AUTOMATIC IDENTIFICATION SYSTEM
USCG AIS Encoding Guide

v.25

This Guide is intended to assist in the proper encoding of an Automatic Identification System (AIS) used in U.S. navigable waters

AIS is a valuable navigation safety radio communication tool. However, its effectiveness is undermined by the broadcast of inaccurate, improper or outdated data. Users are reminded that U.S. regulations (33 CFR 164.46) require that it be maintained in effective operating condition, which includes accurate input and upkeep of all AIS data parameters.

Continual failure to do so may prompt civil penalty action. To avoid penalties, always ensure your AIS is up-to-date and encoded according to this Guide.

Dynamic Data…must be encoded via external systems that are type-certified, properly installed, and operational [1]

- **Electronic Positioning Fixing System (EPFS), Transmitted Heading (THD), and Rate of Turn (ROT)** sensors, per 33 CFR 164.46(c), must be interfaced to the AIS on the following vessels on international voyage passenger ships of 150 gross tonnage (GT) or more; cargo ships of 300 GT or more, or of 50,000 GT or more, respectively. An external EPFS is not required on vessels that solely operate domestically.

- **Pilot Plug,** on vessels required to embark pilots, must be readily available and easily accessible from the primary conning position of the vessel and permanently affixed (not an extension cord) and adjacent (within 3 feet) to a 120-volt 50/60 Hz AC power receptacle (NEMA 5-15).

Safety-Related Text Messaging…must be short, concise, and used only to exchange pertinent navigation safety-related information

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

- Although not prohibited, **AIS text messaging should not be relied upon as the primary means for distress (MAYDAY) or urgent (PAN PAN) communications.** [2]

- Use of AIS mobile devices ashore is prohibited, except for FCC licensed Maritime Support Stations; which may test equipment up to an hour per day.
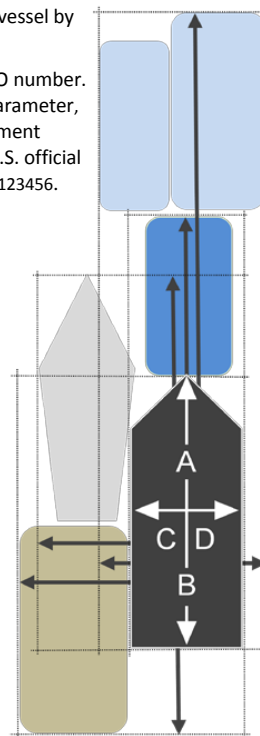
Static Data…should be encoded at installation and reflect the vessel's official radio license or documentation

- **Maritime Mobile Service Identity (MMSI)** [3] must reflect the MMSI assigned to the vessel by the FCC or one of its agents.

- **Vessel Names** that exceed the AIS's 20 character limit should be shortened (not truncated) to 15 character-spaces, followed by an underscore {_}, thence the last 4 characters-spaces of the vessel name, e.g. *GRAND JOLLY ROGER OF THE SEA* to *GRAND JOLLY OF _ SEA*, *THE GRAND JOLLY ROGER* to *THE GRAND JOLLY_OGER*. Names should not include vessel type precursors, e.g. F/V, M/V, MV, OSV, P/V, REC, S/V, T/B; except public vessels, e.g. CG, CBP, USN, LAPD, NYFD, WSF. Undocumented vessels should reflect the vessel's state registration number–vice name–preceded by 'US#', e.g. US#AZ1234YZ.

  Associated (daughter) craft or tenders, should reflect the parent vessel's name, followed by a numerical sign {#}, and a sequential number that distinguishes it from the vessel's other crafts. For example, the third tender of the *JOLLY ROGER* should be encoded as JOLLY ROGER#3. Additionally, its AIS call-sign parameter should reflect the last 6-digits of *JOLLY ROGER*'s MMSI preceded by the letter 'A', e.g. A123456.

- **Call-sign** must reflect the call-sign assigned to the vessel by the FCC; absent an assignment, leave blank.

