Automatic Identification Systems

Automatic Identification Systems
What is AIS?

An automated autonomous system for the exchange of navigational information between suitably equipped vessels and shore stations using distinct messages and operating on two designated marine VHF channels.
AIS Reports
Ship to Ship
AIS Reports
AIS Reports
VTS
Control
Center
Port Info
Port Info
Local Data
(Tides, Current,
Weather)
DGPS
Corrections
Administration
(Pilots, Berth
Assignments)
Plus Aids To Navigation and SAR Aircraft
How did we get AIS?

International Maritime Organization (IMO)
Maritime Safety Committee

- Assembly (A)
- Council (C)
  - Technical Cooperation (TCC)
  - Legal (LEG)
  - Maritime Safety (MSC)
  - Facilitation (FAL)
  - Marine Environment Protection (MEPC)
    - Bulk Liquids and Gases (BLG)
    - Carriage of Dangerous Goods, Solid Charges and Containers (DSC)
    - Fire Protection (FP)
    - Radiocommunications and Search and Rescue (COMSAR)
    - Safety of Navigation (NAV)
    - Ship Design and Equipment (DE)
    - Stability and Load Lines and Fishing Vessel Safety (SLF)
    - Standards of Training and Watchkeeping (STW)
    - Flag State Implementation (FSI)

BLG and FSI are subsidiary to MEPC for pollution aspects
ITU: International Telecommunications Union (UN)
Frequency Mgmt and ICT Performance Standards

IEC: International Electrotechnical Commission (non-Govt)
Standards such as IEC 61162 interfacing protocols and AIS equipment standard

IHO: International Hydrographic Organization (Inter-Govt)
All matters related to hydrography incl. Chart standards

IALA: International Assoc. of Lighthouse Authorities (non-Govt)
Navigational Standards (Aids To Navigation – VTS - AIS!)
NMEA: National Marine Electronics Association (non-Govt)
NMEA 0183 and NMEA 2000 protocols

RTCM: Radio Technical Commission for Maritime Services (non-Govt)
U.S. Radar Standards for UTVs, FCC EPIRB standards, DGPS interface (SC104)
Why do we need AIS?

Creates a much improved situational awareness for the Navigators by overcoming the inherent limitations of sight, VHF voice and radar for collision avoidance – regardless of vessel size.
How does AIS work?

The heart of the system is a transmission protocol called Self Organizing Time Division Multiple Access (SOTDMA).

This protocol is what allows AIS to be autonomous and continuously operational.
SO-TDMA

60 Seconds
2250 Slots

AIS-1

A B C A C ...

AIS-2

B C A ...

26.67 ms
1 Slot = 256 Bits

- Identity
- Position
- Speed over Ground
- Course over Ground
- Heading
- Rate of Turn
- Navigation Status
- Time Stamp
Due to the anticipation of far more non-regulated vessels than regulated vessels, the Maritime Safety Committee commissioned the technical organizations to develop an alternative system that we know as Class B.
Class A – Regulated Vessels

Uses the SOTDMA protocol
2- to 10-second Interval while Underway
3 Minutes while at Anchor
Supplemental Data at 6-minute Intervals
12.5 watt transmitter

Class B – non-Regulated Vessels

Uses a CSTDMA protocol which politely interweaves with Class A transmissions
30-second Interval while Underway >2 knots
3 Minutes while at Anchor
Supplemental Data at 6-minute Intervals
2 watt transmitter
SOTDMA

60 Seconds
2250 Slots

AIS-1

A    B    C    A    C    ...  

AIS-2

B    C    A    ...  

26.67 ms
1 Slot = 256 Bits

- Identity
- Position
- Speed over Ground
- Course over Ground
- Heading
- Rate of Turn
- Navigation Status
- Time Stamp
Schematic Diagram of Class “A” Ship-borne AIS Station

*1) The external keyboard/display may be e.g. radar, ECDIS or dedicated devices.
*2) The internal keyboard/display may optionally be remote.
Schematic Diagram of Class B Ship-borne AIS Station
AIS Nav Broadcasts

- Latitude (both Classes)
- Longitude (both Classes)
- Speed over Ground (both Classes)
- Course over Ground (both Classes)
- Position Accuracy (both Classes)
- Time Stamp (both Classes)
- MMSI Number (both Classes)
- True Heading (A requirement - B only if available)
- Rate of Turn (class A only)
- Navigation Status (class A only)
- DSC receiver fitted Y/N? (Class B only)
AIS Supplemental Broadcasts

- MMSI (both Classes)
- Radio Call Sign (both Classes)
- Name (both Classes)
- Type of Ship/Cargo (both Classes)
- Dimensions of Ship (both Classes)
- Location of Reference Point (both Classes)
- IMO Number (class A only)
- Type of Position Fixing Device (class A only)
- Draught of Ship (class A only)
- Destination (class A only)
- ETA at Destination (class A only)
- Vendor ID (class B only)
Place Cursor over AIS Target to view COG, SOG, CPA, TCPA
### AIS Target Info: ISLAND ADVENTURE

<table>
<thead>
<tr>
<th>Position</th>
<th>COG</th>
<th>SOG</th>
</tr>
</thead>
<tbody>
<tr>
<td>40°40'.976N</td>
<td>035°T</td>
<td>4.9kt</td>
</tr>
<tr>
<td>074°02'.507W</td>
<td></td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Heading ROT</th>
<th>CPA</th>
<th>TCPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>034°T</td>
<td>924ft</td>
<td></td>
</tr>
<tr>
<td>+000°/min S</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>MMSI</th>
<th>Last seen</th>
</tr>
</thead>
<tbody>
<tr>
<td>309247000</td>
<td>10/30/2006</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Call sign</th>
<th>Dest</th>
</tr>
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<tbody>
<tr>
<td>C6KT</td>
<td>EVERGLADES</td>
</tr>
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<table>
<thead>
<tr>
<th>IMO No</th>
<th>ETA</th>
</tr>
</thead>
<tbody>
<tr>
<td>7359486</td>
<td>10/29</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Length</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>511ft</td>
<td>Under Way Using Engine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Beam</th>
<th>Vessel</th>
</tr>
</thead>
<tbody>
<tr>
<td>67ft</td>
<td>Passenger</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Draught</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20.3ft</td>
<td></td>
</tr>
</tbody>
</table>
Installations

SN Circular 227
Installation Considerations

- VHF Antennas and cabling
- GPS Antennas
- Equipment Interfaces
- Ship’s Power Sources
- Pilot Plugs
A very important difference about VHF antennas

The AIS frequencies are on the high end of the VHF-FM band (@ 162 mhz). Because of this, the standard marine VHF antennas are not manufactured for optimum performance at those frequencies.

Use the proper antenna for best performance
- VHF Antenna
  - Possibly Integrated GPS Antenna
- 6’ Feet from Conductive Objects
- Ideally 6’ Directly above or below VHF
- Otherwise 30’ Horizontal Separation
The IMO Safety Nav Circular 227 recommends the use of RG-214 coax which is a double screened coax cable which has better shielding capabilities (3% more).

As a matter of comparison, here are the four common types:

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
<th>Db Loss</th>
<th>Percentage Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>RG-58</td>
<td>@ 50 ft</td>
<td>3.0</td>
<td>50%</td>
</tr>
<tr>
<td>RG-8 Mini</td>
<td>@ 50 ft</td>
<td>2.3</td>
<td>40%</td>
</tr>
<tr>
<td>RG-8</td>
<td>@ 50 ft</td>
<td>1.2</td>
<td>20%</td>
</tr>
<tr>
<td>RG-214</td>
<td>@ 50 ft</td>
<td>1.2</td>
<td>20%</td>
</tr>
</tbody>
</table>
GPS Antennas

The suggested mounting is one which gives a complete sky view from 5 degrees above the horizon to 90 degrees (the zenith).
All interconnection cables used to interface NMEA 0183 inputs from external GPS units, Gyrocompasses, Satellite Compasses, Speed Logs, and the like should use shielded pair type cables.
Figure 2: NMEA Connection Diagram

<table>
<thead>
<tr>
<th>NMEA0183 Device</th>
<th>183V2C TB</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX(A)</td>
<td>RX(A)</td>
</tr>
<tr>
<td>TX(B)</td>
<td>RX(B)</td>
</tr>
<tr>
<td>RX(A)</td>
<td>TX(A)</td>
</tr>
<tr>
<td>RX(B)</td>
<td>TX(B)</td>
</tr>
</tbody>
</table>

To Power
+12VDC

GND

Optional Power Supply
10 - 16VDC

Figure 3: 183V2C Block Diagram

DB9 Female RS-232

Terminal Blocks
NMEA0183

TX(A)

TX(B)

RX(A)

RX(B)

+5V

Power Conversion Block

+12VDC

GND
DC voltage drops <3%

Class A units: \( \sim 5 \) A @ 24 vdc
10 awg for 50 ft

Class B units: \( \sim 2 \) A @ 12 vdc
14 awg for 25 ft
For Class A systems, the IMO recommendation SN Circ 227 is that the unit should be connected to an Emergency Source.

For IMO vessels, this means the Emergency Generator to which all the Communication and Navigation equipment is to be connected to.

