How I fitted a Class B AIS transponder

Installing marine electronics can sometimes be tricky, but Mike Coates found fitting a Class B AIS system was quite straightforward

I recently upgraded my Navman chart plotter to one which would accept and interrogate AIS transmissions, so I could keep an eye on shipping movements around me – and be seen by them. The results were impressive when working in close proximity to a commercial vessel, especially when in busy approaches to ports. From several miles away and via their transmitted COG and CPA, the Navman was able to compute if the ships were a potential hazard to us.

Having read the accident reports on the *Ouzo* and despite having a good mast-mounted radar reflector (which I know is visible for at least 15NM from ships that have called us), I decided that being visible to ships via their AIS receiver would be an additional bonus in preventing a collision situation. As with any new electronic instrumentation, the AIS transceiver market is starting a little slowly and there are currently only a handful of manufacturers to choose from.

Installation

The SeaTraceR transponder I chose is supplied with a comprehensive and easy-to-read manual that covers user information, installation and troubleshooting.

The actual physical installation is as easy as installing a DSC VHF transceiver and aerial. The most difficult part I encountered – as a result of having to alter the cable lengths supplied with the combined aerial – was fitting the VHF and GPS TNC-type plugs.

Prior to installation the transponder requires programming with user information via a PC. This programming is simple and straightforward: after loading the software from the supplied CD, the SeaTraceR is connected via the nine-way D-type connector mounted on the rear panel, to a similar connector on the serial port of your PC using the cable provided. The same cable and socket on the rear of the SeaTraceR is used for data-out to your plotter or laptop.

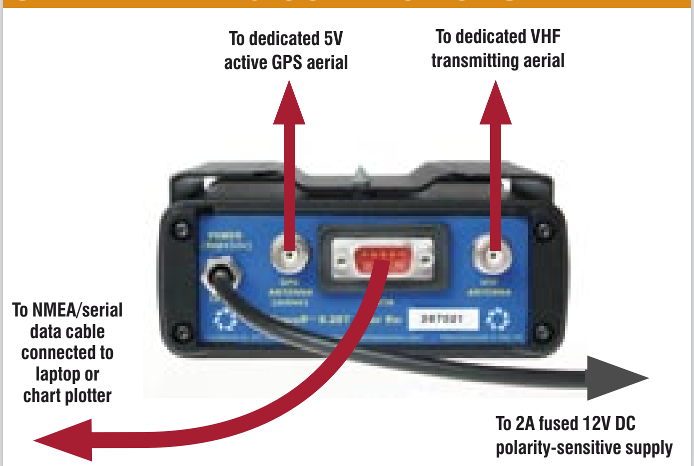
Details of your vessel's name, call sign, MMSI number, and the position on the vessel of the GPS aerial are loaded into the appropriate boxes on the screen. Left clicking with the mouse on the 'load data to AIS' will then ask for confirmation that the MMSI number is correct, and clicking 'yes' uploads the information. Just like DSC VHF radios, once you have loaded the MMSI number it is impossible to change it without returning the unit to a distributor.

Mike at the helm of his Hans Christian 43T *Jolly Swagman*, using his new AIS system. AIS information is displayed on the Navman chart plotter mounted on the console Mike made in Practical Projects (PBO 493)

The transponder should be mounted on a solid, vibration-free base in a dry area, but once fitted it can be almost forgotten about, access only being required to see the LEDs on the front panel in the event of a fault.

To run it you need a 2A fused 12V DC polarity-sensitive supply (reversing the polarity may damage the unit), a dedicated 5V active GPS aerial which should be mounted with a free view through 360°, and a dedicated VHF transmitting aerial – ie not shared with any other VHF transmitter/ receiver. Both aerials must be mounted with at least a 2m vertical separation from any MF, VHF transmitting antennas or radar scanner. The aerial must cover up to 162.025MHz – check this, as some don't. You will also need a suitable chart plotter or laptop to display the output data. The VHF aerial should be mounted as high

SIMPLE WIRING CONNECTIONS

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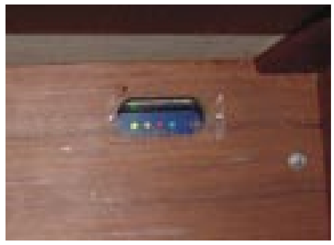
The transponder was mounted in the void under the cockpit steering pedestal, meaning a shorter run for the feeder cables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on the vessel as practical (because it uses VHF, AIS transmission is pretty much line of sight).

