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| **US Radiocommunications Sector****Fact Sheet** |
| **Working Party:** WP 5B | **Document No:** USWP5B35-04 |
| **Reference:** Document 5B/315 Annex 4.4  | **Date:** 08 September 2025 |
| **Document Title:** Preliminary Draft Revision of Recommendation ITU-R M.1371-5, Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile frequency band |
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| **Purpose/Objective:** The purpose of this document is to provide updated content for the proposed AIS Message 28, identify vessels navigating autonomously and vessels navigating by remote control, and clarify how Messages 1 and Message 14 are used to identify devices operating in burst mode, and some general editorial cleanup and clarification.  |
| **Abstract:** The USCG had previously proposed a new AIS Message 28, a single slot Aids to Navigation (AtoN) message, 3 years ago. Since that time, we have refined the message content. This contribution provides an update to the message content. Message 1, 2, 3 navigation status has been modified to identify vessels navigating autonomously and vessels navigating by remote control. For devices operating in burst mode, the timing relationship between the transmission of Message 1 and Message 14 is clarified to uniquely identify the transmitting device. |

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| **Radiocommunication Study Groups** |  |
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| **08 September 2025** |
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| United States of America |
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1. **Introduction**

This document proposes updated technical content to Recommendation ITU-R M.1371-5. These changes are a result of ongoing refinement of the new AIS Message 28, a single slot Aids to Navigation (AtoN) message. This contribution identifies vessels that are navigating autonomously or by remote control, and clarifies the relation between the transmission of Message 1 and Message 14 when operation in burst mode and provides some general editorial cleanup.

1. **Summary of changes**

Listed below are the proposed changes to Document 5B/315 Annex 4.4 , which contribute to the revision of Recommendation ITU-R M.1371-5:

Updated Table A7-3 to address editorial issues and to propose using Navigational status 9 and 10 to indicate navigating remotely or navigating autonomously.

Updated Table A7-41 to reflect the work that has been done on Message 28.

Modified section A8-5 to clarify how Message 1 and Message 14 are related.

Added a new section A8-6 to describe how to use the information contained in Message 1 and Message 14 to create the Supplemental device ID.

Removed any reference to Channel 2006, AMRD Group B, and 106.900 MHz.

Added a DTE indicator for the application layer.

General editorial cleanup and clarifications.

1. **Attachment**

The following attachment contains the proposed changes to Annex 4.4 of the chairman’s report. Only the new proposed changes are shown in track changes. Note that only the relevant sections have been included in this proposal.

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| Source: Document 5B/TEMP/112Subject: Recommendation [ITU-R M.1371-5](https://www.itu.int/rec/R-REC-M.1371-5-201402-I/en) | Annex 4.4 toDocument 5B/315-E |
| 13 May 2025 |
| English only |
| Annex 4.4 to Working Party 5B Chair’s Report |
| PRELIMINARY DRAFT REVISION OF RECOMMENDATION ITU-R M.1371-5 |
| Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile frequency band |

*(No additional changes prior to this section)*

*(No additional changes prior to this section)*

TABLE A1-2

Reporting intervals for equipment other than Class A shipborne mobile equipment

|  |  |  |
| --- | --- | --- |
| **Platform’s condition** | **Nominal reporting interval** | **Modified reporting interval** |
| **Class B “SO” shipborne mobile station** |
| Not moving faster than 2 knots (default)(5) | 3 min | 3 min |
| Moving 2−14 knots | 30 s | 30 s |
| Moving 14−23 knots | 15 s | 30 s(3) |
| Moving 14−23 knots and changing course | 5 s | 15 s(3) |
| Moving >23 knots | 5 s | 15 s(3) |
| **Class B “CS” shipborne mobile station** |
| Not moving faster than 2 knots (default)(5) | 3 min | – |
| Moving faster than 2 knots | 30 s | 15 s(4) |
| **Other AIS stations** |
| Search and rescue aircraft (airborne station) | 10 s(2) | 2 s(2) |
| Aids to navigation | 3 min(6) | – |
| Mobile aids to navigation stations moving faster than 2 knots | 30 s |  |
| AIS base station | 10 s(1) | 3 1/3 s(1) |
| (1) The base station’s reporting interval (RI) should decrease to 3 1/3 s after the station detects that one or more stations are synchronizing to the base station (see § 3.1.3.3.1, Annex 2).(2) The aircraft RI should decrease to 2 s when changing course, speed and/or altitude.(3) Class B “SO” AIS shall report at the “Modified reporting interval” only when the last four consecutive frames each have less than 50% Free slots. Class B “SO” AIS shall not return to the “Normal reporting interval” until 65% or more of the slots of each of the last four consecutive frames are free.(4) Class B “CS” station moving faster than 14 knots.(5) If speed information is lost during normal operation, the reporting schedule should revert to the default reporting interval.(6) Shorter RI could be used when an Aid to Navigation is deficient, i.e., off-position, signal outage, etc. |

**A1-5 Frequency band**

AIS stations should be designed for operation in the VHF maritime mobile band, with 25 kHz bandwidth, in accordance with RR Appendix **18**.

Four international channels have been allocated for AIS use:

- AIS 1 161.975 MHz

- AIS 2 162.025 MHz

- 75 156.775 MHz for AIS satellite uplink

- 76 156.825 MHz for AIS satellite uplink

*(No additional changes prior to this section)*

**A2-4.1.1 Operating frequency channels**

Four frequencies have been designated in RR Appendix **18** for AIS use worldwide, on the high seas and in all other areas (see § 2, Annex 3).. The four designated frequencies are:

– AIS 1 (161.975 MHz);

– AIS 2 (162.025 MHz);

– channel 75 (156.775 MHz), Message 27 transmission only;

– channel 76 (156.825 MHz), Message 27 transmission only;

*(No additional changes prior to this section)*

**A6-4.2.1.1 Dual channel operation**

The AIS should be capable of operating on two parallel channels in accordance with § A6-4.41. Two separate TDMA receive channels or processes should be used to simultaneously receive information on two independent frequency channels. One TDMA transmitter should be used to alternate TDMA transmissions on two independent frequency channels.

