



AUTOMATIC IDENTIFICATION SYSTEM

New AIS Encoding Guidance for U.S. waters

Automatic Identification System (AIS) is a maritime navigation safety communications system standardized by the International Telecommunication Union (ITU), adopted by the International Maritime Organization (IMO), that: provides vessel information, including the vessel's identity, type, position, course, speed, navigational status and other safety-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. (47 CFR §80.5).

Notice. The Coast Guard continues to see an unacceptable number of AIS users who are not updating their *Navigational Status* or accurately broadcasting static or voyage related information – MMSI, name, dimensions, static draft, destination, ETA, etc. AIS users should particularly remember to update their *Navigational Status* when at anchor or moored; which reduces the AIS reporting rate to once every 3 minutes vice every 2–10 seconds, and, mitigates network congestion. For guidance on properly programming your AIS see our ***AIS Encoding Guide*** (that follows or available at our AIS Frequently Asked Questions (FAQ) #2 at the website listed below).

Note, AIS *Ship Types 20-29*, normally used to represent *Wing in Ground* vessels should be used instead to represent the following vessels when operating in U.S. waters (including the U.S. EEZ):

- 20–*Wing in Ground (WIG) vessels;*
- 21–*Vessels engaged in towing by pushing ahead or alongside, i.e. pushboat, and who's AIS dimension values (ABCD) solely represent the length and breadth of the vessel;*
- 22–*Vessels engaged in towing by pushing ahead or alongside, i.e. pushboat, and, who's AIS dimension values represent the maximum rectangular dimensions of the vessel and its tow;*
- 23–*Vessels designed to tow by pushing ahead or alongside, i.e. pushboat, but, not currently engaged in towing, i.e. lightboat;*
- 24–*Mobile Offshore Drilling Units (MODUs), Liftboats, Floating Production Systems (FPS), Floating Production Storage and Offloading Vessels (FPSO);*
- 25–*Offshore Supply Vessels (OSV);*
- 26–*Processing vessels (i.e. fish);*
- 27–*School, scientific, research or training ships,*
- 28–*U.S. public or governmental vessels, and,*
- 29–*Autonomous or remotely-operated craft.*

AIS users are compelled to properly operate their AIS at all times (33 CFR §164.46), not doing so could subject the user and owner to civil penalties not to exceed \$40,000.

Alert. Voluntary use of AIS Class B devices continues to grow. Although all Class A devices will receive Class B dynamic data (i.e. position, course and speed), some older Class A models are unable to render this information on their AIS display(s) and/or receive Class static data (i.e. vessel name, call-sign). Therefore, the Coast Guard cautions new AIS Class B users to not assume that they are *seen* by other AIS users or that all their information is available to all Class A users. Further, we strongly exhort effected users update their devices (e.g. AIS Class A, electronic chart systems, radar, multi-function displays) in order to view this stream of valuable AIS information. For a listing of Coast Guard type-approved AIS Class A devices which require an update in order to properly display AIS Class B information or cross-comparison characteristics table of AIS Class A vs. AIS Class B see our AIS FAQ #13 and #14, respectively, at the website listed below.

Warning. AIS is another available means (i.e. radar) to determine risk of collision, however, assumptions should not be made on the basis of AIS information alone, and, as with any source of navigation information: it should not be solely relied upon in making navigational and collision-avoidance decisions (also see Navigation Rule 7). Further, while AIS allows for safety related ship-to-ship text messaging to communicate with others, e.g. passing arrangements, these communications do NOT relieve users from the requirements set forth in the Vessel Bridge-to-Bridge Radiotelephone regulations (33 CFR §26) nor do they relieve a vessel from sound or display signals requirements of the Navigation Rules.

Report: To report a problem or for further information regarding AIS, including our plans to extend U.S. carriage requirements to most commercial ships transiting U.S. navigable waters, contact cgnav@uscg.mil or visit www.navcen.uscg.gov/?pageName=AIS.

