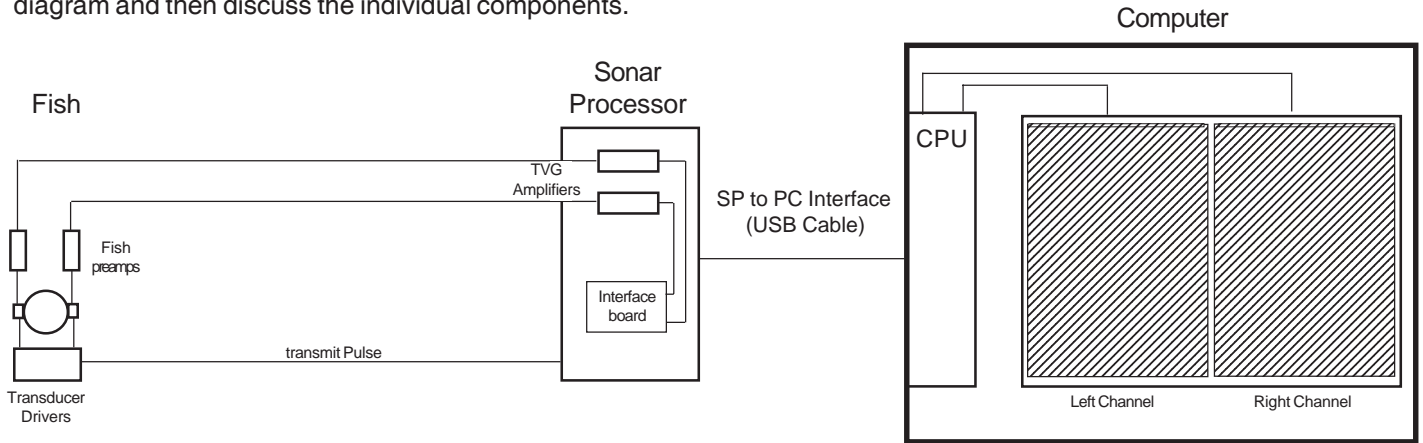


PC Display

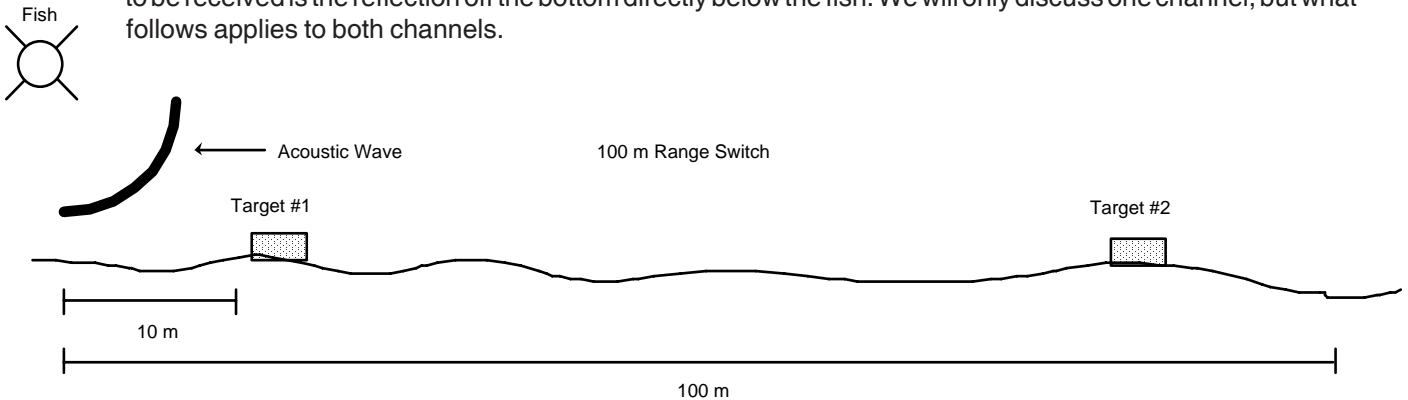
JW FISHERS SIDE SCAN SONAR THEORY OF OPERATION

BLOCKDIAGRAM

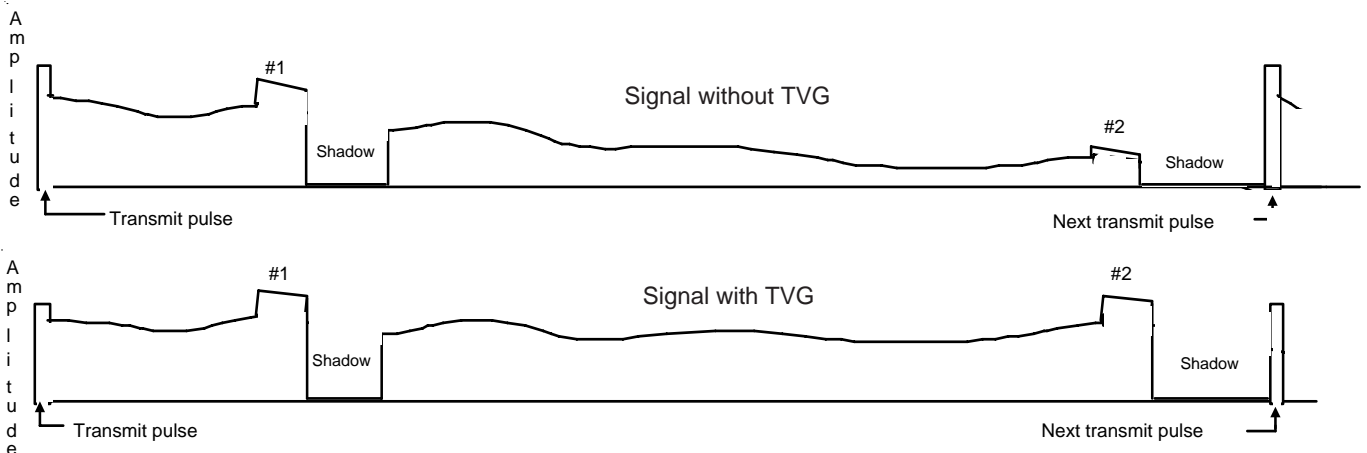
The key to side scan operation is to understand how the side scan works. We will begin with an overall block diagram and then discuss the individual components.

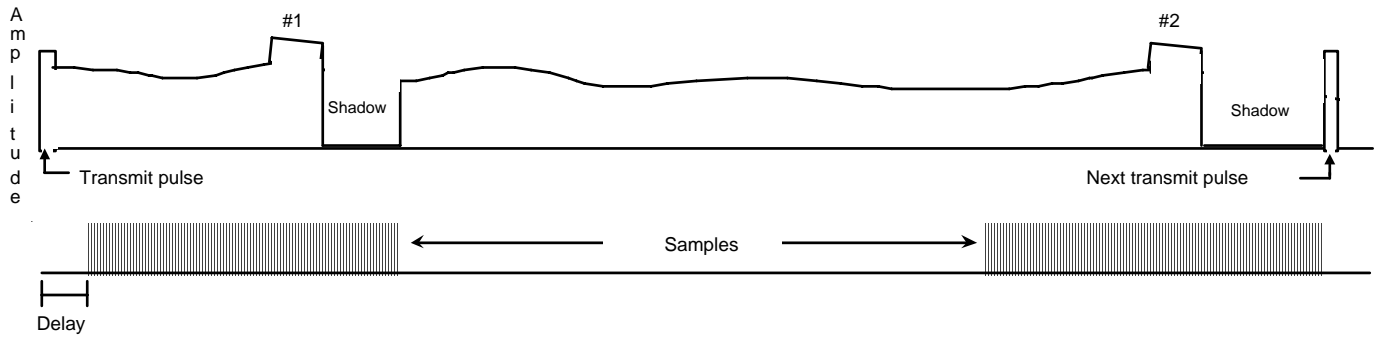


When Record is selected, the computer (Central Processor Unit or CPU) scans the operator selected settings and sends a transmit pulse to the transmit electronics in the fish. A short duration 1000 watt pulse is generated to both transducers. Each transducer produces its own 100Khz or 600Khz sound wave that travels out away from each side of the fish. The pre-amps in the fish listen to the same transducers for returning echoes. As the sound wave sweeps out across the bottom, echoes are continuously received by the transducers and amplified by the pre-amps in the fish. The first echo to be received is the reflection off the bottom directly below the fish. We will only discuss one channel, but what follows applies to both channels.



The Fish preamps send the amplified echo signals up the cable to the "time variable gain" (TVG) amplifiers in the Sonar Processor. The TVG amps increase their gain over time to compensate for signal loss which occurs when the signal travels through the water. If TVG circuits were not used, then target #1 would display dark, but target #2 would display very light. Figures below shows the signal with and without the TVG circuits.





After the transmit pulse, the CPU generates a short delay* (to allow the transducers to settle) and after the delay, it looks at the output of the TVG circuit, and takes evenly spaced samples of the signal. The spacing between each sample pulse is determined by the Range selected. The CPU sends the pieces of information to the display where each sample is displayed on the screen. It is the amplitude of the samples of the received signal that determines the color displayed. Targets # 1 and 2 above would display as a dark** color whereas the normal bottom return would print a light color on the display. After displaying the line, all lines on the screen move down one to allow room for the next line.

While the above displaying took place, the CPU sent another transmit pulse to the fish. This sequence repeats itself for as long as the side scan is turned on.

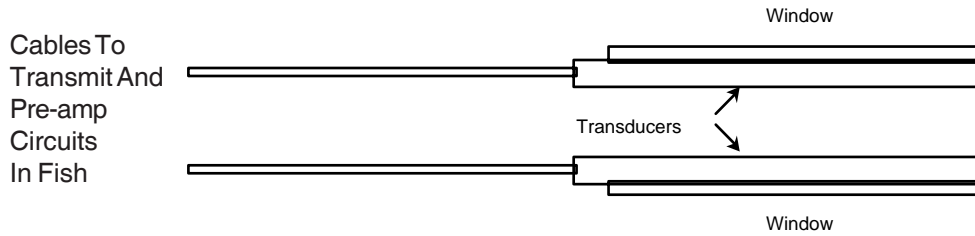
Each transmit pulse results in one line being displayed in each channel. Both channels are displayed simultaneously. How often we transmit depends on the Range selected.

* This delay can be extended, by the operator, for water column removal (covered later).

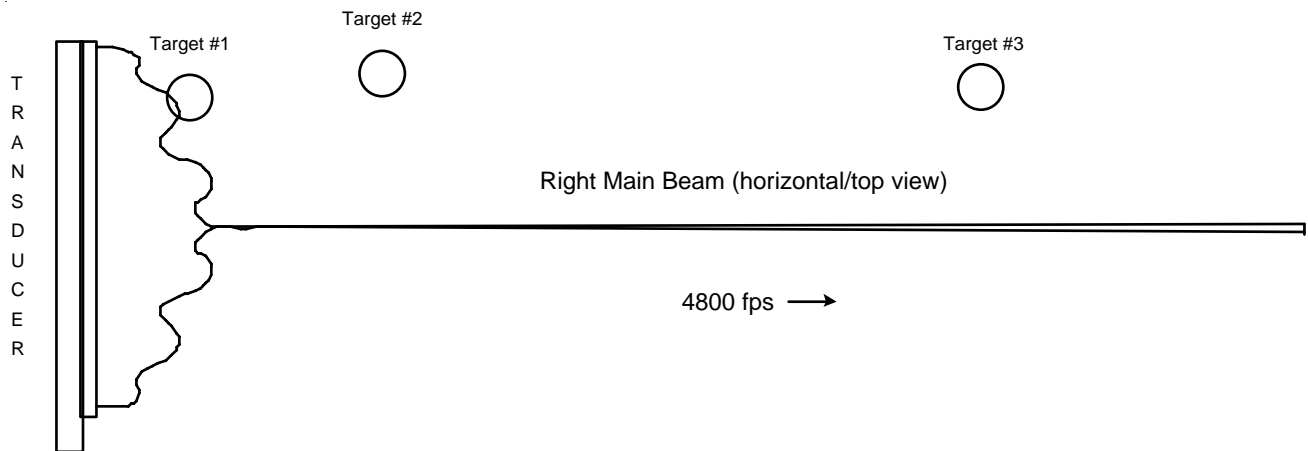
** For ease of explanation, we will assume that the operator has selected “gray scale” for display colors. A soft (low amplitude) return would display light gray and a hard (high amplitude) return would display a dark gray (black).

TRANSDUCERS

The fish contains two transducers (four transducers if SSS-100K/600K model).

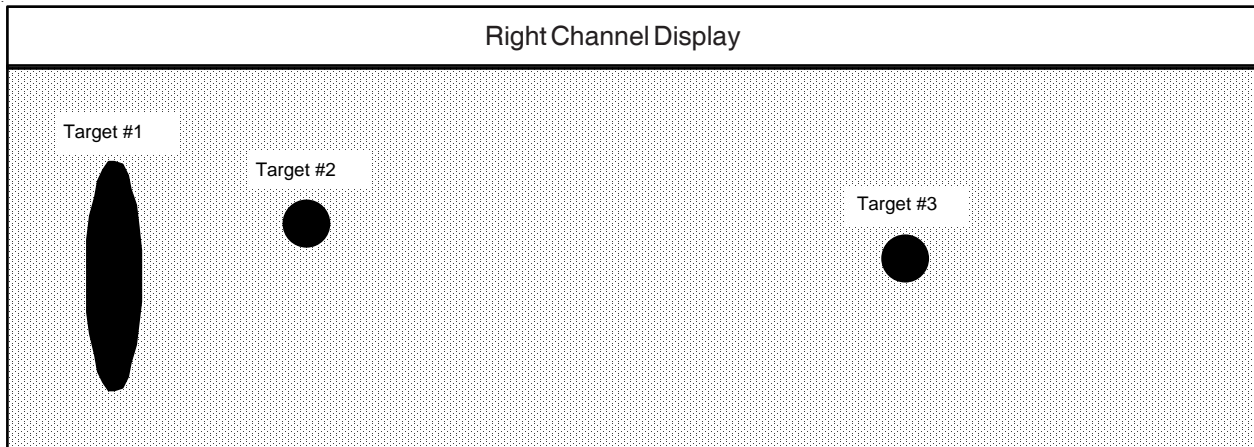


The transducers are hit with a short duration 1000 watt pulse which causes a highly focused sound wave to be generated from the side face (window) of the transducer. If the transducers are out of water, you can hear the transducers "snap" as they react to being hit with the high power pulse. If you touch the window, you can feel the pulse.

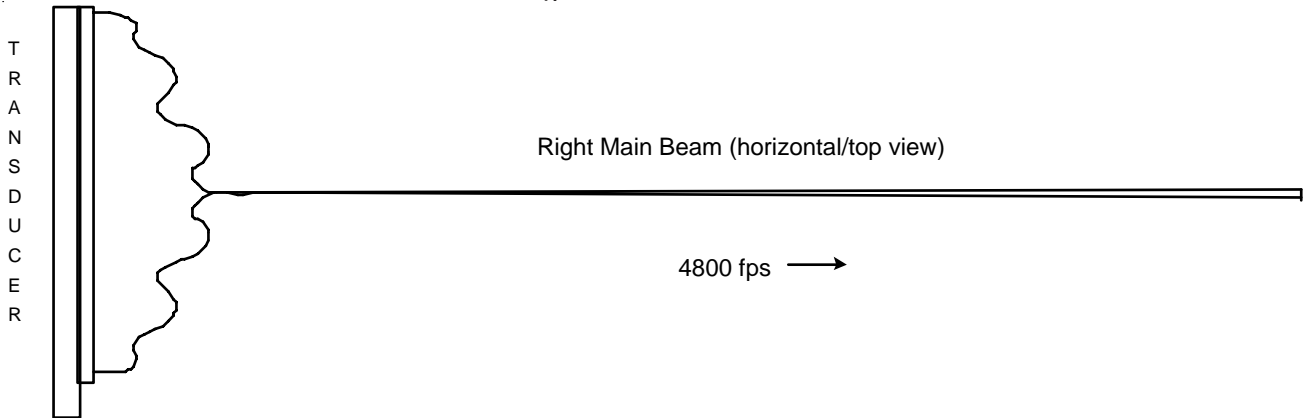


The main center beam is extremely narrow (aprox 1 deg wide) and has a tremendous amount of power. It is this main beam that sweeps across the bottom (away from the fish) at 4800 ft per sec; which makes for high resolution pictures. Close to the transducer, is a very broad beam which is the result of side lobes. All side scan transducers have side lobes. Top quality transducers, such as those used in the JW FISHERS Side Scan Sonar, have very short side lobes which extend a very short distance. Poor quality transducers have long side lobes extending 20-30 % of the total beam length.

