

# AIS for Cruising Yachts

*Communications Expert Alan Watson takes a look at AIS and how the technology can benefit cruising sailors.*

Marine electronics have steadily improved over the years but every so often there is a quantum leap forward such as the introduction of GPS. The most recent leap forward is AIS (automatic information system) which, for the first time, gives us actual information on who another vessel is and such things as her course and speed. The ability to identify another vessel at distance is very useful if you wish to talk on the VHF and the course/speed information helps in making a collision risk assessment.

## How does it work?

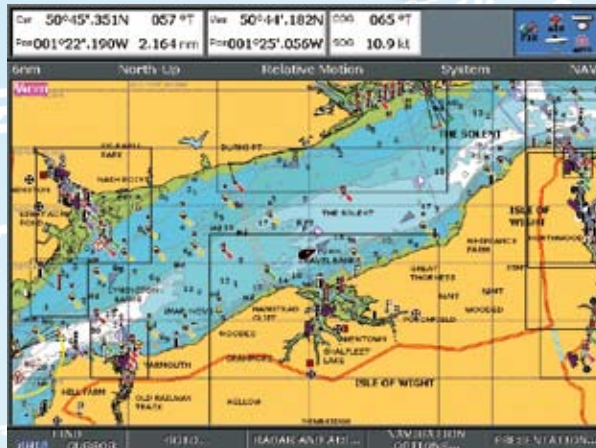
All vessels over 300 tons are obliged to carry AIS (designated Class A). The equipment, called a transponder, sends out information about the vessel and also receives information from other vessels. The data is sent on VHF and will have similar range to a normal vessel VHF; typically you can expect to receive AIS data from a big ship at 12-15 miles range.

On the big ship the received AIS information may, but not necessarily, be displayed on their electronic chart and radar system which then shows the location of all other vessels transmitting AIS. This is certainly not the case in all vessels and many just have a standalone AIS box somewhere in the corner of the bridge. This is important when considering what to fit in a small craft.

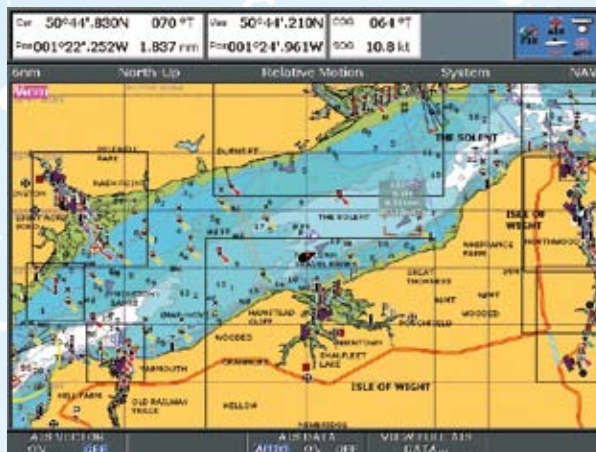
In a small craft we can receive the AIS transmissions from other vessels and, although this can be displayed on a stand-alone unit it is far better to display the information on the chartplotter/radar.

## Installing AIS

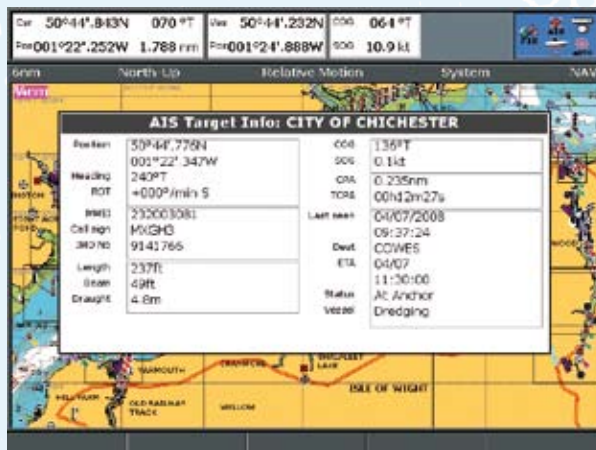
AIS is easy to install although you may not get the full warranty if you do it yourself. For a receive only, the box needs a connection to a VHF aerial and a connection to the chart plotter. The VHF aerial can either be a dedicated one for the unit or make use of the existing VHF aerial via a splitter. The Raymarine AIS receiver has a splitter built in so it's just a case of "looping through" the VHF aerial. The loss of signal to the VHF from going through the splitter is negligible. The connection from the AIS to the chart plotter is a two wire NMEA but operates at a higher data rate than the NMEA 0183 that has been around for years. It is important to check that you plotter is compatible. It may be that the NMEA input to your chart plotter is already used by, for instance, the GPS. To get over that the Raymarine AIS contains an NMEA multiplexer which means that you can connect the GPS to the AIS box which then combines the GPS information with the AIS and feeds the whole lot to the plotter at the higher data rate.