- **IMO Number** [4] must reflect the assigned 7-digit IMO number. Use leading zeroes (not trailing zeroes) to fill the parameter, e.g. 0001234567. U.S. vessels without an IMO assignment should (if your AIS is 10-digit capable) input their U.S. official number preceded by '10000', e.g. 1001234567, 1000123456.

- **Type of positioning source** must reflect the actual positioning system in use; i.e. interfaced to the AIS or the internal AIS EPFS.

- **Type of vessel (and cargo)** should reflect the appropriate *Ship Type* listed in the Table; but, not its cargo type.

- **Antenna Position | Dimensions (ABCD values)** must be encoded in meters, not feet, and reflect the overall dimensions of the vessel, ABDC values expressed as the distance fore (A), aft (B), to port (C), and to starboard (D) to the positioning-system antenna used by AIS; the intersection of the two white lines in the diagram. Improper calibration or encoding could navigation safety.

  U.S. Ship Type 57,'Spare–for assignments to local vessels' (See Table) is to be used by vessels towing ahead or alongside, who's dimensions reflect the overall rectangular area of the vessel and its tow—as shown in the Figure.

Record your ABCD values and know your password— you will need them to reprogram your static data. Note, Class B devices in the U.S. can only be encoded by the vendor or manufacturer's agent.

Voyage Related Data…should be encoded as needed and kept accurate and up to date

- **Navigation Status** must always be up-to-date, i.e. at anchor, underway, engaged in fishing, etc. Vessels engaged in towing, if capable, should use Navigation Status '11' when towing astern or '12' when pushing ahead or alongside [5]

  Remember to change update your status when at anchor or moored, which reduces AIS reporting rates to every 3 minutes; thus mitigates network congestion and improves overall AIS efficiency and range.

- **Static Draft** must be encoded in meters, not feet, and reflect the vessel's actual or maximum draft.

- **People on Board (POB),** although some legacy AIS devices allow for POB reporting it is not required.

- **Estimated Time of Arrival (ETA)** must be encoded in Universal Time Coordinated (UTC), not local time; and, reflect the ETA to your destination or voyage departure time, if moored or anchored. Not applicable to vessels on unknown or variable schedules (e.g. workboats).

- **Destination** [6] and your origination must be encoded using 5-character UN location codes (UN/LOCODE) for (per IMO SN/Circ.244) or 4-character U.S. Geographic Unique ID (US/GUID) codes [7], as follows:

  Origination>Destination using UN/LOCODE only

  USNYC>NLRTM …one-way voyage New York City to Rotterdam
  USCI R>USMSY>USCI R …a roundtrip between Cairo, IL and New Orleans, LA
  USHOU<>USHOU …operating solely within a well defined area, e.g. fleeting area, vessel traffic service area, etc.

  Origination>Destination using US/GUID only

  US^0YOP><0Q6L …a scheduled route, e.g. Staten Island Ferry
  US^0X6M>0WYY>0X6M …a roundtrip between Cairo, IL and New Orleans, LA
  US^0NVR<< …anchored, moored, or on station (e.g. MODU, FPSO)

  Origination>Destination using UN/LOCODE and US/GUID

  CNSHA>US^0VCY …for Shanghai to San Francisco Pier 35

  Note, the difference in symbology { ^ | > | >< | << | <> } [8]

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1. Per either IMO SN/Circ. 227 & 224 or NMEA 0400:3-10 Installation Guidelines.
2. See 47 CFR 80.1109–Distress, urgency, and safety communications.
3. See http://wireless.fcc.gov/services/index.htm {Ship Radio Stations}.
4. Obtained at www.imonumbers.lrfairplay.com/datause.aspx.
5. Older AIS devices will not offer these statuses or may show them as 'Reserved for Future' use. Although not required, we exhort all AIS users to seek AIS firmware upgrades to avail themselves of these advantageous statuses.
6. Any port or offshore place in which a vessel is bound to embark or disembark vessel passengers, crew or cargo (not barge movements); or anchor or maintain station for extended period of time (e.g. anchorage, Outer Continental Shelf (OCS) activity).
7. IMO SN/Circ.244, country (ISO 3166), United Nations Location (UN/LOCODE), or U.S. Geographic Unique Identifiers (US/GUIDS) codes for ports, places, berths, routes, and waterways, can be found (or to request the later) at: www.navcen.uscg.gov/locode.
8. If your AIS lacks angle brackets {>} characters, substitute with parenthesis: {) |)(| () | {| ((}

