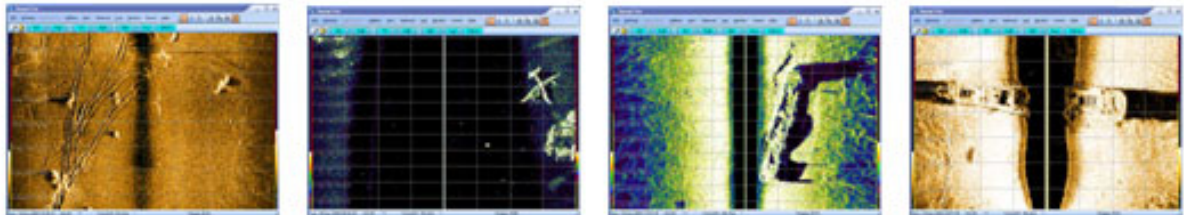


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Learn More about Side Scan Sonars

Side Scan Sonars provide sophisticated digital pictures of the sea-floor surface. Common applications for side scan sonars include; accurate mapping of large sections of the seabed; overall sidescan survey to locate pipeline or cable routes, seamounts, obstructions and other features. Specifically, shipwreck location, mine hunting, downed aircraft search and lost cargo operations all require the use of side scan sonar.



Example sidescan data captured with Trittech SeaKing Sidescan Systems using Trittech Seanet Pro software

The side scan sonar transmits a narrow acoustic beam to the side of the survey track line which propagates out across the seabed. As the acoustic beam travels outward from the side scan sonar, the seabed and other obstructions reflect some of the incident sound energy back in the direction of the side scan sonar (known as backscatter). The travel time of the acoustic pulses from the side scan sonar are recorded together with the amplitude of the returned signal as a time series and sent to a topside console for interpretation and display.

Tritech SeaKing Side Scan Sonar Systems are available in two assemblies; an ROV or AUV mounted system which has separate transducers that are mounted on either side (port and starboard) of the survey vessel or a Towfish Side Scan System. The Towfish side scan sonar system has a hydrodynamic shape and resembles a torpedo or missile with a long body containing the transducers and electronics and a set of tail fins to keep the towbody in line with the tow track. The Towfish side scan sonar is normally towed behind and below the surface survey vessel.

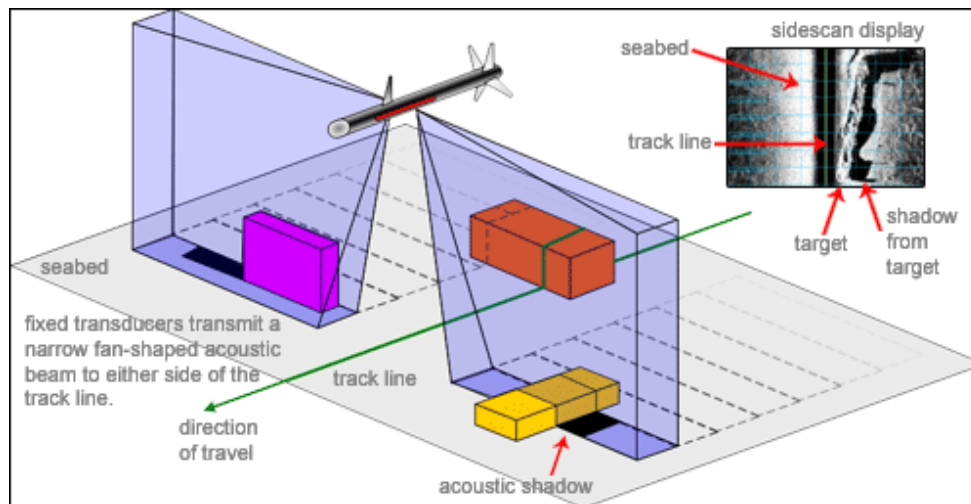
As with any acoustic sonar, side scan sonars only show echoes of objects that reflect sound back to the side scan sonar transducer, such that hard shiny surfaces are sometimes only seen when they are at right angles to the side scan sonar and rough seabed textures can blot out smaller targets completely. Some types of material, such as metals, boulders, gravel or recently extruded volcanic rock, are very efficient at reflecting acoustic pulses (high backscatter). Finer sediments like clay and silt, on the other hand, do not reflect sound well (low backscatter). Strong reflectors create strong echoes, while weak reflectors create weaker echoes. Knowing these characteristics, you can use the strength of acoustic returns from the side scan sonar to examine the composition of the sea floor.

Interpretation of side scan sonar data develops with experience. Side scan sonar reflections of isolated small objects give no indication of shape or attitude. Manmade structures, such as platforms or rock walls tend to have regular patterns that are easier to identify. Using a side scan sonar is rather like looking at a world made of shiny black plastic, in the dark, with only a narrow torch beam for illumination. Remember that when close to large objects, or in a depression in the seabed, that the viewing range of the side scan sonar may be severely limited. Very strong reflectors may give multiple echoes along a bearing line, and are identified by being equispaced in range. The plan view provided by the side scan sonar also does not show how high an object is,

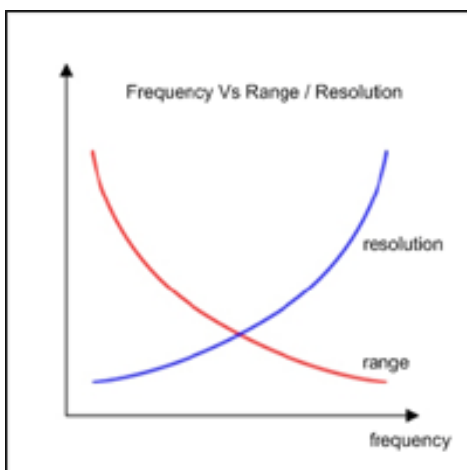
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unless an acoustic shadow is cast, in which case the length of the acoustic shadow is related to the height of the object, its range, and the height of the side scan sonar.



Experience with the side scan sonar will enable the side scan operator to be able to quickly and effectively set controls such as receiver gain and dynamic range to give as even a background as possible, without swamping the side scan display, and maximise the performance capabilities of the side scan sonar. Separate controls are available for Port and Starboard side scan transducers. Although normally the settings would be the same, under some conditions (e.g. sloping seabed) different settings may be needed from port to starboard.



Underwater, sound transmission is limited. This is most notable in useable ranges. The usable range of high frequency sound energy is greatly reduced by seawater, typically to around 50 to 100 metres. Low frequency sound energy is reduced at a much lesser rate with usable ranges of in excess of 200 metres achievable. Therefore, a tradeoff exists between higher resolution images produced by a high frequency side scan sonar and the longer range provided by a low frequency side scan sonar. Trittech SeaKing Side Scan Sonar Systems are normally supplied with one of two operating frequencies, typically 325 kHz and 675 kHz. The lower 325 kHz frequency side scan sonar is capable of detecting large targets at ranges in excess of 200 metres. The higher 675 kHz frequency side scan sonar has a narrow beam and shorter (100m) range for more detailed images of closer targets.