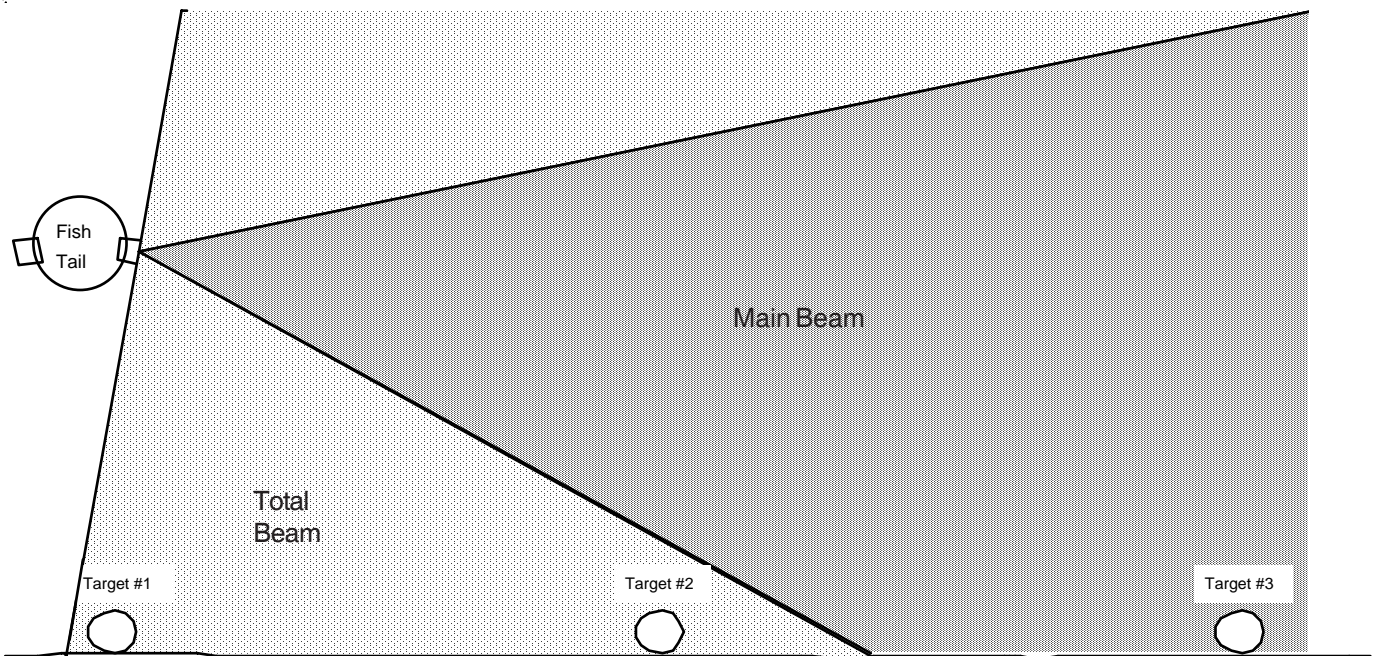
The impact of side lobes is that the printed picture will be distorted if the transducer passes very close to a target (a few feet). The printout for the above equally sized targets is shown below. The distortion of target #1 is due to it being in the beams path much longer than it should have been. Target #1 was in the beams path much longer than the other two targets.



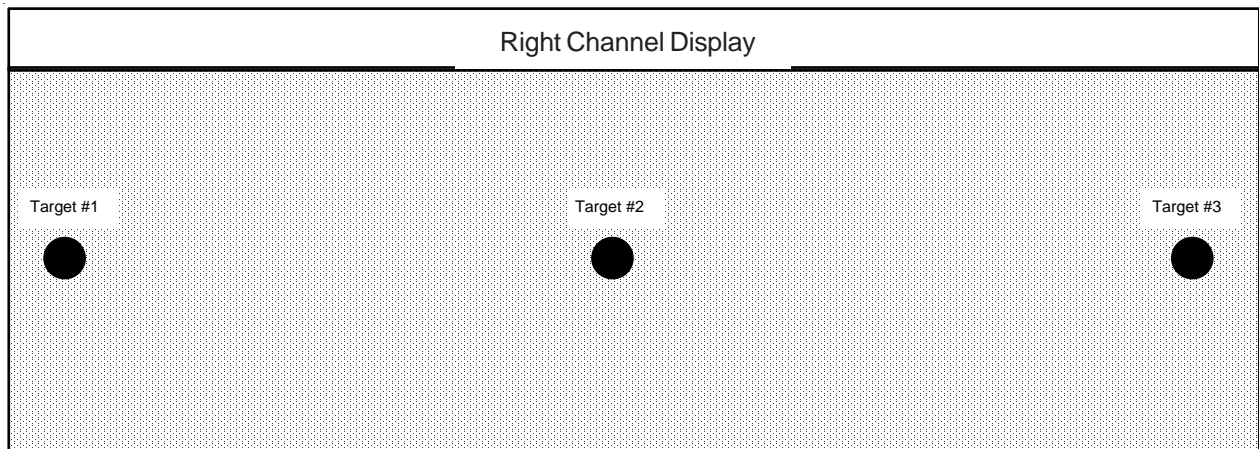
The transducers horizontal beam is 1 degree wide.



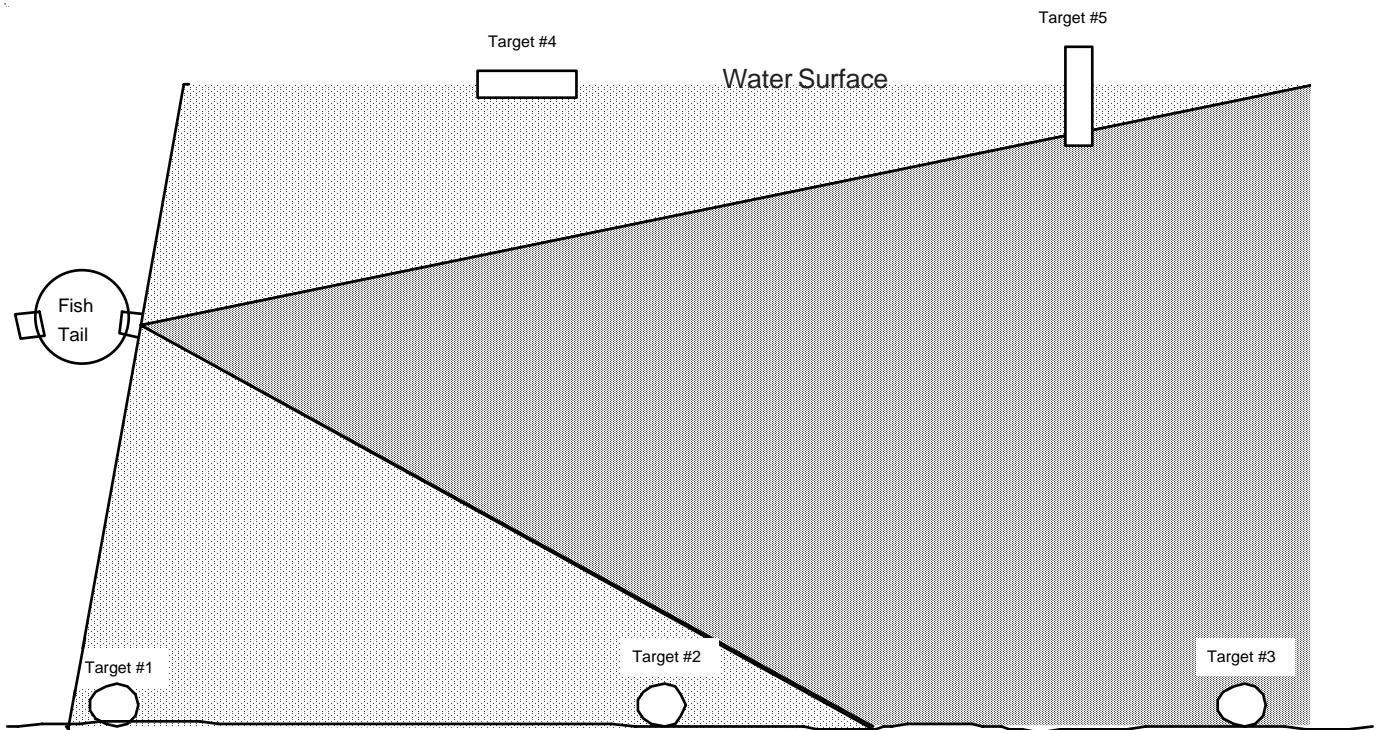
To insure complete bottom coverage, out away from the fish, the vertical part of the narrow beam must be very wide. The vertical part of the beam is 40 deg wide. The transducer is tilted (pointed) 10 deg down to insure that the main impact of the beam will sweep across the bottom. The main power of the beam is in the dark shaded area. The lightly shaded area shows the secondary area of the beam. It lacks the power of the main part of the beam, but is part of the overall vertical beam pattern and does detect targets.



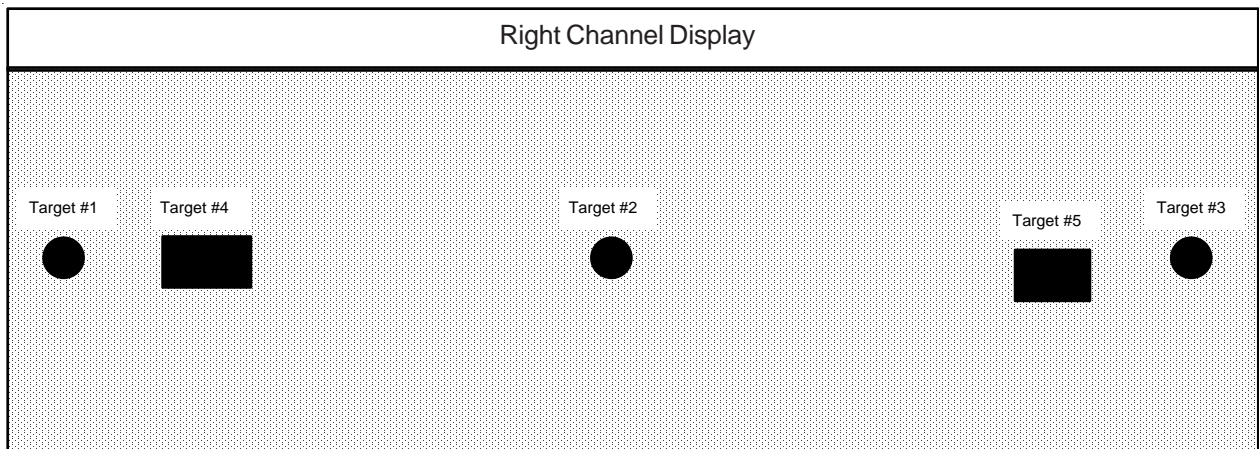
All of the targets shown above will be picked up and displayed as shown below. Drawing assumes targets are in a straight line (water column factor not included - covered later).



Some part of the main beam and the secondary component go above the fish. When operating in water depths of 50+ ft, with the fish near the bottom, the upper sound wave does not effect the display. However, with the fish within 20 ft of the surface, the water surface and targets on the surface will effect the display. If the water surface is fairly calm, there will be little effect on the display. If the water is very rough (choppy), and the fish is close to the surface, the echo reflections from the waves will be visible on the display. The drawings below show the effect of surface targets when the fish is close to the surface.

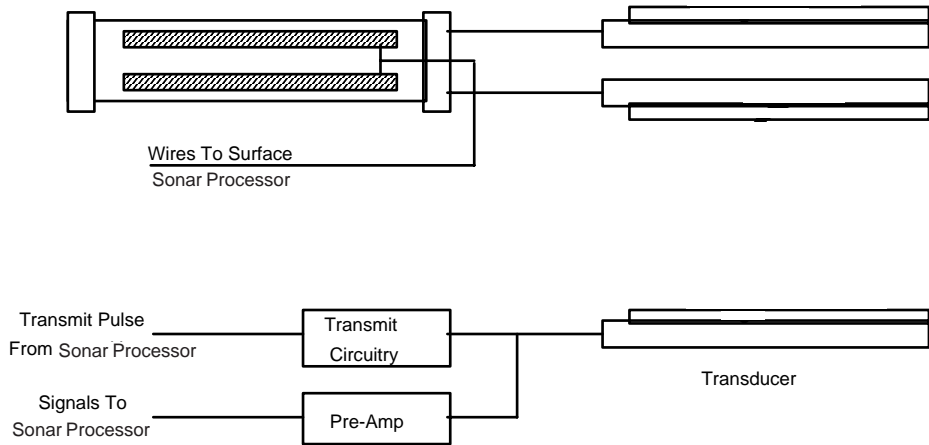


All of the targets shown above will be picked up and displayed as shown below. Drawing assumes targets are in a straight line (water column factor not included - covered later). The displayed position of target #4 is not an error; #4 is much closer to the transducer than #2.

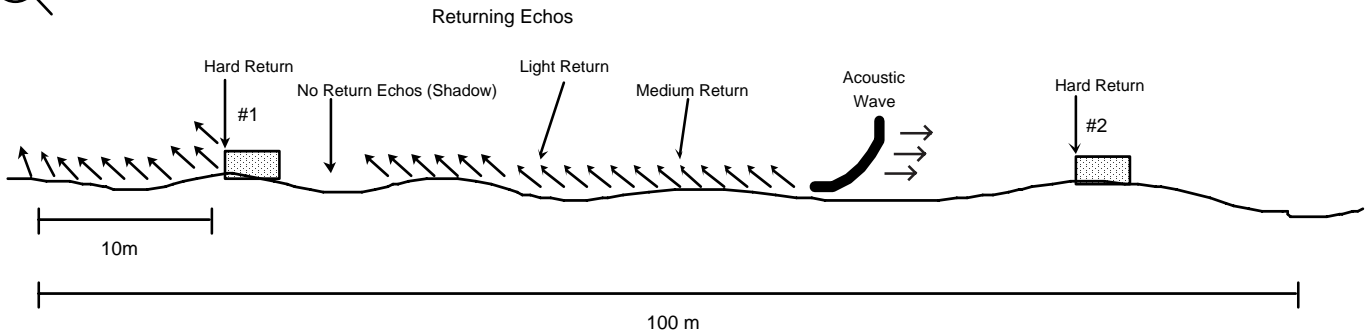
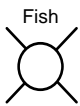


FISHELECTRONICS

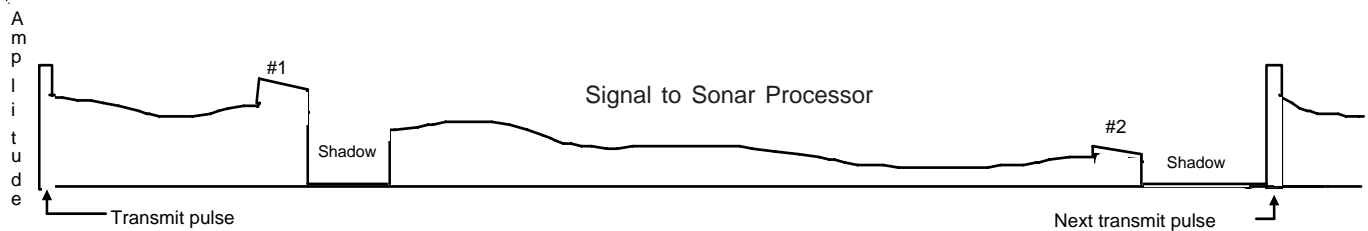
The fish contains an underwater housing that contains the electronics to generate the 1000 watt power pulse to each transducer; and preamps to amplify the returning echoes received by the transducers. The amplified signals are then sent to the surface Sonar Processor where they are processed.



The transmit pulse is generated by the Computer. The signal is sent down the tow cable where it triggers the transmit circuitry in the fish. The transmit circuitry generates the 1000 watt power pulse to each transducer. The transducer generates the narrow sound beam that travels out away from the side of the fish. Echoes immediately begin returning from the bottom as the wave continues to sweep across the bottom.

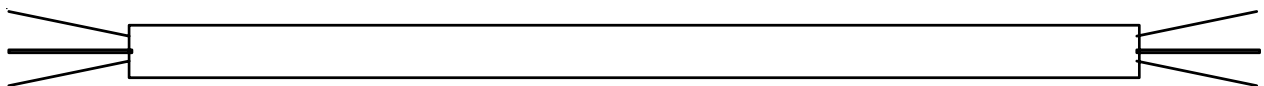


The returning echoes strike the transducer which produce the return electrical signals. The signals are amplified by the preamp and sent up the tow cable to be processed by the "time variable gain" (TVG) circuit in the Sonar Processor. Signals continue to be received and amplified until the next transmit pulse. The sequence is then repeated.



