ENAV22-9.5.3

## 3.19 Message 21: Aids-to-navigation report

This message should be used by an Aids to navigation (AtoN) AIS station. 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, 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, could also transmit 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.

ABLE 73

| 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 |
| Station ID | 30 | MMSI number assigned to the aid, (see Article 19 of the RR 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 47 “@@@@@@@@@@@@@@@@@@@@” = not available = default.  The name of the AtoN may be extended by the parameter “Name of Aid-to-Navigation Extension” below |
| Position accuracy | 1 | 1 = high (≤10 m)  0 = low (>10 m) 0 = default The PA flag should be determined in accordance with Table 50 |

TABLE 73 (*end*)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Number of bits | Description | |
| 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) |
| Dimension/ reference for position (1) | 30 | Reference point for reported position; also indicates the dimension of an AtoN (m) (see Fig. 42 and § 4.1), if relevant(1) |
| Type of electronic position fixing device | 4 | Use of differential corrections is defined by field position accuracy above: 0 = undefined (default) 1 = global positioning system (GPS) 2 = GNSS (GLONASS) 3 = combined GNSS  4 = Loran-C 5 = Chayka 6 = not ie  7 = manually inputted  8 = Galileo 9 = BeiDou  10-15 = not 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 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 (2) | 1 | For floating AtoN, only: 0 = on position; 1 = off position.  NOTE 1 – This flag should only be considered valid by receiving station, if the AtoN is a floating aid, and if time stamp is equal to or below 59. For floating AtoN the guard zone parameters should be set on installation |
| AtoN status | 8 | AtoN status as defined in Table [TBD]. 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 = real AtoN at indicated position; 1 = virtual AtoN, does not physically exist(2). |
| Assigned mode flag | 1 | 0 = Station operating in autonomous and continuous mode = default 1 = Station operating in assigned mode |
| Spare | 1 | Spare. Not used. 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 of up to 14 additional 6-bit-ASCII characters for a  2-slot message may be combined with the parameter “Name of Aid-to-Navigation” at the end of that parameter, when more than 20 characters are needed for the name of the AtoN. This parameter should be omitted when no more than 20 characters for the name of the A-to-N are needed in total. Only the required number of characters should be transmitted, i.e. no @-character should be used |
| Spare | 0, 2, 4, or 6 | Spare. 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 |

*Notes relating to Table**73*

ABCD values range are as defined:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Number of bits** | **Bit Fields** | **Dimension Range (m) / knots** |
| **A** | 9 | Bit 21 - 29 | 0-510 m, 511 = greater than 510 m |
| **B** | 9 | Bit 12 - 20 | 0-510 m / degrees, 511 = greater than 510 m |
| **C** | 6 | Bit 6 -  11 | 0-62 m / knots, 63 = greater than 62 m / knots |
| **D** | 6 | Bit  0 - 5 | 0-62 m, 63 = greater than 62 m |

Figure 42

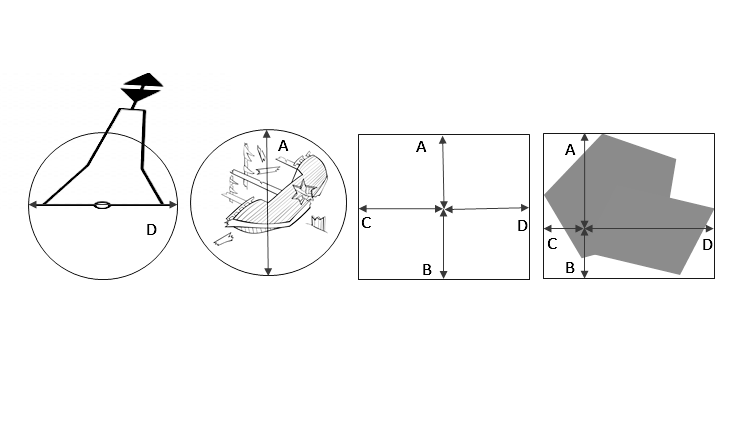
Reference point for reported position of a maritime aid to navigation,   
or the dimension of an aid to navigation or the area it denotes

ABCD dimension values represent, either:

A circular dimension, where if A = B = C = 0, D > 1 and represents the circular diameter of a physical AtoN, centered on the reference position. If B = C = D = 0, A = the circular diameter of an area\* centered on the reference position.

