Across the shipping lanes with AIS

PBO's Sarah Norbury tried out AIS on a summer cruise to Brittany. Did it make crossing the shipping lanes any easier?

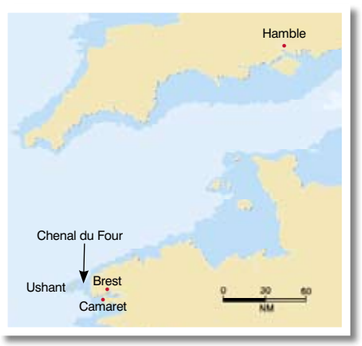
We navigated with Navionics electronic charts, and plotted our position on the paper chart every hour

Like many sailors, I love cruising but hate being among ships. After a number of well-publicised collisions in the English Channel in the last few years, my reluctance to cross the shipping lanes this summer was growing. I knew I wasn't alone; readers were telling us of their misgivings, and asking what we thought of AIS.

Five years ago if anyone had said, 'Soon ships will transmit data on VHF. You will see a constantly updated "aerial view" of your boat and ships, and whether you're on collision course, and their names and MMSI numbers,' who would have believed such a wonder could exist?

I wanted to find out if AIS would make sailing to France on a typical cruise with an ordinary family crew any easier, and in a case of auspicious timing Raymarine launched an AIS kit in May last year for their colour display that would integrate with our existing Raymarine system, including 14-year-old Autohelm/Raymarine ST50 instruments, ST6000 autopilot and Navdata repeater. Now we could combine AIS with electronic charts and Marpa radar on the Raymarine C120 display. Bring on the shipping lanes!

At half-past-midnight on a late May morning we motored out of the River Hamble in a drizzly, cloudy, flat calm. We were heading non-stop to Brest, 230NM away, expected passage time, around 40 hours. There were four of us onboard: my parents, myself and friend Jon. The AIS showed lots of ships moored in Southampton Docks. At 0300 we shot through the Hurst Narrows at 9.9 knots (6 knots boatspeed, 3.9 knots tide) and half-an-hour later we passed Needles Fairway buoy, and were out in the English Channel.



Setting up the AIS

Setting up the Raymarine AIS 250 on our Starlight 39 was straightforward. This is the first AIS kit-in-a-box complete with everything required for installation, including a built-in VHF/FM antenna splitter, which means you don't need an additional antenna and a single multiplexer to combine NMEA signals into one stream at 38,400 baud.

It is a simple matter of connecting the VHF antenna to the 'AIS engine' and using the VHF antenna splitter cable supplied to connect to the VHF radio. This utilises a single antenna for both AIS and VHF. The next step is to connect a 12/24V power supply and finally connect the NMEA output to the NMEA input on the C-Series display.

Right in the middle of the English Channel, I 'zoomed out' the chart to show England (Portland Bill), France (top of Cherbourg peninsula) and our boat in the separation zone between the ship's grey icons. The radar was left on larger scale showing the same ships as images on both radar and the AIS overlay

Ships in the Channel

It was 0400 when I targeted my first ship on AIS. I clicked on the little grey arrow icon and a data box appeared saying it was a ferry going into Poole. I settled down with a cup of tea to watch the screen when we suddenly swerved. In the pitch dark the helmsman had spotted long ropes streaming menacingly from lobster pots 6NM south of Anvil Point, a reminder that staring at a screen should not preclude keeping a lookout on deck at all times.

Over the next few hours, I had the Navionics chart on a small scale (72NM from the bottom to top of the screen) and picked up ships in the west-going shipping lanes. I clicked on a few, checking our CPAs (Closest Points of Approach). None looked worrying until at 0530 I clicked on a ship coming from the east and saw that our CPA was just a third of a mile. The data box also told me she was *Arklow Rainbow,* 298ft long, 13.35NM away, travelling at 12.5 knots.

I clicked on another grey arrow. The data box said, 'Sailing vessel *Astrid*, destination Weymouth, 2.8 knots, using engine.'

'Look for a tall ship,' I called up towards the cockpit.

At 0600 *Arklow Rainbow*'s CPA was still only 0.340NM, and we'd cross in 01h 42m 38s. I decided to keep an eye on her.

Calling a ship

For the purposes of this article, I really wanted to call *Arklow Rainbow*, and as there were few other ships around, I thought it wouldn't hog the airwaves or cause any confusion. Knowing a ship's name and MMSI number is one of the big advantages of AIS and although we were in calm waters with good visibility, I could imagine that if we had been well heeled over, or the sea was rough, in which cases radar reflectors have shown in experiments to be less effective, I would be concerned about whether the ship could see us on his radar screen, and our skipper would be considering taking action to increase the CPA, even though we were the stand-on vessel.