TOW CABLE

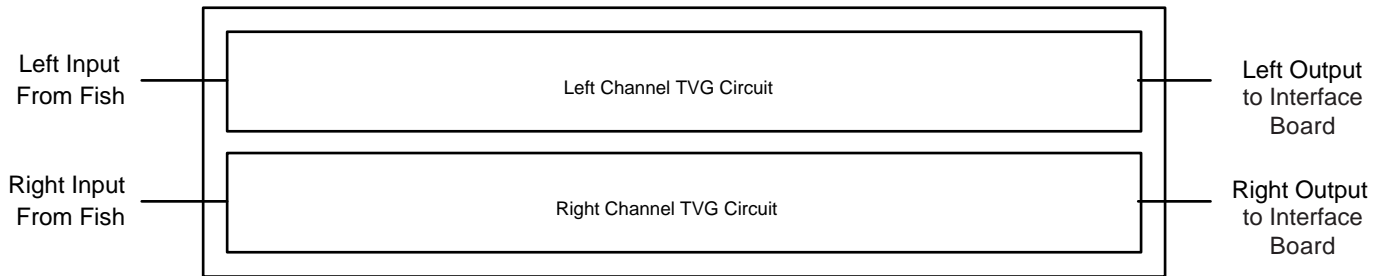
The 150' to 500' tow cable is a hollow core polypropylene rope with three electrical cables in the center. One cable is a six conductor cable which is used for sending the transmit pulse and voltages to the fish. The other two cables are coax's which are used to send the return echoes, from the preamps in the fish, to the left and right channel TVG circuits in the Sonar Processor.



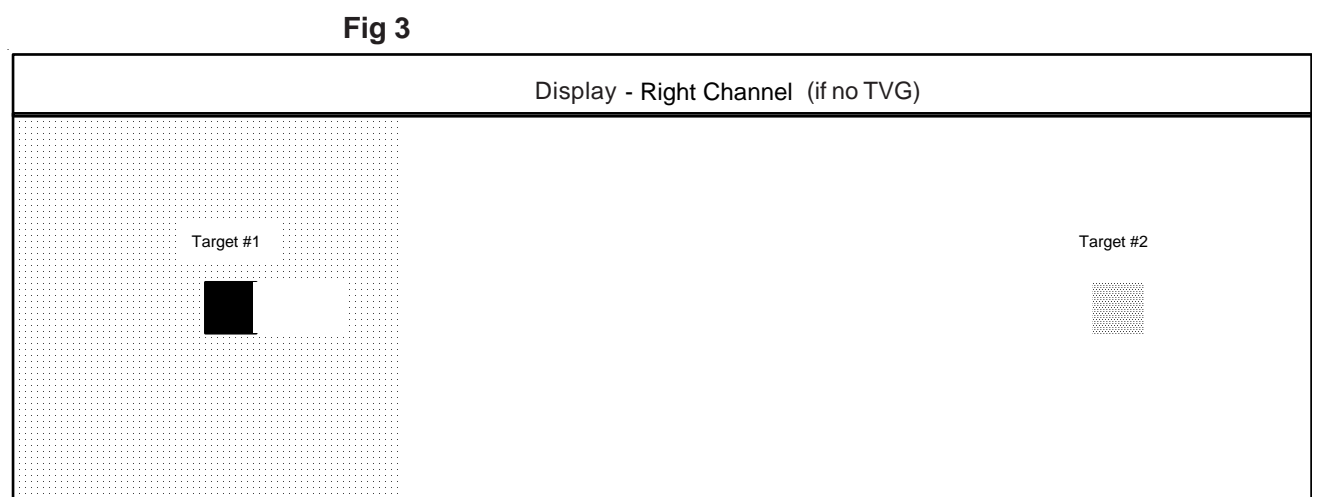
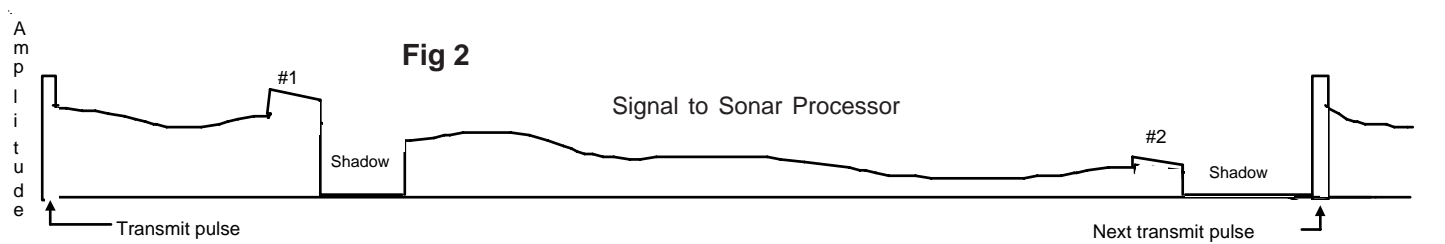
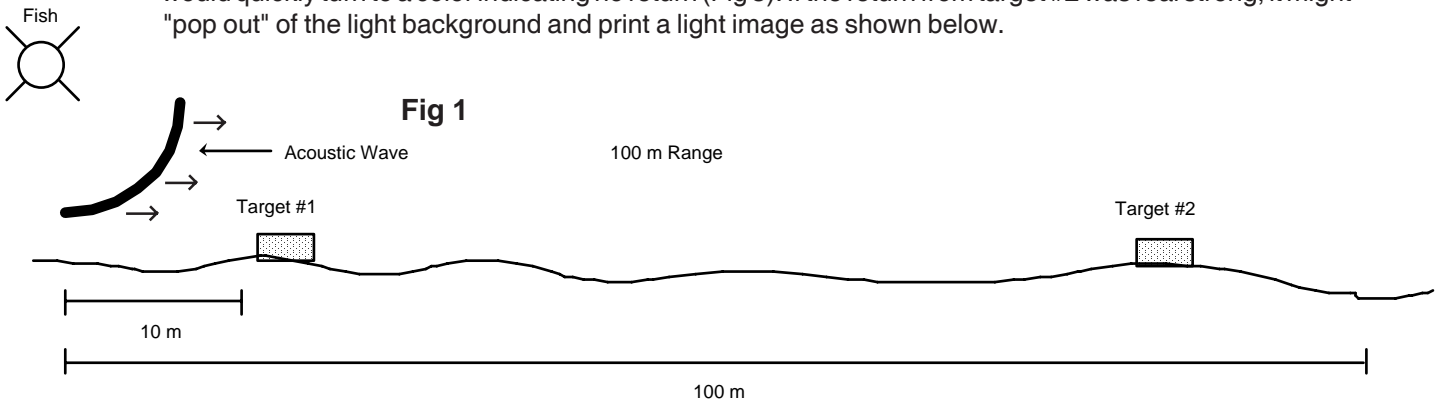
TIME VARIABLE GAIN (TVG)

The sonar Processor contains a TVG circuit on the PC board that receives the echo signals from the fish preamplifier boards. The TVG circuit amplifies and makes time variable gain adjustments to the signal to make up for signal losses which occur when the echoes are traveling through the water. Each channel has its own TVG circuit. Each TVG circuit has its own set of operator controls which are located of the Sonar Processor's top panel.

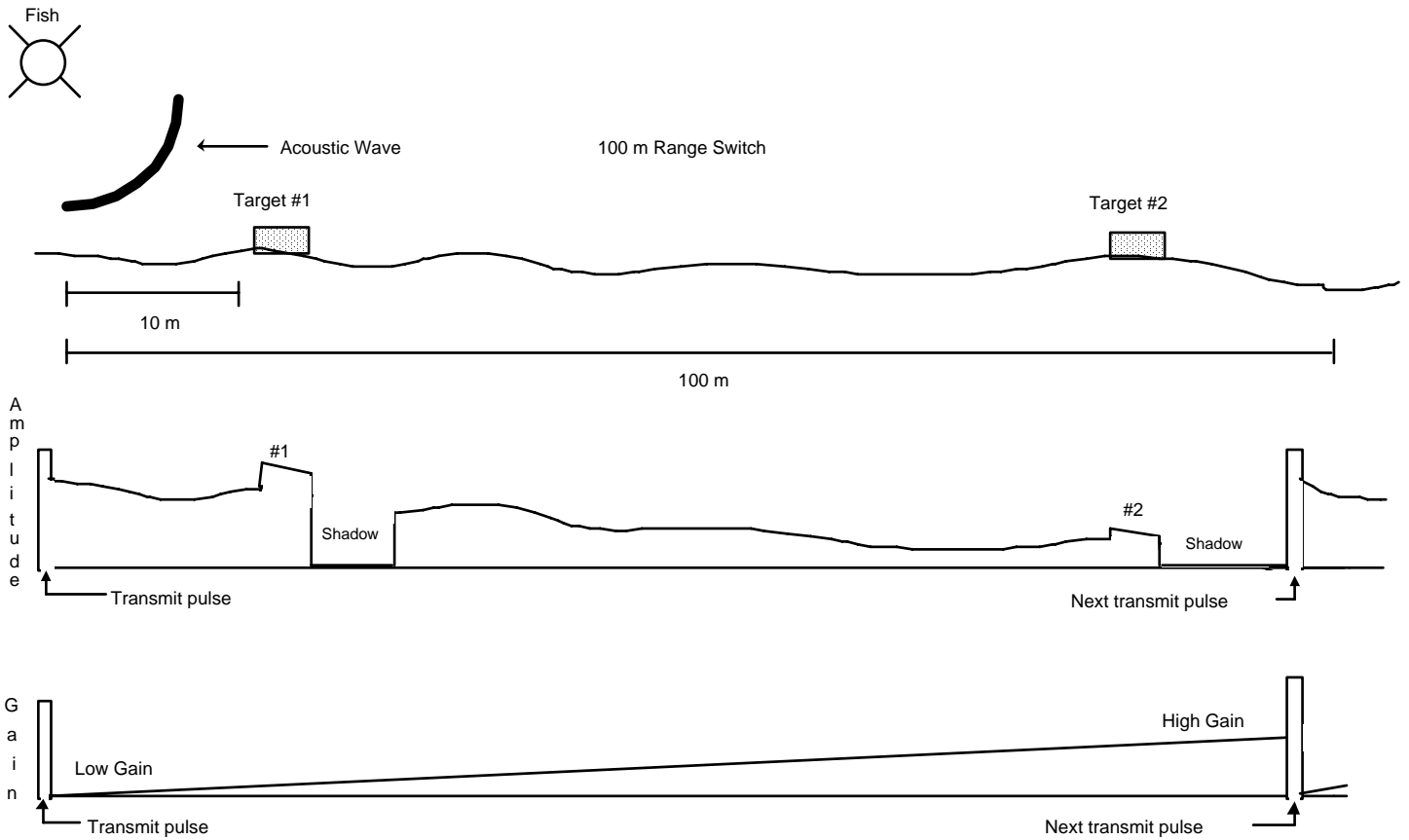
TVG Board



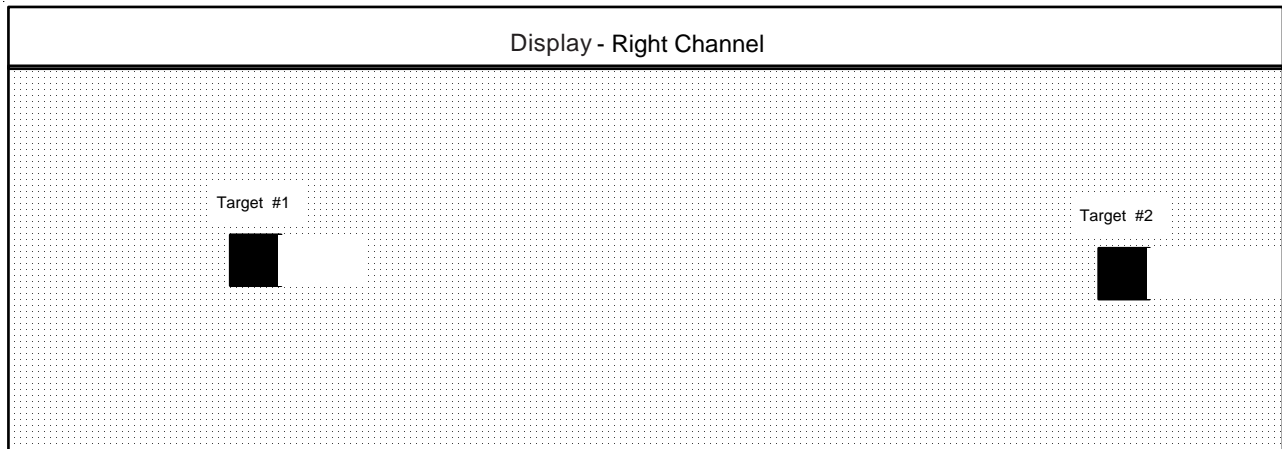
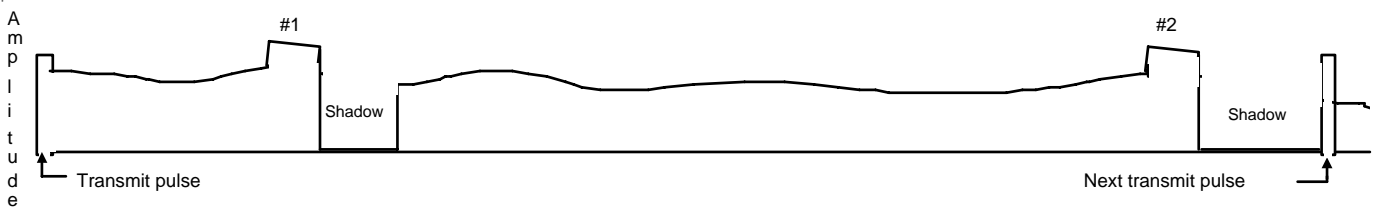
The signal return (shown below) to the Sonar Processor is the signal that we would expect to see at the output of the fish preamps. The amplitude of the signal that reaches the Computer determines the color of the image. If the TVG circuit did not modify the signal shown below (Fig 2), then the display would start out good, but the bottom return would quickly turn to a color indicating no return (Fig 3). If the return from target #2 was real strong, it might "pop out" of the light background and print a light image as shown below.



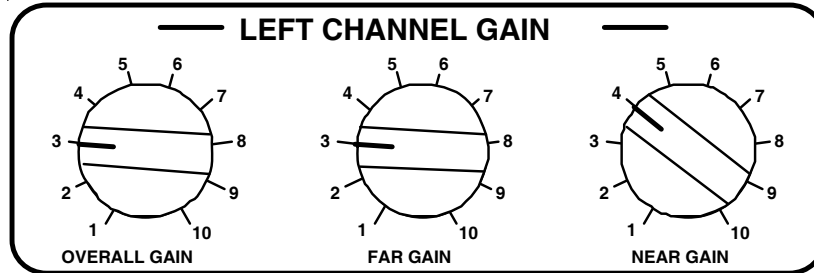
The signal (second drawing below) feeds the input of the TVG amp. The TVG amp has been adjusted, by the operator, to automatically increase the gain over time. The third drawing below shows the gain increase (called the ramp).



The drawing below shows the output of the TVG amp with the second drawing above applied to the input. When this signal is printed, there will be a even color across the paper with two dark colors representing the two targets.

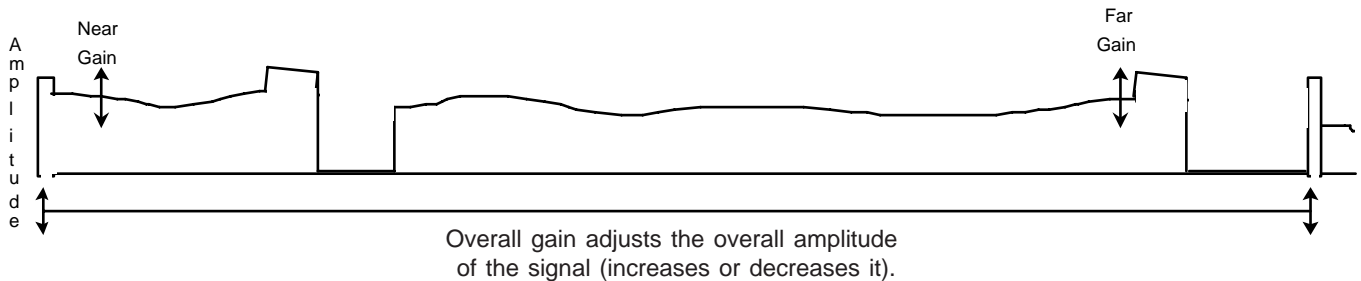


Each TVG amplifier has three operator controls. They are located on the top panel of the Sonar Processor. Recommended settings for the TVG controls are provided in the Operation Section of this manual. Final TVG adjustments are made by the operator while the unit is running. The function of these controls is to adjust the amplifiers to compensate for losses that occur when the signal travels through the water. When they are adjusted properly, a reasonably even color is displayed across the screen during side scanning. The even color is the result of reflections off the bottom.