*(No additional changes prior to this section)*

**A7-3.1 Messages 1, 2, 3: Position reports**

The position report should be output periodically by mobile stations.

TABLE A7-3[[1]](#footnote-1)

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Message ID | 6 | Identifier for this Message 1, 2 or 3 |
| Repeat indicator | 2 | Used by the repeater to indicate how many times a message has been repeated. See § 4.6.1, Annex 2; 0-3; 0 = default; 3 = do not repeat any more |
| Source ID | 30 | Unique Identity of the source of the message per Article **19** and Recommendation ITU-R M.585 |
| Navigational status  | 4 | 0 = under way,1 = at anchor, 2 = not under command, 3 = restricted manoeuvrability, 4 = constrained by her draught, 5 = moored, 6 = aground, 7 = engaged fishing, 8 = under way under sailing only, 9 = reserved for future use, 10 = reserved for future use,11 = power-driven vessel towing astern (regional use), 12 = power-driven vessel pushing ahead or towing alongside (regional use),13 = reserved for future use,14 = active AIS-SART, active MOB-AIS or active EPIRB-AIS, 15 = undefined  (default) (also used by AIS-SART under test, MOB-AIS under test or EPIRB-AIS under test) |
| Rate of turnROTAIS | 8 | 0 to +126 = turning right at up to 708° per min or higher0 to –126 = turning left at up to 708° per min or higher Values between 0 and 708° per min coded by  ROTAIS = 4.733 SQRT(ROTsensor) degrees per minwhere ROTsensor is the Rate of Turn as input by an external Rate of Turn Indicator (TI). ROTAIS is rounded to the nearest integer value.+127 = turning right at more than 5°per30 s (No TI available)–127 = turning left at more than 5° per 30 s (No TI available)–128 (80 hex) indicates no turn information available (default).ROT data should not be derived from COG information. |
| SOG | 10 | Speed over ground in 1/10 knot steps (0-102.2 knots)1 023 = not available = default, 1 022 = 102.2 knots or higher |
| Position accuracy | 1 | The position accuracy (PA) flag should be determined in accordance with Table 501 = high (*≤* 10 m)0 = low (*>*10 m)0 = default |
| Longitude | 28 | Longitude in 1/10 000 min (±180°, East = positive (as per 2’s complement), West = negative (as per 2’s complement). 181 = (6791AC0h) = not available = default) |
| Latitude | 27 | Latitude in 1/10 000 min (±90°, North = positive (as per 2’s complement), South = negative (as per 2’s complement). 91° (3412140h) = not available = default) |
| COG | 12 | Course over ground in 1/10 = (0-3 599). 3 600 (E10h) = not available = default. 3 601-4 095 should not be used |
| True heading | 9 | Degrees (0-359) (360-510 should not be used)511 = not available = default |

TABLE A7-3 (*end*)

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Time stamp | 6 | UTC second when the report was generated by the electronic position system (EPFS) (0-59, or 60 if time stamp is not available, which should also be the default value, or 61 if positioning system is in manual input mode, or 62 if electronic position fixing system operates in estimated (dead reckoning) mode, or 63 if the positioning system is inoperative) |
| Special manoeuvre indicator | 2 | 0 = not available = default1 = not engaged in special manoeuvre2 = engaged in special manoeuvre(i.e. regional passing arrangement on Inland Waterway)3 = reserved for regional use |
| Operating Mode | 2 | 0 = manually operated (under power or sail) = default1 = wing-in-ground2 = remotely operated3 = autonomously operated (i.e., dynamically positioned, AI-track controlled, etc.) |
| Transmit power | 1 | 0 = default = high power1 = low power |
| RAIM-flag | 1 | Receiver autonomous integrity monitoring (RAIM) flag of electronic position fixing device; 0 = RAIM not in use = default; 1 = RAIM in use. See Table A7-5 |
| Communication state | 19 | See Table A7-4  |
| Number of bits | 168 |  |

*Editor’s note: for crewing status an alternative message is being considered with a new message type.*

*(No additional changes prior to this section)*

**A7-3.3 Message 5: Ship static and voyage related data**

Should only be used by Class A shipborne stations when reporting static or voyage related data. Existing AIS stations on SAR aircrafts may use Message 5 as described in Rec. ITU-R M.1371. In future implementations SAR aircraft AIS stations may use Message 24A instead.

TABLE A7-7

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Message ID | 6 | Identifier for this Message 5 |
| Repeat indicator | 2 | Used by the repeater to indicate how many times a message has been repeated. Refer to § 4.6.1, Annex 2; 0-3; 0 = default; 3 = do not repeat any more  |
| Source ID | 30 |  Unique Identity of the source of the message per Article **19** and Recommendation ITU-R M.585 |
| AIS version indicator | 2 | 0 = station compliant with Recommendation ITU-R M.1371-11 = station compliant with Recommendation ITU-R M.1371-3 2 = station compliant with Recommendation ITU-R M.1371-5 3 = station compliant with Recommendation ITU-R M.1371-6 (or later) |
| IMO number (1) | 30 | 0000000001-0000999999 not used 0001000000-0009999999 = valid IMO number;0010000000-1073741823 = official flag state number. |
| Call sign | 42 | 7 x 6 bit ASCII characters, @@@@@@@ = not available = default.Craft associated with a parent vessel, should use “A” followed by the last 6 digits of the MMSI of the parent vessel. Examples of these craft include towed vessels, rescue boats, tenders, lifeboats and liferafts.  |
| Name | 120 | Maximum 20 characters 6 bit ASCII, as defined in Table A7-2 “@@@@@@@@@@@@@@@@@@@@” = not available = default. The Name should be as shown on the station radio license.. |

