Radar for the Private Boater – Eye Ayes!

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Several times in the articles on the COLREGs, it was noted that no accident at sea will ever have the blame apportioned 100-0 and that you are obligated by Rule 5 (see "Look Out Below – and Above – and About!", SSP, 7/18/07) to use all available means to maintain a proper look-out. This means, if you have radar, you had better have it on. So, who wants that extra responsibility? Well, we've all heard the expression, "Ignorance is bliss" and sometimes it is. Not on the water, where "knowledge is power." This is what this column is about.

Radio Detection and Ranging

If there is a better sounding maritime short-hand than "scuba," it has to be "radar." We've grown up hearing about it and being subject to it—we've all been on the parkway doing +55 mph – that we instinctively "get it." It is the eyes that can penetrate fog, rain, night and snow…but "getting it" and using it effectively is as much art as science.

First, what is happening? Electromagnetic energy is shot out of the radar's "transceiver" (a transmitter and receiver combined in one) at the speed of light and, if it hits something of sufficient density, returns at the speed of light. This enables the radar unit to instantly determine the distance of the object from you. The transceiver rotates three to four times per minute so you are constantly scanning for all comers and all objects that will return a signal! Will a sailboat? Well, her sails certainly won't and, unless she has a kicker engine on her stern, her low-lying hull might not either, nor her wooden mast. Radar needs some amount of density. Here is one anecdote that illuminates the issue. A couple of summers ago, while we were conducting a night patrol, we were transiting from buoy 5 to buoy 6 in Narrow Bay east of the Smith Point Bridge. A moonless and cloudy night, we picked up a good-sized object lying 1,000 feet directly in the fairway, dead ahead. I was at the helm and couldn't see a thing—no lights, no glow from a wake, nothing. I call out to my crewmen to move to the bow to extend my sight—now we're 500 feet away and still no one can see a thing. But she's big and underway slowly…so, while throttling back to a "slow bell" (just enough speed to maintain steerage), we turn on the forward-looking infrared system (FLIR, like a kind of radar that detects tiny temperature differences at great distances) since I knew the engine of whatever was ahead of us had to be warmer than the boat and the water. And there, in full majesty, was a flock of swans paddling along in serene closeness—but so many and so close together that they showed up as a single, solid object to the radar, even though the FLIR could see each swan individually.

And therein is one of the issues of "getting the concept" of radar and using it effectively. A tug boat and a tow might very well look like a very large vessel. Two boats abeam of each other might also look like a single, larger boat. Another issue is the sea state itself and that is in two dimensions. First, while radar can see through light rain and light snow, as it gets heavier, the signals flood the system and the screen "whites out." Back in the day, the radar observer would "fiddle" with various dials to try to find the right mix of tuning to reduce the return signals from the weather while still being able to see something important, like another boat. Now, you flip a switch or press a button and tell the system that it is snowing or raining and the built-in computer does most of the work for you. But what is the second dimension I mentioned? Well, think of the radar like a gun shooting out electronic bullets in a straight line. As the seas build, and your bow rises and falls as it makes way over those building seas, the "gun" is shooting up into outer space or down into the water, reducing the effectiveness when you may need it the most. If you aren't aware of that, you can't effectively interpret what you are seeing or might not be seeing…

State of the Art

But, with all these caveats, I would recommend saving up and taking the step. There are several great systems (see below) and prices have come down dramatically while functionality has gone up even more dramatically. The cost, while nothing to sniffle at ($2,800-$3,500), is a fraction of what it was 10 years ago and, relative to your income and certainly inflation, is a far smaller bite. Function has exploded upwards. I mentioned the computer's ability to "teach itself" how to see through snow and rain. How about painting the radar picture directly and simultaneously onto an integrated GPS screen? How about calculating how close a "bogey" will get to you—and when—for 10 objects simultaneously? Set off an alarm that you set that says, "tell me when any object comes within a half a nautical mile of me." Child's play. All this and more is available in the modern system.

With respect to the systems out there, here is a partial listing of full-featured but stand-alone systems:
Icom LCD 570R (www.icomamerica.com) $2,800
Simrad RA30 (www.simrad.com) $3,200
SI-TEX T-721 (www.si-tex.com) $3,000.