- Near Gain - Adjusts the TVG gain at the start of the sweep.
- Far Gain - Adjusts the TVG gain at the finish. Operator adjusts for even color of the displayed line.
- Overall Gain - Adjusts the gain of the complete line up or down. It adjusts overall darkness or lightness.

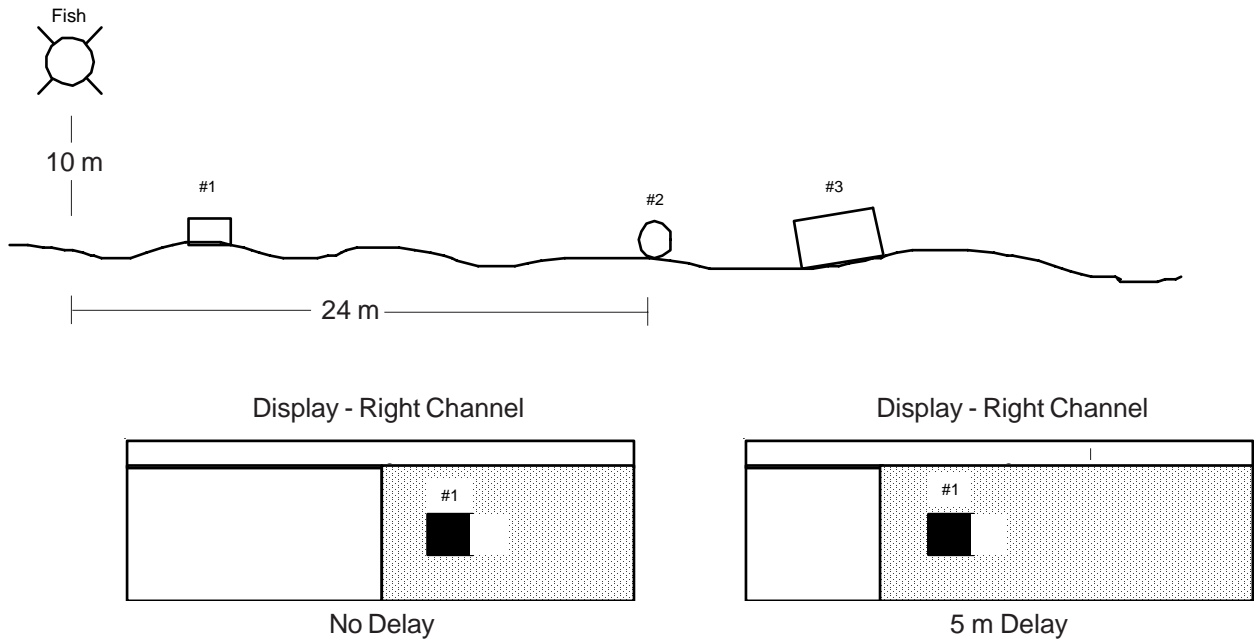
Note: The analog signal below (for both the left and right channels) is visible on the display so the operator can be viewing the analog signal while making the TVG adjustments. The goal is to have a reasonable flat signal along its length (not downward or upward sloping).



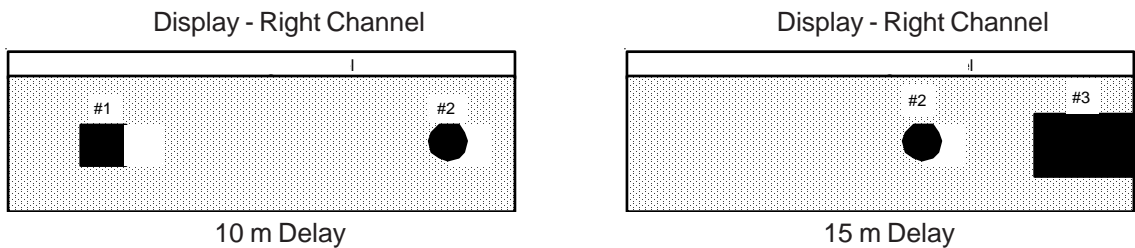
Delay

Commonly called water column removal. Generally, the fish is towed off the bottom 10 - 15% of the Range setting. If we are looking for a small target, that would require a 25 m (80 ft) Range setting, we would tow the fish 3-4 m (12 ft) off the bottom. This insures that the transducers are low enough to produce shadowing for targets off the bottom, and high enough off the bottom to insure the beam makes it out to the distance selected by the Range setting.

If bottom conditions (trees, debris, etc) do not allow the fish to be towed 10 - 15% off the bottom, then a significant amount of display space may be wasted just waiting for the acoustic wave to reach the bottom. If bottom conditions required the fish to be towed 10 m off the bottom, and we are operating in the 25 m Range position (due to small target size); then the first half of the printed line will be blank (light color). Target #1 is printed in the middle of the right channel and target #2 which is 24 m away, is missed completely.



The Delay selection delays the start of the sampling sequence. If the Delay was set to 5 m, then one-half of the 10 m blank space would be eliminated. If set to 10 m, then all blank space would be eliminated, and both targets #1 and #2 would be printed. If a 15 m Delay was selected, we would lose target #1, but would pick-up part of #3 which is greater than 25 m from the fish.



Computer

The system will run on a Laptop, Desktop, or on JW Fishers optional “Splash Proof” computer. The “Splash Proof” is a computer system that is built into a Underwater Kinetics case. It utilizes a 10” Ultra Bright” display which is much easier to read in a open boat.



Optional Ultra Bright Computer in Splash Proof Case

OPERATOR SWITCHES AND CONTROLS

THE HARDWARE

Sonar Processor Box - There are two sets of GAIN controls on the Sonar Processor box. One set is for the right channel (right side transducers on the side scan fish) and the other set for the left channel (the left side transducer on the side scan fish). The Near Gain, Far Gain, and Overall Gain controls are adjustments for the Time Variable Gain (TVG) amplifier. The function of these controls is to adjust the amplifiers to compensate for signal losses that occur when the signal travels through the water. When they are adjusted properly, a reasonably even color will represent the ocean floor from the center of the screen to the outer edge of the scanned area.

The Sonar Processor amplifies and conditions the signal from the fish. The amplifier in the Sonar Processor is called a Time Variable Gain (TVG) amplifier. The gain of the amplifier increases over time for each returning signal. The operator has very precise control of the TVG amplifier using the three gain controls.



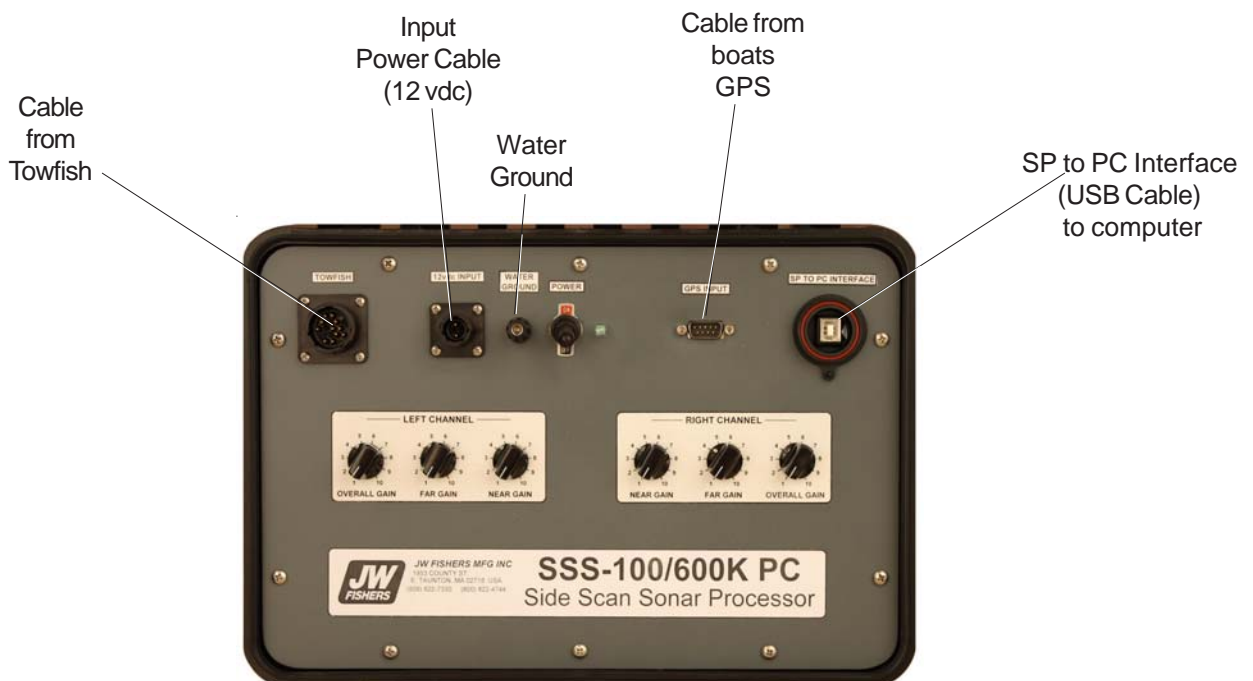
SONAR PROCESSOR BOX

The control panel of the Sonar Processor Box contains:

- **Power On Switch** - 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 towfish is connected (it should be before power is turned on) then power is also sent to the "downstairs" electronics in the fish.
- **Near Gain Control** - Adjusts the gain for objects close to the fish.
- **Far Gain Control** - Adjusts the gain of TVG amplifier so that the reflected signal from objects farthest from the Head can be amplified sufficiently to produce an image on the monitor.
- **Overall Gain Control** - Adjusts the darkness of the overall sonar image in the selected color.

OPERATOR SWITCHES AND CONTROLS (continued)

- **TOWFISH CONNECTOR** - The cable from the towfish is attached to this connector.
- **GPS INPUT** connector - Your GPS plugs into this connector. The Sonar Processor requires a NMEA 0183 input. It may be necessary to select this type of output from a menu in your GPS unit (see the Appendix in the back of this manual for more detail).
- **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)
- **POWER INPUT** - The input power for the Sonar Processor is 12 volts dc. A power cable is supplied with the side scan 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. An optional 120 vac to 12 vdc wall transformer is available.
- **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.

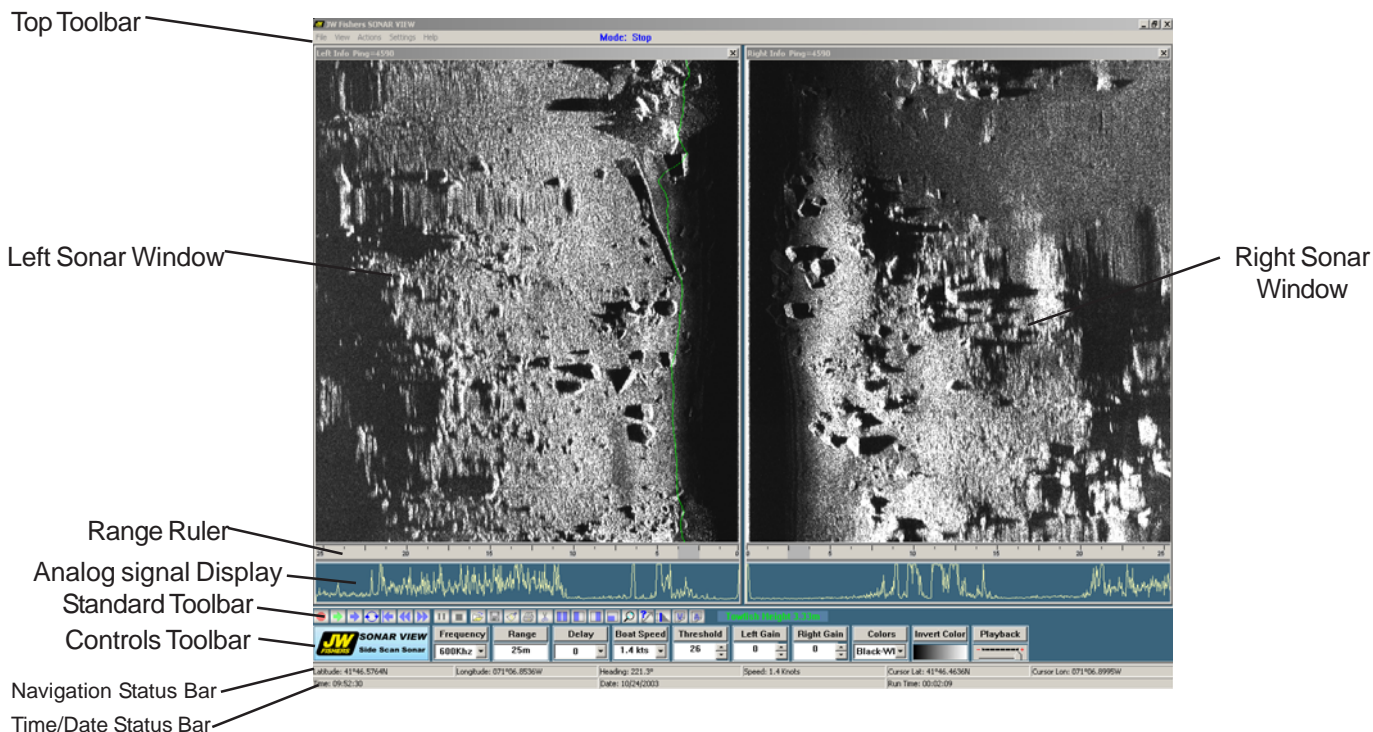


SONAR PROCESSOR BOX

OPERATOR SWITCHES AND CONTROLS (Continued) -

THE SOFTWARE

The majority of operator controls are located in toolbars on the screen. The number of tools in each toolbar, and therefore the number of toolbars, will depend on the resolution setting on your computer display. The resolution setting for the display below was 1024 by 768.



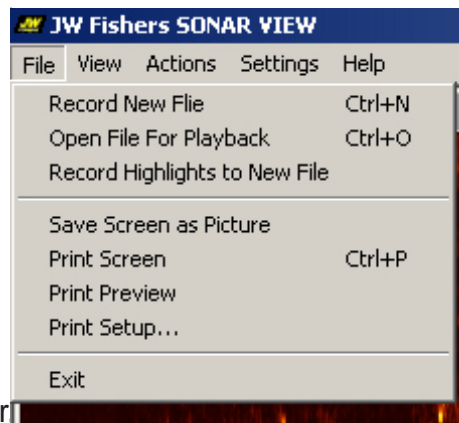
TOOL BARS:

TOP TOOLBAR

There are 5 pulldown menus in the top toolbar: FILE, VIEW, ACTIONS, SETTINGS and HELP. The selections available under each heading:

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 29 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.