A rectangular dimension, where if A = B > 1, and C = D > 1, where A represents True north. If f A = B and C =D, AB represents the North-South dimension, CD represents the West-East dimension, and, the intersection of ABCD represents the reference point for the area\*. If A + B + C + D > = 2, A represents True north, B, C, D represent due south, west, and east, respectively. The intersection of ABCD represents the reference point for the broadcasted position (antenna location).

COG and SOG of dynamic isolated danger (Type 28), special mark (Type 30) or MATON (Type 31). If A = D = 0, B + C > 0, then B = COG = 001-360 degrees; 361 = not available = default; 362 = adrift; 000, 363-511 not used; C = SOG = 01-60 knots, 00 = adrift; 61 = 61 knots or greater; 62 = not available = default; 63 = not used.



\* Such as an area encompassing: a reference point (Type 1), structure (Type 3), wreck (Type 4), isolated danger (Type 28) or safe water (Type 29).

|  |
| --- |
|  |

TABLE 74

The nature and type of aids to navigation can be indicated with 32 different codes

|  |  |  |
| --- | --- | --- |
|  | Code | Definition |
|  | 0 | Default, Type of AtoN not specified |
|  | 1 | Reference point |
|  | 2 | RACON |
|  | 3 | Fixed structures off-shore, such as oil platforms, rigs, wind farms.  (NOTE 1 – This code should identify an obstruction that is fitted with an AtoN AIS station) |
|  | 4 | Emergency Wreck (Fixed) Marking Buoy |
| Fixed AtoN | 5 | Light, without sectors |
|  | 6 | Light, with sectors |
|  | 7 | Leading Light Front |
|  | 8 | Leading Light Rear |
|  | 9 | Beacon, Cardinal N |
|  | 10 | Beacon, Cardinal E |
|  | 11 | Beacon, Cardinal S |
|  | 12 | Beacon, Cardinal W |
|  | 13 | Beacon, Port hand |
|  | 14 | Beacon, Starboard hand |
|  | 15 | Beacon, Preferred Channel port hand |
|  | 16 | Beacon, Preferred Channel starboard hand |
|  | 17 | Beacon, Isolated danger |
|  | 18 | Beacon, Safe water |
|  | 19 | Beacon, Special mark |
| Floating AtoN | 20 | Cardinal Mark N |
|  | 21 | Cardinal Mark E |
|  | 22 | Cardinal Mark S |
|  | 23 | Cardinal Mark W |
|  | 24 | Port hand Mark |
|  | 25 | Starboard hand Mark |
|  | 26 | Preferred Channel Port hand |
|  | 27 | Preferred Channel Starboard hand |
|  | 28 | Isolated danger |
|  | 29 | Safe Water |
|  | 30 | Special Mark |
|  | 31 | Mobile AtoN or AIS Mobile Marker used to mark vehicles, platforms, objects, such as Light vessel/LANBY/mobile offshore drilling units, unmammed autonomous vehicles, debris, etc. |
| NOTE 1 – The types of aids to navigation listed above are based on the IALA Maritime Buoyage System, where applicable.  NOTE 2 – There is potential for confusion when deciding whether an aid is lighted or unlighted. Competent authorities may wish to use the regional/local section of the message to indicate this.  TABLE [bis]   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **AtoN Status Page(s) and Descriptions** | | | | | | | | Bit Order | Bits | ***RACON / Light*** | ***MATON*** | ***Position Indicating Device*** | ***Bridge*** | Bits | | 1st, 2nd, & 3rd | Page ID = 111 | Page ID = 110 | Page ID = 101 | Page ID = 001 | | | | 4th  &  5th | 00 | No RACON installed | Drifting Hazard (e.g. wreck, derelict vessel, debris) | Fitted on a person (e.g. diver) - assistance not required | Bridge in the open position | 00 | | 01 | RACON installed but not monitored | Mobile ocean data acquisition system (e.g. met-hydro data) | Fitted to fishing apparatus, gear, or a net | Bridge in the closed position | 01 | | 10 | RACON operational | Other type of collecting or sampling system or platform | Fitted to a scientific apparatus, craft, gear, or system | Bridge is operative | 10 | | 11 | RACON Error | TBD | Fitted to some other type of craft, apparatus, cable or system | Bridge in inoperative / in maintenance | 11 | | 6th  &  7th | 00 | No light or no monitoring | Guard or safety Zone | Non-self-propelled | Navigable channel span lighting operative | 00 | | 01 | Light ON | Military operation area or target | Self-propelled autonomously operated | Navigable channel span lighting inoperative | 01 | | 10 | Light OFF | Search and rescue area or marker | Self-propelled remotely operated | RACON operative | 10 | | 11 | Light fail or at reduced range | Monitoring, containment, or retrieval zone | Towed or tethered to a parent craft | RACON inoperative / not installed | 11 | | 8th | 0 | Good Health | Free-floating | Monitored | Tender on scene | 0 | | 1 | Alarm | Dynamic Positioning | Unmonitored | Remotely operated | 1 | | | |

