

Looking Ahead

Magic it's not, but cruisers who understand forward-looking sonar's limits are pleased with what it can do for them.

By Ben Ellison

We have a problem: With the exception of some gloriously transparent tropical waters, we can't see where about half—a very important half—of our boat is going. Sure, we have charts that indicate dangers under the surface, and we can have a skeg that might protect our precious running gear if we do mess up, but what we really want is an underwater eye peering ahead of our bow. There is an electronic approximation of this called forward-looking sonar (FLS), and I set out recently to find out just how well it works.

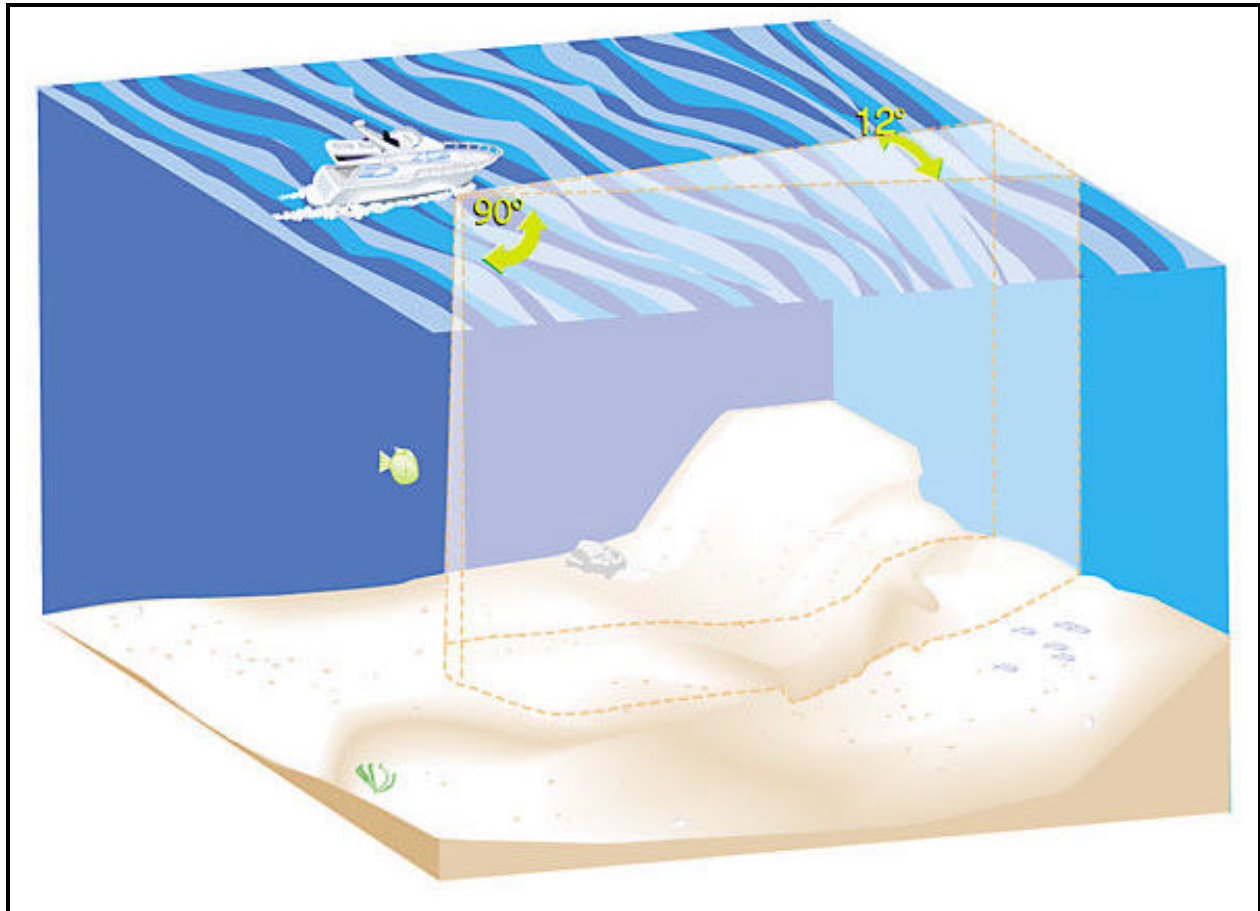
First, some definitions are in order. We're not talking here about "side-scanning" or "searchlight" sonar. These beasts start at more than \$10,000—"those are just the toy models," according to a Simrad representative—and their large mechanical transducers demand major installation. Though these machines can usually be made to focus their pings directly ahead for grounding avoidance, they are really meant for commercial fishfinding, even net management. Of more interest to most passagemakers are the FLS devices that use much simpler solid-state transducers and can be had for between \$700 and \$2,000.