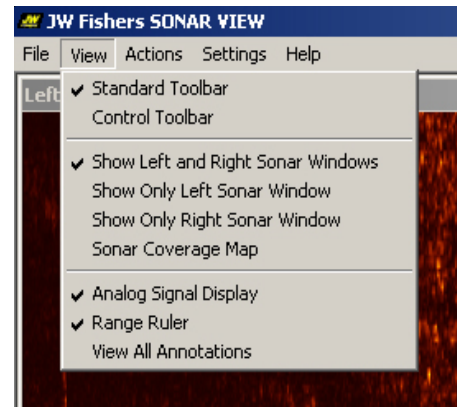


OPERATOR SWITCHES AND CONTROLS (continued)

TOP TOOLBAR (continued)

View:

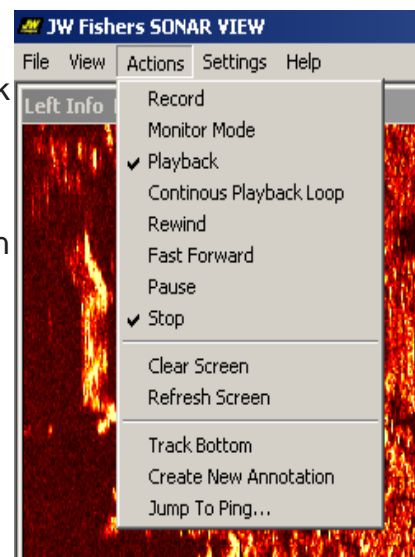
- **Standard Toolbar** - Displays icons for various tools at the bottom of the screen directly above the Controls toolbar (range, boat speed, colors, etc).
- **Control Toolbar** - Shows operator adjustable controls at the bottom of the screen (range, boat speed, colors, etc). When the Controls toolbar is selected a menu comes up that allows the operator to select which control buttons are shown.
- **Show Left and Right Sonar Windows** - When this command is selected both right and left channels of the sonar image are displayed on the monitor.
- **Show Only Left Sonar Window** - When this command is selected only the left channel of the sonar image is displayed on the monitor.
- **Show Only Right Sonar Window** - When this command is selected only the right channel of the sonar image is displayed on the monitor.
- **Sonar Coverage Map** - Shows the optional sonar coverage mapping window.
- **Analog Signal Display** - An analog graphic above the Controls toolbar shows the amplitude and intensity of the signal being returned to the towfish. This display should be observed while adjusting the TVG amplifiers (signal should be flat along its length).
- **Range Ruler** - Puts range marks on the monitor which allow the operator to easily determine the distance between any target and the towfish (i.e. the boat).
- **View All Annotations** - Opens a dialog that shows all text annotations in the current file.



Actions:

The commands shown under the ACTION pulldown menu duplicate many of the commands shown on the Standard Toolbar.

- **Record** - Selecting this command operates the sonar and saves the data to a file.
- **Monitor Mode** - This command is for real time viewing of sonar images without recording data.
- **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.
- **Track Bottom** - opens the bottom tracking setup window.
- **Create New Annotation** - opens the create annotation dialog.
- **Jump to Ping...** - used to skip directly to a specific ping number during playback.

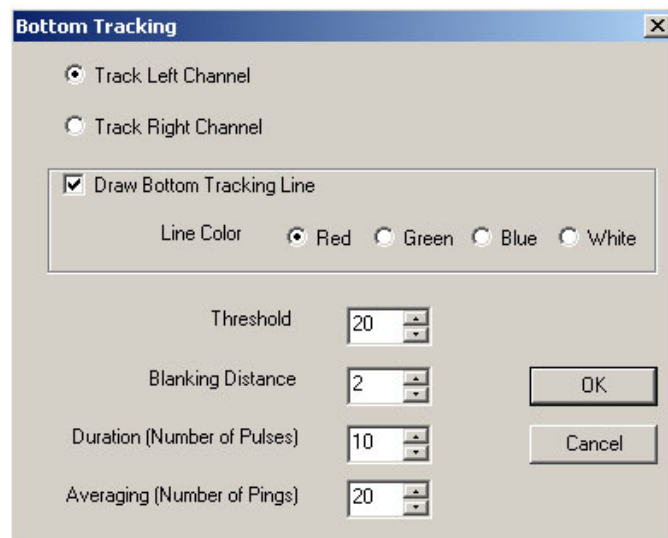


Bottom Tracking

The Bottom Tracking tool calculates the depth of water beneath the towfish. When Bottom tracking is active the Towfish Altitude is displayed to the right of the “Standard Toolbar”. If the towfish is the proper distance from the bottom, the Towfish Altitude text is green. If the towfish is **not** the proper distance from the bottom, the Towfish Altitude text is red.

Bottom Tracking Instructions:

1. Select: Action Menu -> Track Bottom.



Bottom Tracking Window

2. Select Channel to Track.
3. Check “Draw Bottom Tracking Line” to draw a bottom tracking line on image.
 - a. Select Line color.
4. The “Threshold” control (0-100%) determines the minimum intensity signal used to calculate the bottom return. 20% is a good starting point.
5. “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.
6. The “Duration” sets the number of consecutive pulses above the “Threshold” value to determine the bottom return. 10 is a good starting point.
7. “Averaging (Number of pings)” determines the number of pings averaged together to determine the bottom return. 20 is a good starting point.

OPERATOR SWITCHES AND CONTROLS (continued)

TOP TOOLBAR (continued)

Settings:

- **Select Serial Port number** - The SONAR VIEW software will identify available com ports. The operator must select one of the available com ports and plug the Sonar Processor box into that port.
- **Set Date Format** - The operator can choose either: month/ day/ year or day/month/year. The date is displayed in the Settings Toolbar 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 Toolbar and is recorded with the sonar data.
- **Restore Default Settings** - Returns settings to the original factory default settings.
- **Smoothing** - The default setting for this function is "always on". It smooths out the rough edges in the image created by sonar returns of varying strength. In slower computers it is sometimes necessary to turn this setting off to get the best sonar image.
- **Frequency 100 Khz** - Operator selects which frequency Fish is being used. If dual frequency Fish, the operator selects which frequency to operate.
- **Frequency 600 Khz** - Operator selects which frequency Fish is being used. If dual frequency Fish, the operator selects which frequency to operate.



Help:

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



RECORD HIGHLIGHTS (under the FILE Menu)

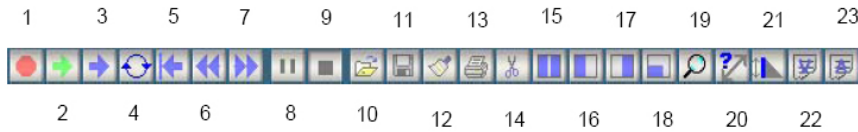
Allows the operator to create a new, smaller file containing any size portion of another previously recorded file.

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.

OPERATOR SWITCHES AND CONTROLS (continued)

TOOL BARS: (CONTINUED)


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

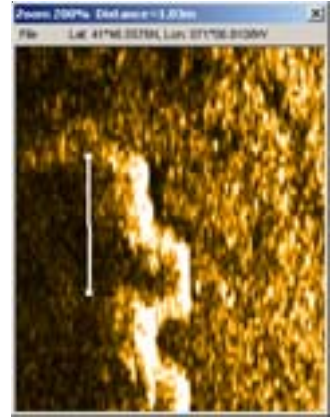


- 1 - Records new file (Note: Pressing the “F1” key on the keyboard also records a new file.)
- 2 - Monitor mode, only real time viewing of the sonar image with no recording of data.
- 3 - Playback.
- 4- Playback Loop (see pg 42)
- 5 - Rewind to beginning
- 6 - Rewind.
- 7 - Fast forward
- 8 - Pause.
- 9 - Stop playing file,
- 10 - Opens a file for playback,
- 11 - Saves screen as Bitmap picture.
- 12 - Clears the screen.
- 13 - Print screen.
- 14 - Record Highlights (see pg 44)
- 15 -Two windows - shows left side and right side sonar images.
- 16 - Left Window - shows left side sonar image only.
- 17 - Right Window - shows right side sonar image only.
- 18 - Sonar Coverage Map - shows the optional sonar coverage map window
- 19 - Zoom - enlarges object (see page 31 for more details).
- 20 - Measure size - sizes the object (see page 31 for more details)
- 21 - Measure Target Height - opens the measure target height tool
- 22 - View Annotations - Displays a list of all text annotations in the current file .
- 23 - Add Annotations - Opens the “Add Annotation” window.

ZOOM

There are two ways to zoom in on an area:

1. Use the Standard toolbar zoom button ()
 - a. Click on the zoom button.
 - b. Move the cursor to the top corner of the area you want to zoom on.
 - c. Press and hold the left mouse button.
 - d. Drag the cursor to bottom corner of the area you want to zoom.
 - e. Release the left mouse button
 - f. 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 coordinates of the center of the zoom area will be 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” pulldown menu.

The options under the file pulldown menu are:

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

MEASURE SIZE

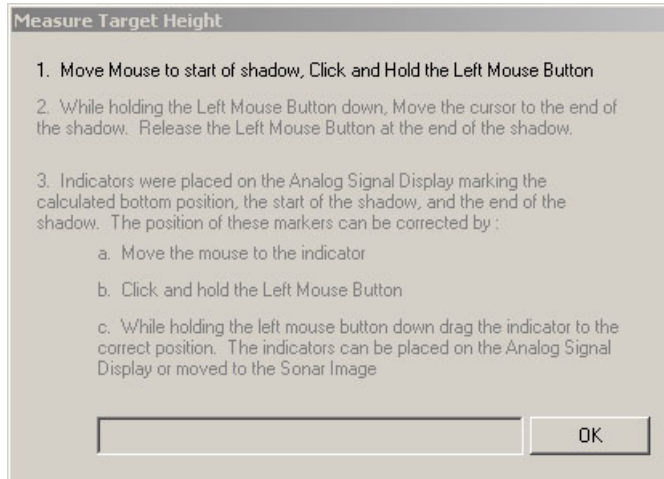
There are two ways to determine the size of an object:

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 in the Title Bar of the Sonar Window.

Target Height Measurement

The Target Height measurement tool allows you to measure the height of a scanned object. To measure the height of an object:

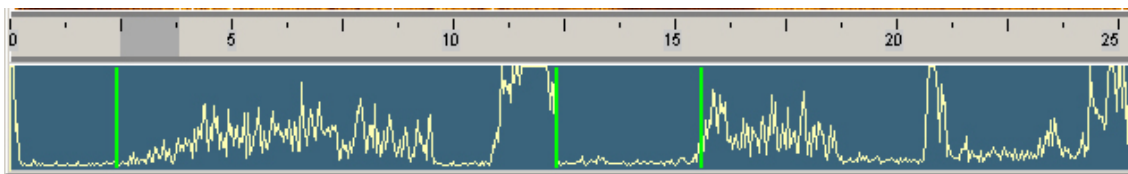
1. Click Measure Target Height toolbar button 



The Measure Target Height Dialog box pops up and walks you through measuring the target height. The current step required to measure the Target height is high-lighted in black text. All other instructions are grayed out. As you completed one instruction that instruction is grayed out and the next instruction is highlighted in black text. The target height will be displayed in the box at the bottom of the Measure Target Height Dialog.

Three markers will be displayed. Finetune by dragging the first marker (left one on example below) to the first bottom return, the middle marker to the beginning of the shadow and the third marker to the end of the shadow

Example of Target Height Measurement indicators placed on analog signal display



Example of Target Height Measurement indicators placed on Sonar Image




Annotations

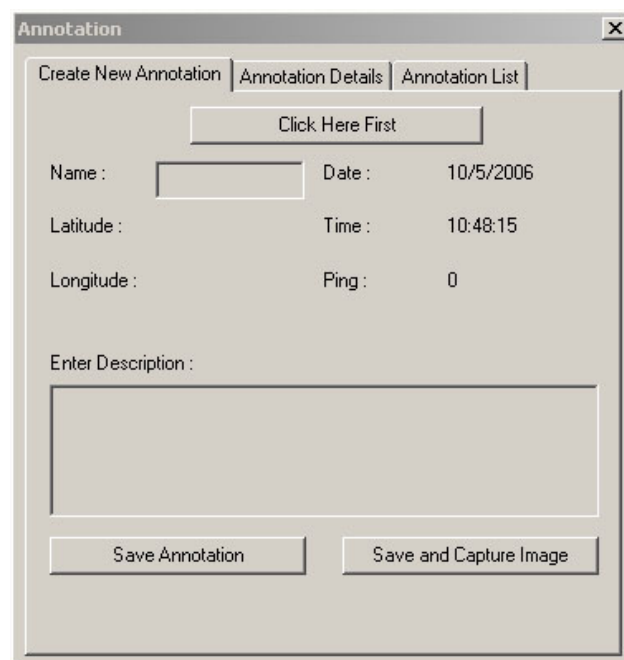
To describe object on the sonar image, the Annotation feature allows you to create a text description of the object. The annotation name tag is displayed on the sonar image, and clicking the name tag will show the full details of the Annotation.



Example of name tag on sonar image

Creating New Annotations

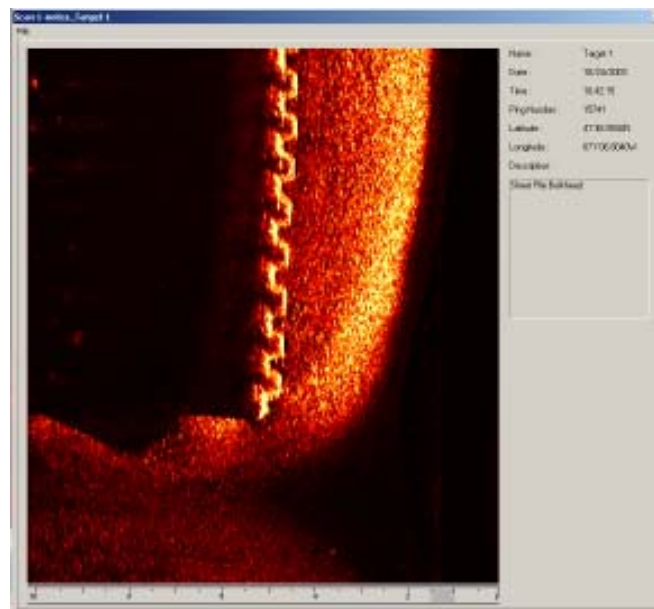
Annotations can be added during recording or during playback. You can create new annotations by clicking the “Create New Annotation” toolbar button  or select “Create New Annotation” under the menu bar Action menu



Create New Annotation Dialog Window

1. Click the “Click Here First” button
2. The “Click Here First” button changes to “Click Target on Screen”
 - a. Move the mouse pointer over the target you wish to attach the annotation to and click the left mouse button. The Latitude, Longitude, and ping number are automatically captured for the annotation record.


3. The “Click Target on Screen” button disappears and red instruction text directs you to enter a name for the annotation. The box for the name becomes active and reads “<Enter Name>”. The name can be up to 14 characters
 - a. As soon as you move to the Enter Name box, the software automatically assigns the name: “Target #” (# is the total annotations +1).
 - b. You can leave the auto name or enter your own name for the target.
4. The red instruction text directs you to enter a description. The description box reads “<Enter Description Here>”
 - a. Enter a verbose description of the target up to 185 characters
 - b. At this time if you use the Measure Distance tool or the Measure Target Height tool, the Distance and/or Target Height will be automatically entered into the description text.
5. Now click:
 - a. The “Save Annotation” button to save the annotation to the file
 - b. Or click the “Save and Capture Image” button.
 - i. The “Save and Capture Image” button captures a bitmap image of the sonar image and creates a report view that displays the Annotation information. The image is automatically stored in the folder where the current sonar image file is stored.
 - ii. The image is automatically named Sonar Image File Name + Note Name.bmp (ex. Sonar file name is Scan 1.xtf , Note Name is “Target 2” Note image is named “Scan 1_Target 2.bmp”)



Saved Bitmap Image

Viewing Annotations

You can view stored Annotations details in different ways. The following three methods allow you to view annotation details when an annotation name tag is currently displayed on the sonar image screen.

1. Select “View all Annotations” in the application “View” menu.
2. Click the “View Annotation” button  on the Standard Toolbar.
3. If an annotation is currently on the sonar image screen, click the name tag on the sonar image.



Click Name Tag

These three methods will open the “Annotation Details” tab of the Annotation Wizard. The “Annotation Details” shows all the details stored about a single annotation.



Annotation Details Window

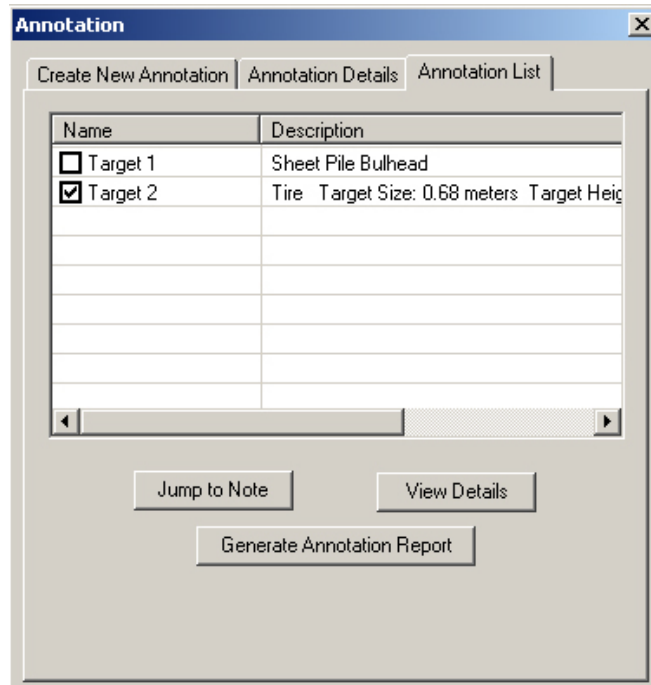
- You can view the details of other annotations by clicking the Previous or Next buttons.
- To jump to the Annotation place in the sonar image file click the “Jump to Note” button. The sonar image file is automatically advanced to the annotation record in the sonar image file and displayed on the screen.
- If an image was stored, you can view the stored image by selecting the “View Image” button. If an image was not stored, the “View Image” button is hidden and replaced with a “Capture Image” button. You can capture an image (as described in step 5 of the “Creating New Annotations” instructions) by clicking the “Capture Image” button.

