

DO I ONLY NEED MY RADAR AT NIGHT?

While we were at our local yacht club for a weekend of fun and camaraderie, instead of heading home Sunday afternoon, we decided to stay through Sunday night and take the boat back to the marina early Monday morning. This seemed like a great plan as we could get out another bottle of Port and have an evening cigar with the other boats that also planned to stay another night. The Monday morning tides looked good and coincided with sunrise almost perfectly. Our plan was set, we would get under way at 0630, have breakfast and get dressed for work in route, and as soon as we are back in the slip with the boat secure we would be off to start the new week. The 45 minute ride down the Calaveras River and San Joaquin deep water channel is usually serene with not many boaters on a cool Monday morning.

Everything was going as planned when we exited the Calaveras River and made the turn into the Stockton Deep water channel. It's chilly outside but we are toasty warm in the pilothouse with a hot breakfast cooking, a fresh cup of hot coffee in hand and the first mate is getting ready to take hot shower. Approximately ¼ mile ahead I spotted the dreaded tole fog, hanging low on the water and looking pretty thick. As we entered the fog bank our visibility went to near zero so we immediately went into limited visibility mode; putting breakfast on hold, transferring control to the weather helm, slowing our speed, activating the fog horn, making sure the navigation lights are on, and checking our position. At this point some skippers would be trying to remember how to turn the RADAR on. In our case, the boat never leaves the dock without the RADAR operating. Good weather or bad our RADAR is always on so it was simply a matter of adjusting the range and we are ready. My flybridge is open to the elements but offers an excellent 360 degree view and allows me to hear very well. While not as warm as the pilothouse, with a jacket on and a hot coffee in hand, standing at the flybridge helm on a chilly fall morning it is just another kind of boating fun.

Fully surrounded by thick fog we start navigating down the Stockton Deep Water Channel when my second fog whistle is answered with another. Only this one is the deep low tone associated with large commercial ships. A quick adjustment on the RADAR range, and yes, there it is, just a few miles upriver is the unmistakable return of a large ship. I take a quick plot of his position and activate the ARPA (**A**utomatic **R**ADAR **P**lotting **A**id) in an effort to determine his course and speed. The ARPA function takes three minutes to obtain an initial fix with course and speed and six minutes to plot an accurate vector. While the ARPA computer was doing its calculations I was also doing them manually. My initial plots showed the ship to be going in the same direction as us but at a greater speed. It was a long three minutes waiting for that initial ARPA information, but when it displayed it confirmed my estimation, that ship was down bound at nearly twice our 4 kts speed and may overtake us before we reach the turn to Fourteen Mile Slough! In three more minutes I will have much more accurate information. Making good use of the next three minutes waiting for the computer, I hail the pilot on the ship to confirm that he knows we are ahead of him. In our brief radio exchange we have confirmed that his RADAR operator knows that we are in the river, has us plotted, and we have agreement that we would stay in the channel, close to the starboard side, and that he would overtake us on our port side. This is turning out to be an exciting morning.

While using our RADAR to navigate in the channel and to track the position of the bulk carrier that was closing the distance between us, for nearly the next hour we

navigated the Deep Water channel with fog whistles answering each, that large target getting closer every minute, and continuously calculating if we would be overtaken before turning into Fourteen Mile Slough. The bulk carrier never did overtake us, but with less than 150 foot visibility we never did see him even though our RADAR showed him to be less than ¼ mile behind us when we made the turn.

Commercial captains operating vessels in San Francisco are required to hold a USCG RADAR certification and re-certify regularly. Not because I have been through the certification classes, but because we always use our RADAR, our skills are current. By being able to competently operate our electronic aids to navigation there is far less stress when conditions like this occur. Having kept our speed slow and only passing a few fishermen out for that early bass, we arrived safely at our dock just a little later than desired.

Most marine RADAR manufacturers provide good documentation on the basic operation of their set. Each device operates a little differently but the basics are the same. Some high end units have controls for sea state, rain, clutter, short pulse length and interference, to name a few. All modern RADAR sets have an AUTO mode that uses preset settings for these controls except the gain and range. If properly installed and calibrated the AUTO setting will get you better than 90% of the performance. This is a good place to start as you familiarize yourself with your particular set. Properly adjusted, even small boats paint a good return on most modern RADAR units.

RAdio **D**etection **A**nd **R**anging, RADAR. The first concept was demonstrated in the late 1880's, a primitive system developed by Tesla in 1917, and the first functioning system was operational in 1934. The same basic principle is used in today's modern sets; an electromagnetic signal is transmitted, it reflects off of distant objects and is received by the set, range and bearing is calculated and then displayed. The powerful signal processing capabilities we have on today's units enable our recreational RADAR's to have easy to understand displays and easy to use controls.

Here is a shot of the RADAR display one late summer afternoon in San Francisco Bay when the fog rolled in. On a RADAR display we are usually in the center and indicated here by the +. The range is 1.5 miles and each ring is 0.5 miles as shown in the upper left corner of the display. I am roughly half way between the Golden Gate Bridge and Alcatraz with the Golden Gate shown at the bottom of the display and Alcatraz in the upper right quadrant. Angel Island is in the upper left. One half mile ahead and just off to the left is Harding Rock RACON. Many of the prominent landmarks in San Francisco have an active RADAR transmitter that sends out a beacon that is picked up by our RADAR set. The transmitted signal contains a Morse code letter for identification and in this case it is the letter "K" as shown by the long-short-long pattern. These RACON's help us to determine an accurate position. If you look closely you can see more than 20 targets within 1.5 miles of my position, all moving in different directions, and at different speeds. This is a pretty typical display with good target definition that allows safe navigation in restricted visibility. If this display looks confusing, you need to spend some quality time with your RADAR.



What lessons did we learn on that early morning cruise? First, RADAR is one of the best tools you have on your boat if you are competent in using it. The best time to practice navigating by RADAR is when you don't need it. Have the unit powered on and scanning on those bright sunny days so that you can get used to how the set operates and what the different targets look like. Whether I'm running a passenger ferry in SF Bay, on a coastal delivery 20 miles offshore, or tooling around the delta, I practice using RADAR all the time. If there is any possibility that I will be underway between dusk and dawn, or if fog is forecasted, I will not leave the dock without an operating RADAR. This is one of the best safety tools you have on board when used properly.

Second, for safety the use of a fog horn is essential.

Third, making radio contact with another vessel in or near an area of restricted visibility makes for safe maneuvering. In this instance communicating with the pilot on the commercial vessel made for a safer transit for both of us.

You made a wise investment when you purchased your RADAR, study the manual, get comfortable with the adjustments and use of your RADAR, take a class if you want to become proficient. When limited visibility conditions occur, you will be more competent in the safe operation of the vessel and may even learn to like operating at night. RADAR, like any other electronic device, is another tool we use to make our passage safe. For most, boating is recreation; our time on the water should be as stress free as possible.

Have a good story to tell. I love a good story. Email me at pat@bayachting.com



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