In addition, an Supplement to the Recommendation also requests that the AIS be connected to a UPS to ensure that the switchover from Main to Emergency does not shut the AIS down.
Required for Class A – Ships on International Voyages

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Transmit A</td>
</tr>
<tr>
<td>4</td>
<td>Transmit B</td>
</tr>
<tr>
<td>5</td>
<td>Receive A</td>
</tr>
<tr>
<td>6</td>
<td>Receive B</td>
</tr>
<tr>
<td>9</td>
<td>Shield</td>
</tr>
</tbody>
</table>
Configuration
<table>
<thead>
<tr>
<th>Data</th>
<th>Preferred</th>
<th>Acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Datum</td>
<td>DTM</td>
<td></td>
</tr>
<tr>
<td>Positioning System:</td>
<td>GNS, GLL</td>
<td>GGA, RMC</td>
</tr>
<tr>
<td>Time of Position, Latitude / Longitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position Accuracy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed over Ground (SOG)</td>
<td>VBW</td>
<td>VTG, OSD, RMC</td>
</tr>
<tr>
<td>Course over Ground (COG)</td>
<td>RMC</td>
<td>VTG, OSD</td>
</tr>
<tr>
<td>Heading</td>
<td>HDT</td>
<td>OSD</td>
</tr>
<tr>
<td>RAIM Indicator</td>
<td>GBS</td>
<td></td>
</tr>
<tr>
<td>Rate of Turn (ROT)</td>
<td>ROT</td>
<td></td>
</tr>
</tbody>
</table>

NMEA Input Sentences for Class A units
Vessel Data
Maritime Mobile Service Identity (MMSI) Number
Vessel Name
Vessel Type and Cargo Type
GPS Antenna Location/Reference Position/ Dimensions
IMO Number (Class A fittings)
Radio Call Sign (if assigned)
<table>
<thead>
<tr>
<th>Distance (meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>(0 - 511 \text{ m})</td>
</tr>
<tr>
<td>(511 \text{ m} = 511 \text{ m or Greater})</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>(0 - 511 \text{ m})</td>
</tr>
<tr>
<td>(511 \text{ m} = 511 \text{ m or Greater})</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>(0 - 63 \text{ m})</td>
</tr>
<tr>
<td>(63 \text{ m} = 63 \text{ m or Greater})</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>(0 - 63 \text{ m})</td>
</tr>
<tr>
<td>(63 \text{ m} = 63 \text{ m or Greater})</td>
</tr>
</tbody>
</table>
As the final check of the system, make sure that you have entered all the Static information correctly.

**USCG Alert # 05-10**

“AIS is only as good as the information provided and exchanged, therefore, users must ensure their unit is always in effective operating condition and broadcasting accurate information”
Confirm with another vessel or shore station that they can receive your vessel’s info correctly and that you are seeing others as well before you leave the vessel.
Take the time to teach the Customer how to operate the AIS and how to decipher what it is telling the Navigator.

Don’t assume they will ‘figure it out’ – especially when they get into the Voyage data fields (destinations, cargo type, etc)

Remind them that it is an AID to navigation
United States Coast Guard
Office of Navigation Systems

Providing navigation safety information for America’s waterways

Jorge Arroyo
Program Analyst
U.S. Coast Guard Headquarters
Washington, DC

International Boat builders’ Exhibition and Conference (IBEX)
October 17th, 2011
Louisville, KY
Automatic Identification System (AIS)

✓ U.S. AIS History
✓ Regulations...Who? Where? When?
✓ AIS Update
✓ Application Specific Messaging
✓ AIS @ www.navcen.uscg.gov
✓ Questions & Answers
AIS History & Timeline


- **OPA ’90**
- **ADSSE ITU-R M.825-3**
- **National Dialog Group**
- **Marine Board Ports & Waterways Study**
- **105th Congress**
- **VTS LMR Public Meeting**
- **FCC Notice DA-02-1362**
- **MTSA - 11/02**
  - Interim - 7/03
  - Final - 10/03
  - Deadline - 1/04

- **WRC’97 AIS1 Ch.87B AIS2 Ch.88B**
- **IMO MSC 74 (69) Performance**
- **ITU-R M.1371-1 Technical**
- **IEC 61993-2 Testing & Certification**
- **2002 IMO Diplomatic Conference**
What started the USCG on AIS?

In 1990, Congress passed the Oil Pollution Act which participation in VTS mandatory and directed the USCG to seek ways to have ‘dependent surveillance’ of all tankers bound for Valdez, Alaska.

To that end, in 1993 the USCG developed Automated Dependent Surveillance Shipboard Equipment (ADSSE), based on Digital Selective Calling (DSC) protocol.
In 1997, Congress...stated that AIS “technology should be the foundation of any future VTS system” and that it “strongly believes that this technology will significantly improve navigational safety, not just in select VTS target ports, but throughout the navigable waters of the U.S”, and, that we “continue working with stakeholders...”

In 1999, the National Dialog Group, comprised of the marine private and public representatives, stated they:

“strongly endorse the widespread use of AIS employing dGPS and onboard transponder technologies...that national use of AIS technology on the greatest number of vessels is essential both as a foundation of a VTS system...improving navigation safety...strongly urge the USCG to take the lead...in developing equipment and procedural standards that will promote universal use of AIS technology”, which will “be less intrusive and distracting to the mariner than will a voice-based control system...”
AIS Timeline


- WRC’97
  - AIS1 Ch.87B
  - AIS2 Ch.88B

- SOLAS
  - V/19.2.4

- 2002 IMO
  - Diplomatic Conference

- IMO
  - MSC 74 (69)
  - Performance

- ITU-R
  - M.1371-1
  - Technical

- IEC 61993-2
  - Testing & Certification

- National System
- Marine Board Ports & Waterways Study

- Marine Board
- ports & Waterways Study

- FCC Notice
  - DA-02-1362

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- OPA ’90
- ADSSE ITU-R
  - M.825-3

- National
  - Dialog Group

- 105th
  - Congress

- VTS LMR
  - Public Meeting

- 1990
- 1994
- 1997
- 1998
- 1999
- 2000
- 2001
- 2002
- 2003
- 2004
Towards an AIS-based VTS

In an effort to facilitate vessel transits, enhance good order, promote safe navigation, and improve upon existing operating measures on the waterway. The USCG proposed to establish a Vessel Traffic Service on the Lower Mississippi River and transfer certain vessel traffic management provisions on the river.

By implementing a proposed transition to VTS in a phased manner which would allow for the orderly transition from existing regulations and practices to operating procedures appropriate to an AIS-based VTS.

- Ref: 65 FR 24616, Apr. 24, 2000
Mandated by Congress in 2002

• *Marine Transportation & Security Act of 2002*
  - Commercial self-propelled vessels 65 feet or greater;
  - Towing Vessels over 26 feet or greater and 600 hp or more;
  - Passenger vessels as determined by USCG; and
  - those the USCG deems necessary for safety.
AIS Carriage Regulations 33 CFR 164.46

The following must have a properly installed, operational, type-approved AIS

- **On international voyage:**
  - ✓ Tankers, Passenger ≥ 150 GT, all others ≥ 300 GT
    - ❌ Per SOLAS Regulation V/19.2.4
  - ✓ Self-propelled commercial vessels ≥ 65 feet
    - ❌ Except fishing and small passenger vessels (<150 passengers)

- **Within a VTS area:**
  - ✓ Self-propelled commercial vessel 65+ feet
    - ❌ Except fishing & small passengers vessels
  - ✓ Towing vessel ≥ 26 feet and ≥ 600 hp
  - ✓ Vessel certificated to carry ≥ 150 passengers
AIS Rulemaking [Changes in Bold-type]

- 10/23/03 current AIS requirement published (33 CFR 164.46)
- 07/01/03-01/09/04, 3 meetings & comment period re: AIS expansion
- 10/31/05, agenda entry re: expansion of AIS to all navigable waters
- 12/16/08, NPRM published; 04/15/09, comment deadline (73 FR 78295)
  - Proposed compliance date: NLT 7 month after Final Rule
  - AIS prices: Class A, $2,800-5,000; Class B, $700-1,500
    - Installation cost will vary by display options & interfacing
    - SOLAS requires interfacing to GPS, THD, ROT, back-up power
  - Potentially could effect 17,442 vessels/14,506 small biz’s, i.e.
    - Commercial self-propelled vessels of ≥ 65 feet
      - No exclusions
    - Towing vessels ≥ 26 feet and > 600 hp
    - Vessels with ≥ 50 passengers (vice 150 for hire)
    - Hi-Speed vessels with ≥ 12 passengers for hire
    - Certain dredges & floating plants, &
    - Vessel moving certain dangerous cargoes

Estimated Expanded AIS Population

<table>
<thead>
<tr>
<th>Ships ≥65ft</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight Ship</td>
<td>298</td>
</tr>
<tr>
<td>Industrial Ship</td>
<td>748</td>
</tr>
<tr>
<td>MODU</td>
<td>210</td>
</tr>
<tr>
<td>OSV</td>
<td>553</td>
</tr>
<tr>
<td>Research Vessel</td>
<td>97</td>
</tr>
<tr>
<td>School Ship</td>
<td>19</td>
</tr>
<tr>
<td>Tank Ship</td>
<td>122</td>
</tr>
<tr>
<td>Unclassified</td>
<td>385</td>
</tr>
<tr>
<td>Unknown</td>
<td>541</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fishing ≥65ft</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Documented</td>
<td>4,571</td>
</tr>
<tr>
<td>Undocumented (est.)</td>
<td>949</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Towing ≥26ft &amp; ≥600hp</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (U.S.)</td>
<td>16,323</td>
</tr>
<tr>
<td>Foreign Flag ≥65ft</td>
<td>1,119</td>
</tr>
<tr>
<td>Total (All)</td>
<td>17,442</td>
</tr>
</tbody>
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## U.S. AIS Carriage Population