TABLE A7-7 (*end*)

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Type of ship and cargo type | 8 | 0 = not available or no ship = default1-99 = as defined in § A7-3.3.2100-199 = reserved, for regional use200-255 = reserved, for future use |
| Overall dimension/reference for position | 30 | Reference point for reported position.Also indicates the dimension of ship (m) (see Fig. A7-1 and § A7-3.3.3). 0 = not available = default A = B = C = D be set to “0” |
| Type of electronic position fixing device | 4 | 0 = not available = default1 = GPS2 = GLONASS3 = combined GNSS4 = Loran5 = Chayka6 = INS 7 = manually inputted = surveyed or charted position 8 = Galileo,9 = BDS10 & 11 = not used = reserved for future use12 = integrated PNT system13 = inertial navigation system14 = terrestrial radio navigation system15 = internal GNSS |
| ETA | 20 | Estimated time of arrival; MMDDHHMM UTCBits 19-16: month; 1-12; 0 = not available = defaultBits 15-11: day; 1-31; 0 = not available = defaultBits 10-6: hour; 0-23; 24 = not available = defaultBits 5-0: minute; 0-59; 60 = not available = default  |
| Maximum present static draught | 8 | In 1/10 m, 255 = draught 25.5 m or greater, 0 = not available = default; in accordance with IMO Resolution A.851 |
| Destination | 120 | Maximum 20 characters using 6-bit ASCII; @@@@@@@@@@@@@@@@@@@@ = not available |
| DTE | 1 | Data terminal equipment (DTE) ready (see § A7-3.3.1)0 = available 1 = not available = default  |
|  DTE (Application Specific Messages) | 1 |  Data terminal equipment (DTE) ready (0 = available, 1 = not available = default) (see § A7-3.3.1) |
| Number of bits | 424 | Occupies 2 slots |

1. “IMO number parameter should be in accordance with the IMO ship identification number scheme adopted by IMO (Resolution A.1117(30)). If the ship does not have an IMO number, an official flag State number should be used.”

Editor’s note: To be approved by IMO NCSR 12

This message should be transmitted immediately after any parameter value has been changed.

**A7-3.3.1 The data terminal equipment indicator**

The purpose of the DTE indicators is to indicate to an application on the receiving side that, if set to available, the transmitting station conforms at least to the minimum keyboard and display requirements and/or the portrayal of Application Specific Messages. On the transmitting side, the DTE indicator may also be set by an external application via the Presentation Interface. On the receiving side, the DTE indicator is only used as information provided to the application layer, that the transmitting station is available for communications.

*(No additional changes prior to this section)*

**A7-3.7 Message 9: Standard aircraft in the maritime service position report**

This message should be used as a standard position report for aircraft involved in SAR operations and other safety-related communications. Aircraft involved in other activities should not transmit this message. The default reporting interval for this message should be 10 s.

TABLE A7-14

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Message ID | 6 | Identifier for Message 9; always 9 |
| Repeat indicator | 2 | Used by the repeater to indicate how many times a message has been repeated. See § 4.6.1, Annex 2; 0-3; 0 = default; 3 = do not repeat any more |
| Source ID | 30 |  Unique Identity of the source of the message per Article **19** and Recommendation ITU-R M.585 |
| Altitude (GNSS) | 12 | Altitude (derived from GNSS or barometric (see altitude sensor parameter below)) (m) (0-4 094 m) 4 095 = not available,4 094 = 4 094 m or higher |
| SOG | 10 | Speed over ground in knot steps (0-1 022 knots)1 023 = not available, 1 022 = 1 022 knots or higher |
| Position accuracy | 1 | 1 = high (≤10 m) 0 = low (>10 m)0 = defaultThe PA flag should be determined in accordance with Table A7-4 |
| Longitude | 28 | Longitude in 1/10 000 min (±180°, East = positive (as per 2’s complement), West = negative (as per 2’s complement); 181 = (6791AC0h) = not available = default) |
| Latitude | 27 | Latitude in 1/10 000 min (±90°, North = positive (as per 2’s complement), South = negative (as per 2’s complement); 91 = (3412140h) = not available = default) |
| COG | 12 | Course over ground in 1/10 = (0-3 599). 3 600 (E10h) = not available = default; 3 601-4 095 should not be used |
| Time stamp | 6 | UTC second when the report was generated by the EPFS (0-59 or 60 if time stamp is not available, which should also be the default valueor 61 if positioning system is in manual input mode or 62 if electronic position fixing system operates in estimated (dead reckoning) modeor 63 if the positioning system is inoperative) |
| Altitude sensor | 1 | 0 = GNSS1 = barometric source |
| Spare | 7 | Should be set to zero. Reserved for future use |
| DTE | 1 | Data terminal ready (0 = available 1 = not available = default)(see § A7-3.3.1) |
| DTE (Application Specific Messages) | 1 | Data terminal equipment (DTE) ready (0 = available, 1 = not available = default) (see § A7-3.3.1) |
| Spare | 2 | Should be set to zero. Reserved for future use |
| Assigned mode flag | 1 | 0 = Station operating in autonomous and continuous mode = default1 = Station operating in assigned mode |
| RAIM-flag | 1 | RAIM flag of electronic position fixing device; 0 = RAIM not in use = default; 1 = RAIM in use see Table 50 |
| Communication state selector flag | 1 | 0 = SOTDMA communication state follows1 = ITDMA communication state follows |
| Communication state | 19 | SOTDMA communication state (see § 3.3.7.2.1, Annex 2), if communication state selector flag is set to 0, or ITDMA communication state (see § 3.3.7.3.2, Annex 2), if communication state selector flag is set to 1 |
| Number of bits | 168 |  |

*(No additional changes prior to this section)*

**A7-3.17 Message 19: Extended Class B equipment position report**

For future equipment: this message is not needed and should not be used. All content is covered by Message 18, Messages 24A and 24B.