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ENCODING GUIDE

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AUTOMATIC IDENTIFICATION SYSTEM is a valuable 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 accurate input and upkeep of all AIS data parameters. Failure to do so may subject a vessel to civil penalties of up to \$40,000 per occurrence. To avoid penalties AIS Users in the United States should ensure their system is encoded as follows:

Static Data...should be manually inputted at installation & password protected. Remember the password. You will need it to re-encode or update these AIS parameters

✦ **Maritime Mobile Service Identifier (MMSI), call sign, & vessel name** should match your radio license. There should only be one MMSI assigned to the vessel. If you are licensed-by-rule, input {@@@@@} as your call-sign. Names should **not** include abbreviations (except public vessels, i.e. USCG, USCGC, USACE, USS, LAPD, NYFD, etc.) or vessel type precursors, i.e. F/V, M/V, MV, OSV, P/V, REC, S/V, TUG, etc. Names exceeding 20 characters (the parameter limit) should **not** be abbreviated, but may be truncated to 20 characters which include all any unique distinguishing characters. For example, World-wide Traders' tug 123456 should be identified and inputted as {WORLD-WIDE TRA123456}.

If nameless, use your state registration number preceded by {USA#} as your name, e.g. USA#NY1234YZ. If unnumbered (e.g. associated craft, vessel tenders), use your parent vessel's name followed by a dash {-} and a numerical designator that distinguishes you amongst others. For example, the first tender for the cruise ship *Freedom of the Seas* should be identified and inputted as {FREEDOM OF THE SEA-1}. Additionally, its AIS message 24B call-sign parameter should reflect the last 6-digits of *Freedom of the Seas* MMSI preceded by {A}, e.g. A123456.

✦ **IMO Number**² should match your assigned 7-digit IMO number. If necessary, use leading zeroes (**not** trailing zeroes) to fill this parameter, e.g. 0001234567. Absent an IMO assignment input your U.S. official documentation number preceded by either '100' or '1000', e.g. 1001234567, 1000123456. Input all zeroes vice your official number if your AIS does not provide for exactly 10-digits.

Dynamic Data...should be provided via systems that are properly installed, maintained & operational³

- ✦ **Type of positioning source and accuracy** should be accurately set, i.e. GPS, surveyed, manual input, etc. The positioning 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 degree of accuracy (whether greater or less than 10 meters).
- ✦ **Heading** data should be integrated into the AIS on vessels of 150 gross tonnage or greater; and, **Rate of Turn** data on vessels of 50,000 gross tonnage or greater (per SOLAS Regulation V/19.2).
- ✦ **A Pilot Plug**, on vessels required to embark pilots, should be connected and properly wired to the AIS. It should be permanently located near a 3-prong, 120-volt, AC receptacle.

Voyage Related Data...should be manually inputted as necessary to always indicate current conditions

✦ **Navigation Status** should indicate your current navigational status, i.e. at anchor, underway, engaged in fishing, etc. Remember to change your status when anchored or moored. Doing so reduces the AIS reporting rate to once every 3 minutes vice once every 2–10 seconds. This mitigates network congestion.

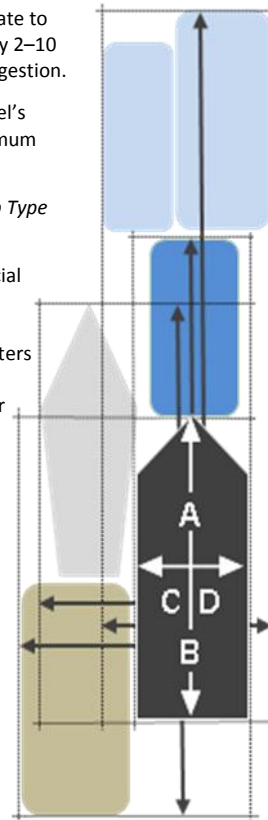
✦ **Static Draft** should indicate the vessel's actual draft. Input the vessel's maximum draft if the actual draft is unknown.

✦ **Type of vessel** should indicate a *Ship Type* denoted in the accompanying table.