<table>
<thead>
<tr>
<th>Vessel Service</th>
<th>SOLAS</th>
<th>IR 7/1/02</th>
<th>FR 11/23/03</th>
<th>NPRM 12/16/08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishing Boat</td>
<td>1</td>
<td>749</td>
<td>-</td>
<td>5,520</td>
</tr>
<tr>
<td>Cargo Ship</td>
<td>154</td>
<td>77</td>
<td>77</td>
<td>298</td>
</tr>
<tr>
<td>Industrial Vessel</td>
<td>21</td>
<td>11</td>
<td>11</td>
<td>748</td>
</tr>
<tr>
<td>MODU</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>210</td>
</tr>
<tr>
<td>Offshore Supply Vessel</td>
<td>55</td>
<td>433</td>
<td>432</td>
<td>553</td>
</tr>
<tr>
<td>Passenger Vessel</td>
<td>81</td>
<td>576</td>
<td>171</td>
<td>3,235</td>
</tr>
<tr>
<td>Public/Research/School</td>
<td>10</td>
<td>18</td>
<td>16</td>
<td>116</td>
</tr>
<tr>
<td>Tank Ship</td>
<td>102</td>
<td>15</td>
<td>15</td>
<td>122</td>
</tr>
<tr>
<td>Towboat/Tug</td>
<td>13</td>
<td>2,215</td>
<td>2,212</td>
<td>4,560</td>
</tr>
<tr>
<td>Dredge</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>35</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>11</td>
<td>13</td>
<td>385</td>
</tr>
<tr>
<td>Unknown</td>
<td>-</td>
<td>16</td>
<td>16</td>
<td>541</td>
</tr>
<tr>
<td>Foreign &gt;65'&lt;300GT</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,119</td>
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<tr>
<td><strong>Totals</strong></td>
<td>438</td>
<td>4,121</td>
<td>2,963</td>
<td>17,442</td>
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</table>
AIS Certification Standards Update

- IEC 61993-2 Class A published in 2001
  - Edition 2 completed – publication 2012
- IEC 62287-1 Class B published in 2006
- IEC 62320-1 AIS base station published in 2007
- IEC 62320-2 AIS AtoN base station published in 2008
- IEC 61097-14 AIS SART published in 2009
  - Their use became permissible 1/1/10
- IEC 62287-2 Class B SOTDMA
  - Still in development – publication 2012
AIS SART – GMDSS Search and Rescue AIS Transmitter

NEW PRODUCT – Part of GMDSS from Jan. 2010:
- Alternative to traditional radar SART, for use in life boats / rafts
- Location is automatically shown on electronic chart / ECDIS
- Each AIS-SART has a unique code, unlike radar-SART & 121.5, thus many in the same area will not overload the search system.
- Transmit 1 burst of 8 transmissions every minute, using SOTDMA
- 1 W ERP output / 96 hours operation
Key West Trials Aviation Results

Detection Range in NM

- 20,000 ft
- 10,000 ft
- 5,000 ft
- 1,000 ft

- 406 EPIRB
- 121.5 Homer
- Radar SART A
- AIS EPIRB
- AIS SART
- AIS PLB
- AIS SART on VESSEL
<table>
<thead>
<tr>
<th>ID#</th>
<th>ITU-R M.1371 AIS Message Descriptions - Applications</th>
<th>A</th>
<th>U</th>
<th>S</th>
<th>I</th>
<th>N</th>
<th>Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,3</td>
<td>Position Reports – autonomous (au), assigned (as), or interrogated (in)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Base Station Report – UTC/date, position, slot nr.</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Class A Report - static and voyage related data</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>6,7,8</td>
<td>Binary Message – addressed, acknowledge or broadcast</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>5/2</td>
</tr>
<tr>
<td>9</td>
<td>SAR aircraft position report</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>10,11</td>
<td>UTC/Date - enquiry and response</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>12,13,14</td>
<td>Safety Text Message – addressed, acknowledge or broadcast</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>5/2</td>
</tr>
<tr>
<td>15</td>
<td>Interrogation – request for specific messages</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>Assignment Mode Command</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>Binary Message – DGNSS Correction</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>18,19</td>
<td>Class B Reports – position &amp; extended</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>Data Link Management – reserve slots</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>ATON Report – position &amp; status</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td>Channel Management</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>Group Assignment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>Class B-CS Static Data</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>Binary Message - single-slot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>26</td>
<td>Binary Message - multi-slot (STDMA)</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>
### 3.3.8.2.6 Message 8: Binary broadcast message

This message will be variable in length, based on the amount of binary data. The length should vary between 1 and 5 slots.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Number of bits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message ID</td>
<td>6</td>
<td>Identifier for Message 8; always 8</td>
</tr>
<tr>
<td>Repeat indicator</td>
<td>2</td>
<td>Used by the repeater to indicate how many times a message has been repeated. See § 3.3.8.2.1.1</td>
</tr>
<tr>
<td>Source ID</td>
<td>30</td>
<td>MMSI number of source station</td>
</tr>
<tr>
<td>Spare</td>
<td>2</td>
<td>Not used. Should be set to zero</td>
</tr>
<tr>
<td>Binary data</td>
<td>Maximum 968</td>
<td>Application identifier 16 bits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Should be as described in § 3.3.8.2.4.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Application data Maximum 952 bits Application specific data</td>
</tr>
<tr>
<td>Total number of</td>
<td>Maximum 1008</td>
<td>Occupies 1 to 5 slots</td>
</tr>
<tr>
<td>bits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Meteorological & Hydrological Reporting

- Improves the overall safety & efficiency of marine traffic
- Some in place since 2002

**Station ID**: SUPERIOR SHOALS, NY  
**Station Type**: Weather Station  
**Latitude**: 44° 28' 12.00'' N  
**Longitude**: 075° 48' 00.00'' W  
**Wind Speed**: 26.9 kts  
**Wind Gust**: 30.1 kts  
**Wind Direction**: S  
**Air Pressure**: 996.0 mbar  
**Air Temp**: 17.4°C  
**Dew Point**: 12.4°C  
**Visibility**: 25.4 km  
**Water Temp**: 18.0°C  
**Time of Report**: 10:34:00  
**Time Since Last Report**: 00h 02m 16s
AIS can transfer data via binary messages...

• Provides a means to use other applications
  • Encode application on the transmission side
  • Decode application on the receive side
• Sent as either General or Addressed broadcast
  • Addressed messages (MMSI-to-MMSI) receives an acknowledgement that the binary message was received
GUIDANCE ON THE APPLICATION OF AIS BINARY MESSAGES

1. The Maritime Safety Committee, at its seventy-eighth session (12 to 21 May 2004), approved SN/Circ.236 on Guidance on the application of AIS binary messages as prepared by the Sub-Committee on Safety of Navigation at its forty-ninth session (30 June to 4 July 2003).

2. Automatic Identification System (AIS) is a working system for ship identification and tracking that has the capability of the service of binary messages. The concept, functional requirements, and technical constraints are described in annex 1.

3. The Sub-Committee on Safety of Navigation, at its forty-ninth session selected seven (7) binary messages as shown in annex 2 to this circular to be used as a trial set of messages. The idea is to use this set of 7 messages for a trial period of 4 years with no change. It should be noted that 4 additional system-related messages identified in Recommendation ITU-R M.1371 are needed for the operation of the system.

4. The criteria for selecting the 7 trial messages were:
   .1 demonstrated operational need;
   .2 a cross-section of users, including ships, VTS, pilots, and port authorities; and
   .3 messages already developed for format and content.

5. In addition, messages were limited to a maximum number of 3 slots to reduce the potential for overloading the AIS frequencies designated for IMO.

6. In addition to these 7 messages and 4 system-related messages, the Sub-Committee agreed to allow 2 additional messages in the 4-year trial period to test the process of introducing new binary...
<table>
<thead>
<tr>
<th>Topic</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Met/Hydrological</td>
<td>*</td>
</tr>
<tr>
<td>Dangerous cargo indication</td>
<td>*</td>
</tr>
<tr>
<td>Fairway closed</td>
<td>*</td>
</tr>
<tr>
<td>Tidal window</td>
<td>*</td>
</tr>
<tr>
<td>Extended ship static &amp; voyage-related data</td>
<td>*</td>
</tr>
<tr>
<td>Number of persons on board</td>
<td>**</td>
</tr>
<tr>
<td>VTS-generated/synthetic targets</td>
<td>**</td>
</tr>
</tbody>
</table>
GUIDANCE ON THE USE OF AIS APPLICATION-SPECIFIC MESSAGES

1. The Maritime Safety Committee, at its seventy-eighth session (12 to 21 May 2004), approved SN/Circ.236 on Guidance on the application of AIS binary messages as prepared by the Sub-Committee on Safety of Navigation at its forty-ninth session (30 June to 4 July 2003).

2. The Sub-Committee on Safety of Navigation, at its forty-ninth session (30 June to 4 July 2003), selected seven (7) binary messages as shown in annex 2 to SN/Circ.236 to be used as a trial set of messages for a period of four years with no change. It was noted that four additional system-related messages were identified in Recommendation ITU-R M.1371 for the operation of the system.

3. The Sub-Committee on Safety of Navigation, at its fifty-fifth session (27 to 31 July 2009), after evaluating the use of binary messages in the trial period defined in SN/Circ.236, agreed on Guidance on the use of AIS Application-Specific Messages, including messages which are recommended for international use.