For legacy equipment: this message should be used by Class B AIS station. This message should be transmitted once every 6 min in two slots allocated by the use of Message 18 in the ITDMA communication state. This message should be transmitted immediately after the following parameter values change: dimension of ship/reference for position or type of electronic position fixing device.

TABLE A7-26

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Message ID | 6 | Identifier for Message 19; always 19 |
| Repeat indicator | 2 | Used by the repeater to indicate how many times a message has been repeated. See § 4.6.1, Annex 2; 0-3; 0 = default; 3 = do not repeat any more |
| Source ID | 30 | Unique Identity of the source of the message per Article **19** and Recommendation ITU-R M.585 |
| Spare | 8 | Should be set to zero. Reserved for future use |
| SOGProvided by Message 18 | 10 | Speed over ground in 1/10 knot steps (0-102.2 knots)1 023 = not available, 1 022 = 102.2 knots or higher  |
| Position accuracyProvided by Message 18 | 1 | 1 = high (≤10 m) 0 = low (>10 m)0 = defaultThe PA flag should be determined in accordance with Table A7-4 |
| LongitudeProvided by Message 18 | 28 | Longitude in 1/10 000 min (±180°, East = positive (as per 2’s complement), West = negative (as per 2’s complement); 181° (6791AC0h) = not available = default) |
| LatitudeProvided by Message 18 | 27 | Latitude in 1/10 000 min (±90°, North = positive (as per 2’s complement), South = negative (as per 2’s complement); 91 = (3412140h) = not available = default) |
| COGProvided by Message 18 | 12 | Course over ground in 1/10 = (0-3 599). 3 600 (E10h) = not available = default; 3 601-4 095 should not be used |
| True heading Provided by Message 18 | 9 | Degrees (0-359) (360-510 should not be used)511 = not available = default |
| Time stamp Provided by Message 18 | 6 | UTC second when the report was generated by the EPFS (0-59 or 60) if time stamp is not available, which should also be the default value or 61 if positioning system is in manual input mode or 62 if electronic position fixing system operates in estimated (dead reckoning) mode, or 63 if the positioning system is inoperative) |
| Spare | 4 | Should be set to zero. Reserved for future use |
| Name Provided by Message 24A | 120 | Maximum 20 characters 6-bit ASCII, as defined in Table A7-2.@@@@@@@@@@@@@@@@@@@@ = not available = default |
| Type of ship and cargo type Provided by Message 24B | 8 | 0 = not available or no ship = default1-99 = as defined in § A7-3.3.2100-199 = reserved, for regional use200-255 = reserved, for future use |
| Dimension of ship/reference for position Provided by Message 24B | 30 | Dimensions of ship in metres and reference point for reported position (see Fig. A7-1 and § A7-3.3.3) |
| Type of electronic position fixing deviceProvided by Message 24B | 4 | 0 = not available =default; 1 = GPS, 2 = GLONASS, 3 = combined GNSS, 4 = Loran5 = Chayka, 6 = INS, 7 = manually inputted = surveyed or charted position; 8 = Galileo, 9 = BDS10 & 11 = not used, reserved for future use 12 =integrated PNT system13 = inertial navigation system14 = terrestrial radio navigation system, 15 = internal GNSS |
| RAIM-flag Provided by Message 18 | 1 | RAIM (Receiver autonomous integrity monitoring) flag of electronic position fixing device; 0 = RAIM not in use = default; 1 = RAIM in use see Table 50 |
| DTE Provided by Message 18 (Display Flag) | 1 | Data terminal ready (see § A7-3.3.1) 0 = available 1 = not available; = default |
| DTE (Application Specific Messages) | 1 | Data terminal equipment (DTE) ready (0 = available, 1 = not available = default) (see § A7-3.3.1) |
| Assigned mode flag Provided by Message 18(Mode Flag) | 1 | 0 = Station operating in autonomous and continuous mode = default1 = Station operating in assigned mode |
| Spare | 3 | Should be set to zero. Reserved for future use |
| Number of bits | 312 | Occupies two slots |

*(No additional changes prior to this section)*

**A7-3.18 Message 20: Data link management message**

This message should be used to pre-announce the fixed allocation schedule (FATDMA) for one or more base station(s) and it should be repeated as often as required. This way the system can provide a high level of integrity for base station(s). This is especially important in regions where several base stations are located adjacent to each other and mobile station(s) move between these different regions. These reserved slots cannot be autonomously allocated by mobile stations.

*(No additional changes prior to this section)*

**A7-3.19 Message 21: Aids-to-navigation report**

This message should be used by an AIS Aids to navigation (AtoN) to report the position and status of an AtoN. This station may be mounted on an aid‑to‑navigation or this message may be transmitted by a fixed station when the functionality of an AtoN station is integrated into the fixed station. This message should be transmitted autonomously at a Rr of once every three (3) min or it may be assigned by an assigned mode command (Message 16) via the VHF data link, or by an external command, or after any parameter value has changed. This message should not occupy more than two slots.