✦ **Dimensions** should indicate the official dimensions of the vessel. Input meters, **not** feet. Dimensions are described in terms of distance in meters to the positioning-system antenna used by AIS (e.g. GPS antenna). Refer to the diagram. In this example the AIS's GPS antenna is located at the intersection of the two white lines.

Also to be used by U.S. *ship type 22* (see Table) to convey the overall rectangular proportions of the vessel and its tow—as portrayed by the dark arrow lines within the rectangles in the diagram.

✦ **Estimated Time of Arrival** to destination or voyage departure (if moored or anchored). Input Universal Time Coordinated (**not** local time).



Destination and your origination should be inputted using: ISO 3166 country and UN location codes (UN/LOCODE)⁴ for international voyages (per IMO SN/Circ.244); or U.S. geographically unique ID (GUID)⁵ codes for voyages to any U.S. port or place⁶ as follows:

Origination>Destination using ISO 3166 country & UN/LOCODE
US NYC>NL RTM...for New York City to Rotterdam⁷

Vessels inbound to the U.S. should also include a US/GUID
CN SHA>US SFO^0VCY...for Shanghai to San Francisco Pier 35

Domestic voyages, US^US/GUID |>|<|<>|<|>>|US/GUID
US^0YRX>0Z50...a one-way voyage
US^0Y0P><0Q6L...a scheduled route, i.e. Staten Island Ferry
US^0VCY><0VCY...a voyage to nowhere & back, e.g. an excursion
US^0YQ8<>0YQ8...operations in a confined area, e.g. a fleeting area
US^0NVR< ...at anchored, moored, or on station, e.g. MODU, FPSO
US^0WKZ>>0Q1Z-07QJ...a one-way voyage, via an alternate route (i.e. Berwick Bay, LA to New Orleans, LA, via Harvey Lock and the Gulf Inter-coastal Waterway)

Use of GUIDS effective 1 April 2012

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

✦ AIS safety-related text messages (SRM) must be in English and solely to exchange navigation safety information.

✦ Although not prohibited, AIS text messaging should **NOT** be relied upon as the primary means for distress (MAYDAY) or urgent (PAN PAN) communications.⁸

✦ Keep SRM concise and as short as possible (less than 90 characters). The use of abbreviations is acceptable and highly encouraged; see the Notice to Mariners, USCG Local Notice to Mariners, Light List and U.S. Nautical Chart No. 1 for a listing of common abbreviations.

✦ Testing or repair facilities, in conjunction with on-air testing, should also periodically broadcast an AIS SRM: {TEST BCST}. Repair testing should be kept to a minimum and not exceed an hour per day.

¹ See <http://wireless.fcc.gov/services/index.htm> (Ship Radio Stations)

² Obtained at www.imonumbers.lrfairplay.com/datause.aspx

³ Per IMO SN/Circ. 227 & 224 or NMEA 4.0 Installation Guidelines

⁴ Find Country (ISO 3166) & United Nations Location Codes (UN/LOCODE) at: www.unecce.org/cefact/locode/welcome.html

⁵ Find U.S. Geographically Unique ID's (US/GUIDS) at: www.navcen.uscg.gov/?pageName=locode

⁶ Any port or place in which a vessel is bound to anchor, moor, or maintain station (i.e. Outer Continental Shelf activity)

⁷ If AIS lacks angle brackets {>} substitute with parenthesis { } | (|) | ((|)

⁸ See 47 CFR 80.1109—Distress, urgency, and safety communications



**2-digit numeric codes for *Type of Ship and Cargo Type* are composed from 1st and 2nd digit columns; or as defined in columns 2x, 3x, or 5x.
The terms used are as defined in IMO SOLAS, 46 U.S.C. 2101 or 33 CFR 140.10. Blue and/or italic text denotes amplifying text not found in the original source (ITU-R M.1371-4)**

