The acronym "AIS" stands for Automatic Identification System. We at PSICOMPANY.COM are principally involved in marine based AIS systems.

AIS was created to give vessel operators the ability to gather and distribute electronic navigational data information to other mariners, including those requiring navigational data from those who may be out of visual range and those who may have geographic obstructions in their navigational path.

Picture in your mind; a modern shipboard radar or an electronic chart display or chartplotter that includes a symbol capacity for every significant ship within VHF radio range, each as desired with a velocity vector (indicating heading and speed). Each ship "symbol" could reflect the actual size of the ship, with position to linked to GPS or differential GPS accuracy. By "pointing and clicking" on a ship symbol, you could acquire the ship name, speed and course, classification, call sign, MMSI, registration number, and much more. Historical ship's plotting information, closest point of approach, time to closest point of approach and additional navigation information, more accurate and timely than information available from an automatic radar plotting aid, could also be available. Display information previously available only to modern Vessel Traffic Service operations centers can now be available to every AIS - equipped ship as we will discuss.

With this navigational data, you could hail any vessel over marine VHF by specific name, rather than by "ship off my starboard bow" or some other imprecise means. Or you could access that vessel directly using GMDSS equipment. Also, you could receive from the vessel, or send to the vessel, short safety-related text messages.

The AIS is a shipboard broadcast system that acts like a smart transponder. It operates in the VHF maritime band, and has capacity of conducting 4,500 navigation reports per minute with navigational update capacity to every two seconds. It utilizes Self-Organizing Time Division Multiple Access (SOTDMA) modulation to meet a high broadcast rate potential, ensuring reliable ship-to-ship, or ship-to-shore operations.

Types of AIS
There is a wide variety of pricing and feature differentiation when it comes to Marine AIS, as AIS falls into three distinct categories or types:
"Class A" AIS
"Class B" AIS
and lastly receive only AIS

Also, AIS is available with either a built in display system or it can come designed to display it's information on chartplotter, marine radar, or similar marine network display device.

Each "Class A" AIS system consists of two VHF TDMA receivers , a VHF transmitter, a VHF DSC receiver, and antenna system, and standard marine electronic communications connections to shipboard display and sensor systems. Ship's Position and system timing information is sourced from a GPS receiver or a differential DGPS receiver for precision positioning in inland and coastal waters. Additional data broadcast by the AIS system, when available, is obtained from shipboard marine electronics through marine data link connections. Course and speed over ground and Heading information would be provided by

all "Class A"IS-equipped ships. Other information, such as rate of turn, pitch and roll, angle of heel, and destination and Estimated Time of Arrival may also be included.

The AIS transponder capability works in continuous or autonomous mode, regardless of whether it is operating in the open seas or coastal and even inland areas. Transmissions use packet modulation over 25 or 12.5 kHz channels. To avoid radio interference problems, each AIS station transmits and receives over two radio channels. This allows radio channels to be shifted without communications loss from other vessels. The AIS design architecture provides for automatic contention resolution between itself and other stations, and communications integrity is maintained even in overload situations.

If the AIS network gets overloaded with AIS navigation data, the AIS system begins excluding data from its farthest reception range. So for instance, if you were operating in a major metropolitan shipping harbor, you may only receive AIS data pertinent to operating in that harbor. As the AIS data transmissions lessen, then the geographic scope of reception and transmission increases automatically.

From a practical radio propagation standpoint, the AIS system coverage range is similar to marine VHF radio applications, essentially depending on the height of the antenna. Its propagation is slightly better than that of marine radar. It is possible for AIS to gather data in visually obstructed areas and behind islands if the land masses don't obstruct radio signals. A typical value to be expected at sea is nominally 20 nautical miles. With the help of radio repeater stations, the coverage for both ship and VTS stations can be extended over several hundred miles.

The system is backwards compatible with digital selective calling systems, allowing shore-based GMDSS systems to inexpensively establish AIS operating channels and identify and track AIS-equipped vessels, and is ultimately intended to replace existing DSC-based query systems.