4. The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), concurred with the Sub-Committee’s views and approved the Guidance on the use of AIS Application Specific Messages, as set out at annex.

5. Member Governments are invited to bring the annexed Guidance to the attention of all concerned.

6. This circular revokes SN/Circ.236 as from 1 January 2013.
### IMO SN/Circ.289 ASM’s

<table>
<thead>
<tr>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearance time to enter port</td>
</tr>
<tr>
<td>Marine traffic signal</td>
</tr>
<tr>
<td>Berthing data</td>
</tr>
<tr>
<td>Weather observation report from ship</td>
</tr>
<tr>
<td>Area notice – broadcast &amp; addressed</td>
</tr>
<tr>
<td>Extended ship static and voyage-related data*</td>
</tr>
<tr>
<td>Dangerous cargo indication*</td>
</tr>
<tr>
<td>Environmental Data</td>
</tr>
<tr>
<td>Route information – broadcast &amp; addressed</td>
</tr>
<tr>
<td>Text description – broadcast &amp; addressed</td>
</tr>
<tr>
<td>Meteorological and Hydrographic [sensor] data</td>
</tr>
<tr>
<td>Tidal window</td>
</tr>
</tbody>
</table>
Future ASM developments...

- International Assoc. of Marine Aids to Navigation & Lighthouse Authorities (IALA) Guidelines & Recommendations
  - E-Navigation Committee, Portrayal Working Group
  - Maintaining an AIS ASM catalogue
- Radio Technical Commission for Maritime Services (RTCM) Standards
  - Special Committee 121 - AIS ASM
  - Special Committee 129 - Navigation Portrayal
  - Special Committee 109 – Electronic Chart Systems
- U.S. Coast Guard
  - To expand our AIS ASM test beds to Louisville KY and with USACE LOMA effort
  - To expand mandatory AIS carriage to all U.S. waters
  - To require ECS and its integration with AIS (including ASM’s)
  - To provide NOAA PORTS via NAIS
### Application Specific Messages

By pressing the column title you can sort the list

<table>
<thead>
<tr>
<th>Title</th>
<th>Msg</th>
<th>DAC</th>
<th>FI</th>
<th>Status</th>
<th>Registrant</th>
<th>Not to be used after</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring aids to navigation</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>In force</td>
<td>Zemi Lite Buyo Co., Ltd</td>
<td></td>
</tr>
<tr>
<td>Text telegram using 6-bit ASCII</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>In force</td>
<td>ITU-R.M.1371-1</td>
<td></td>
</tr>
<tr>
<td>Application acknowledgement</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>replaced</td>
<td>ITU-R.M.1371-1</td>
<td>04/01/2010</td>
</tr>
<tr>
<td>Interrogation for specified FM's within the IAL branch</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>In force</td>
<td>ITU-R.M.1371-1</td>
<td></td>
</tr>
<tr>
<td>Capability Interrogation</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>In force</td>
<td>ITU-R.M.1371-1</td>
<td></td>
</tr>
<tr>
<td>Capability reply</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>In force</td>
<td>ITU-R.M.1371-1</td>
<td></td>
</tr>
<tr>
<td>Application acknowledgement to an addressed binary message</td>
<td>6</td>
<td>1</td>
<td>5</td>
<td>In force</td>
<td>ITU-R-M.1371-4</td>
<td></td>
</tr>
<tr>
<td>DANGEROUS CARGO INDICATION</td>
<td>6</td>
<td>1</td>
<td>12</td>
<td>Deprecated</td>
<td>IMO Circ. 236</td>
<td>01/01/2013</td>
</tr>
<tr>
<td>Tidal Window</td>
<td>6</td>
<td>1</td>
<td>14</td>
<td>Deprecated</td>
<td>IMO Circ. 236</td>
<td>01/01/2013</td>
</tr>
<tr>
<td>Number of persons on board</td>
<td>6</td>
<td>1</td>
<td>16</td>
<td>In force</td>
<td>IMO Circ. 289</td>
<td></td>
</tr>
<tr>
<td>NUMBER OF PERSONS ON BOARD</td>
<td>6</td>
<td>1</td>
<td>16</td>
<td>Deprecated</td>
<td>IMO Circ. 236</td>
<td>01/01/2013</td>
</tr>
<tr>
<td>Ship waypoints (WP) and/or route plan report</td>
<td>6</td>
<td>1</td>
<td>17</td>
<td>In force</td>
<td>ITU-R-M.1371-1</td>
<td></td>
</tr>
<tr>
<td>Clearance time to enter port</td>
<td>6</td>
<td>1</td>
<td>18</td>
<td>In force</td>
<td>IMO Circ. 289</td>
<td></td>
</tr>
<tr>
<td>Advice of waypoints (AWP) and/or route plan of VTS</td>
<td>6</td>
<td>1</td>
<td>18</td>
<td>In force</td>
<td>ITU-R.M.1371-1</td>
<td></td>
</tr>
<tr>
<td>Extended ship static and voyage related data</td>
<td>6</td>
<td>1</td>
<td>19</td>
<td>In force</td>
<td>ITU-R.M.1371-1</td>
<td></td>
</tr>
<tr>
<td>Berthing data</td>
<td>6</td>
<td>1</td>
<td>20</td>
<td>In force</td>
<td>IMO Circ. 289</td>
<td></td>
</tr>
<tr>
<td>Area notice</td>
<td>6</td>
<td>1</td>
<td>23</td>
<td>In force</td>
<td>IMO Circ. 289</td>
<td></td>
</tr>
<tr>
<td>Dangerous cargo indication</td>
<td>6</td>
<td>1</td>
<td>25</td>
<td>In force</td>
<td>IMO Circ. 289</td>
<td></td>
</tr>
<tr>
<td>Route information</td>
<td>6</td>
<td>1</td>
<td>28</td>
<td>In force</td>
<td>IMO Circ. 289</td>
<td></td>
</tr>
</tbody>
</table>
Future ASM developments...

• International Assoc. of Marine Aids to Navigation & Lighthouse Authorities (IALA) Guidelines & Recommendations
  ✓ E-Navigation Committee, Portrayal Working Group
  ✓ Maintaining an AIS ASM catalogue

• Radio Technical Commission for Maritime Services (RTCM) Standards
  ✓ Special Committee 121 - AIS ASM
  ✓ Special Committee 129 - Navigation Portrayal
  ✓ Special Committee 109 – Electronic Chart Systems

• U.S. Coast Guard
  ✓ To expand our AIS ASM test beds to Louisville KY and with USACE LOMA effort
  ✓ To expand mandatory AIS carriage to all U.S. waters
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Real-Time PORTS® Locations
AIS ASM NOAA PORTS Portrayal
Future ASM developments...

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  - To provide NOAA PORTS via NAIS
Meteorological & Hydrological Reporting

- Improves the overall safety & efficiency of marine traffic
- Some in place since 2002
USACE RTCV
Real-time Current - Velocity System

Target 101126
Latitude 40° 30' 09.72" N
Longitude 080° 05' 08.70" W
Time of Tx 15:15
Average Wind Speed N/A
Wind Gust N/A
Air Temperature N/A
Relative Humidity N/A
Air Pressure N/A
Water Level Report -0.1 m
Surface Current Speed 2.36 ft/s
Surface Current Direction 280°
Lock Order

- Used by Saint Lawrence Seaway since 2002
- Improves efficiency, lock utilization, mitigates racing & wait time
Area Notice (Geo-referenced Information)

Time to Expire: 4h 54m 55s
Latitude: 42° 13' 47.19" N
Longitude: 069° 57' 18.37" W
Radius: 9260 m
Start Time: 2008.10.15 16:37:00
Type: Right whale detection
MMSI: 3669734
## Area Notice Descriptions