Viewing Annotations (continued)

The following methods allow you to view annotation details when an annotation name tag is **not** currently displayed on the sonar image screen.

1. Select “View all Annotations” in the application “View” menu.
2. Click the “View Annotation” button  on the Standard Toolbar.

These methods will open the Annotation Wizard “Annotation List” tab. This view lists all of the Annotations found in a Sonar Image file.



Annotation List Window

By checking off an Annotation on the list you can then view the details of the annotation by clicking the “View Details” button, or jump to the Annotation place in the sonar image file clicking the “Jump to Note” button.

If you wish to generate a text file containing all of the Annotation information in a sonar image file, click the Generate Annotation report button.

Editing Annotations

The “Annotation Details” tab also allows information to be edited.

The screenshot shows a window titled "Annotation" with three tabs: "Create New Annotation", "Annotation Details", and "Annotation List". The "Annotation Details" tab is selected. The window contains the following fields and controls:

- Name:** Tagal 1
- Date:** 10/24/2003
- Time:** 10:42:15
- Ping:** 15741
- Latitude:** 41°46'59.92N
- Longitude:** 071°06'00.40W
- Description:** Sheet Pile Bulkhead

Below the description field, there is a note: "Annotation Tied on Screen Screen can be Moved by:" followed by instructions: "1. Left clicking the tied and holding the Left Mouse Button down" and "2. Drag the tied to the desired position and release the mouse." At the bottom of the window, there are three buttons: "Edit Annotation", "Save Changes", and "Discard Changes". A status bar at the bottom center shows "1 of 1".

Annotation Details Window

1. Click the “Edit Annotation” button.
 - a. The name and description boxes turn white and become active allowing the Annotation Name and description text to be edited.
 - b. The “Jump to Note” and View / Capture Image” buttons are replaced with “Save Changes” and Discard Changes buttons.
2. Make changes to the Name or Description.
3. When you are finished editing,
 - a. Click the “Save Changes” button to save the changes you have made.
 - b. Click the “Discard Changes” button to discard the changes you have made.

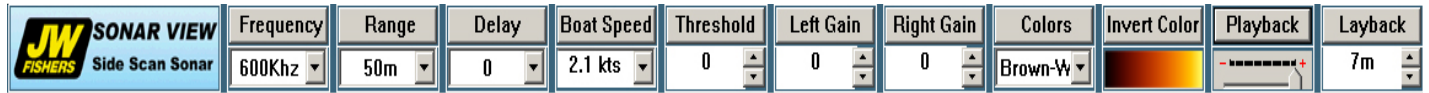
NOTE:

Changes are not saved until the “Save Changes” button is clicked.

OPERATOR SWITCHES AND CONTROLS (continued)

TOOL BARS: (CONTINUED)

Controls Toolbar - Shown at the bottom of the sonar screen. Clicking on “Controls Toolbar” under VIEW at top of page, user can select which controls are shown at the bottom of the page. The operator adjustable controls are:



- **Frequency** - allows the operator to select the frequency on a dual frequency side scan.
- **Range** - available range settings in meters are; 5,10,25,50,75,100,200,300,400,500, 600. On the 600K frequency setting only the 5, 10, 25, 50, and 75 meter range settings are displayed.
- **Delay** - It delays displaying the image for 1,2,5,10,15,20, or 25 m (operator selectable). Commonly called water column removal. Eliminates the displayed image for the period of time that the signal takes to reach the bottom.
- **Boat 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.
- **Threshold** - Changes the overall baseline of the returned signal so that even the smallest signal is visible on the monitor. Threshold is selected by clicking on the up or down arrows on the right hand side of the box showing the threshold number to scroll through the 256 settings (0-255).
- **Left gain** - Increases or decreases the size of the signal coming from the towfish and shown as the sonar image on the left side of 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 by clicking on the up or down arrows on the right hand side of the box showing the gain number.
- **Right gain** - Increases or decreases the size of the signal coming from the towfish and shown as the sonar image on the right side of 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 by clicking on the up or down arrows on the right hand side of the box showing the gain number.
- **Colors** - there are seven different color schemes are available. The color shade furthest to the left is displayed with low amplitude signal returns and the color shade furthest to the right for hard returns.
- **Invert Colors** - Inverts the selected color scheme effectively doubling the number of color choices
- **Playback Speed Slider**- Controls the playback speed of a previously recorded file.
- **Towfish Layback**- The GPS position captured by Sonar View is the position of the GPS antenna. The towfish 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.

On the bottom of the screen are two status bars. One bar displays the boat's position (latitude and longitude), compass heading, nautical speed, and the position (latitude and longitude) of the mouse arrow on the screen. The other bar displays the time, date, and run time of the file.

Latitude: 41°46.5764N	Longitude: 071°06.8536W	Heading: 221.3°	Speed: 1.4 Knots	Cursor Lat: 41°46.5853N	Cursor Lon: 071°06.8653W
Time: 09:52:30	Date: 10/24/2003			Run Time: 00:02:09	

SONAR VIEW SOFTWARE INSTALLATION

Before connecting the Side Scan Sonar system to your PC for the first time it is necessary to install the JW Fishers Sonar View software, the required hardware drivers, and configure your PC for use with your JW Fishers Side Scan Sonar system. Follow the instructions on the next five pages to complete this process.

If you have purchased a complete Side Scan Sonar 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 47.

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 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) (see instructions on page 41).**

(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 SOFTWARE INSTALLATION

Operation of the *SONAR VIEW* 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 calibrate and 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 control the Sonar Processor Settings. The Third program, *SONAR VIEW*, 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 plug the USB cable from the Sonar Processor into your PC at this time. You will be prompted to do so later in this installation.**

1. Start PC
2. Insert *SONAR VIEW* Installation CD into CD or DVD drive.
3. The JW Fishers *SONAR VIEW* banner should appear. If it does, Skip to step 5
4. If the *SONAR VIEW* 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* . Click on Setup.exe. This will start the installation program.
5. A message box will open stating windows is configuring InstaCal. InstaCal will automatically install.
6. After the InstaCal installation is complete, a *PL-2303 Driver Installer Program* will launch.
7. The 'Welcome to the InstalShield Wizard for PL-2303 USB to Serial' box opens. Click 'Next' to continue
8. The driver will install, and then the 'InstalShield Wizard Complete' message box will show. Click 'Finish' to complete this step.
9. The 'Welcome to JW Fishers *SONAR VIEW* 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'.

INSTALLING HARDWARE AND SOFTWARE (continued)

SONAR VIEW SOFTWARE INSTALLATION (CONTINUED)

13. The “Select Installation Folder’ box opens. The default folder is C:\ Program Files\
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* 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 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 plug 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 SOFTWARE INSTALLATION IS CONTINUED ON NEXT PAGE

INSTALLING HARDWARE AND SOFTWARE (continued)

When you first connect the Sonar Processor SP to PC Interface (USB Cable), the Windows “Found New Hardware Wizard will launch.

1. The first message box will state: ‘Can Windows Connect to Windows update to search for software?’ Select ‘No, not this time.’ then click ‘Next’ to continue.

2. The next screen states: ‘If your hardware came with an installation CD of Floppy, insert it now The drivers have already been installed on the PC. It is not necessary to insert the CD. Select ‘Install the software automatically (Recommended)’, then click ‘Next’ to continue.

InstaCal program - Interface board configuration and calibration

Before the *SONAR VIEW* can be used for the first time, this 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. From the Start menu select Programs / Measurement Computing / InstaCal.
2. The InstaCal software starts.
3. A ‘Plug and PlayBoard Detection’ window should open. USB-1208HS should show in the window. Click ‘OK’
4. ‘Board #0 - USB-1208HS’ should show in the board list window.
5. From the ‘Install’ pull-down menu click on ‘Configure’. The ‘Board Configuration’ box opens.
6. • Next to ‘Number of Channels’, select ‘8 Single Ended’. from the drop down list.
• Click ‘OK’ to continue.
7. Exit the InstaCal program.

SONAR VIEW SOFTWARE INSTALLATION IS CONTINUED ON NEXT PAGE

INSTALLING HARDWARE AND SOFTWARE (continued)

When you run the SONAR VIEW software for the first time it will be necessary to configure the SONAR VIEW software to open the correct COM (serial) port for 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 SONAR VIEW system. Do not launch the SONAR VIEW Application at this time.
2. Select the windows 'Start' menu and single right mouse click on '(My)Computer'.
3. A pop-up menu will appear. Left mouse click on 'Manage'
4. Left mouse click on 'Device Manager' (found in the left hand list).
5. In the Device Manager window a list of your computers hardware will be shown. Click on '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 'Prolific USB to Serial Com Port (COM4)' or 'Belkin Serial Port (COM6)'. Note which COM port number has been assigned to the USB to Serial Adapter.
7. Close all open windows.
8. Launch the SONAR VIEW application
9. A message box will appear stating "Unable to Open Serial Port. Select Cancel to work Offline". Select "Cancel".
10. Open the "Setting Menu" and select "Select Serial Port Number"
11. Select the COM port number that matches the COM port number assigned to the USB to Serial Adaptor

The SONAR VIEW COM settings are now configured.

***Note:**

If the USB to Serial Adaptor is installed in a different (physical) USB port, the COM port number changes and you will have to repeat these steps to reconfigure the COM settings.

The hardware and software installation is now complete.

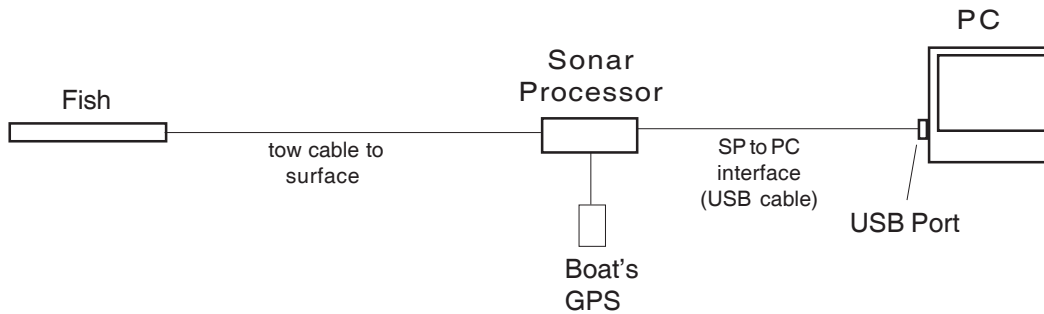
SONAR VIEW SOFTWARE INSTALLATION FOR PLAYBACK ONLY

Use this install to put *SONAR VIEW* on computers that will only be used to playback previously recorded files.

1. Start PC
2. Insert *SONAR VIEW* Installation CD into CD or DVD drive.
3. The *SONAR VIEW* Installation program should auto-run. If it does not, skip to step 5.
4. Exit the *SONAR VIEW* Installation program without installing any software.
5. Open Windows Explorer from the Start / Programs menu or right click on the Start button and select Explore from the menu.
6. Select Jwf – *SONAR VIEW* . Open the *SONAR VIEW* folder. Click on Setup. This will start the *SONAR VIEW* installation program.
7. The 'Welcome to JW Fishers *SONAR VIEW* Setup Wizard' box opens. Click 'Next' to continue.
8. The customer information box opens "Enter your name, organization, and the software serial number provided by JW Fishers. Click 'Next'.
9. The 'Confirm Installation' box opens. Click 'Next'.
10. The "Select Installation Folder' box opens. The default folder is C:\ Program Files\. This should only be changed if either the Windows or Program Files folder is not located on the C:\ drive. Click 'Next'.
11. The *SONAR VIEW* software installation will complete. Click 'Close' in the 'Installation Complete' box.
12. Remove the Installation CD from the drive now.
13. *SONAR VIEW* is now ready to run for playback only.
14. When running *SONAR VIEW* a warning will appear:
"A Required Interface board was not found, Recording has been disabled".
Click ok to enter playback only mode.

CONNECTING THE CABLES

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



Step 1.

Attach the tow cable from the side scan towfish to the Sonar Processor box.

Step 2.

Attach the SP to PC interface USB cable from the Sonar Processor to an available USB port on the computer.

Note: Always use the same USB port when operating the Side Scan Sonar. This will eliminate the need to change communications settings.

SP to PC Interface
Splash Proof USB Cable

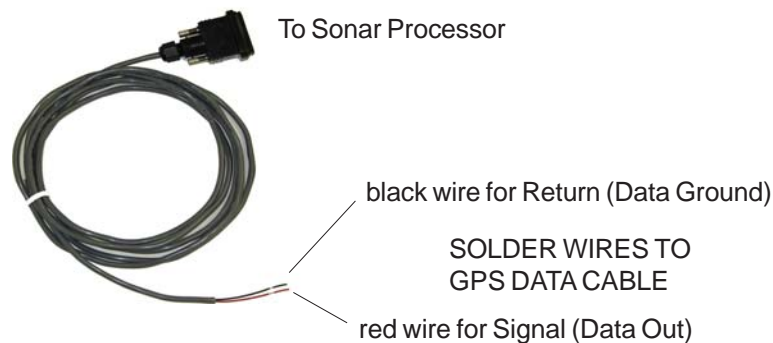


CONNECTING THE CABLES (continued)

Step 3.

Attach the output cable from the GPS system to the SP box. NOTE: The GPS system must have a serial output, not USB. There is no adaptor to connect a GPS with USB output to a serial port.

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 the “GPS INPUT” jack on the SP box. 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.



POWER INPUT -

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 (this also recharges the internal battery). An optional 12vdc to 120vac inverter can be used to power the AC Power Supply included with the computer.

*Note:

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.

OPERATION

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

For the sample Playback only the computer with the loaded Sonar View 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. It could be in a lake, slow moving river, or in a harbor or a bay area of the ocean.

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



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SAMPLE PLAYBACK

It is recommended that before beginning use of the PC side scan sonar, 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 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: C:\Program Files\JW Fishers\SONAR VIEW\Sample Data Files
2. Under the VIEW command at the top of the screen select the Standard Toolbar and Control Toolbar. Both toolbars will then be shown at the bottom of the screen.
3. Click the Playback button on the toolbar on the bottom of the screen. The Playback button is the single blue arrow pointing to the right. The saved file will begin to play.
4. Using the toolbar on the bottom of the screen, click on the invert color button and note how the sonar image changes.
5. Change the selection on the colors menu next to the COLOR button, and note how the sonar image changes.
6. Click the Stop button on the toolbar on the bottom of the screen. The Stop button is the black square.
7. Click the Rewind button on the toolbar on the bottom 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. Click the Playback button to continue playing the file.
8. Click the Fast Forward button on the toolbar on the bottom 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.
9. 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.
10. To measure a target on the screen click the measure button on the toolbar (see page 30). Hold the shift key and click the mouse arrow on one end the target. Holding both the shift key and 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 (in meters) will be displayed in the signal window title bar.
11. 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 buttons. 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 colors, gains, and threshold.
12. 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.