Two companies, Interphase and EchoPilot, serve this market. Each has a particular scheme for scanning the water column vertically, from the bottom to the surface ahead, and delivering the resulting profile to an LCD display. It's important to note that this is meant to be a real-time snapshot, as opposed to the historical graph of bottom seen on a normal fishfinder, and it's much harder to generate. Unless you're a bat, it's really difficult to distinguish the incoming angles of multiple acoustic echoes!

Though Interphase and EchoPilot have both been offering their products for years, the percentage of boats they've equipped remains small. And I could find very little substantive writing about FLS in the boating press. All of this made the technology even more intriguing. Can forward-looking technology help a passagemaker avoid a floating container in the open sea or an uncharted rock in an unfamiliar anchorage? Fortunately, I was able to contact a number of actual FLS users for answers.

Rod McInnis has been using an Interphase Probe around San Francisco Bay aboard his 36-foot Carver since 1995 and was the least enthusiastic of my correspondents. While he reports great service from Interphase, he says, "The reality of a scanning sonar didn't exactly match my expectations." His main gripe is the limited range. While a similarly priced fishfinder might find bottom at 2,000 feet, no FLS is able to pack the same punch into a multidirectional transducer. Interphase claims a forward range of 1,200 feet for its top model, EchoPilot about half that. These are small numbers, especially compared to the human eye or radar on the surface, and they really only apply to ideal conditions. An important, and unfortunate, limit to FLS range is depth; due to surface and bottom echo interference, FLS can generally

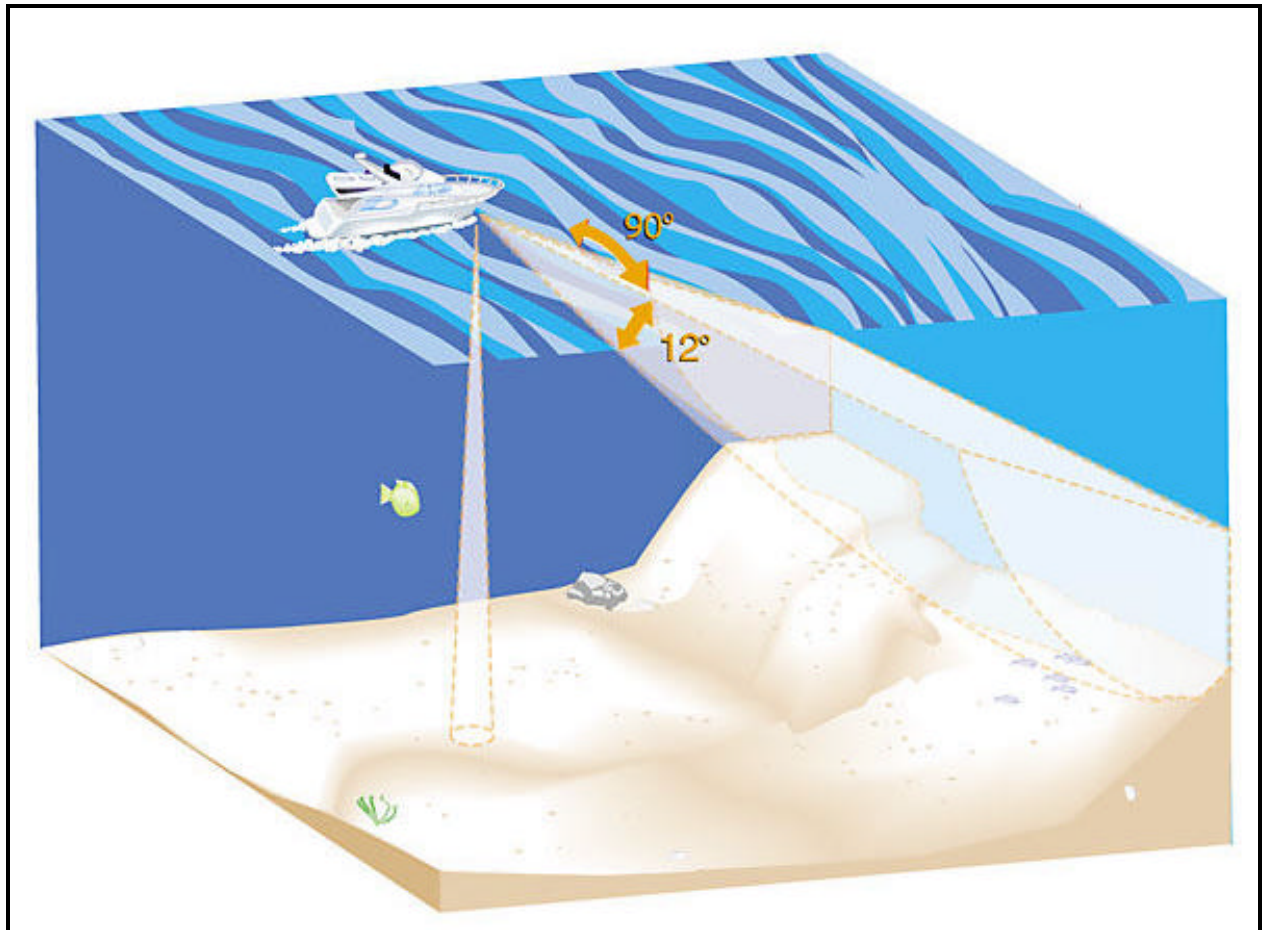
see ahead only about six times the depth of the water column. Thus, in the 25-foot soundings that McInnis often encounters in the California Delta, his forward view only extends 150 feet beyond his bow (minus the distance his transducer is mounted aft to avoid aeration when he's planing).