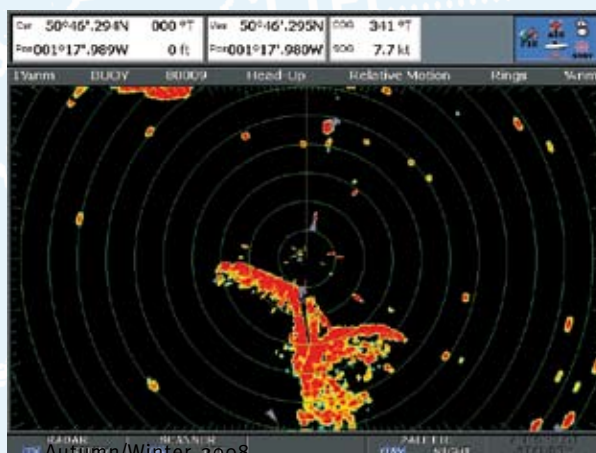
◀ Fig 1 shows my boat going eastwards through the Solent, equipped with Raymarine E series and a Raymarine AIS receiver. The AIS targets are the wedge shaped icons; one is directly ahead and going in the same direction as me, a second is coming towards me and there are a few more off Cowes.



◀ Putting the cursor on the one of interest gives his course, speed, how close we will pass (CPA) and how long before this will happen (TCPA)



◀ Selecting "view full AIS data" gives the full information on the vessel which now tells me that the vessel is the City of Chichester which is a dredger and is at anchor. It's still worth keeping an eye open as vessels sometimes forget to change their status from "at anchor" to "underway" and not long after I spotted a vessel doing 12 knots while announcing itself as "aground". Its also worth noting that warships do not normally transmit AIS.



◀ Similarly the AIS data can be overlaid on the radar picture which makes target identification much easier. This picture was taken from alongside in Cowes and identifies a ferry inbound, another outbound as well as a large vessel coming down the Thorne channel.

## Raymarine AIS250 Receiver

The popular AIS250 receiver, a compact unit designed to integrate with Raymarine's SeaTalk® network, brings this technology to the reach of boat owners using Raymarine's C and E series multifunction displays, which have now been upgraded to show AIS symbols and information directly on to both the chartplotter and radar screens. The AIS250 is a switched dual channel, multiplexed system, which means a single receiver uses complex software to monitor AIS Class A and Class B transmissions over both standard VHF frequencies, giving more detailed information than would be available on a single channel receiver.

RRP £655.00 ex.VAT

[www.raymarine.com](http://www.raymarine.com)



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Installing a Class B is not much different; you still need a VHF antenna, although in this case it is better to have dedicated one. It will also need a connection to the chartplotter and it will additionally need GPS information to know position, course and speed.

### Where to next?

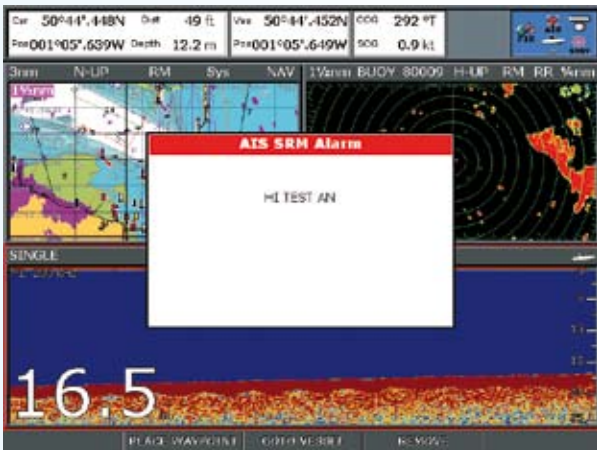
AIS is certainly a worthwhile addition to the navigation kit and it is a great help to be able to identify that tanker on the horizon. Care is still necessary as not all ships are sending AIS and some that are send incorrect data. If you elect to fit a Class B, although this will be picked up by other ships there is no guarantee that the information will be displayed on their navigation system, so do not assume you have been seen.