What is broadcast by AIS

A "Class A" AIS unit broadcasts the following information every 2 to 10 seconds while underway, and every 3 minutes while at anchor at a radio power level of 12.5 watts. The information broadcast includes:

- Vessel MMSI number – unique traceable identification
- Navigation status - not only are "at anchor" and "under way using engine" currently defined, but "not under command" is also currently defined.
- Rate of turn - right or left, 0 to 720 degrees per minute
- Speed over ground - 1/10 knot resolution from 0 to 102 knots.
- Position accuracy - differential GPS or other source
- Longitude - to 1/10000 minute and Latitude - to 1/10000 minute
- Course over ground - relative to true north to 1/10th degree
- True Heading - 0 to 359 degrees derived from gyro or navigation input
- Time stamp - The universal time to nearest second that this information was generated

In addition, the "Class A" AIS unit broadcasts the following information every 6 minutes:

- MMSI number - same unique traceable identification previously discussed, which links the data to described vessel
- IMO number - unique referenced identification (related to ship's construction)
- Radio call sign - international call sign assigned to vessel, often used on voice radio
- Name - Name of ship, 20 characters are provided
- Type of ship/cargo - there is a table of possibilities that are available
- Dimensions of ship - to nearest meter
- Location on ship where reference point for position reports is located
- Type of position fixing device - various options from differential GPS to undefined
- Draught of ship - 1/10 meter to 25.5 meters [note "air-draught" is not provided]
- Destination - 20 characters are provided
- Estimated time of Arrival at destination - month, day, hour, and minute in UTC

So "Class A" is intended vessels meeting the requirements of IMO AIS carriage requirement, and mariners who want the most technical capability in gathering and distributing navigational data.

And "Class B" provides facilities not necessarily in full accord with IMO AIS carriage requirements. The "Class B" is nearly identical to the "Class A", except the "Class B":

- Has a reporting rate less than a "Class A" (e.g. every 30 sec. when under 14 knots, as opposed to every 10 sec. for "Class A")
- Does not transmit the vessel's IMO number
- Does not transmit ETA or destination
- Does not transmit navigational status
- Is only required to receive, not transmit, text safety messages
- Is only required to receive, not transmit, application identifiers (binary messages)
- Does not transmit rate of turn information
- Does not transmit maximum present static draught

Receive Only AIS is a much less expensive alternative to "Class A" and "Class B" AIS systems. This technology allows you to view all AIS transmissions on your compatible radar or chartplotter and/or vessel network display device, but does not have capacity to transmit your own position and data to the AIS network. These AIS units are available from $200 to $400 and come as either one channel or two channel versions. From an operational standpoint, it is well worth the money to consider the dual channel receive only device.

You will also need a standard marine VHF antenna for the AIS receiver. You can't directly share the VHF antenna used by your VHF transceiver because when you transmit on the marine VHF it would destroy your AIS receiver. There are automatic antenna switches available, but you're simply better off just installing a second antenna. We suggest mounting the secondary antenna 4 feet or further from the transmitting marine VHF antenna for best results.

If you want additional AIS product information, please be our guest at the web URL PSICOMPANY.COM/AIS. We have the top AIS products available from the best manufacturers including:

ACR Electronics
Comnav
Furuno
Garmin
ICOM
JRC
Raymarine
Shine Micro
Si-tex
Simrad
Standard Horizon

You can also call us weekdays from 8:30 AM to 5:00 PM PST and our Toll free Telephone number is **1-800-826-2907**. We are here and ready to help you with any questions on AIS, including volume or fleet pricing, and we can also help you interfacing your AIS to other network devices onboard your vessel.

We came to work today just to help you with your AIS needs, so please feel free to gives us a call! We would be happy to help you!

Marine AIS Units with Thousands of Units Installed:
http://www.psicompany.com/furuno-fa150-ais/
http://www.psicompany.com/furuno-fa50-ais/
http://www.psicompany.com/furuno-fa30-ais/
http://www.psicompany.com/jrc-jhs-182/

Additional Information Links:
http://www.navcen.uscg.gov/enav/AIS/default.htm
http://www.uscg.mil/ACQUISITION/nais/
http://en.wikipedia.org/wiki/Automatic_Identification_System
http://www.psicompany.com/ais