So I made a voice call, '*Arklow Rainbow*, this is yacht *Zest*,' and gave him our position and course. 'We have a CPA of around a third of a mile. Can you see us on your radar? Over.'

A charming officer replied that he had indeed seen us on his radar and had been tracking us for the last 15 minutes. He thought we would pass with plenty of room, but if it looked close he would alter course to the north to go behind our stern. I thanked him, and he said kindly, 'Steam gives way to sail.'

I clicked on the grey arrow at 0705, to see that he had altered course to the north and our CPA was now a less intimidating 0.773NM in 23 minutes' time.

At 0705, *Arklow Rainbow* passed astern.

Of course, there was no safety need to call the ship, and it would be potentially dangerous if yachts and ships were all calling each other to discuss situations rather than simply abiding by the collision regulations as we should. A fast cat ferry captain told me this is already a problem. His route takes him across the English Channel, and now that AIS tells ships his ferry's name, they call him on DSC and ask him to change course to avoid them, as he's much faster, even when under the Colregs it's his right of way. 'They used to call us before AIS,' he said. 'They'd see us on radar and call on the VHF, "fast ferry in xx position," but we could pretend we hadn't heard. Now we can't.'

However, in bad visibility, or rough weather, or any situation that feels uncomfortable, what a great aid to safety it is to be able to call a ship by name (see this month's skipper's check card, page 75).

We called the ship *Arklow Rainbow* on VHF, and she said she'd alter course to go behind us

Crossing the shipping lanes

Normally, when we reach the shipping lanes, out come the binoculars, hand-bearing compass and notebook. Eyes left, looking for the grey shapes of ships coming, sometimes hardly any, other times so many it's like trying to cross the M25 at rush hour. Many's the time we've stopped and waited for a long time to let them go past. We note their bearings, then look for more ships coming in, then note the bearings of the first ones again so see if they've changed. My dad tends to be down below monitoring the radar, and marking the ships on a 'plotting sheet' (this is the first year we've had a Marpa automatic radar-plotting aid). If we were on collision course with a ship, the skipper would decide what action to take. Once we'd crossed the first lane, we'd relax a little till we reached the ships coming in the opposite direction. Then it was eyes right and the whole routine would start again. In calm weather and good visibility it's an interesting diversion, in rough weather or fog, it's nerve-wracking and potentially dangerous.

It's so much easier with AIS. The screen shows your boat, and the ships pointing in the direction they're moving, like an aerial photo. We could see when we were about to cross the lanes, we clicked on any ship that looked as though it might pass close and read its CPA and TCPA. As we crossed, I superimposed the AIS and radar on the chart, intending to try the Marpa, but the AIS was so much easier to use that I just focused on that. In bad visibility it would be important to keep an eye on the radar, though, for any yachts, powerboats, naval ships or other vessels not transmitting an AIS signal.

By midday we were between the lanes, near the East Channel Racon. We didn't feel lonely as we could hear both Portland and Guernsey coastguards. Guernsey asked if anyone could assist a fishing boat taking on water south of Guernsey, the first of three incidents we'd hear on the radio.

AIS target info for the ferry *Pride of Bilbao*

Meeting the *Pride of Bilbao*

We were feeling listless, we'd been motoring in a flat calm for 12 hours and as usual hadn't run a proper watch system as no one ever feels like going to sleep when they're supposed to. We dozed a bit, and snacked on bacon sandwiches and chocolate.

The east-going lane was just as easy with the AIS as the west-going had been, then I saw a new ship coming from the south-west, and realised I recognised its shape from our news pages. 'It's the *Pride of Bilbao*,' I said. This was one of the ships implicated in the loss of the yacht *Ouzo* and her three crew in the Channel in 2006 (see News, page 8). I rushed below, clicked on the AIS icon and it was confirmed. As she steamed past, we were all quiet for a while.

Ships that don't show up

At 1420 I saw our first radar target that did not have a matching AIS icon. I put a Marpa marker on it, and the line went in front of us, meaning it would go across our bow, but suddenly, it turned. I went up and looked, and saw it was a big fishing boat going round in a circle. Another reminder not to abandon radar for AIS.