In future major navigation points will have AIS and may even replace Racons in time. One interesting thought is that the AIS equipment does not have to be physically located on the buoy it is marking so we can perhaps look forward to "virtual" buoys that show on the chart plotter but are not actually there.

## Choice of equipment and installation

### There are three different types of AIS equipment:

- Class A for vessels which are required to fit AIS. This equipment is high power and transmits status information as well as basic vessel details of course speed etc. The status information has to be updated by the crew to show things like next port of call, alongside or underway etc. Class A also have the facility to send short text messages over AIS. Below is an SRM (safety related message) received in the Solent recently, it looks like someone else was exploring the features of AIS!



- Class B for vessels not obliged to fit AIS. Class B is similar to Class A in that it transmits information about its own vessel but does so at lower power, less often and does not have status data.
- Receive only. This equipment receives information from Class A and B vessels and displays it but does not transmit.

Class B is becoming more popular in small craft but needs to be used with caution, the prospect of all the vessels in the annual Round-the Island race all transmitting AIS does not bear thinking of, whilst on a blue water voyage it has obvious benefits. I have elected to fit receive only on my boat.

## AIS – Feedback from World Cruising Club Participants

For yachts heading off on the first leg of Rally Portugal from Plymouth to Bayona an important consideration is how to plan their route taking the busy shipping lanes and traffic separation schemes into account. Most yachts opted to stay outside the Ushant TSS, and had planned to do the same off Cape Finisterre. However lighter winds and a good forecast as the yachts approached Finisterre encouraged some to take the inshore passage, necessitating them to cross this busy 4 lane TSS.

There is no doubt that AIS helped yachts achieve this safely, and with less stress, than with crossing the separation scheme without the benefits of AIS. Use of AIS amongst the fleet was widespread, with only 4 out of 13 yachts not having it. Surprisingly one yacht opted not to use their AIS during the passage. Those that did were extremely positive about their decision to fit AIS and of its' use. Comments included:

*"AIS is a must, I now think of it as standard" – Blue Beyond*

*"AIS was essential and made crossing Biscay less stressful" – Bali Hai*

*"I wouldn't be without it" – Scott-Free*

*"AIS was the best kit onboard for crossing Biscay" - Mariah*

World ARC yachts interestingly were less well equipped; this is mainly due to the fact that many of them left their home port in mid 2007 or before. Just over half the fleet (15 out of 27 surveyed) are not fitted with AIS; of the twelve that have AIS only 1 has the transmit function fitted. Two yachts fitted with receive only AIS reported that they would have the transmit function in future; another regretted not fitting it. Of those yachts without AIS most said they would fit it in future, with two unable to fit to due incompatibility problems with their existing older plotters. Since the start of World ARC one yacht has upgraded from receive only to transmit/receive, whilst another has fitted receive only. Without exception the yachts with AIS found it invaluable and a small price for a piece of equipment that so greatly enhances safety.

The main advantage of AIS is that it enables contacts to be identified and therefore makes calling other vessels much easier, a particular advantage in a close quarters situation. World ARC yachts reported a much greater response when calling a ship by name, often ensuring an alteration of course by the give way vessel. Comments included:

*"AIS is the biggest advance in maritime safety on the market in 20 years.*

*An incredible piece of equipment" – Robert Moore, Into the Blue*

*"There are many places where AIS is invaluable; it should be mandatory for yachts in the UK" – James Anderson, Cleone*

*"AIS is very important; cost for transmit units is still too high, and small transmit units for yachts unfortunately have a high power consumption" – Roger Langevin, Branec IV*

*"Wouldn't leave port without it. Best value buy to date. Great to be able to call a yacht by name" – Suzan Nettleship, Malmaani*

There is no doubt that use of AIS contributes greatly to safety at sea, particularly for yachts, and all owners should seriously consider fitting a system before going off long distance cruising. Judging on the reports from those already out there and using the system, fitting AIS is well worthwhile, and if budget allows choosing the transmit function won't be regretted.

## About The Author



Alan Watson has been afloat from an early age, on small craft in his childhood and then serving as an Electronics Officer in the merchant Navy before returning to small craft. Back ashore he combined a career in communications with boating. He is an RYA instructor/examiner for VHF (SRC), radar, diesel engines as well as the range of theory courses. He specialises in radar tuition and teaches radar for a number of sea schools including Ondeck and for Raymarine. He is frequently at sea in his own boat, a Nelson 42, "Trinity Star" as well as the preserved warship HMS Medusa.