<table>
<thead>
<tr>
<th>Area Notice Description</th>
<th>Chart Feature</th>
<th>Environmental Caution Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchorage Area: Anchorage closed</td>
<td>Chart Feature: Bridge partially open</td>
<td>Environmental Caution Area: High wind</td>
</tr>
<tr>
<td>Anchorage Area: Anchorage open</td>
<td>Chart Feature: Channel obstruction</td>
<td>Environmental Caution Area: Storm front (line squall)</td>
</tr>
<tr>
<td>Anchorage Area: Anchoring prohibited</td>
<td>Chart Feature: Reduced vertical clearance</td>
<td>Environmental Caution Area: Storm warning</td>
</tr>
<tr>
<td>Anchorage Area: Deep draft anchorage</td>
<td>Chart Feature: Semi-submerged object</td>
<td>Information: Icebreaker waiting area</td>
</tr>
<tr>
<td>Anchorage Area: Shallow draft anchorage</td>
<td>Chart Feature: Shoal area</td>
<td>Information: Location of response units</td>
</tr>
<tr>
<td>Anchorage Area: Vessel transfer operations</td>
<td>Chart Feature: Shoal area due east</td>
<td>Information: Pilot boarding position</td>
</tr>
<tr>
<td>Cancellation – cancel area per Msg Linkage ID</td>
<td>Chart Feature: Shoal area due north</td>
<td>Information: Places of refuge</td>
</tr>
<tr>
<td>Caution Area: Cluster of fishing vessels</td>
<td>Chart Feature: Shoal area due south</td>
<td>Information: Position of icebreakers</td>
</tr>
<tr>
<td>Caution Area: Derelicts (drifting objects)</td>
<td>Chart Feature: Shoal area due west</td>
<td>Instruction: Await instructions prior to ...</td>
</tr>
<tr>
<td>Caution Area: Dredge operations</td>
<td>Chart Feature: Submerged object</td>
<td>Instruction: Contact Port Administration here</td>
</tr>
<tr>
<td>Caution Area: Fairway closed</td>
<td>Chart Feature: Sunken vessel</td>
<td>Instruction: Contact VTS at this point/juncture</td>
</tr>
<tr>
<td>Caution Area: Fishery – nets in water</td>
<td>Clearance granted – proceed to berth</td>
<td>Instruction: Do not proceed beyond this point/juncture</td>
</tr>
<tr>
<td>Caution Area: Harbour closed</td>
<td>Distress Area: Person overboard</td>
<td>Other – Define in associated text field</td>
</tr>
<tr>
<td>Caution Area: Marine event</td>
<td>Distress Area: Pollution response area</td>
<td>Proceed to this location – await instructions</td>
</tr>
<tr>
<td>Caution Area: Marine mammals habitat</td>
<td>Distress Area: SAR area</td>
<td>Report from ship: Icing info</td>
</tr>
<tr>
<td>Caution Area: Marine mammals in area – reduce speed</td>
<td>Distress Area: Vessel abandoning ship</td>
<td>Report from ship: Miscellaneous information</td>
</tr>
<tr>
<td>Caution Area: Marine mammals in area – report sightings</td>
<td>Distress Area: Vessel collision</td>
<td>Restricted Area: Active military OPAREA</td>
</tr>
<tr>
<td>Caution Area: Marine mammals in area – stay clear</td>
<td>Distress Area: Vessel disabled and adrift</td>
<td>Restricted Area: Drifting Mines</td>
</tr>
<tr>
<td>Caution Area: Protected habitat – no fishing or anchoring</td>
<td>Distress Area: Vessel fire/explosion</td>
<td>Restricted Area: Entry approval required prior to transit</td>
</tr>
<tr>
<td>Caution Area: Protected habitat – reduce speed</td>
<td>Distress Area: Vessel flooding</td>
<td>Restricted Area: Entry prohibited</td>
</tr>
<tr>
<td>Caution Area: Protected habitat – stay clear</td>
<td>Distress Area: Vessel grounding</td>
<td>Restricted Area: Firing – danger area.</td>
</tr>
<tr>
<td>Caution Area: Risk (define in Associated text field)</td>
<td>Distress Area: Vessel listing/capsizing</td>
<td>Restricted Area: Fishing prohibited</td>
</tr>
<tr>
<td>Caution Area: Seaplane operations</td>
<td>Distress Area: Vessel requests medical assistance</td>
<td>Restricted Area: No anchoring.</td>
</tr>
<tr>
<td>Caution Area: Survey operations</td>
<td>Distress Area: Vessel sinking</td>
<td>Rouge or suspicious vessel</td>
</tr>
<tr>
<td>Caution Area: Swim area</td>
<td>Distress Area: Vessel under assault</td>
<td>Route: Alternative route</td>
</tr>
<tr>
<td>Caution Area: Traffic congestion</td>
<td>Environmental Caution Area: Heavy icing</td>
<td>Route: Recommended route</td>
</tr>
<tr>
<td>Caution Area: Underwater operation</td>
<td>Environmental Caution Area: Restricted visibility</td>
<td>Route: Recommended route through ice</td>
</tr>
<tr>
<td>Caution Area: Underwater vehicle operation</td>
<td>Environmental Caution Area: Strong currents</td>
<td>Security Alert – Level 1/2/3</td>
</tr>
<tr>
<td>Chart Feature: Bridge closed</td>
<td>Environmental Caution Area: Hazardous sea ice</td>
<td>Vessel requesting non-distress assistance</td>
</tr>
<tr>
<td>Chart Feature: Bridge fully open</td>
<td>Environmental Caution Area: High waves</td>
<td>VTS active target</td>
</tr>
</tbody>
</table>
*** UPDATED 6-6-2011: Warning for Fukushima, Japan ***

In response to the situation at the Fukushima Nuclear Power Plant in Japan, the U.S. Coast Guard recommends, as a precaution, that vessels avoid transiting within 20 kilometers (11.2 nautical miles) of the Fukushima Nuclear Power Plant (36° 35' N, 141° 02' E). Read the entire notice.

**AUTOMATIC IDENTIFICATION SYSTEM OVERVIEW**

Picture a shipboard radar or an electronic chart display that includes a symbol for every significant ship within radio range, such as those of the U.S. Navy. Each symbol can reflect the actual size of the ship, with position to GPS or differential GPS accuracy. By clicking on a ship symbol, you can learn the ship name, course and speed, classification, call sign, registration number, NMSI, and other information. Maneuvering information, closest point of approach (CPA), time to closest point of approach (TCPA), and other navigation information, more accurate and timely than information available from an automatic radar plotting aid, can also be available. Display information previously available only to modern vessel traffic service operations centers can now be available to every AIS user as seen below.

What You See With AIS (click on image above to enlarge in a new browser window)

With this information, you can call any ship over VHF radiotelephone by name, rather than by "ship off my port bow" or some other
Each AIS system consists of one VHF transmitter, two VHF TOWA receivers, one VHF DSC receiver, and standard marine electronic communications links (I.EC 91102-1) to shipboard display and sensor systems (AIS Schematic). Position and timing information is normally derived from an integral or external global navigation satellite system (e.g., GPS) receiver, including a medium frequency differential GPS (DGPS) receiver for precise position in coastal and inland waters. Other information broadcast by the AIS, if available, is electronically obtained from shipboard equipment through standard marine data connections. Heading, information and course and speed over ground would normally be provided by all AIS-equipped ships. Other information, such as rate of turn, angle of heel, pitch and roll, and destination and ETA could also be provided.

The AIS transponder normally works in an autonomous and continuous mode, regardless of whether it is operating in the open seas or coastal or inland areas. Transmissions use 9.6 Kbps OMSK FM modulation over 25 or 12.5 kHz channels using HDLC packet protocols. Although only one radio channel is necessary, each station transmits and receives over two radio channels to avoid interference problems, and to allow channels to be shifted without communications loss from other ships. The system provides for automatic collision resolution between itself and other stations, and communications integrity is maintained even in overload situations.

Each station determines its own transmission schedule (slot), based upon data link traffic history and knowledge of future actions by other stations. A position report from one AIS station fits into one of 2250 time slots established every 10 seconds. AIS stations continuously synchronize themselves to each other, to avoid overlap of slot transmissions. Slot selection by an AIS station is randomized within a defined interval, and tagged with a random number of between 8 and 5 frames. When a station changes its slot assignment, it pre-announces both the new location and the timeout for that location. In this way new stations, including those stations which suddenly come within radio range close to other vessels, will always be received by those vessels.
**TYPES OF AUTOMATIC IDENTIFICATION SYSTEMS**

ITU-R Recommendation M.1371-1 describes the following types of AIS:

**Class A**

Shipboard mobile equipment intended for vessels meeting the requirements of IMO AIS carriage requirement.

**Class B**

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

- Has a reporting rate less than a Class A (see 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 raw or turn information
- Does not transmit maximum present speed/data

See a comparison of Class A and Class B AIS.

**Search and Rescue Aircraft**

Aircraft mobile equipment, normally reporting every ten seconds.

**Aids to Navigation**

Shore-based or mobile station providing location and status of an aid to navigation (ATON). Normally reports (message 21) every three minutes. These stations may also be programmed to provide other navigation safety information, for example, meteorological and hydrological data, via application specific text or binary messages (i.e., messages 6, 8, 12, 14, or 23). For more information read ITU Recommendation A.126 on THE USE OF AIS IN MARINE AIDS TO NAVIGATION SERVICES and Guideline 1892 on THE...
<table>
<thead>
<tr>
<th>AIS Class A &amp; B Comparison</th>
<th><strong>Class A</strong></th>
<th><strong>Class B/CS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmit Power</td>
<td>2w</td>
<td>12.5w / 2w (low-power)</td>
</tr>
<tr>
<td>Reporting Rate</td>
<td>2 - 10 sec - speed and/or course dependent</td>
<td>30 sec. fixed</td>
</tr>
<tr>
<td>Communication Protocol</td>
<td>SO-TDMA</td>
<td>CS-TDMA</td>
</tr>
<tr>
<td></td>
<td>Self-Organizing amongst Class A's</td>
<td>Carrier-Sense(s), polite to Class A's</td>
</tr>
<tr>
<td>Frequency Range &amp; Bandwidth</td>
<td>156.025 - 162.025 MHz @ 12/25 kHz DSC Required</td>
<td>161.500 - 162.025 MHz @ 25 kHz DSC &amp; 12.5 kHz Optional</td>
</tr>
<tr>
<td>Position Source</td>
<td>External GNSS &amp; Internal GPS</td>
<td>Internal GPS</td>
</tr>
<tr>
<td>Digital Interfaces</td>
<td>2 Input-Output Ports &amp; Multiple Outputs</td>
<td>Optional</td>
</tr>
<tr>
<td>Display</td>
<td>Multiple Keyboard Display (MKD)</td>
<td>Optional</td>
</tr>
<tr>
<td>Safety Text Messaging</td>
<td>Receive &amp; Transmit</td>
<td>Transmit Optional &amp; Pre-configured</td>
</tr>
<tr>
<td>Data</td>
<td>All</td>
<td>No Rate of Turn, Navigation Status, Destination, ETA, Draft, IMO#</td>
</tr>
<tr>
<td>CG Type-Approvals</td>
<td>22 Models - 16 Manufacturers</td>
<td>8 Models - 8 Manufacturers</td>
</tr>
<tr>
<td>Approximate Cost</td>
<td>$2,800 - 4,000</td>
<td>$700 - 1,500</td>
</tr>
</tbody>
</table>
**Updated 6-8-2011: Warning for Fukushima, Japan** In response to the situation at the Fukushima Nuclear Power Plant in Japan, the U.S. Coast Guard recommends, as a precaution, that vessels avoid transiting within 20 kilometers (10.8 nautical miles) of the Fukushima Nuclear Power Plant (37°25.2′N, 141°02.9′E)...