A glimpse of Guernsey disappeared behind us as we sailed west towards the sunset. It was lonely, no land or ships in sight, just the vast blue sky brushed with wispy clouds, and a deepening chill in the air. We huddled deeper into our oilies and pondered on how many miles the surprisingly big swell was adding to our journey. We Solent sailors are used to a short chop, and it felt strange to climb a wave, and lollop along a plateau, before being gently let down on the other side.

With 1.5 knots of tide against us, our VMG was only 4.8 knots. ETA at our first waypoint, at the top of the Chenal du Four, was 11 hours away, at 0700. As Jon and I sat up keeping watch in the cockpit, Mum and Dad asleep below, we knew we were in for a long, cold night. Only the thought of French croissants, camembert and crêpes to come kept us smiling.

Through the night, sailing towards the corner of France, there was nothing on AIS (there were presumably ships in the Channel, but none within VHF range), but plenty of radar targets. These were fishing boats. Occasionally we'd get close enough to see their lights. Just as the night seemed interminable, we saw land, and fishing boats, bathed in the light of a full moon over France. And the tide was rushing us along at a VMG of 8 knots!

The ability to show your position and waypoints on both chart and radar displays made the Chenal du Four easy. Note the AIS ship on the chart. You can also overlay chart, radar and AIS on one image

Through the night, sailing towards the corner of France, there was nothing on AIS, but plenty of fishing boats on radar

We tried to keep to three-hour watches, but it didn't work. If the passage had been longer we would have been more disciplined. *Zest* has two good sea-berths in the saloon, where we simply crash out in full oilskins, lifejacket and boots, ready to rush up on deck if needed. We just slept when we were tired, and always had two people on watch.

However, we were very disciplined about being hooked on at night, making sure we had our lifejacket lights attached. It was cold, even in full thermal under-layers, balaclava, woolly hat, and gloves.

Yacht in distress

At last daylight came and we were almost at our first waypoint north of the Chenal du Four, in gathering fog, when Jon called, 'Listen, someone's in trouble.' I turned up the radio and started taking notes. An English man's voice was saying, 'Cross Corsen, Cross Corsen,' (the name of the nearest coastguard station). 'This is yacht *Blue Eye*.' They had rigging failure meaning they couldn't sail, and their engine had broken down. Their position was 48.49.61N, 004.53.16W and they requested a tow. They only had hand-held VHF.

The coastguard, in excellent English, replied to *Blue Eye*, but did not get a response. Then we heard *Blue Eye* calling the coastguard, who couldn't hear them. Realising we were positioned between the coastguard and the yacht, and they could no longer hear each other, I thought we must try and help. 'Shall I call them?' I asked the skipper. 'Yes,' he replied. 'Cross Corsen, Cross Corsen, this is yacht *Zest*, I can hear you, and *Blue Eye*, over.' The coastguard then asked us our position, and what kind of boat we were. Then he asked, 'Can you tow a boat of 10 metres?'

What is AIS?

Most ships over 300 tons are required by law to transmit AIS (automated identification system) signals on VHF to inform other vessels, and the authorities, of their presence. Ships transmit using Class A and Class B equipment; yachts are advised to transmit on the lower specification Class B. A ship's dynamic information, including position, course and speed, is updated every two seconds to three minutes, dependent on speed and changing course.

Static information including the ship's name, type, size, destination and call sign is updated every six minutes. These broadcasts can be received by a standard marine VHF antenna and fed to a receiver/decoder – either a standalone unit with display, or an AIS 'engine' connected to a PC or chart plotter. The chart software in the PC or plotter constantly computes the ship's positions in relation to your boat, giving you the incredibly useful data known as CPA, or 'closest point of approach' (ie how much you'll miss each other by), and TCPA (time to closest point of approach).

Creating your own system

To create your own AIS receiver system, you need:

- Either a dedicated VHF aerial or a 'splitter' (available for around £100) that enables you to use your existing VHF aerial
- An AIS engine (from around £130 for a single-channel model)
- Possibly a software upgrade for your PC or chart plotter if it's more than a couple of years old.

First, you need to decide whether you want to just receive signals, or whether to buy a yacht transceiver (commonly called a transponder) that transmits on Class B as well as receiving Class A and B, allowing ships to 'see' you on their screens.

I decided to test receive only as (a) many ships currently only have a small, non-graphic display for their AIS, which according to the official report on the *Ouzo* disaster, on the *Pride of Bilbao* it was not connected to the radar. The official report says that even if *Ouzo* had been transmitting on AIS, the ship would not have seen her, and (b) we're publishing a major review of AIS transponders in April's PBO.

