



# Sonar Secrets

See more fish and monitor bottom contours with high-tech transducers.

By Doug Thompson

**T**he acronym SONAR stands for SOund NAVigation Ranging, and it's a technique to locate underwater objects like fish. Transducers (devices that emit and detect sound waves) point into the water from the bottom or exterior of your boat and are connected to a fishfinder or depth sounder screen. As sound waves emanate into the water and echo back to the transducers, the size and location of the objects below the boat are displayed on the screen. It's a great way for anglers to find bottom contours and actual fish as well as determine the sea floor depth.

"The transducer is both the signal transmitter and receiver for your depth-finder/fishfinder," explains Craig Cushman, director of marketing for AIRMAR Technology Corporation, a leading transducer company. "Having the right transducer for your needs installed in the proper spot on your boat's hull will provide your fishfinder screen with clear, uninterrupted details of the bottom and everything in the water column under your boat."

Transducers saw very little change up until 2011, when CHIRP (Compressed High-intensity Radar Pulse) sonar became the new standard. While transducer form factors have stayed the same, the frequencies changed drastically. "You can now choose between low-, medium-, and high-frequency bands of CHIRP," says Dave Dunn, Garmin's director of marine sales.

For 2020, Garmin has a new line of ultra-high-definition products that provide even higher resolution pictures of the bottom. Garmin has a technology called Panoptix which takes this a step further and shows you live images under the boat.

"The crown jewel of the Panoptix family is the LiveScope, which gives you high-resolution images of the bottom and also allows you to see fish swimming," says Dunn. "The clarity and detail is unmatched by any other recreational sonar."

Regardless of technology, the key to great performance is how the system is set up to match the unique characteristics of a boat.

"A sonar is only as good as its transducer installation," says Jeremiah Clark, Lowrance sonar product group owner. "Every sonar transducer needs good, clean, non-turbulent water flow in order to effectively send and receive the sonar signal. Sonar is great at shooting through water but is not good at shooting through air."

Any turbulence or cavitation to the signal will cause sonar performance to suffer. If you have the transducer coming out of the water at speed, you will have very poor sonar performance. In addition, fouling on the face of transducers can reduce their sensitivity, bottom-echo returns, and positive fish targets.

To combat this, PropSpeed, a New Zealand-based company that makes coatings for props and shafts, created Foulfree, a foul-release product to keep transducers clean. The coating forms a slippery surface over the transducer face and prevents marine growth from attaching for a year or more.

"Foulfree is an exciting new coating specifically made to enhance the performance of transducers," says Chris Baird, CEO of PropSpeed. "Bringing together our revolutionary product design and working with the experts from AIRMAR, we are able to offer boaters a new solution to an age-old problem and improve sonar performance for anglers and cruisers alike."

Many boat owners have misconceptions about how transducers operate and should be aware of issues that arise related to their installation.

"One of the most common misconceptions is 'the higher the frequency, the deeper the sonar will go,'" Cushman says. "It's just the opposite. Higher frequencies are better for shallow-water performance and detail, low frequencies for deeper performance. Just like on a stereo speaker, the high tweeter carries the details and small sounds, but they disappear first when you distance yourself from the speaker. The woofer is low frequency and can be heard from farther away. Transducers and frequencies work on the same principles."



An issue boat owners deal with is a transducer that works intermittently or stops working at a certain speed.

“This is a classic transducer placement issue,” Cushman says. “If the display always stops providing depth at the same speed, it means air (or turbulence) has disrupted the signal. A few remedies to consider are changing where the transducer is on the hull or go to a fairing block model. Try steering to the left or to the right. If the depth locks on or drops out consistently, there are simple ways to fix the situation.”

Other times, the boat owner thinks the transducer needs

an adjustment. While the transducer is a complex piece of technology, it’s the multifunction display or control head that does all the thinking. Gain or sensitivity changes to the display can help deep- and shallow-water performance.

Most transducers are built into the boat’s bottom or hung off the transom.

“Neither installation on its own is superior to the other,” Clark says. “It is more important that the transducer should match the vessel type and desired use. Many transducers share the exact same transmit/receive elements in a transom or a thru-hull transducer, the difference being the installation type or transducer body that these elements are mounted in.”

Smaller trailer boats typically do not need expensive and complex-to-install thru-hull transducers, and in most cases, a properly installed transom transducer is the right choice. Larger vessels, where the smoothest water flow may be under the hull, benefit from thru-hull installations versus transom mount.

“The most important thing is to select the right transducer for what you are trying to do,” Dunn says. “Often, people will have unrealistic expectations of what the transducer is capable of, for example, customers will have a six hundred-watt transducer and expect to see two thousand, five hundred feet down....It’s important to remember that there are limitations to the technology and physics.”

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