### Automatic Identification System (AIS)

**What is AIS?**
- How AIS Works
- Types of AIS
- AIS Messages
- Class A Position Report
- Class A Static & Voyage Data
- Class B Reports
- Nationwide AIS (NAIS)
- Cargo Requirements
- Reference Information
- Frequently Asked Questions

### Primary Mission Areas:

- Global Positioning System
- Differential GPS
- Nationwide DGPS
- Long Range Identification and Tracking
- Civil GPS Service Interface Committee
- Automatic Identification System
- Nationwide AIS (NAIS)
- Electronic Navigational Charting
- Maritime Telecommunications
- LORAN C (archive)

### Services & Reporting:

- Receive Free LORI Updates
- Receive Free GPS Status Messages
- Receive NAVIONIC Updates

### AIS Messages

The following is a listing of current AIS Messages:

<table>
<thead>
<tr>
<th>Message ID</th>
<th>Name</th>
<th>Description</th>
<th>Priority</th>
<th>Access Scheme</th>
<th>Communication State</th>
<th>M/B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Position report</td>
<td>Scheduled position report; (Class A shipborne mobile equipment)</td>
<td>1</td>
<td>SOTDMA, RADIUS, ITDMA</td>
<td>SOTDMA</td>
<td>M</td>
</tr>
<tr>
<td>2</td>
<td>Position report</td>
<td>Assigned scheduled position report; (Class A shipborne mobile equipment)</td>
<td>1</td>
<td>SOTDMA</td>
<td>SOTDMA</td>
<td>M</td>
</tr>
<tr>
<td>3</td>
<td>Position report</td>
<td>Special position report; response to interrogation; (Class A shipborne mobile equipment)</td>
<td>1</td>
<td>RADIUS</td>
<td>TOWA</td>
<td>M</td>
</tr>
<tr>
<td>4</td>
<td>Base station report</td>
<td>Position, UTC, date and current slot number of base station</td>
<td>1</td>
<td>RADIUS, RADIUS, ITDMA</td>
<td>SOTDMA</td>
<td>B</td>
</tr>
<tr>
<td>5</td>
<td>Static and voyage related data</td>
<td>Scheduled static and voyage related vessel data report; (Class A shipborne mobile equipment)</td>
<td>4</td>
<td>RADIUS, RADIUS, ITDMA</td>
<td>N/A</td>
<td>M</td>
</tr>
<tr>
<td>6</td>
<td>Binary addressed message</td>
<td>Binary data for addressed communication</td>
<td>4</td>
<td>RADIUS, RADIUS, ITDMA</td>
<td>N/A</td>
<td>M/B</td>
</tr>
<tr>
<td>7</td>
<td>Binary acknowledgement</td>
<td>Acknowledgement of received addressed binary data</td>
<td>1</td>
<td>RADIUS, RADIUS, ITDMA</td>
<td>N/A</td>
<td>M/B</td>
</tr>
<tr>
<td>8</td>
<td>Binary broadcast message</td>
<td>Binary data for broadcasted communication</td>
<td>4</td>
<td>RADIUS, RADIUS, ITDMA</td>
<td>N/A</td>
<td>M/B</td>
</tr>
<tr>
<td>9</td>
<td>Standard SAR aircraft position report</td>
<td>Position report for airborne stations involved in SAR operations, only</td>
<td>1</td>
<td>SOTDMA, RADIUS, ITDMA</td>
<td>SOTDMA</td>
<td>M</td>
</tr>
<tr>
<td>10</td>
<td>UTC/Date inquiry</td>
<td>Request UTC and date</td>
<td>3</td>
<td>RADIUS</td>
<td>N/A</td>
<td>M/B</td>
</tr>
<tr>
<td>11</td>
<td>UTC/Date</td>
<td>Current UTC and date</td>
<td>3</td>
<td>RADIUS</td>
<td>RADIUS</td>
<td></td>
</tr>
</tbody>
</table>

**www.navcen.uscg.gov**
**UPDATED 6-8-2011: Warning for Fukushima, Japan** In response to the situation at the Fukushima Nuclear Power Plant in Japan, the U.S. Coast Guard recommends, as a precaution, that vessels avoid transiting within 20 kilometers (10.8 nautical miles) of the Fukushima Nuclear Power Plant (37°25′.6N, 141°03′.0E)...read the entrata.

## Nationwide AIS

- Nationwide AIS (NAIS)
- AIS vs NAIS
- NAIS Expansion
- Report on NAIS Problem
- NAIS Data Formats
- Request NAIS Data

## Primary Mission Areas:

- Global Positioning System
- Differential GPS
- Nationwide DGPS
- Long Range Identification and Tracking
- Civil GPS Service Interface Committee
- Automatic Identification System
- Nationwide AIS (NAIS)
- Electronic Navigation & Charting
- Maritime Telecommunications
- LORAN C (archive)

## Services & Reporting:

- Receive Free NAVTEX Updates
- Receive Free GPS Status Messages
- Receive NAIS Updates
- Join GOSSC (free)
- Report an ATON Discrepancy or Obstacle
- Report a GPS Problem
- Report a DGPS Problem
- Report an LRT Problem
- Report on NAIS Problem

## Nationwide Automatic Identification System

The Nationwide Automatic Identification System (NAIS) consists of approximately 200 VHF receiver sites located throughout the coastal continental US, inland areas, Alaska, Hawaii and Guam. NAIS is designed to collect AIS transmissions from local vessels. Currently, NAIS collects valuable maritime data in 59 critical ports throughout the United States for use by Coast Guard operators and port partners. The primary goal of NAIS is to increase Maritime Domain Awareness (MDA) through data dissemination via a network infrastructure, particularly focusing on improving maritime security, marine and navigational safety, search and rescue, and environmental protection services.

In response to the Maritime Transportation Security Act of 2002, the NAIS Project was initiated and officially chartered in December 2003. NAIS allows the USCG to collect safety and security data from AIS-equipped vessels in the nation’s territorial waters and adjacent sea areas, and share that data with USCG operators and other government partners. AIS data collected improves the safety of vessels and ports through collision avoidance and the safety of the nation through detection, identification, and classification of vessels.

NAIS consists of an integrated system of AIS, data storage, processing, and networking infrastructure. In addition, NAIS integrates with other systems for purposes of sharing infrastructure, quicker implementation, and improved performance.

You may click on the picture below to view a larger version of the image in a new browser window.
**UPDATED 6-8-2011: Warning for Fukushima, Japan**

In response to the situation at the Fukushima Nuclear Power Plant in Japan, the U.S. Coast Guard recommends, as a precaution, that vessels avoid transiting within 20 kilometers of 10.8 nautical miles of the Fukushima Nuclear Power Plant (37°25.6′N, 141°02′08″E)...read the entire notice.

**AUTOMATIC IDENTIFICATION SYSTEM (AIS) REQUIREMENTS**

On October 22nd, 2003 the Coast Guard published a Final Rule (68 FR 60550) that amended a previously promulgated interim Rule (63 FR 38953) that harmonized the AIS mandates of the Safety of Life at Sea Convention, as amended by the 73rd (MSC.73) and 75th Session (MSC.78), and the Maritime Transportation Security Act of 2002 (MTSA), which delineates U.S. AIS carriage requirements as follows:

Title 33, Code of Federal Regulations

§154.01 Applicability

(a) This part (except as specifically limited by this section) applies to each self-propelled vessel of 1000 or more gross tons (except as provided in paragraphs (c)(1) and (d) of this section, or for foreign vessels described in §164.48 when it is operating in the navigable waters of the United States except the St. Lawrence Seaway.

(b) * * *

(c) Provisions of §§164.11(a)(2) and (c), 164.30, 164.33, and 164.49 do not apply to warships or other vessels owned, leased, or operated by the United States Government and used only in government non-commercial service when these vessels are equipped with electronic navigation systems that have met the applicable agency regulations regarding navigation safety.

§154.48 Automatic Identification System (AIS)

(a) The following vessels must have a properly installed, operational, type approved AIS as of the dates specified:

(1) Self-propelled vessels of 65 feet or more in length, other than passenger and fishing vessels, in commercial service and on an international voyage, not later than December 31, 2004;

(2) Notwithstanding paragraph (a)(1) of this section, the following, self-propelled vessels, that are on an international voyage must also comply with SOLAS, as amended, Chapter V, regulations 19.2.1.6, 19.2.4, and 19.2.3.5 or 19.2.5.1 as appropriate (incorporated by reference, see §164.03):

(i) Passenger vessels, of 155 gross tonnage or more, not later than July 1, 2003;

(ii) Tankers, regardless of tonnage, not later than the first safety survey for safety equipment on or after July 1, 2003;

(iii) Vessels, other than passenger vessels or tankers, of 50,000 gross tonnage or more, not later than July 1, 2004; and

(iv) Vessels, other than passenger vessels or tankers, of 300 gross tonnage or more but less than 50,000 gross tonnage, not later than the first safety survey for safety equipment on or after July 1, 2004, but no later than December 31, 2004.

