Islander September 2009
Technology Update

Tracking – Increased Safety or Big Brother?

Over the last decade, there has been a phenomenal increase in the desire to track practically anything that moves. These targets now range from aircraft and ships to shipping containers, jet skis and even children!

What are the characteristics of these targets or, in tracking terminology, “physical assets” that need to be tracked? Well, basically, the physical asset is something which can be moved, and which has significant value to the owner or, in the case of his child, priceless value. Obviously our cruise line owner will not be interested in tracking a tree in his garden or his house, but he has a vested interest in knowing the whereabouts of his ships, his yacht, and his son who is out playing on one of the yacht’s jet skis.

The desire to track assets has increased due to security and safety threats, but also because the technology is now available to make it happen. In addition to safety and security, there are other benefits to be had from tracking. One of these is that it improves planning and thus efficiency and as such helps reduce costs. Having said this, there is also a concern from some quarters that “big brother” is watching and this will put a limit on our traditional range of operations.

A “big brother” example happened here in Mallorca this spring. An abbreviated version of the story goes... a yacht with a tracking system that was accessible to the management company and the owner via a web browser was being prepared for the season start. The management company and the owner were told by the captain that the yacht would be moved from her winter berth to the fuel dock and back. The owner then remotely watched the yacht go to Ibiza and back over the weekend. The owner called the captain to ask why the yacht had gone to Ibiza to be told he had just refuelled the yacht in Palma and returned the yacht to her berth in Palma. Unsurprisingly the captain lost his job! Is the “big brother” syndrome good news or bad news? It is great news for the owner. He got rid of an untrustworthy captain and was protecting his asset.

In the nautical industry, we are now inundated with technologies that can track assets. We now have space AIS, we have conventional VHF based AIS, we have Inmarsat D based SSAS, we have LRIT, we have GSM tracking systems, we have radar ARPA, we have VHF and UHF, we have VSAT vessel tracking and on and on and on. As per usual with technology I have loaded the last sentence with acronyms which I will explain as necessary.

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AIS (Automatic Tracking System)

For those readers who don't know what AIS is, picture a shipboard display system such as the chart plotter with overlaid electronic chart data that includes a mark for every significant ship within radio range; each showing a velocity vector (indicating speed and heading). Each ship "mark" could reflect the actual size of the ship, with position to GPS or differential GPS accuracy.

Then by "clicking" on a ship mark, you could learn the ship name, course and speed, classification, call sign, registration number, MMSI, and a lot of other information.

With this information, you could call any ship over the VHF radiotelephone by name, rather than by "ship off my port bow" or some other imprecise means. Or you could dial it up directly using your onboard GMDSS equipment. Or you could send to the ship, or receive from it, short safety-related email messages.

Up until recently, this information has been available to any other ship or land stations equipped with an AIS receiver within VHF range which is typically 50 nautical miles. Thus on your yacht you are a moving receiver picking up transmitted information from vessels within your 50nm radius. At the same time you are transmitting, to anyone who might listen, details of who you are, your exact position and where you are going.

What are the benefits and the hazards? The features exceed those provided by the standard radar ARPA (Automatic Radar Plotting Aid) tracking tools available on most vessels. To start with, radar can only see something that has an uninterrupted line of sight view. Thus it cannot see around the bend in a river or behind a harbor wall. ARPA also cannot identify the name of the vessel or MMSI number. However radar can see vessels that don't have radar whereas AIS doesn't see a vessel that doesn't have a working AIS or has it switched off and not transmitting.

The international news stations had a bit of a problem recently getting their heads around the fact that the MV Arctic Sea en route from Finland to Algeria loaded with wood (or is that an acronym for "Weapons Of Our Destruction"?) disappeared when evidently it was fitted with all the current maritime tracking devices. It's really quite simple. If you don't want to be seen and identified, switch it off and then the trackers will have to resort to radar, but then they will not know whether they are looking at the MV Artic Sea or the SY Maltese Falcon until, God forbid, they pick up their binoculars if they ever get close enough.

Internet and Space AIS

So IF a vessel has their AIS switched on you can see it up to about 50nm away and track it. Once it is out of range it's gone.

That is no longer the case. Firstly, many of you out there may be a little surprised to discover your yacht is being tracked on the public internet, live, wherever it is in the world, for everyone to see. There are a number of sites now available. One of the first was www.aislive.com which is a subscription site, so a little protection was afforded to limit complete public access. However, my current favourite is www.marinetraffic.com Select the "Port" tab and enter Palma de Mallorca and zoom into any of the pink diamonds and click on them. You'll immediately see several yachts which you recognize. Then go to "Vessels" and have a look at this. You can find vessels almost anywhere in the world, so long as they are within range of an AIS receiver. This system relies on volunteers connecting their AIS receivers to the web provider via the Internet and is totally free.

Above I mentioned the word "almost". You cannot find a vessel and you will not be tracked if you are further than 50nm away from an AIS receiver. This will not be the case for much longer. We now have the introduction of Space AIS.

A while ago, I wrote about the Canadian company COM DEV who were developing a satellite that when in orbit could pick up the VHF AIS transmissions from vessels. Well, they have been operating their trial satellite successfully for over a year. Through a new subsidiary they are now building a global constellation of satellites to monitor the earth for AIS transmissions, whether the vessel is up a river or in mid ocean. Each satellite can see an area of about 5,000km at one time and has ten minutes to cover that space. The satellites will have overlapping areas and they have to be able to detect all the overlapping transmissions and decode them all within ten minutes no matter how many ships are in view. The system has been proven to detect and decode 1,000 ships in 90 seconds.

There is no need to change any equipment on vessels, and it is a secure system. As the data set encompasses the entire Earth and exactly where every ship is it is a very sensitive set of data. They say this is an issue they are taking very seriously in the implementation of the system. The data is encrypted and it is not something you will ever see on the Internet.

Tender and People Tracking

Tender Tracking Systems provide real time location and identification of watercraft, as they operate around a super yacht. Tender status is provided on the main vessel, instantly alerting crew to alarms. The track of the tender is shown on the super yachts

navigation plotter screen. Thus watch keepers can keep an eye on the location of the owner's priceless assets, his sons and daughters. Alarms could include a panic button on a tender or a jet ski or an "on-tow", if a tender is be towed. The alarm will be raised if the rope breaks. The "scout ahead" tender depth feature can be used to present depth data to the main vessel chart system where charted depth data is limited.

I bumped into a friend the other day on the street and he was asking me about whether technology exists to track his children. I mentioned the use of wristwatches that are worn by children of a few clients. From my experience this is the most common way the seriously wealthy track their children. He was saying that he would seriously consider micro-chipping his children. Maybe RFID chips?

Radio Frequency Identification (RFID) is a controversial technology that uses tiny microchips to track items from a distance. These RFID microchips have earned the nickname "spychips" because each contains a unique identification number, like a Social Security number for things that can be read silently and invisibly by radio waves. They are used to identify and track shipping containers.

Or maybe use the Brickhouse Child Locator? This device is less intrusive and can help you locate wandering children, pets or elderly family members. The instant your loved one wanders too far, the hand-held locator will instantly notify you with loud beeping, vibration and directional guidance all at once.

There are so many other examples and so many other stories. So, the current tracking phenomenon could be driven by the needs of Big Brother, Big Daddy, the Boss, or just plain old common sense.

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