The AIS 'Type of Ship' parameter is listed as a 2-digit numeric code and/or labeled as shown in the columns below. Blue italic text is amplifying text not found in the original source (ITU-R M.1371-5) or your AIS. The terms used are as defined in IMO SOLAS, 46 U.S.C. 2101 or 33 CFR 140.10.			
1st digit	**2nd digit**	**[3x] others "engaged in"**	**[5x] special craft**
0 – Not available	0 – All ships of this type	30 – Fishing *should include fish processors and fish tenders**	50 – Pilot vessel
1 – Reserved for future use	~~1 – Carrying DG, HS or MP , IMO hazard or pollutant category X~~ *DO NOT USE*	31 – Towing *ahead or alongside, but, **not astern***	51 – Search and rescue vessels, *i.e. USCG boats, USCG Auxiliary boats, assistance towers, first-responders, standby vessels*
2 – WIG *(Wing-In-Ground) craft*	~~2 – Carrying DG, HS, or MP, IMO hazard or pollutant category Y~~ *DO NOT USE*	32 – Towing *astern, regardless whether the* ~~and~~ length of the tow exceeds 200 m or breadth exceeds 25 m*	52 – Tugs, *light boats, fleet boats, or similar workboats*
3 – Other vessels *engaged in actions listed in column [3x]*	~~3 – Carrying DG, HS, or MP, IMO hazard or pollutant category Z~~ *DO NOT USE*	33 – Engaged in dredging or underwater operations*, or other equipment operations that may obstruct navigation (such as buoy tending, exploration, ice breaking, production, salvaging, sampling, surveying, or other similar activities, but, **not** diving, fishing, towing or military operations)**	53 – Port tenders, *yacht tenders, dive tenders, attending and off-shore supply vessels, or similar support craft; but, **not** fish tenders*
4 – HSC *(hi-speed craft) or passenger ferries*	~~4 – Carrying DG, HS, or MP, IMO hazard or pollutant category OS~~ *DO NOT USE*	34 – Engaged in diving operations *or other types of operations with persons in the water**	54 – Vessels with anti-pollution facilities or equipment
5 – Special craft *per column [5x]*	5 – Reserved for future use	35 – Engaged in military operations *or other types of restricted operations**	55 – Law enforcement vessels, *i.e. U.S. Customs and Border Protection vessels, Department of Natural Resources Conservation boats, marine police boats , etc.*
6 – Passenger ships *other than HSC and passenger ferries; **not** including tenders or off-shore supply vessels [see 53]*	6 – Reserved for future use	36 – Sailing *vessels**	~~56 – Spare–for assignments to local vessels~~ *DO NOT USE*
7 –Cargo *(freight) ships or integrated tug barge (ITB) vessels*	7 – Reserved for future use	37 – Pleasure craft	57 – Spare–for assignments to local vessels, *i.e. articulated tug-barges, pushboats, long haulers, whose dimensions (See Fig.1, ABCD values) represent the overall rectangular area of the vessel **including its tow*** **Do not use when ABCD values DO NOT include the tow**
8 – Tankers *or integrated tug **tank** barge vessels*	8 – Reserved for future use	38 – Reserved for future use	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	39 – Reserved for future use	59 – Ships according to RR Resolution No. 18 (Mob-83)

* Also update your Navigation Status accordingly, i.e. 3 = restricted maneuverability; 7 = engaged in fishing; 8 = under sail; 11 = towing astern; 12 = pushing ahead/alongside, etc.

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