1 st digit	[1x 4x 6x 7x 8x 9x] 2 nd digit	[2x] U.S. specific vessels	[3x] others "engaged in"	[5x] special craft
0 – Not available <i>DO NOT USE</i>	0 – All ships of this type	<i>20 – WIG (Wing In Ground) vessels</i>	30 – Fishing*	50 – Pilot vessel
1 – Reserved for future use <i>DO NOT USE</i>	1 – Carrying DG (Dangerous Goods), HS (Hazardous Substances), or MP (Marine Pollutant), IMO hazard or pollutant category A/X; or use 41/61 if carrying < 12 passengers for hire	<i>21 – Engaged in towing other than barges by pushing ahead or hauling alongside (i.e. articulated tug-barges, push-boats, workboats); whose dimensions (ABCD values) solely represent the overall dimensions of the vessel*</i>	31 – Engaged in towing by pulling (not pushing or hauling)	51 – Search and rescue vessels, i.e. USCG boats, USCG Auxiliary, assistance towers
2 – WIG or the vessels denoted in column [2x] operating in U.S waters, including the U.S. EEZ	2 – Carrying DG, HS, or MP, IMO hazard or pollutant category B/Y; or use 42/62 if carrying ≥ 12 passengers for hire	<i>22 – Engaged in towing barges by pushing ahead or hauling alongside (i.e. articulated tug-barges, push-boats, workboats); whose dimensions (ABCD values) represent the overall rectangular dimensions of the vessel and its tow*</i>	32 – Engaged in towing by pulling (not pushing or hauling) and length of the tow exceeds 200 meters (656 ft.)	52 – Harbor tugs
3 – Other vessels engaged in actions denoted in column [3x]	3 – Carrying DG, HS, or MP, IMO hazard or pollutant category C/Z; or use 43/63 for ferry service carrying < 150 passengers	<i>23 – Light boats (i.e. push-boats or work boats not engaged in towing; whose dimensions (ABCD values) solely represent the vessel dimensions of the vessel*</i>	33 – Engaged in dredging, or underwater operations, (e.g., salvaging, surveying, but, not diving) *	53 – Fish, offshore or port tenders
4 – HSC (Hi-speed Craft) or passenger vessels < 100 GT, including tenders	4 – Carrying DG, HS, or MP, IMO hazard or pollutant category D/O; or use 44/64 for ferry service carrying ≥ 150 passengers	<i>24 – Mobile Offshore Drilling Units (MODUs), Liftboats, Floating Production Systems (FPS), Floating Production Storage and Offloading Vessels (FPSO)</i>	34 – Engaged in diving operations*	54 – Commercial response vessels with anti-pollution facilities or equipment
5 – Special craft, per column [5x]	5 – Reserved for future use <i>DO NOT USE</i>	<i>25 – Offshore Supply Vessels (OSV)</i>	35 – Engaged in military operations	55 – Law enforcement vessels, i.e. USCG cutters, marine police
6 – Passenger ships ≥ 100 GT	6 – Reserved for future use <i>DO NOT USE</i>	<i>26 – Processing vessels (i.e. fish)</i>	36 – Sailing vessels*	56 – Spare—for assignments to local vessels as designated by the USCG Captain of Port
7 – Cargo (freight) ships, including Integrated Tug-Barge (ITB) vessels	7 – Reserved for future use <i>DO NOT USE</i>	<i>27 – School, scientific, research or training ships</i>	37 – Pleasure craft (recreational vessel)	57 – Spare—for assignments to local vessels involved in a marine event
8 – Tankers	8 – Reserved for future use <i>DO NOT USE</i>	<i>28 – U.S. public or governmental vessels</i>	38 – Reserved for future use <i>DO NOT USE</i>	58 – Medical transports (as defined in the 1949 Geneva Convention and Additional Protocols) or similar public safety vessels
9 – Other types of ship	9 – No additional information <i>contact cgnav@uscg.mil prior to use</i>	<i>29 – Autonomous or remotely-operated craft</i>	39 – Reserved for future use <i>DO NOT USE</i>	59 – Ships according to RR Resolution No. 18 (Mob-83)