Other buying decisions include the following:

- A standalone unit, which is both receiver and display. We know of only one on the market: the NASA AIS 'radar'.
- An AIS 'engine' as the black box is called, to link to your PC plotter or chart plotter.
- Single or dual channel. Some experts say dual channel is best; others disagree. We present the arguments in our April issue.
- Separate VHF aerial or a 'splitter'? See April's PBO.

Landfall! However many gizmos you have, eyeball pilotage is part of what makes cruising interesting

Lifeboat rescue

I'd plotted *Blue Eye*'s position, and she was two hours north of us. We were now faced with motoring two hours away from our destination, finding a boat in fog, then towing it for several hours in a large Atlantic swell. But *Blue Eye* was drifting near the Ushant traffic separation scheme; not a nice place to be in those conditions.

'Yes,' I replied. 'We can tow her.'

'Please call her,' said the coastguard.

I called, '*Blue Eye, Blue Eye, Blue Eye*, this is yacht *Zest*, the coastguard has asked us to tow you, we are 10 miles south of you, we'll be there in two hours, over.'

Blue Eye thanked us, but asked us to request a lifeboat, which we did, and I called *Blue Eye* back to say it was coming.

We felt that was a good outcome. *Blue Eye* would be rescued much more quickly by the lifeboat. (A week or so later my parents found themselves in the same marina as *Blue Eye*, and the couple onboard told her it had been a great comfort to hear an English voice, and to know that someone could hear them. Their experience was alarming and the rescue was beset by problems. We'll tell the whole story in a future issue).

Relieved, we carried on down the Chenal du Four, the wide channel between the corner of France and the island of Ushant. On the AIS I saw a couple of small Ushant ferries and one stationary fishing boat.

Suddenly, in French then English, the radio blared, 'Mayday relay, mayday relay, this is Cross Corsen, there is a man overboard from a fishing boat off Ushant. All vessels please look out and report if you see anything.'

We all agreed that being among ships is less stressful with AIS

We saw a lifeboat leaving Le Conquet. It showed on the AIS as 'unidentified'.

The mist that had been with us all morning was turning into fog.

At 1000 there was a Securité message from Cross Corsen, 'Visibility is less than one mile. All vessels in the separation scheme should keep a good lookout and navigate with caution.'

Twenty minutes later, we were sailing in a light breeze in the mouth of the Brest estuary in thick fog. We decided Camaret was much easier to sail in to than Brest, so we quickly clicked the chart plotter's cursor onto our new destination to make a waypoint. We sailed pretty much 'blind', using the chart plotter and Marpa. The AIS was redundant because none of the yachts and fishing boats around Camaret transmitted an AIS signal. I sat glued to the Marpa, so we'd know if any were on collision course with us.

At last, 37 hours after leaving the Hamble, we landed in France. Exhausted but happy, we headed to the nearest restaurant for our favourite Breton delights: *moules frites* and local cider. Jon and I had to be back at work and we'd booked our flights home from Brest to Southampton on the very handy Fly-be service, so we set off next morning across the estuary. I had expected the naval harbour of Brest to be covered in AIS targets, but somewhat disappointingly there were just a few ferries. I should have remembered that naval ships don't have to transmit on AIS.

Seeing round corners

To get to the huge Brest Moulin Blanc marina, you go past the main harbour, out of which come ferries travelling at high speed. I was able to say to the skipper, 'A fast ferry's going to come out from behind that wall any minute.' AIS can see places radar can't. In fog or darkness, this would be very useful.

Problems with AIS

AIS isn't perfect. As I found on our cruise, there are plenty of vessels out there that are not obliged to transmit, and there have been errors in transmissions reported. If you choose a transponder, your transmissions may not be seen by ships, either because many ships' AIS displays are primitive compared to the yachtsman's, and it's suspected that some ships may not monitor yachts' transmissions. The answer is to make the most of AIS's brilliant portrayal of ships' movements in almost-real time, but to keep a good eyeball and radar look-out too.

Would we recommend it?

All the crew agreed that navigating among ships had been much less stressful with AIS and that once any sailor who cruises among ships had used it, they'd wonder how they'd ever done without it.

MORE AIS ARTICLES

Want to know more? Then see articles on AIS from previous issues of PBO by visiting **www.pbo.co.uk** by clicking on 'Find PBO articles'. Or you can call our Copy Service on tel: 01202 440832

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