For mounting convenience I decided to fit a neat, combined GPS/VHF aerial. My preferred mounting position to maximise the receive/transmit range would have been on the spreaders, however, the radar is mounted just above which gave rise to concern that the high wattage output from the scanner may damage the GPS or AIS receivers.

The only alternative mounting position above crew head height (to avoid VHF-radiated transmissions from the AIS aerial) was the mounting pole for our wind generator, so a stand-off bracket was added to accept the combined aerial.

Testing, testing...

After I installed the unit I carried out a test comparing reception with the combined aerial and a standard VHF helical stub-aerial mounted in the same position. With the combined aerial we were able to receive vessels up to 21NM away, but with the helical antenna – which possibly didn't cover the required 162.025MHz frequency anyway – the receiving distance was reduced to less than 10NM.

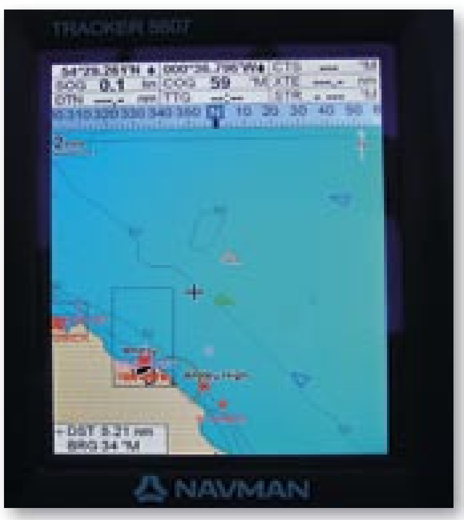
The transponder was mounted in the void under the cockpit steering pedestal – this kept feeder cables from the aerials and the output cable to the GPS plotter short. I cut an aperture in the cover panel and fitted a Perspex window allowing the LEDs on the SeaTraceR's panel to be viewed.

The cable from the AIS transponder could have been hard-wired to the plotter by removing one of the connecting plugs, to expose the cables, but this would prevent me being able to connect the unit to a PC for future programming if required. I therefore mounted a nine-pin D-type socket to the box housing the plotter connections.

On powering up, all four LEDs on the front panel flash twice, the red, green and blue will then go out leaving the yellow on.

I had been advised that all GPS receivers need to lock onto at least three satellites to compute a position from the initial cold start, where the GPS has no previous stored information, and this could take up to 30 minutes. However, our receiver locked on in less than two minutes.

Once this cold start has been achieved there is a further short delay until the first position report is transmitted. Then the yellow LED will go out and the green LED will illuminate, indicating the unit is operating correctly. The blue LED will flash each time an incoming AIS message is received.



AIS signals displayed on a Navman chart plotter

The screen picture (below) shows AIS signals displayed on a Navman chart plotter. Vessels and their directions are represented by triangles. The red and green triangles are vessels considered to be a hazard to the vessel interrogating the signals – in this case *Jolly Swagman* is the black hull positioned in harbour. Shore-based Coastguard stations also show up as triangles, but their SOG will show as zero because, obviously, they are stationary.

When the plotter's cursor is placed over a vessel the Navman will display the name or MMSI number, plus the SOG and COG at the bottom of the screen.

Pressing the enter button instructs the Navman to interrogate the information available, whereby the screen changes to a full page showing the information transmitted by the vessel.

Safety warning

Remember, not all vessels transmit or receive AIS signals. Under the Colregs it is your duty to always keep a good lookout.

For maximum help in reduced visibility, AIS should ideally be combined with radar. Radar can show passive targets such as debris or vessels not equipped with functioning AIS. If you are uncertain about another vessel's intention and they are transmitting AIS, you'll be able to identify them and call on DSC or Channel 16.

AIS is definitely a piece of kit worth considering if you venture into waters with large volumes of commercial vessels, such as the English Channel. PBO

CONTACT: Colin Watts of SevenStar Electronics, suppliers of the SeaTraceR, is very informed on the subject and was able to provide answers to all the technical questions we had.
■ SevenStar Electronics, tel: 01793 852829, www.sevenstarelectronics.com

PRICES: SeaTraceR Class B AIS transponder, £499; Combined GPS/VHF aerials are approximately £75.