The IALA NAVGUIDE stipulates: “A floating aid to navigation, which is out of position, adrift or during the night is unlighted, may itself become a danger to navigation. When a floating aid is out of position or malfunctioning, navigational warnings must be given.” Therefore, a station, which transmits Message 21 should also transmit a safety related broadcast message (Message 14) upon detecting that the floating AtoN has gone out of position or is malfunctioning, at the Competent Authority’s discretion.

TABLE A7-28

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Message ID | 6 | Identifier for Message 21 |
| Repeat indicator | 2 | Used by the repeater to indicate how many times a message has been repeated. See § 4.6.1, Annex 2; 0-3; 0 = default; 3 = do not repeat any more |
| Source ID | 30 | Unique Identity of the source of the message per Article **19** and Recommendation ITU-R M.585 |
| Type of aids-to-navigation | 5 | 0 = not available = default; refer to appropriate definition set up by IALA; see Table 74 |
| Name of Aids-to-Navigation | 120 | Maximum 20 characters 6-bit ASCII, as defined in Table 47The name of the AtoN may be extended up to 14 additional 6-bit-ASCII characters in the “Name of Aid-to-Navigation Extension” parameter“@@@@@@@@@@@@@@@@@@@@” = not available = default.Additional characters (up to 14) may be added using the “Name of Aid-to-Navigation Extension” parameter. |
| Position accuracy | 1 | The PA flag should be determined in accordance with Table 50.0 = low (>10 m) = default1 = high (≤10 m)  |
| Longitude  | 28 | Longitude in 1/10 000 min of position of an AtoN (±180°, East = positive, West = negative181 = (6791AC0h) = not available = default) |
| Latitude | 27 | Latitude in 1/10 000 min of an AtoN (±90°, North = positive, South = negative91 = (3412140h) = not available = default) |
| Dimension/reference for position | 30 | Reference point for reported position; also indicates the dimension of an AtoN (m) (see Fig. A7-2*s* and § A7-3.19.1) |
| Type of electronic position fixing device | 4 | 0 = not available = default1 = GPS2 = GLONASS3 = Combined GNSS4 = Loran5 = Chayka6 = INS 7 = manually inputted = surveyed or charted position. (The accurate position enhances its function as a radar reference target)8 = Galileo9 = BDS10 & 11 = not used, reserved for future use12 = integrated PNT system13 = inertial navigation system14 = terrestrial radio navigation system15 = internal GNSS |
| Time stamp | 6 | UTC second when the report was generated by the EPFS (0-59, 60) if time is not available, which should also be the default value or 61 if positioning system is in manual input mode or 62 if electronic position fixing system operates in estimated (dead reckoning) mode or 63 if the positioning system is inoperative) |
| Off-position indicator | 1 |  0 = on position; 1 = off position.This flag should only be considered if time stamp is equal to or below 59. For a floating aid, it denotes that the AtoN exceeds the zone parameters set on installation when the field value is 1.For a fixed aid, it denotes that internal GNSS position of the AtoN exceeds the zone parameter set on installation when the field value is 1, i.e. suspected GNSS anomaly. |
| AtoN status | 8 | Reserved for the indication of the AtoN status, refer to IALA Recommendation R0126, *The Use of the AIS in Marine AtoN Services*00000000 = default |
| RAIM-flag | 1 | RAIM (Receiver autonomous integrity monitoring) flag of electronic position fixing device; 0 = RAIM not in use = default; 1 = RAIM in use see Table 50 |
| Virtual AtoN flag | 1 | 0 = default = physical AtoN at indicated position; 1 = virtual AtoN, does not physically exist. |
| Assigned mode flag | 1 | 0 = Station operating in autonomous and continuous mode = default1 = Station operating in assigned mode |
| Spare | 1 | Should be set to zero. Reserved for future use |
| Name of Aid-to-Navigation Extension | 0, 6, 12, 18, 24, 30, 36, … 84 | This parameter may be used to add up to 14 additional 6-bit-ASCII characters to the “Name of Aid-to-Navigation” parameter: to extend the Name of the Aid-to-Navigation; to provide its AtoN’s designator, e.g., LB1, for Lighted Buoy 1; and/or to report a deficiency of this AtoN, e.g., LT OUT, LB1\*LT OUT, to inform that this AtoN’s light signal is inoperative. When preceded by @@@, it denotes that this parameter’s text should be portrayed as its label and not the “Name of Aid-to-Navigation” parameter, not including the @@@.This parameter should not be padded, i.e., with @-characters, and omitted when not used. |
| Spare | 0, 2, 4, or 6 | Used only when parameter “Name of Aid-to-Navigation Extension” is used. Should be set to zero. The number of spare bits should be adjusted in order to observe byte boundaries |
| Number of bits | 272-360 | Occupies two slots |

*(No additional changes prior to this section)*

**A7-3.26** **Message 28: Aid-to-Navigation Report (Single-slot message)**

Message 28 provides similar information as AIS Message 21, but in one slot versus two slot, and can be used to report MAtoN direction and speed or provide extended information on the AtoN (i.e., its height) and what it’s marking (i.e., hazardous area). It may be accompanied by Message 24A - Static Data Report, Part A to provide the charted name of the AtoN.

This message may also be sent by a vessel to report an AtoN deficiency (i.e., off-position or malfunction), or navigational hazard or obstruction, or to confirm an AtoN position and status.