(3) Notwithstanding paragraphs (a)(1) and (a)(2) of this section, the following vessels, when navigating an area denoted in table 191.12(c) of §191.12 of this chapter, not later than December 31, 2004.
**UPDATED 6-6-2011: Warning for Fukushima, Japan**

In response to the situation at the Fukushima Nuclear Power Plant in Japan, the U.S. Coast Guard recommends, as a precaution, that vessels avoid transiting within 20 kilometers (10 nautical miles) of the Fukushima Nuclear Power Plant (36°25'S, 141°02'W)...

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**Automatic Identification System (AIS)**

- What is AIS?
- How AIS Works
- Types of AIS
- AIS Messages
- Class A Position Report
- Class A Static & Voyage Data
- AIS Class Reports
- Inmarsat AIS (IAS)
- C carriage requirements
- Reference information
- Frequently Asked Questions

**Primary Mission Areas:**

- Global Positioning System
- Enhanced OOPS
- Inmarsat OOPS
- Long Range Identification and Tracking
- CMR/OPS Service Interface Committee
- Automatic Identification System
- Inmarsat AIS (IAS)
- Electronic Navigation & Charting
- Maritime Telecommunications
- LORAN (archive)

**Services & Reporting:**

- Receive Free LORAN Updates
- Receive Free AIS Status Messages
- Receive NAVtex Updates

**International Maritime Organization**

The International Maritime Organization (IMO), headquartered in London, is a specialized agency of the United Nations which is responsible for measures to improve the safety and security of international shipping and to prevent marine pollution from ships. It also is involved in legal matters, including liability and compensation issues and the facilitation of international maritime traffic. It was established by means of a Convention adopted under the auspices of the United Nations in Geneva on 17 March 1948 and met for the first time in January 1959. It currently has 195 Member States.

- IMO Resolution MSC.74(68), Annex 3, RECOMMENDATION ON PERFORMANCE STANDARDS FOR AN UNIVERSAL SHIPBORNE AUTOMATIC IDENTIFICATION SYSTEMS (AIS). This standard defines the basic performance requirements for AIS equipment, and was used by International Telecommunications Union and International Electrotechnical Commision in developing technical and test standards.
- IMO Resolution A.917(22), GUIDELINES FOR THE ONBOARD OPERATIONAL USE OF SHIPBORNE AUTOMATIC IDENTIFICATION SYSTEMS (AIS). These 14 page guidelines have been developed to promote the safe and effective use of shipborne Automatic Identification Systems (AIS), in particular to inform the mariner about the operational use, limits and potential use of AIS. Consequently, NS should be operated taking into account these Guidelines.
- IMO Resolution MSC.149(76), Annex 1, RECOMMENDATION FOR THE PROTECTION OF THE AIS VHF DATA LINK. Which recommends that Class B AIS devices, as well as any device which transmits on the radio channels AIS 1 or AIS 2, should meet the appropriate requirements of Recommendation ITU-R M.1371 (series); Class B AIS devices should be approved by the Administration; and, that Administrations should take steps necessary to ensure the integrity of the radio channels used for AIS in their waters.
- IMO Safety of Navigation Circular 227, GUIDELINES FOR THE INSTALLATION OF A SHIPBORNE AUTOMATIC IDENTIFICATION SYSTEM (AIS). These 11 page guidelines, prepared by the International Association of Lighthouse Authorities (IALA) and adopted by the International Maritime Organization (IMO), contains guidelines for manufacturers, installers, owners, suppliers and ship surveyors. It does not replace documentation supplied by the manufacturer. IMO Safety of Navigation Circular 245 amends these guidelines to recommend that AIS be connected through an uninterrupted power supply. U.S. Adherence to IMO Installation Guidelines: USCG AIS Data Entry Guidelines.
- IMO Marine Safety Circular 1252, GUIDELINES ON ANNUAL TESTING OF THE AUTOMATIC IDENTIFICATION SYSTEM (AIS)
- IMO Safety of Navigation Circular 256, GUIDELINE ON THE USE OF AIS APPLICATION-SPECIFIC MESSAGES (ASM)
- IMO Safety of Navigation Circular 260, GUIDELINE FOR THE PRESENTATION AND DISPLAY OF AIS APPLICATION-SPECIFIC MESSAGES (ASM) INFORMATION

**International Association of Lighthouse Authorities**

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**Homeland Security**

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**AIS FREQUENTLY ASKED QUESTIONS**

1. What is AIS?
2. How do I program my AIS?
3. What is the AIS rule and are there alternatives to the rule for small businesses?
4. How much does an AIS cost?
5. How does AIS help to increase security (and what is NAX)?
6. What must AIS be in operation?
7. Does the installation of the AIS require additional equipment in order for the AIS to operate properly?
8. Is it necessary to have electronic navigational charts for use with the AIS?
9. Are fishing vessels subject to AIS carriage, and, in onboard Vessel Monitoring System (VMS) an acceptable substitute for the AIS?
10. Why have some AIS units stopped broadcasting valid position reports?
11. Why am I unable to see an AIS vessels name or other static information (dimensions, call sign, etc.)?
12. Why do I sometimes see more than one vessel with the same MMSI or vessel name (i.e. NAUT)?
13. I just purchased and installed an AIS Class B, will AIS Class A user "see" me?
14. Do AIS Class B devices meet current USCG AIS carriage requirements?
15. Is the USCG considering expanding AIS carriage to other vessels or outside of VTS areas?
16. How can I get a copy of an AIS presentation I saw or heard about that was given at...
17. Where can I get AIS data?
18. What is a MMSI and where can I get one for my AIS?
19. What is AIS Channel Management?
20. Can I use my AIS in an emergency or for distress messaging?
21. Have an AIS question not answered here?

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1. **What is AIS?** Par 47 CFR §80.3, AIS is a marine navigation safety communications system standardized by the International Telecommunication Union (ITU) and adopted by the International Maritime Organization (IMO) that provides vessel information, including the vessels identity, true, position, course, speed, navigational status and other safetly-related information automatically to appropriately equipped shore stations, other ships, and aircraft, receives automatically such information from similarly fitted ships, monitors and tracks ships, and exchanges data with shore-based facilities. Read more on what it is, how it works, what it broadcasts, and more. The website also contains frequently asked questions and resources for further information.
AUTOMATIC IDENTIFICATION SYSTEM (AIS) is an invaluable navigation safety radio communication tool. However, its usefulness is undermined by the broadcast of inaccurate, improper or outdated data. Mariners are reminded that U.S. regulation requires that each AIS be maintained in effective operating condition which includes the accurate input and upkeep of all AIS data fields. Failure to do so may subject a vessel to civil penalties of up to $25,000 per occurrence. To avoid such penalties AIS user should ensure their system are encoded as follows:

Static Data... should be manually input at installation and password protected — know your password, you will need it to reencode your AIS

- Maritime Mobile Service Identifier (MMSI), call sign, and vessel name should mirror the vessel’s official radio station license. Vessel names should NOT include precursors or designators, such as: F/V, M/V, MV, OSV, P/V, REC, S/V, TUG, etc. Vessel names of 20 characters or greater should NOT be abbreviated or truncated; previously FCC licensed fleet vessels, which should include the segment of its name that is unique to the vessel, e.g.

  MYCOMPANYFLEETBOAT1234, MYCOMPANYFLEETB1234
  MYCOMPANYFLEETBOAT ALPHA, MYCOMPANYFLEET ALPHA

  FCC unlicensed pleasure craft should use (??????????) as their call-sign and their registration number preceded by (USA#) as their name, e.g. USA#WA1234YZ. If unnumbered (e.g. tenders, associated craft), use their parent ship (name followed by a a dash (-)) and a numerical designator that distinguishes it amongst others, e.g. PARENTSHIPNAME-n, (n = 1, 2, 3, ...), and should reflect the last 6 digits of the parent MMSI preceded by (A), e.g. A123456, in their AIS message 248 call-sign parameter.

- IMO Number should reflect the vessel’s assigned IMO number or absent an IMO assignment its U.S. documentation number preceded by (100) or (1000), e.g. 1001234567, 1000123456.

Dynamic Data... should be provided via properly installed and integrated external sensors and that are accurate and continuously operational

- Type of positioning source and accuracy should be properly identified, e.g. GPS, surveyed or manual input. This same source should provide: course over ground in 1/10 degrees, speed over ground in 1/10 knots, vessel position in 1/10 seconds of latitude & longitude, and its accuracy (i.e. greater than or less than 10 meters).

- Heading and Rate of Turn as required per SOLAS Chp. V Regulation 19.2 for vessels of 150 or 50,000 GT or greater, respectively.

Voyage Related Data... should be updated expeditiously

- Navigation Status should reflect the current status of the vessel, e.g. at anchor, underway using engines, engaged in fishing, etc. Always remember to change your status from underway to anchored or moored.

- Type of vessel shall reflect a ship type denoted in the accompanying table, which is either manually inputted or menu selection.

- Dimensions are derived from the distance to AIS or vessel’s GPS antenna location to 4 cardinal points (ABCD) expressed in meters NOT feet. Also to be used by 'ship types 91' to convey the rectangular proportions of the tow.

- Static Draft should reflect the actual or maximum draft, if the actual draft is unavailable or unknown.