Left
Blank

SAMPLE RECORDING

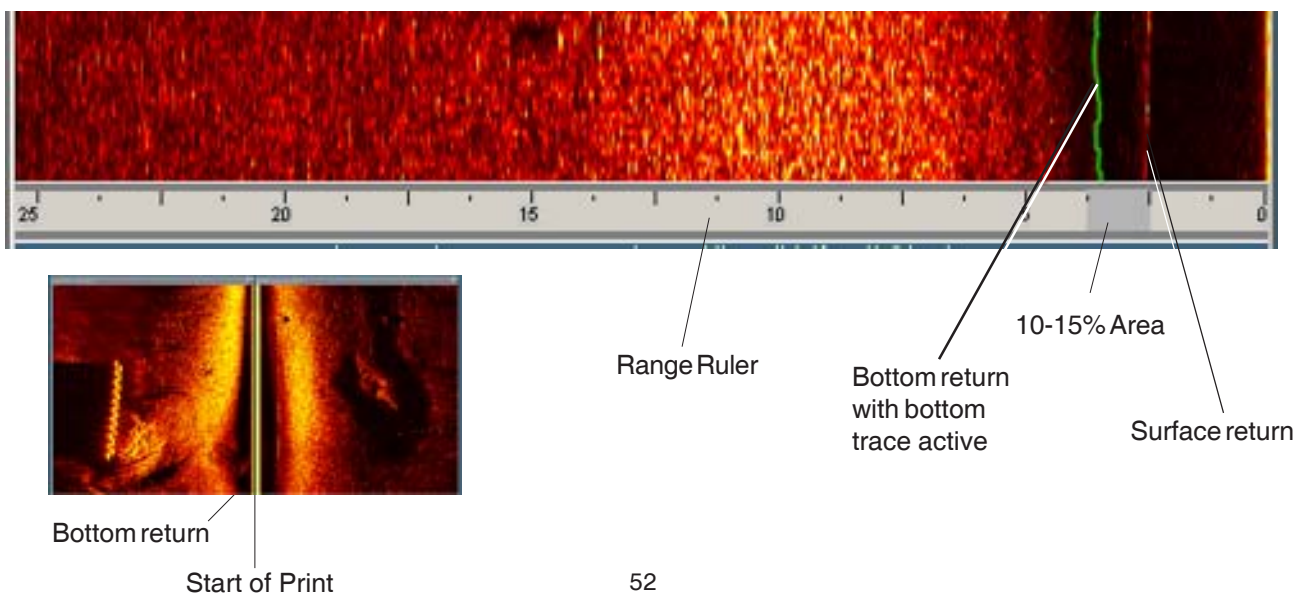
The ideal location for the first "in the water" tow test is in a calm body of water 20 to 30 foot deep. It could be in a lake, slow moving river, in a harbor, or a bay area of the ocean.

Running the side scan 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 side scan.

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.

Cable up the system 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 optional 120 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) Install the tow arm on the fish, fish will not tow correctly without it.
- 2) With the boat underway 1-3 kt, 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. If you are operating the fish close to the prop wash, the display will not show an image from that side of the fish.
- 3) If you are operating in very shallow water, 7-10 ft, there is nothing wrong with towing the fish just below the surface (2-3 ft of cable let out - stay away from prop wash). In this situation you should be able to operate in the 10 and 25 meter ranges. Because the fish is so close to the bottom, you will not be able to operate in the longer ranges. The rule of thumb is that the distance the fish should be towed off the bottom equals 10-15 % of the Range setting. It is **critical** that the fish is not too close to the bottom (will not get a picture of the bottom), or not too far off the bottom (will miss targets below the boat). The fish is at the correct distance off the bottom when there is approximately 10 to 15% of space between the start of the image and the bottom return. See drawing below. Note: If you are in shallow water you may also see a surface return printed (a second line printed). The shaded area in the ruler represents 10-15% of the range. The bottom return should occur in this general area.



SAMPLE RECORDING (continued)

- 4) Power up the computer.
- 5) Power up the Sonar Processor **after** the computer has booted up (the computer will not properly boot up if the Sonar Processor is powered up)

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 application. To begin select Monitor Mode on the Standard toolbar at the bottom of the screen (make sure the Standard Toolbar and Control Toolbar has been checked under VIEW in the Top Toolbar). Monitor Mode will allow you to view the side scan data but not to record it. Recording will come later (step 8).
2. Select the frequency of the Fish under “Settings”. If it is a dual frequency fish, select 600Khz. The higher frequency gives a better quality image on the short ranges.
3. Select a scan range under “Range” on the control toolbar at the bottom of the screen. There are 11 range settings (for 100Khz Fish) between 5 and 600 meters. Longer range settings allow a larger area to be scanned, but the resolution of the scan is lower. Shorter range settings produce higher resolution images (if 600Khz fish) and are recommended when searching for small or “soft” targets. For this exercise select 25 meters.
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 kt) the better the image. If the GPS connected to the computer outputs a speed, select “AUTO” from the boat speed box on the screen.
5. Select a screen color under “Colors” on the control toolbar. The color combinations allow the sonar image to be displayed in various shades of both 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.
6. Make a preliminary setting of the Gain Controls (TVG) on the Sonar Processor box (not on the software). Start with all three gain controls (for each channel) full counter clockwise. Adjust the Overall Gain to 5 then start turning up the Near Gain until the image is clearly displayed. Lastly adjust the Far Gain control for a balanced image across the display.

While making the TVG adjustments, observe the Analog Signal Display below each channel (see page 27 for location). When the TVG is properly adjusted the overall baseline of the displayed signal will be somewhat flat and in the lower center area of the screen. A typical TVG adjustment setting for the 25 m range would be: Near 4 1/2, Far 7, and Overall 5 1/2.

Note: When recording, it is important to have the Gains properly adjusted. If a file is recorded with the Gains 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 Overall Gains set slightly too low; the Gains can be increased by the on-screen Gain Control

SAMPLE RECORDING (continued)

7. Lower the Fish to 10-15% of Range off bottom. This area (water column) will be black on the screen.
8. 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
 2. Select "Record New File" under the "File" pull down menu on the top toolbar (or Press the "F1" key.)

The "Record New Record" 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. 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 side scan and interpreting the printout will improve dramatically with 3-4 hours of making passes at known targets such as channel buoys, following the edge of channels (20-30 m away), and of course scanning known wrecks at different angles (approaches), and at different Ranges.
- Recorded data can be copied to a CD or DVD for transport or archiving. Sonar View can **NOT** playback data that is stored on a CD or DVD. To playback data from a CD or DVD, you must first copy the data from the CD or DVD to the PC's hard drive, and then use Sonar View to playback the data from the hard drive.

On Soft Target Searches (Search and Rescue for Bodies):

High frequency (600K) sidescan is the most effective search tool for bodies and other small targets located on the bottom. Compared to other search and rescue techniques the swath is large, 10 to 20 m wide when on the 5 to 10 m range. Some one-liners on using sidescan for body recovery:

- Must use high frequency (600K).
- Should be in very short range (5-10m on Range) so target will be large on display.
- Keep fish ~10-15% of Range setting off bottom regardless of water depth. This is accomplished by lowering the fish until the printout shows the proper space at the beginning of the image on the display (see page 42)
- Use slow tow speed for bodies or small targets. 1-2 knots is a good speed.

Left
Blank

FAQs

Operation

- Q) What would you consider a good place to start with the gain Controls?
- A) I start with the Near Gain 5, the Far Gain 7, and the Overall Gain 7. Fine tune the Near Gain so objects close to the towfish look good. Next, adjust the Far Gain so objects farthest from the towfish look good. Finally, use the Overall Gain to adjust the overall darkness or lightness of the image.
- Q) How do I adjust to compensate for a bottom that slopes away or towards the transducer?
- A) The transducers produces a fan shaped beam that is 40 degrees in the vertical plane. This allows the Side Scan Sonar to scan gently sloped bottoms minor adjustments. For bottoms that slope gently away from the scanning head, you can compensate by raising the far gain. For bottoms that slope gently up towards the scanning head, you can compensate by lowering the far gain.
- Q) Some of the images are clearly vehicles, while others only show a large, undefined shape.
- A) This is normal. When performing a search, it is important to remember that objects will not always be displayed as you would expect. The orientation of the target in relation to the scanning head can make a big difference in the how the sonar “sees” the target. Changing the orientation of the scanning head in relation to the target will change how it appears on the display.
- Q) Will I still be able to see small objects on the longer range scans?
- A) The 25 meter plus ranges are best when searching for larger objects. Small objects are often overlooked due to their small size when drawn on the screen. On a 21", monitor, a 3ft length object measures only $\frac{1}{4}$ ", which is very easy to overlook. To thoroughly search an area for a small target (body), you will need to perform several shorter range scans. The 5 meter and 10 meter ranges are best for small target searches.
- Q) How do I get the update of JW Fishers Sonar View Software?
- A) Contact JW Fishers for information on software updates.

PH (800) 822-4744

PH (508) 822-7330

E-MAIL: jwfishers@aol.com or info@jwfishers.com

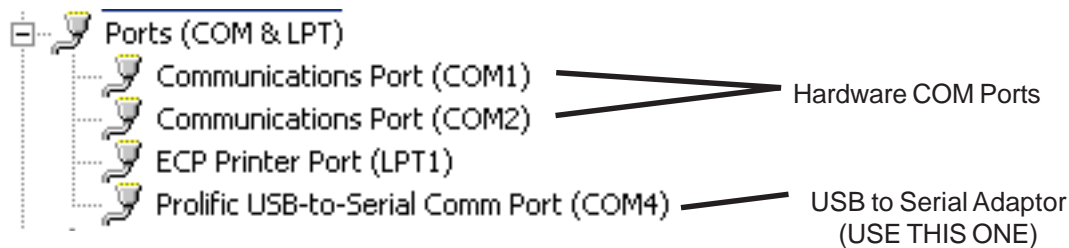
Troubleshooting

Problem: “Unable to Open Serial Port” message

The JW Fishers Sonar requires a COM (serial) port to pass operation parameters from the PC to the Sonar. It will be necessary to configure the JW Fishers Sonar software to open the correct COM (serial) port for communications. Below are instructions for configuring the COM (serial) port.

To select the COM (serial) port number that the software will use:

1. Cable and power up the JW Fishers Sonar system. Do not launch the JW Fishers Sonar application at this time.
2. Select the Windows ‘Start’ menu and single right mouse click on ‘My Computer’.
3. A pop-up menu will appear. Left mouse click on ‘Manage’
4. Left mouse click on ‘Device Manager’ (found in the left hand list).
5. 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 ‘Prolific USB to Serial Com Port (COM4)’ or ‘Belkin Serial Port (COM6)’. Note which COM port number has been assigned to the USB to Serial Adapter.



7. Close all open windows.
8. Launch the JW Fishers Sonar application
9. A message box will appear stating “Unable to Open Serial Port. Select Cancel to work Offline”. Select “Cancel”.
10. Open the “Settings” Menu and select “Select Serial Port Number”
11. Select the COM port number that matches the COM port number found in step 6. (If more than one COM port was listed, try each one until you find the one that works.)

The JW Fishers Sonar COM settings are now configured.

*Note:

If the USB to Serial Adaptor is installed in a different (physical) USB port, the COM port number changes and you will have to repeat these steps to reconfigure the COM settings.

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-1208HS should show in the window. Click ‘OK’
4. ‘Board #0 - USB-1208HS’ should show in the board list window.
5. From the ‘Install’ pull-down menu click on ‘Configure’. The ‘Board Configuration’ box opens.
6. Next to ‘Number of Channels’, select ‘8 Single Ended’. From the drop down list.
7. Click ‘OK’ to continue.
8. Exit the InstaCal program.

PC-CARD (older) systems

The PC-CARD Interface Board must be Installed in the PC

1. From the Start menu select Programs / Measurement Computing / InstaCal.
2. The InstaCal software starts.
3. In the ‘PC Board list’ click on ‘PC-CARD-DAS16/330’ to highlight it.
4. From the ‘Install’ pull-down menu click on ‘Configure’. The ‘Board Configuration’ box opens.
 - Next to ‘Clock 0 Source’, select ‘Internal’.
 - Next to ‘Clock Speed’, select ‘10MHz’.
 - Next to ‘ADC External Pacer Edge’, select ‘Rising’.
 - Click ‘OK’ to continue.
5. From the ‘Calibrate’ pull-down menu click on ‘A/D’. The automatic calibration will begin. Allow the calibration to complete. When calibration is complete, click ‘OK’.
6. Exit the InstaCal program.

The interface board is now configured.

APPENDIX A

CONFIGURING YOUR GPS

The Side Scan accepts standard NMEA 0183 information obtained from a 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 Side Scan can obtain the boats position and heading 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 Side Scan 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.

APPENDIX B

USB TO SERIAL ADAPTOR

Windows XP

1. Load the driver software for the USB to Serial Adapter. Follow the manufacturer's instructions. Leave the adapter connected to the PC. Skip this step if it has already been done.

Complete the following steps to open the 'Device Manager' on your PC. These steps are necessary to find out what 'Com Port Number' the PC has assigned to the adapter's USB connection.

2. Select 'Start' and choose 'My Computer'.

3. Under 'Other Places', select 'Control Panel'.

 If the 'Pick a Category' window opens, select 'Printers and other hardware'.

 In the 'See Also' list, select 'System'.

 If the 'Classic View' window opens, select 'System'.

4. In the 'System Properties' window, select the 'Hardware' tab.

5. Select 'Device Manager'

6. In the Device Manager window a list of your computers hardware will be shown.

Click on 'Ports (Com & LPT)'. If this is not shown, make sure the USB to Serial adapter is plugged into the USB port and its software driver is correctly installed.

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 'Belkin Serial Port (COM6)' or 'Prolific USB to Serial Com Port (COM4)'. Click on this item.

7. When the 'Properties' window opens, select the 'Port Settings' tab.

8. Change the 'Bits per Second' to 4800.

9. Click the 'Advanced' button.

10. At the bottom of the 'Advanced settings' window, click on the 'Com Port Number' selection and select COM1, COM2, COM3, or COM4. It does not matter which one as long as it is not listed as (in use). Note which COM port you selected and click 'OK'.

11. Close all open windows.

*Note:

 If the USB to Serial Adaptor is installed in a different USB port, the COM port number changes

Windows 98SE NEXT PAGE

APPENDIX B (continued)

USB TO SERIAL ADAPTOR (continued)

Windows 98SE

1. Load the driver software for the USB to Serial Adapter. Follow the manufacturers instructions. Leave the adapter connected to the PC. Skip this step if it has already been done.

Complete the following steps to open the 'Device Manager' on your PC. These steps are necessary to find out what 'Com Port Number' the PC has assigned to the adapter's USB connection.

2. Click on 'My Computer'.

3. Select 'Control Panel'. Select 'System'.

4. In the 'System Properties' window, select the 'Device Manager' tab.

5. In the Device Manager window a list of your computers hardware will be shown.

Click on 'Ports (Com & LPT)'. If this is not shown, make sure the USB to Serial adapter is plugged into the USB port and its software driver is correctly installed.

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 'Belkin Serial Port (COM6)' or 'Prolific USB to Serial Com Port (COM4)'. Make note of the COM number; you will need it when operating the SCAN-650 software. Click on this item.

6. When the 'Properties' window opens, select the 'Port Settings' tab.

7. Make the following selections in the Port Settings tab:

Bits per second = 4800

Data Bits = 8

Parity = None

Stop bits = 1

Click 'OK'

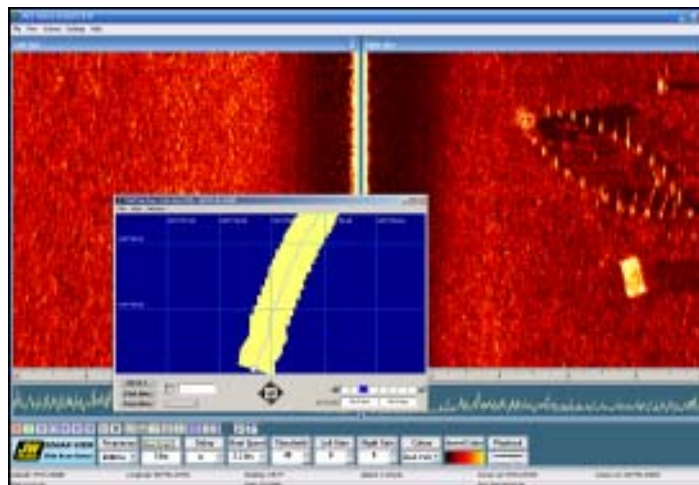
8. Close all open windows.

***Note:**

If the USB to Serial Adaptor is installed in a different USB port, the COM port number changes

Side Scan Sonar Coverage Map (option - can be purchased anytime)

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



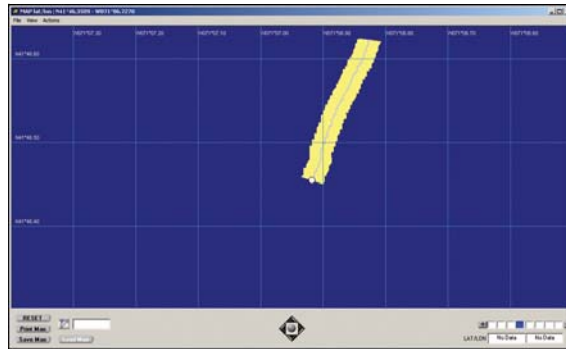
JW FISHERS MFG INC
1953 COUNTY ST.
E. TAUNTON, MA 02718 USA

(508) 822-7330; (800) 822-4744; FAX (508) 880-8949
Email: jwfishers@aol.com WEB: www.jwfishers.com

Side Scan Sonar Coverage Map (option - can be purchased anytime)

The SSS Coverage Map uses GPS or Loran information to generate a map representing the ground covered when scanning with your JWF Side Scan Sonar. This coverage map allows thorough scanning of an area.