TABLE A7-41

| **Parameter** | **Bits** | **Description** |
| --- | --- | --- |
| Message ID | 6 | Identifier for this message; always 28. |
| Repeat Indicator | 2 | Used by the repeater to indicate how many times a message has been repeated. 0-3; 0 = default; 3 = do not repeat any more. Note 1: Notwithstanding Section 4.6.1.1, Annex 2, mobile stations should repeat this message if Repeat Indicator = (1or 2 and within 100 nm of this reported position). |
| Source ID | 30 | Identity (in the MMS) of the source of the message (see RR Art. **19** and Rec. ITU-R M.585) |
| Time stamp | 6 | UTC second when the report was generated by the electronic positioning fixing system (EPFS), (0-59); 60 = time stamp is not available = default; 61 = EPFS is in manual input mode; 62 = EPFS is in dead reckoning mode; 63 = EPFS is inoperative; 64 = this a vessel report is in response to a AtoN Confirmation Discrepancy Flag request; or, 65 = this is a vessel report of a AtoN deficiency or a navigation hazard or obstruction. |
| Longitude | 28 | Longitude in 1/10 000 min of position of an AtoN (±180°, East = positive, West = negative, 181 = (6791AC0h) = not available = default) |
| Latitude | 27 | Latitude in 1/10 000 min of an AtoN (±90°, North = positive, South = negative, 91 = (3412140h) = not available = default) |
| Restricted Use Indicator | 2 |  Indicates where the AtoN may be operated.0 = unrestricted use = default1 = use restricted to the territorial waters of the flag state (of MMSI MID)2 = use restricted to the Exclusive Economic Zone (EEZ) of the flag state (of MMSI MID)3 = use restricted as defined by its flag state (of MMSI MID)NOTE 1 – Use outside of a restricted area requires permission of the AtoN’s flag state (of MMSI MID) competent authority. |
| AIS AtoN Station Type | 3 | Indicates the type of AIS AtoN station. See IALA Recommendation R0126, The Use of the AIS in Marine AtoN Services, R1016, Mobile Marine Aids to Navigation (MAtoN) and IMO MSC Circular 1473, Policy on Use of AIS Aids to Navigation.0 = a physical AIS AtoN (floating)1 = a physical AIS AtoN (fixed)2 = a synthetic predicted AIS AtoN3 = a synthetic monitored AIS AtoN4 = a virtual AIS AtoN5 = a mobile AIS AtoN6 = a mobile self-propelled AIS AtoN7 = no AIS AtoN station in use = default (to be used when a vessel is reporting a hazard, obstruction, or AtoN deficiency of AtoN not reporting via AIS).  |
| Types of AtoN | 7 | 0 = not available = default 1-127 = refer to message 21 Table 29 or Table BIS 2 below). |
| IALA AtoN MRN  | 17 | AtoN unique IALA Marine Resource Name (MRN). national identification number. The MMSI MID represents the nationality. 000001-131 071, 0 = not available or unassigned = defaultSee IALA Guideline G1143, IALA MRN for AtoN, e.g., urn:mrn:iala:aton:<ISO 3166-1 alpha-2 code for its nationality>:<national identification number>. |
| AtoN Dimensions Type | 4 | Defines what Dimensions A and B represent.0 = AtoN Dimensions Type unknown or not provided = default.1 = AtoN Height and Structural Area. The reported position represents the midpoint of a shape that encompasses the structural area of the AtoN (i.e., buoy, ODAS, platform, bridge, building, tower, wind turbine, etc.). - Dimension A = radius of the circle, in 1-meter steps, 0-511. - Dimension B = its height above sea level, in 0.1-meter steps, 0-204.7, 204.7 = 204.6 meters or greater. Intended to convey the physical dimensions of a large AtoN or the structure it resides on and assists its sightings. 2 = AtoN Swing Circle. If Type of AtoN > 19 < 31, the reported position also represents the centre of its swing circle; and Dimension A (in 100-meter steps, 0–51 100) + Dimension B (in 1-meter steps, 0–100) = its radius. Dimension B = 101-2 047 reserved for future use. 3 = Mobile AtoN Vector. Dimension A = COG, in true degrees: 0-359 in 1-degree steps, 360 = COG unreported; 361 = dynamically positioned on station, COG unreported, 362 = purposedly adrift, COG unreported, 362 = self-propelled, COG unreported; 363 = tethered, COG unreported, 364 = COG unknown = default, 365-511 reserved for future use; Dimension B = SOG, in 1 knot steps, 0-59; 60 = SOG unreported; 61 = dynamically positioned on station, SOG unreported, 62 = purposedly adrift, SOG unreported, 63 = self-propelled, SOG unreported; 64 = tethered, SOG unreported, 65 = SOG unknown = default, 66-2 047 reserved for future use. 4 = AtoN Area-Polygon. The reported position represents the starting point of a vertex, whose endpoint should be the reported position of the subsequent vertex broadcast from the same MMSI/MRN, to form a polygon area of navigational interest, i.e.,- Dimension A is the sequence number of each vertex, starting from 1, 0-8; 9-511 reserved for future use. If Dimension A = 0, then this vertex endpoint should connect to the start point of vertex 1 to form a closed polygon.- Dimension B indicates the total number of lines in the polygon, up to 9 lines; 0-8; 9-2 047 reserved for future use. 5 = AtoN Area-Circle. The reported position represents the centre of a circular area encompassing a navigational interest, i.e., aquaculture farm, wind farm, etc.- Dimension A (in 1-meter steps, 0-99; 100-511 reserved for future use.) + Dimension B (in 100-meter steps, 100–204 700) = its radius.6 = AtoN Boundary Line 1. The reported position represents the starting point of a right-hand line that bounds an area of navigational interest, i.e., [ice sheet, reported shoaling].- Dimension A defines its orientation, clockwise from true North, in 1-degree steps: 0–359; 360–511 reserved for future use.- Dimension B defines the length of this diagonal, in 10-meter steps, 10-20 470.7 = AtoN Area-Sector. If AtoN Dimension Type Additional Data Flag = 1, the reported position represents the starting point of a line that is to be connected clockwise with an accompanying AtoN Dimension Type 6 with the same reported position to form a sector area of navigational interest.- Dimension A defines its orientation, clockwise from true North, in 1-degree steps: 0–359; 360–511 reserved for future use.- Dimension B defines the length of this line, in 10-meter steps, 10-20 470.8 = AtoN Boundary Line 2. The reported position represents the midpoint of a line that bounds an area of navigational interest, i.e., (ice sheet, reported shoaling, water).