- Estimated Time of Arrival to destination or voyage departure, expressed in Universal Time Coordinated NOT local time.

- Destination should be encoded using UN/LOCODE3 or US/GUID4 codes as follows:

  UN/LOCODE format is required for international voyages
  Originating Country (1) Port-Origin (1) Port (1) E.g.
  BS#FPO-US NRY for Rotterdam to New York City
  US SFO-OH SHA for San Francisco to Shanghai

  US/GUID format is required for U.S. domestic voyages
  US+G UID (+ / 0 / A / 1) GUID E.g.
  US+0VRX-0000 for berth to berth voyages
  US+0Z25=0VBM for scheduled circuity voyages, i.e. ferries
  US+0Z25=0C25 for voyages to nowhere and back
  US+0Z25=0Z25 operating in a confined area, i.e. fleeting area, marina
  US@0Z25 for anchored, moored, or hovering in one location

  If AIS lacks angle brackets (<>) substitute with parenthesis:() or [ ]

Safety-Related Text Messaging... should be short, concise, and, only to exchange pertinent navigation safety-related information

- AIS safety-related text messages (SRM) must be in English and solely to exchange or communicate navigation safety information, such as a SECURITE broadcast.

- Although not prohibited, AIS text messaging should NOT be relied upon as the primary means for broadcasting distress or urgent communications, such as a MAYDAY4 or PAN PANT.

- So as to not conget the AIS network, SRM should be as short and concise. The use of abbreviations and acronyms is highly encouraged. See your Local Notice to Mariners and NOAA Chart No. 1 for a listing of acceptable abbreviations.

- AIS Stations wishing to convey that they are in a test mode may broadcast should periodically broadcast a (TESTING-IGNORE) AIS SRM. Test periods shall not exceed an hour per day.

Embarked U.S. Pilots are highly encouraged to assist mariners in the proper encoding of their AIS

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3 See http://wireless.fcc.gov/services/index.htm (Ship Radio Stations)

4 Obtained at www.imonumbers.fairplay.com/dataset.aspx

5 United Nations Location Codes (UN/LOCODE) at: www.unec.org/cefa/codes/locode/service/location.htm


7 See 47 CFR 80.1109, Distress, urgency, and safety communications
<table>
<thead>
<tr>
<th>1&lt;sup&gt;st&lt;/sup&gt; digit</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; digit</th>
<th>Other Vessels Codes (3x)</th>
<th>Special Craft Codes (5x)</th>
<th>USA-Specific Regional Codes (9x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0 - All ships of this type</td>
<td>0 - Pilot vessel</td>
<td>90 - Email <a href="mailto:cgnav@uscg.mil">cgnav@uscg.mil</a> if you are another type of U.S. vessel not listed in this Table</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1 - Carrying DG (Dangerous Goods), HS (Hazardous Substances), or MP (Marine Pollutant), IMO hazard or pollutant category A, X, or more than 150 passengers</td>
<td>31 - Engaged in towing by pulling (not pushing or hauling)</td>
<td>91 - Engaged in towing barges by pushing ahead or hauling alongside (i.e. articulated tug-barges, push-boats, workboats); and, its dimensions (ABCD values) represent the overall rectangular dimensions of the vessel AND its tow*</td>
</tr>
<tr>
<td>2</td>
<td>W</td>
<td>2 - Carrying DG, HS, or MP, IMO hazard or pollutant category B, Y; or 50-149 passengers</td>
<td>32 - Engaged in towing by pulling by length of the tow exceeds 200 meters (656 ft)</td>
<td>92 - Engaged in towing other than barges by pushing ahead or hauling alongside (i.e. articulated tug-barges, push-boats, workboats); and, its dimensions (ABCD values) solely represent the vessel dimensions*</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>3 - Other vessels, per column (3x)</td>
<td>33 - Engaged in dredging, salvage, survey or underwater operations*</td>
<td>93 - Light boats (i.e. push-boats or work boats NOT engaged in towing; and, dimensions (ABCD values) solely represent the vessel dimensions*</td>
</tr>
<tr>
<td>4</td>
<td>HSC</td>
<td>4 - Carrying DG, HS, or MP, IMO hazard or pollutant category C, Z, or 12-49 passengers</td>
<td>34 - Engaged in diving operations*</td>
<td>94 - Offshore supply vessels (OSV)</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>5 - Reserved for future use (DO NOT USE)</td>
<td>35 - Engaged in military operations</td>
<td>95 - Mobile Offshore Drilling Units (MODU)</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>6 - Reserved for future use (DO NOT USE)</td>
<td>36 - Sailing vessels*</td>
<td>96 - School, scientific, research or training ships</td>
</tr>
<tr>
<td>7</td>
<td>Cargo</td>
<td>7 - Reserved for future use (DO NOT USE)</td>
<td>37 - Pleasure craft</td>
<td>97 - Autonomous, remotely-controlled or otherwise self-propelled unmanned craft</td>
</tr>
<tr>
<td>8</td>
<td>Tankers</td>
<td>8 - Reserved for future use (DO NOT USE)</td>
<td>38 - Reserved for future use (DO NOT USE)</td>
<td>98 - Non-self-propelled vessels</td>
</tr>
<tr>
<td>9</td>
<td>Other types of ship, per column (9x)</td>
<td>9 - No additional information</td>
<td>39 - Reserved for future use (DO NOT USE)</td>
<td>99 - No additional information</td>
</tr>
</tbody>
</table>

* Remember to update 'Navigation Status' when engaged in fishing, sailing, or restricted in your ability to maneuver; and, 'Ship Type' and Dimensions (ABCD) values when engaged in towing. 

This Guide can also be downloaded at www.navcen.uscg.gov/enav/ais/AISFAQ.htm
15. Is the USCG considering expanding AIS carriage to other vessels or outside of VTS areas? Yes. On December 16th, 2008, the Coast Guard published a proposed rule (78 FR 76293) to amend the current AIS regulations, and expand AIS requirements beyond Vessel Traffic Service (VTS) areas to all U.S. navigable waters and require AIS carriage for additional commercial vessels, including commercial vessels carrying 50 or more passengers, fishing vessels 35 feet or greater, hi-speed passenger vessels, vessels and towing vessels operating in or near channels or harbors, and vessels coming or going to certain dangerous cargoes. As a benchmark of vessels affected, we invited your participation via www.regulations.gov to view the public comments submitted on our proposal and to register for email notifications regarding future actions on this rulemaking, and www.reginfo.gov (RIN: 1625-AAS9) for its timeline.

16. How can I get a copy of an AIS presentation I saw (or heard about it) that was given at COAST Guard Office of Navigation Systems personnel here:
   - [NOAA AIS Public Meeting in Washington, DC (5MB/9.9KB) and Seattle, WA (5MB/9.9KB).pdf (1.8MB) Washington, DC audio mp3 (1.2MB) Seattle, WA audio mp3 (7.8MB)]
   - [ArmsCo NAVIC (9MB).pdf (22.5KB)]
   - [ArmsCo NAVIC (17MB).pdf (5.0MB)]
   - [ArmsCo NAVIC (2008).pdf (Transcript and NAVIC Resolution re: AIS Class A carriage) (589.8KB)]
   - [ArmsCo NAVIC (17MB).pdf (3.2MB)]
   - [ArmsCo NAVIC (1MB).pdf (0.16MB)]

17. Where can I get AIS data? Although the U.S. Coast Guard operates our Nation's AIS network (NAIS), we do not currently make our AIS information available to the general public. There are, however, numerous AIS networks and commercial purveyors that do provide AIS data and back information on the World Wide Web, many of which are listed on Wikipedia's AIS webpage. Local, state and federal government agencies may request U.S. Coast Guard Nation-wide AIS data here.

18. What is a MMSI and where can I get one for my AIS? A unique and official Maritime Mobile Service Identity (MMSI) number is required for every AIS station, see our MMSI page for more information.

19. What is AIS Channel Management? One of the lesser known and potent features of AIS is its ability to operate on multiple channels of the VHF-FM marine band. This frequency agility ensures AIS can be used even when the default channels are otherwise unavailable or compromised. In such conditions, competent authorities, such as the Coast Guard, can use an AIS base station to re-program shipborne AIS devices to other more appropriate channels within a defined region(s) of 200 to 2000 square nautical miles. This can be done automatically (and without user intervention) by receipt of the AIS channel management message (AIS message 23) or manually entered via the AIS Minimal Keyboard Display (MKD) or similar input device. Once commanded or input the channel management information will stay in memory for 5 weeks or until a vessel exceeds 900 nautical miles from the defined region. AIS channel management commands can only be automatically overridden via another channel management message for the same defined region or manually overridden or erased by the user via the unit channel (regional frequencies) management functions—read more. Note, reinitializing or resetting your AIS or transmission channels will not necessarily reprogram your unit back to default channels.

20. Can I use my AIS in an emergency or for distress messaging? Yes, but, be aware that AIS related distress messages are not currently received, processed, recognized or recorded upon as Global Maritime Distress Safety Systems (GMDSS) messages would be by the Coast Guard or other maritime first responders. Therefore, AIS should not be relied upon as the primary means of broadcasting distress or urgent communications, nor used in lieu of GMDSS such as Digital Selective Calling radars which are designed to process distress messaging. Nonetheless, AIS remains an effective means to augment GMDSS and provides the added benefit of being heard (via text messaging) by other AIS users within VHF radio range. For further guidance, see USC&ICC Alert 5-10.

21. Have an AIS question not answered here? Please contact us.