

electronics

Tracking your boat

By **Bill Howard**

It used to be that filing a “float plan” was a good way to ensure that friends, neighbors and loved ones would know when you should return, and who they should contact in an emergency. A “float plan” is always a good idea and I highly encourage letting people know your itinerary while you are out on the water.

Some of the technologies for near real-time tracking of your boat have become available to the general boating public because of better affordability and improved technology. Most of these active systems use a combination of Global Positioning Satellite (GPS) position information and a communications service — satellite, the nationwide GSM/GPRS network (cell towers), or amateur radio. Some have good coverage and tracking ability, while

others, depending upon conditions and location, have little or no coverage. So coverage is a major factor to consider in selecting a “tracking service.”

There are other issues to consider if you plan to use a “tracking service” such as security — Do you really want people to know where your boat is at all times? How do people access your “track” and does the tracking service provide coverage in the area where you plan to cruise? Also, there is a difference between “tracking” your boat and reporting a distress situation. Tracking, for this purpose, is the process of providing near real-time locating information on a routine basis. For a distress situation a tracker may be useful, but a distress radio beacon, such as a registered EPIRB would be more appropriate.

- EPIRBs (Emergency Position-Indicating Radio Beacons) signal maritime distress. Use only the 406

MHz satellite capable units. They need to be registered with NOAA and serviced at least every five years.

- PLBs (Personal Locator Beacons) are for personal use and are intended to indicate a person in distress who is away from normal emergency services. Caution – not all devices labeled as PLBs really have that capability. You get what you pay for.

- SPOT Satellite Messenger can deliver your coordinates to associates via text or email messages. The box that SPOT comes in says “Opening this box is the first step in making sure you don’t come home in one.” SPOT determines your position using GPS and then it uses another satellite system to relay position and limited text information back to your friends. This means coverage is actually pretty good 24/7 if the device has a clear sky view. The cost seems to be reasonable for the device itself. There are

add-on fees for the types of messaging you would like. SPOT is pretty much a “personal locator,” but isn’t that what it’s all about?

- Tracking Transmitters provide a signal that can be located with a radio direction finder. Unless you know some folks with direction finders, like charter fishing boats or tow boats, this is not a good choice for routine tracking. The old ELTs and all 121.5 MHz EPIRBs, often referred to as Category B (or “Mini B’s”) are manual activation units, and an example of a tracking transmitter. They typically provide no identification information. Every 121.5 MHz false alert, and there are many, must be tracked to the source using direction finding equipment. These reasons (and more) have led the International Cospas-Sarsat Program to phase out 121.5 MHz satellite alerting on February 1st, 2009. So, if you have a 121.5 MHz EPIRB it will

no longer work with the Cospas-Sarsat Satellites after that date and you will need to make the switch to a 406 MHz EPIRB.

- Assisted GPS (A-GPS) cell phone systems like Verizon Navigator or Sprint GPS-Locate enhance GPS information on properly equipped phones with additional information from the connected cell site. This appears to be an “emerging” technology that I would watch for awhile.

- Tracking System (Active) is a system that uses both a radiolocation service (GPS or eLORAN when it becomes available) and a communications service to provide near real-time locating information from the tracked asset (your boat) to a remote user.

- Large ships are required to use the Automatic Identification System (AIS) to identify and locate themselves to other AIS equipped vessels within VHF radio range for collision avoidance. The International Maritime Organization’s (IMO) International Convention for the Safety of Life at Sea (SOLAS) requires Class A AIS to be fitted aboard 300 ton or larger international vessels, and all passenger ships regardless of size. The Federal Communications Commission has yet to approve Class B AIS for recreational boaters in the U.S.

- Without question the Marine VHF Radio is one of the most valuable pieces of safety equipment on board. The Coast Guard petitioned the Federal Communications Commission in 1992 to require all marine radios made or sold in the U.S. have a DSC capability. With channel 16 (for voice) and channel 70 (for Digital Selective Calling DSC) being monitored 24 hours a day by the US Coast Guard, the VHF Radio can deliver a call for assistance, allow you to listen to the latest weather report, or simply keep you in touch with other boats on the water. So why don’t we use DSC? Well, the first reason is probably that you have to interconnect your DSC equipped radio to a GPS. All DSC-equipped radios, and most GPS receivers, have an NMEA 0183 two-wire data interface connec-

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Caillin Marie
Drawing 07-106



tor. That NMEA interface allows most GPS models to be successfully interconnected to any model of radio, regardless of manufacturer. The second reason is that you must have a nine digit Maritime Mobile Service Identity (MMSI) that has to be set-up in the DSC equipped radio. The third reason is that you have to read the instruction manual to understand how to use DSC, yada yada. In other words, for most people it is just too tough, and even though it can be a useful tool, most boaters just don’t use it. Interestingly, with an external GPS receiver, the position request and position report functions of DSC allow you to exchange a ship’s position. The received position information can be plotted on a third party GPS or other navigation equipment that accepts NMEA data format. So there is a lot behind that red distress button on your marine VHF radio, but without being tied to a GPS and without an MMSI it is not going to do you much good.

- Toys and other vehicle/child trackers come in all shapes and sizes (one is even embedded in a teddy bear) that are intended to allow you to keep track of vehicles, children, or large pets. They typically use a miniature GPS receiver connected to a small radio transmitter or cell phone, so they will periodically call and leave position information that can be tracked on a web-site, a specialized GPS with built-in radio, or a map on your own cell phone. I use one that has a separate GPS antenna and cellular antenna that updates a tracking web-site. You have control over who can access the tracking web-site,

which is username and password protected. The low-power consumption is a plus but you have to be within cell phone range for the system to work.

- SeaKey® is a satellite-based system that monitors and communicates vital information from your boat to the SeaKey 24/7 Response Center, as well as a personal SeaKey Owner’s website.

- The Automated Position Reporting System (APRS) is my personal favorite. Bob Bruninga, whose amateur

radio call sign WB4APR resembles the name of this system, developed the system for both tracking and messaging. Unlike the overly complex AIS system, APRS uses readily available amateur radio equipment on HF and VHF frequencies. Bob, by the way, works at the U.S. Naval Academy and APRS is used there to track the academy boats. The system has gained world-wide acceptance in the amateur radio community. Other amateur radio operators have taken APRS a step further by creating an APRS interface to findu.com and APRSWorld.com databases. What this means is that with a simple tracking setup like the one shown above, your position will be tracked with the map available on-line.

The downside of APRS is that you need an amateur radio license, and you need to set-up the radio and connect the GPS. I added a better marine VHF antenna to my set-up to get better coverage. Also the APRS information is in the public domain, so anyone who visits the tracking web-site can see the location of your boat.

The summary is that if ease of use is the priority, go with SPOT. If you are interested in providing a safe boating environment, set-up and use your DSC equipped marine VHF radio. If you are an experimenter, try APRS. ↓

Bill Howard, a retired Naval Officer, and his wife Wilma live in Pasadena on Stony Creek. Their boat, Caillin Marie, is a Carver 33 SS kept on Rock Creek. They enjoy cruising on the Chesapeake Bay just to make sure the dockside bars don’t run out of their favorite drinks.