- Dimension A defines its orientation, clockwise from true North, in 1-degree steps: 0–359; 360–511 reserved for future use.- Dimension B defines the length of this line, in 10-meter steps, 10-20 470.9 = AtoN Area-Quadrilateral. If AtoN Dimension Type Additional Data Flag = 1, the reported position represents the midpoint of one side of a quadrilateral area of navigational interest, created by connecting its endpoints clockwise with the endpoints of an accompanying AtoN Dimension Type 6 line.- Dimension A defines its orientation, clockwise from to true North, in 1-degree steps: 0–359; 361(360–511 reserved for future use).- Dimension B defines the length of this diagonal, in 10-meter steps, from 10-20 470.10 = AtoN Boundary Line 1. The reported position represents the starting point of a right-hand line that bounds an area of navigational interest, i.e., (ice sheet, reported shoaling).- Dimension A defines its orientation, clockwise from true North, in 1-degree steps: 0–359; 360–511 reserved for future use.- Dimension B defines the length of this diagonal, in 1/10-nautical mile steps, 0.1-204.7.11 = AtoN Area-Sector. If AtoN Dimension Type Additional Data Flag = 1, the reported position represents the starting point of line that is to be connected clockwise with an accompanying AtoN Dimension Type 10 with the same reported position to form a sector area of navigational interest.- Dimension A defines its orientation, clockwise from true North, in 1-degree steps: 0–359; 360–511 reserved for future use.- Dimension B defines the length of this line, in 1/10-nautical mile steps, 0.1-20.47.12 = AtoN Boundary Line 2. The reported position represents the midpoint of a line that bounds an area of navigational interest, i.e., (ice sheet, reported shoaling, water).- Dimension A defines its orientation, clockwise from true North, in 1-degree steps: 0–359; 360–511 reserved for future use.- Dimension B defines the length of this line, in 1/10-nautical mile steps, 0.1-204.7.13 = AtoN Area-Quadrilateral. If AtoN Dimension Type Additional Data Flag = 1, the reported position represents the midpoint of one side of a quadrilateral area of navigational interest, created by connecting its endpoints clockwise with the endpoints of an accompanying AtoN Dimension Type 6 line.- Dimension A defines its orientation, clockwise from true North, in 1-degree steps: 0–359; 361(360–511 reserved for future use).- Dimension B defines the length of this diagonal, in 1/10-nautical mile steps, 0.1-204.7.14-15 reserved for future use.NOTE 1: Portrayal systems should only override AtoN Dimension Type data of the same AtoN Dimension Type. AtoN Dimension Type 4 and 5 require an AtoN Dimension Type 6 for their portrayal and vice versa.NOTE 2: Use of IMO Application Specific Message Area Notice (DAC=001, FI=22) should be considered to define greater or more complex AtoN Description Areas than can be defined by this parameter. |
| AtoN Dimensions A | 9 | As defined by its AtoN Dimension Type (0 = unknown or unreported = default) |
| AtoN Dimension B | 11 | As defined by its AtoN Dimension Type (0 = unknown or unreported = default) |
| AtoN Dimension Type Additional Data Flag | 1 | To convey that this AtoN has multiple Dimension Types, i.e., Type 1 + Type 2 (physical dimensions and swing circle of the reported AtoN)Type 1 + Type 3 (mobile AtoN physical dimension and its vector)Type 4 + Type 4… (to define a polygon area)Type 6 + Type 7 (to define a sector area)Type 8 + Type 9 (to define a quadrilateral area)Type 10 + Type 11 (to define a sector area)Type 12 + Type 13 (to define a quadrilateral area)0 = This AtoN has a single AtoN Dimension Type = default.1 = This AtoN has multiple AtoN Dimension Types.NOTE 1: The report rate of Message 28 may be shortened to reduce the latency of multiple AtoN Dimension Types, particularly for AtoN Dimension Type 8 (AtoN Area-Polygon) which should broadcast all its vertices within the same frames. |
| AtoN Charted Status | 1 | Indicates whether the AtoN is charted or not.0 = AtoN is uncharted = default1 = AtoN charted |
| AtoN On-station Status | 4 | Indicates whether the AtoN is on-station or not.0 = on-station = default1 = on-station or on course (Mobile AtoN)2 = on-station, but damaged, occulted, submerged or otherwise not properly visible3 = on-station, a virtual AtoN reporting the intended position of this AtoN that is reporting itself off-position4 = off-station location unknown 5 = off-station but reporting its current position6 = off-station adrift7 = off-station, removed or relocated8 = on-station, as a new or temporary AtoN9 = unmarked navigation hazard, used by a vessel to inform of an unmarked navigation hazard. The type of AtoN should be indicated as 1 = reference point. Should be accompanied by a message 14 that provides a description of the hazard, e.g., floating container.10 = unmarked obstruction (anything that restricts, endangers, or interferes with navigation). Type of AtoN should be denoted as 1 = reference point. Should be accompanied by a message 14 that provides a description of the hazard, e.g., vessel aground.11-15 = reserved for future use.NOTE – AtoN off-station may accompany their report with a Message 14 stating: OFF\_STATION. |
| AtoN Status bits | 8 | Reserved for the indication of the AtoN status. See IALA Recommendation R0126, The Use of the AIS in Marine AtoN Services.00000000 = default |
|  |  |  |
|  |  |  |
| AtoN Confirmation / Discrepancy Flag | 1 | This parameter may be used by competent authorities to seek confirmation(s) on the position and/or status of this AtoN; 0 = no confirmation requested = default; 1 = confirmation requestedIf a confirmation is requested, the latest request should be retained for at least 24 hours or until a no confirmation requested message overrides it. Recipients within 2000 m of the reported AtoN are requested to repeat the last message received but with the AtoN’s observed latitude, longitude, AtoN On-station status, and AtoN Status bits. , all other parameters unchanged. Similarly, a vessel reporting a hazard or AtoN discrepancy should report the same parameters. |
|  |  |  |
| Authentication Flag | 1 | 0 = this AtoN is not authenticated = default1 = this AtoN has been authenticated per IALA XXXX |
| Number of bits | 168 | Occupies one slot |