A vertical-scanning, forward-looking sonar creates a profile 90 degrees from surface to bottom, as shown in the illustration above.

McInnis also points out the limitations of the Probe's display in shallow waters. Since its forward scale is one and a half times its depth scale (see illustration on page 82), he must set it at 90 feet just to get a 135-foot forward look; hence, in 25 feet of water, he's only using about a third of the 3.25"x4" screen. It's a small image easily obscured by clutter. He concludes, "If you are expecting something and are going slow, you could pick up an obstacle in time to react to it. But if you are just cruising along, you will never get enough warning. If I had to do it again, I probably wouldn't buy another forward looking sonar."

However, one man's disappointment can be another's delight. David Hoar, writing in the April issue of Pacific Yachting, fairly raves about how his trawler's new Interphase Outlook helps him to gunkhole the outer shores of British Columbia's Queen Charlotte Islands. Hoar is an old hand at this and had even equipped his dinghy with a sounder for reconnaissance work in these famously rocky and poorly charted waters. Now he enters a new anchorage at dead slow ahead, then makes a mental 3D survey by "kicking the stern in a circle, using the forward-scanning sonar to determine the distance to both visible and underwater obstructions while noting their depths." He says that he can even pick out the anchor chains of other vessels, though his Outlook is a lower-powered (and lower-priced) version of the Probe, and declares FLS is "without a doubt the answer" for his adventurous cruising style.



Horizontal scanning sweeps from 45 degrees port to 45 degrees starboard at an affixed 20-degree downward angle.

Wille Meinhardt is similarly pleased with his EchoPilot FLS Silver model navigating the thicket of 30,000 islands—and many more ledges—along the coast of his native Sweden, "To cruise among all those islands means that you have to have a constant check on the chart in order not to lose a grip on where you are," he says. And even if you manage to keep the grip, there are uncharted ledges in this area. Meinhardt happily reports that his FLS seems able to better the 6:1 distance-to-depth ratio when

the danger is a steep, hard surface, and he has thus avoided contact with a couple of such rocks. He has had problems with the display fading out after a day in direct sunlight but says that EchoPilot has provided a new—but yet untested—unit.



The resulting image of the horizontal scan, seen on the Interphase Twinscope display, is more difficult to interpret but useful.

Sheldon Haynie is another satisfied FLS user with another modus operandi. Haynie cruises out of Portsmouth, New Hampshire, and must often buck the mighty tidal currents of the Piscataqua River in his relatively pokey sailboat. He uses Interphase's PCView, "a very capable tool," to avoid shoals and "old sunken pickups" as he hugs the shore in search of back eddies. PCView is a black box product, feeding Haynie's laptop with the same vertical scan imagery as shown on the Probe and Outlook, but with more pixels and in color. Its transducer, the size of "half a grapefruit," can also scan horizontally 45 degrees to port and starboard at a fixed 20-degree downward angle. This is a harder image to interpret, but Haynie likes it to "ride the edge of the channel." Interphase president Charles Hicks tells me that customers transiting the Intracoastal Waterway like the horizontal scan, also found in the Twinscope product, because it not only warns of danger ahead but may also indicate an alternate course.

EchoPilot also offers a sort of horizontal scanning product, but it is quite dissimilar, requiring the user to physically turn the transducer sideways, and is meant for bottom analysis rather than grounding avoidance. The significant difference in the two companies' vertical scanning technologies is that EchoPilot fires and receives back its echoes in one instantaneous process while Interphase utilizes an eight-element phased array. EchoPilot claims that its method delivers very fast profiles that are particularly valuable as a boat maneuvers. Interphase counters that its users can use "Width" and "Mode" controls to choose between fast images or detailed ones.

Judging from the experience of my correspondents, to whom I'm grateful, neither version of FLS is magic, but either can help you keep your bottom intact if you understand its limits, and yours. As Haynie says, "It's still possible to run aground when not looking," and my Swedish friend adds, "Of course, with this instrument I'm taking some chances I would not have taken without it."

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