

AIS (Automatic Identification System)

AIS are one of the most important aids to navigation that you can have added to your navigation system. It is an excellent tool for collision avoidance. In the past we had to depend on visual observation, radar or ARPA (Automatic Radar Plotting Aid) to identify boats in the vicinity. Fog and limited visibility presented a challenge.

AIS will allow us to identify other boats around us that are equipped with AIS transceivers. The boats will show up as targets on AIS capable chartplotters and computer screens. We are not limited to line of sight such as radar and will see boats around bends and behind land masses.

AIS (Automatic Identification System) is a short coastal tracking system. AIS enables an exchange of navigation status between vessels and shore side traffic monitoring centers.

AIS was declared mandatory for international voyaging ships over 299 gross tons by the International Maritime Organization (IMO). These ships must carry AIS transceivers that transmit their position, speed, heading and other static information such as vessel name, ship dimensions, and voyage details. This information has several benefits:

Collision Avoidance:

Ships can now identify other vessels around them and determine their speed and heading and full navigational info to determine any necessary changes to avoid a collision. The ability to identify the vessel's name and establish communications is a great asset. Previously you would only see a target on your radar and no ID information.

Vessel Traffic Services (VTS)

Port traffic control centers can monitor traffic and know exactly what each ship is doing. This is also an aid to security as an unidentified boat would be a cause for concern.

Accident Investigation and Rescue:

In an emergency situation Coast Guard will have all the information necessary to carry out a rescue. In an accident situation all traffic details such as dates and time are precise.

How Does AIS Work

AIS work in the VHF marine band. An AIS transceiver includes a GPS receiver to collect position and speed data, two VHF receivers (one multiplexed with a DSC receiver) and one transmitter that operates on channel 87B and 88B. The information is encoded using GMSK modulations so you will not hear any audible information by tuning your VHF to 87B & 88B. Your AIS receiver will process the information and send it out via NMEA format to your AIS chartplotter or computer display. The targets can be overlaid in chart or radar modes. If you have a Class B transceiver your AIS unit will transmit your vessels information. This information is broadcast at regular intervals>

Types of AIS equipment

1/ Class A Transceiver (Transmit and Receive)

These mandatory units are used by the international voyaging ships over 299 GT. They must be operating at all times. They are expensive units with complex systems to provide maximum information and transmission distance. They receive information from Class A and B units as well as transmit. The transmitters have a range of approximately 74 kilometres (46 miles) dependant on variable conditions. The AIS sends the following data every 2 to 10 seconds based on the vessels speed while underway and every 3 minutes while at anchor:

- Marine Mobile Service Identity (MMIS) 9 digit number
- Navigations Status (underway, at anchor or out of service)
- SOG (speed over ground)

- Position (Latitude and Longitude)
- COG (Course over ground)
- True Heading
- UTC Time Stamp

The following static data is sent every 6 minutes:

- IMO (ships ID number) 7 digit
- Radio Call sign
- Vessel Name
- Type of ship and cargo
- Physical dimensions of the ship
- Destination
- ETA (estimated time of arrival)

2/ Class B Transceiver (Receive and Transmit)

The Class B transceivers are a lower cost unit and can be used by recreational vessels and vessels not mandated to use Class A. These units can be turned on or off at the operators discretion. Such as in fishing tournament that you do not want to broadcast your location. The Class B unit transmission power is limited to 2 watts giving a range of approximately 5 miles. This is to prevent overloading of the available VHF bandwidth. The following information is broadcast every 30 seconds to 3 minutes relative to the vessels speed:

MMIS, Time, SOG, COG, Latitude & Longitude, and True heading

The following static information is transmitted every 6 minutes:

MMIS, Boat Name, Ship Type, Call Sign, Vessel Dimensions and equipment vendor ID.

The AIS processes the received information and outputs the data stream at 38400bps, as RS232 and NMEA formats. This information can be displayed on your AIS chartplotter or computer navigations system.

3/ Receive only AIS units

These are the most economical to purchase. They will provide all the info received by the preceding Class B units and can output the data to an AIS capable chartplotter or computer system. The disadvantage is that Class A and B vessels will not see you on their systems.

4/ VHF Radio with AIS Receiver

VHF radios are now available with built in capabilities to receive AIS information and display it on the VHF screen. These are ideal for boaters who do not have a dedicated AIS receiver and AIS capable chartplotter and want AIS at a reasonable cost.

AIS PRODUCTS

There are many AIS systems on the market. Some of the ones are as follows:

Raymarine AIS 250

This is a receive only unit. It will monitor Class A and B broadcasts. It will interface with Raymarine AIS capable multifunction displays displaying targets in chart or radar mode. The unit has a built in VHF/FM splitter allowing use of one antennae for AIS and VHF. It must be a 3 db antenna. It has NMEA 0183 (one @ 38400 and 1 @4800 bps) output ports that allow interfacing with a computer or other manufactures displays.

Raymarine AIS 500

This is a full Class B receive and Transmit AIS unit. This unit comes with a dedicated GPS. It also has a built in VHF/Fm splitter. It can be used on Raymarine multifunction displays and other manufactures using NMEA outputs. Using the Raymarine MFD you can set up a Buddy Tracking to distinguish your favourite

targets (MMISs). It also has a silent mode to turn off for racing or fishing tournaments.

NOTE:

- I would recommend a separate AIS antenna 3db as it will not work on a 6db VHF antenna which is normal on most VHF installations. The 3 db will degrade your VHF reception.
- The customer must obtain an MMIS number and also program in the pertinent vessel information for AIS transmission

Standard Horizon Matrix GX2100

This unit has a built in dual channel AIS receiver to display Class A and B vessel information directly on the VHF radio display. You will know what is out there and can contact a ship using DSC (digital selective calling) provided you have MMIS Id programmed into the unit. It has alerts for Closest Point of Approach (CPA) alarm.

This is an excellent unit for a boater that does not have an AIS receiver and AIS capable displays.

Benefits:

Now with AIS you have an increased safety tool which will be an excellent aid in busy water ways and in reduced visibility. We now have a wealth of knowledge about the boats in our vicinity. Knowing the ID of AIS equipped vessels in your vicinity allows you to communicate with them knowing their call sign. In offshore voyaging a Class B AIS allows large vessels to know you are out there and is a major safety device. In the past they could miss you on the radar screen. With AIS they will see you and communications can be established if necessary.