Table A7-42

**Type of aids-to-navigation**

|  |  |  |
| --- | --- | --- |
|  | **Code** | **Definition (Type of aid to navigation)** |
|  | 0-31 | Refer to Table A7-29 |
| Mobile AtoN | 32 | Mobile AtoN Ocean Data Acquisition System (ODAS) |
| 33 | Mobile AtoN Water Sampling and/or Monitoring Vehicle |
| 34 | Mobile AtoN Research Vehicle |
| 35 | Mobile AtoN: Towed Cable, Pipe or Semi-submerged Object Marker |
| 36 | Mobile AtoN: Towed Vessel or Object |
| 37 | Mobile AtoN: Flotsam Marker, Large (greater than XX meters) |
| 38 | Mobile AtoN: Flotsam Marker, Small (less than XX meters) |
| 39 | Mobile AtoN: Navigation hazard |
| 40 | Mobile AtoN: Synthetic Target Marker  |
| 41 | Mobile AtoN: Protected Species Marker |
| 42 | Mobile AtoN: Military Operation Target Marker |
| 43 | Mobile AtoN: Dangerous Object |
| 44 | Mobile AtoN: Pollution Spill Marker |
| 45 | Mobile AtoN: Search & Rescue Datum Mark |
| 46 | Mobile AtoN: Datum Mark |
| 47 | Mobile AtoN: Operating Underwater (at times)  |
| 48 | Mobile AtoN: Underwater Operations Marker |
| 49 | Mobile AtoN: Military Operation or Restricted Area  |
|  |  |
|  |  |
|  |  |
| 50 | Mobile AtoN: Dynamic Area |
|  |  |
|  |  |
|  |  |
| 51-63 | Reserved for future use |
|  | 64-127 | Reserved for regional use |

*(No additional changes prior to this section)*

*(No additional changes prior to this section)*

**A8-5 Channel access scheme**

The AIS station should operate autonomously and determine its own schedule for transmission of its messages based on random selection of the first slot of the first burst. The other 7 slots within the first burst should be fixed referenced to the first slot of the burst. The increment between transmissions slots within a burst should be 75 slots and the transmissions should alternate between AIS 1 and AIS 2. The AIS station transmits messages in a burst of 8 messages no more than once per minute.

In active mode the AIS station should use messages with a communication state in the first burst. The communication state should set a slot-time-out = 7 in the first burst, thereafter the slot-time-out should be decreased according to the rules of SOTDMA. All slots should be regarded as candidates in the selection process. When time out occurs, the offset to the next set of 8 bursts is randomly selected between 1 min ± 6 s.

Figure A8-2 illustrates the burst transmissions in active mode starting on AIS 1. It is permissible to start the sequence on AIS 2.

Figure A8-3 illustrates in test or deactivated mode, messages with a communication state should set slot-time-out = 0 and sub‑message = 0 in the first and only burst.

The slot-time-out values of all messages’ communication state within every burst should be the same.

Messages should be transmitted alternately on AIS 1 and AIS 2.

If Message 1 and Message 14 are separated by a multiple of 75 slots and the gap is under 450 slots, they should be deemed to have originated from the same transmitter. The association timeout for linking Message 1 and Message 14 shall be 8 minutes.

Figure A8-2

**Burst transmissions in active mode**



Figure A8-3

**Burst transmissions in test/deactivated mode**



**A8-6 Supplemental ID information**

The source ID should have a unique scheme such as the AIS-SART where the source ID is 970xxyyyy (where xx = manufacturer ID[[2]](#footnote-2) 01 to 99; xx = 00 is reserved for test purposes; yyyy = the sequence number 0000 to 9999, see Annex 1, § 2.1.5).

The 12-character identity shown below can be used to uniquely identify AIS-SART, MOB-AIS and EPIRB-AIS during burst transmission. For AIS message 1 using burst transmission, 9172T3X4X5Y9Y10Y11Y12 is used as the Source Id. For AIS message 14 using burst transmission, the three alphanumeric characters M6P7P8 are appended to the end of the safety related text (see Annex 1, § 2.1.6).

9172T3X4X5M6P7P8Y9Y10Y11Y12

where T3 = device type 0, 2 or 4(0 indicates AIS-SART, 2 indicates MOB-AIS, 4 indicates EPIRB-AIS); X4X5 = manufacturer ID 01 to 99; M6 = supplementary manufacturer ID suffix alphanumeric character; P7P8 = supplementary sequence number prefix alphanumeric character; Y9Y10Y11Y12 = the sequence number 0000 to 9999.

1. 1 Nautical mile = 1 852 metres.

 1 knot = 1 852 m/hr. [↑](#footnote-ref-1)
2. [↑](#footnote-ref-2)