When you start scanning, an area representing the ground covered is highlighted yellow on the coverage map window. As scanning progresses, overlapping scans appear green. This insures 100% coverage when conducting important survey operations.



Side Scan Sonar Map Window

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

- Area covered by the Side Scan Sonar are shown highlighted yellow.
- Overlapping scans are highlighted green.
- Three different types of navigational aid markers can be placed on the coverage map window. Markers showing user defined waypoints, the location of text annotations stored in sonar file, 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 SSS Coverage Map From File –

Opens and displays a Sonar Coverage Map Data File.

Open Marker and Waypoint File –

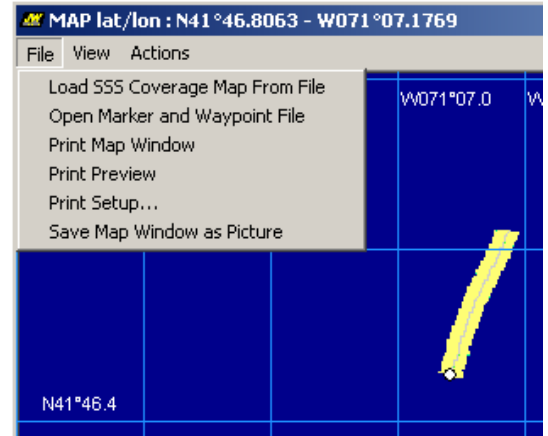
Opens a properly formatted file containing information on navigational aid markers and waypoints.

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 on the Sonar Coverage Map window as a bitmap file.



View:

Show Annotations

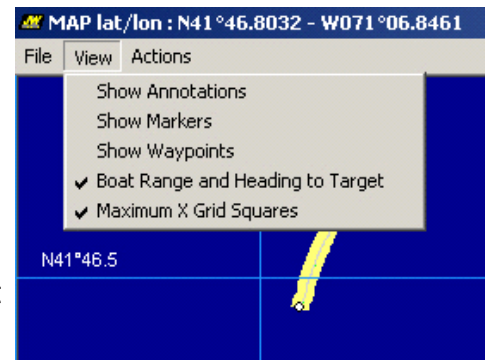
Show Markers

Show Waypoints – Selects whether or not to display Annotations, 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 –

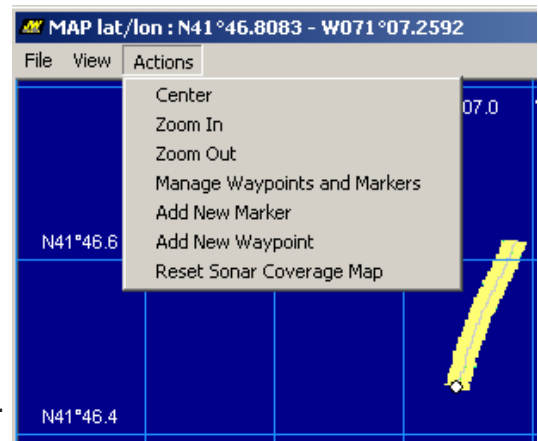
Opens a control that allows the Select which Waypoints and Markers to display on the Map and edit existing Waypoints and Markers.

Add New Marker – New window is displayed for making a new Marker (see page 64)

Add New Waypoint – New window is displayed for making a new Waypoint (see page 64)

Reset Sonar Coverage Map –

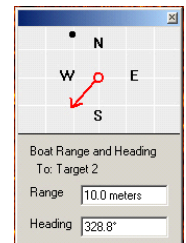
Clears all previous sonar coverage information from the Map.



Tools:

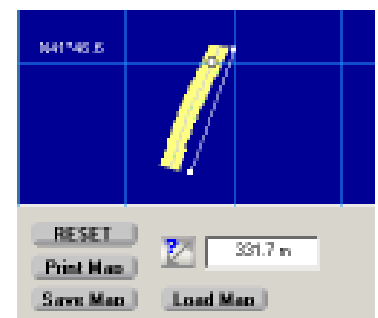
There are variety of tools available to assist in navigation and scanning targets

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)

Three 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, the location of text annotations stored in sonar file, 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. Annotation markers show the location of objects previously scanned.



Annotation Marker

3. 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.

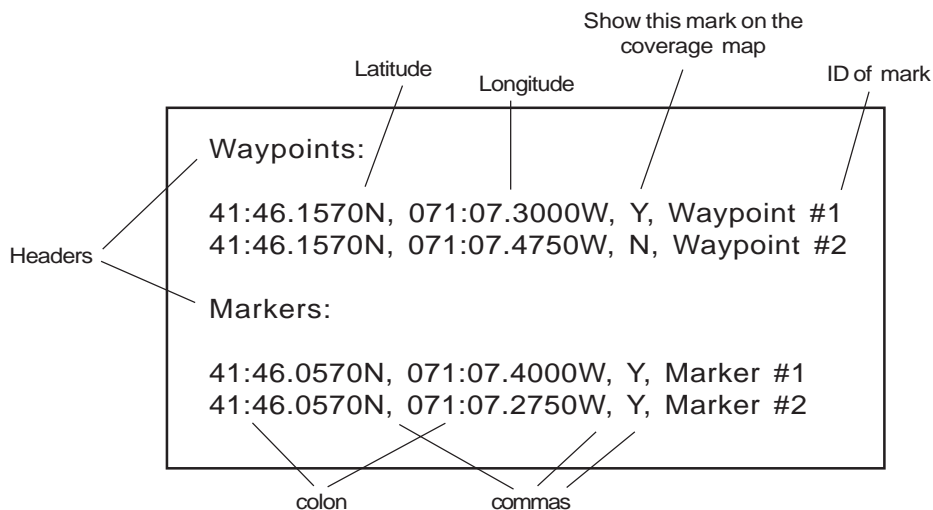
1. Waypoints, and general purpose markers can be entered into properly formatted text file and imported into Sonar View's coverage map.
2. Using an interactive tool window, waypoints, and general purpose markers can be added during operation.

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:
 - o Latitude and longitude are formatted degrees, decimal minutes (DD : MM.MMMM)
 - o The sentence structure is:
Latitude, Longitude, Show Marker/Waypoint (Y or N), ID Text
 - o Colons (:) must be used to separate degrees and Minutes.
 - o Commas (,) must be used to separate each fields.\
 - o The list of waypoints must have the header "Waypoints:"
(The headers are what the software used to determine what kind of marker to place)
 - o 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.

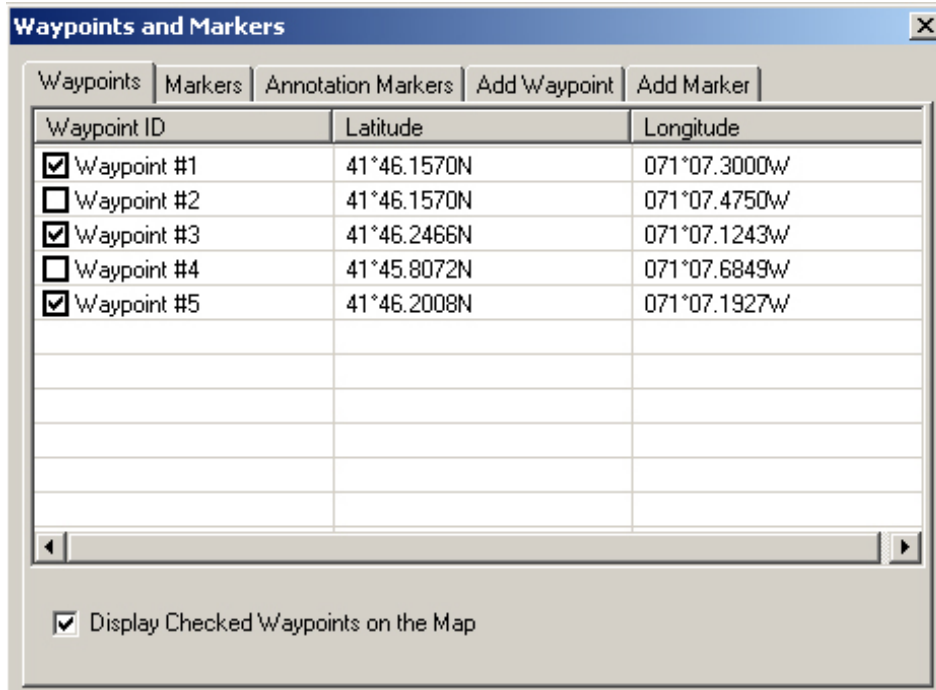
—OR—

- 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

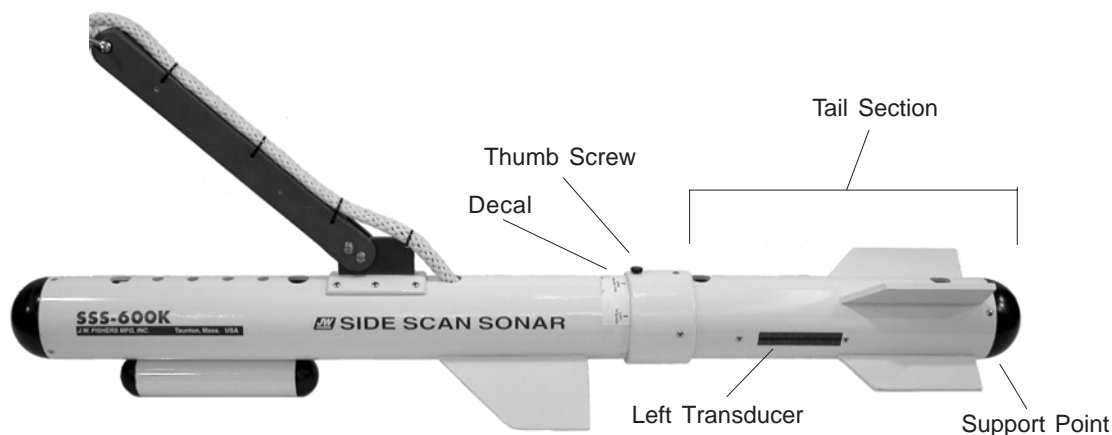
- Selecting “Display Checked Waypoints (Markers) on the Map” will display all of the waypoint or (markers), that are checked off, on the coverage map.
- Double clicking any item text with the mouse will highlight the text, allowing you to edit the item.

INSTRUCTIONS FOR ADJUSTABLE TRANSDUCERS (OPTION)

The adjustable transducer option allows the 600k transducers in the side scan fish to be adjusted so that vertical walls (pilings) and boat hulls (bottoms) can be scanned (two different transducer adjustments).

Adjustment of the transducers is accomplished by removing the thumbscrew from the top of the fish (tail section) and rotating the fin section to the appropriate position which is marked on the fish.

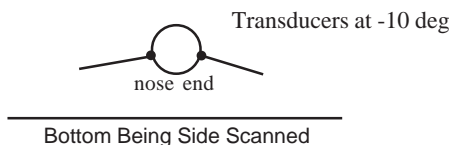
Note: position the fish so that no weight (pressure) is on the fins or tail section when removing or installing the thumb screw. The very end of the tail section should be supported with your hand so the holes can be properly aligned. Do not turn the tail section in a complete circle (360 deg) which could damage the internal cabling.



The tail section can be rotated to five different positions: Normal, Hull Bottom Right, Hull Bottom Left, Vertical Right, and Vertical Left. A decal on the fish shows each position.

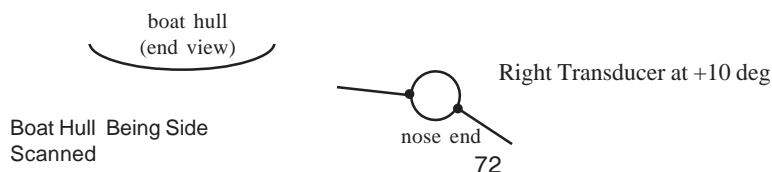
Normal

In this position both 600K transducers are at -10 degrees from the horizon. This is the position that is used for normal bottom side scanning.



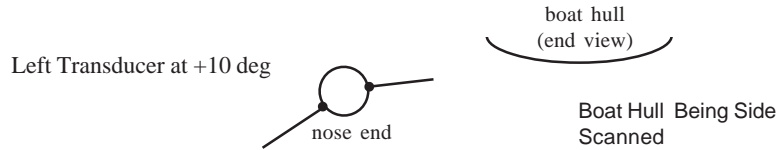
Hull Bottom Right

In this position, the right 600K transducer is at a +10 degrees from the horizon. This is the position that is used for scanning the bottom of a boat on the right side of the fish. The PC is set up to display right channel only; the left transducer output is ignored. The recommended Range setting on the PC is 10 m. The fish is towed 1-2 m below the bottom of the boat hull. In most cases, two passes along the length of the boat hull is required, one pass along one side of the hull and a pass going the other direction along the other side.



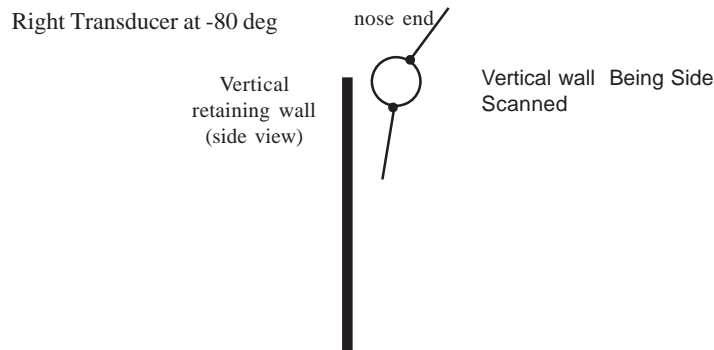
Hull Bottom Left

In this position, the left 600K transducer is at a +10 degrees from the horizon. This is the position that is used for scanning the bottom of a boat on the left side of the fish. The PC is set up to display left channel only; the right transducer output is ignored. The recommended Range setting on the PC is 10 m. The fish is towed 1-2 m below the bottom of the boat hull. In most cases, two passes along the length of the boat hull is required, one pass along one side of the hull and a pass going the other direction along the other side.



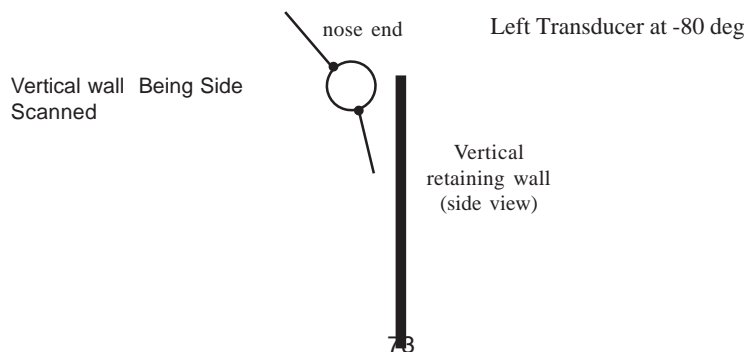
Vertical Right

In this position, the right 600K transducer is at a -80 degrees from the horizon. This is the position that is used for scanning a vertical wall on the right side of the fish. The PC is set up to display right channel only; the left transducer output is ignored. The recommended Range setting on the PC is 10 m. The fish is towed 1-2 m from the face of the wall. In most cases, the fish is just below the surface and is towed along the length of the wall.



Vertical Left

In this position, the left 600K transducer is at a -80 degrees from the horizon. This is the position that is used for scanning a vertical wall on the left side of the fish. The PC is set up to display left channel only; the right transducer output is ignored. The recommended Range setting on the PC is 10 m. The fish is towed 1-2 m from the face of the wall. In most cases, the fish is just below the surface and is towed along the length of the wall.



MAINTENANCE

Your Side Scan was designed to be maintenance free. The fish, sonar processor, and cable are constructed of corrosive resistant materials. When operating in salt water, it is good policy to rinse off the fish in fresh water prior to storage. The transducer's face (window) 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 Side Scan 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 Side Scan 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 Side Scan 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 pays shipping costs.

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. See cover page for contact information.



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