## 3.26 Message 28: Identification and position report for autonomous maritime radio devices [Chinese Proposal]

This message is only transmitted by AMRD for the purpose of identification and position report. The message occupies one time slot.

TABLE 84*bis*

| Parameter | Number of bits | Description |
| --- | --- | --- |
| Message ID | 6 | Identifier for Message 28 |
| 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 | Identity (in the MMS) of the source of the message (see Article **19** of the RR and Recommendation ITU‑R M.585) |
| Type of AMRD | 5 | see Table 84 ter |
| Name of AMRD | 60 | Maximum 10 characters 6-bit ASCII, as defined in Table 47 “@@@@@@@@@@” = not available = default. |
| Dynamic status | 1 | 0 = fixing object = default; 1 = moving object |
| Position accuracy | 1 | 1 = high (≤10 m)  0 = low (>10 m) 0 = default The PA flag should be determined in accordance with Table 50 |
| Longitude | 28 | Longitude in 1/10 000 min of position of an AMRD (±180°, East = positive, West = negative 181 = (6791AC0h) = not available = default) |
| Latitude | 27 | Latitude in 1/10 000 min of an AMRD (±90°, North = positive, South = negative 91 = (3412140h) = not available = default) |
| 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 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) |
| 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 |
| Spare | 1 | Spare. Not used. Should be set to zero. Reserved for future use |
| Number of bits | 168 | Occupies one slots |

TABLE 84*ter*

|  |  |  |
| --- | --- | --- |
| Code | General group | Definition |
| 0 |  | Default, not specified |
| 1 | A | Fishing net indicator |
| 2 |  | Oceanic observation data transmitter |
| 3 |  | Towed unpowered object |
| 4 |  | Derelict object |
| 5 |  | Free floating object (such as floating ice) |
| 6 |  | Object (such as spilled oil) marker |
| 7 |  | Dynamic navigation marker |
| 8-16 |  | Reserved |
| 17 | B | Aquaculture net indicator |
| 18-31 |  | Reserved |

## 3.26 Message 28: Single slot AIS AtoN message [USA Proposal]

Single slot AIS Aid to Navigation Report, is a 1-slot RATDMA message, that may be used alternatively or alternating with a two-slot Message 21A AtoN Report; and, accompanied with Message 24A - Static Data Report, Part A (to provide a ATON Name). It is primarily intended to provide the status of physical AtoN or to denote a virtual AtoN marking a special area, hazard other obstruction. Can also be used to identify [autonomous marine radio devices (i.e. TBD), and provide approximate direction and speed those that are mobile or a MAtoN. Users should have the ability to filter individual AtoN or by type(s).

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Bits** | **Description** |
| Message ID | 6 | Identifier for Message 28. |
| Repeat indicator | 2 | Used by the repeater to indicate how many times a message has been repeated. |
| Source ID | 30 | MMSI or AMRD number |
| 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 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) |
| 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) |
| Position accuracy | 1 | 1 = high (< 10 m), 0 = low (>10 m) = default. See Table [XX] |
| Nature of the AtoN | 7 | Identifies the category and type of AtoN mark. See Table (bis) |
| AtoN ID | 30 | Identifies a Physical AtoN associated with this eAtoN, using five (5) character 6-bit ASCII unique identifier as assigned by the Administration per IALA Guideline GXXX; “@@@@@” = not available = default. |
| Dimension Type | 2 | 0 = circle, A = B = 0 represents a point; A + B = represents a diameter  1 = rectangle, A = True north dimension, B = True east-west dimension  2 = polyline, A = bearing, B = length  3 = vector, A = COG, B = SOG |
| Dimension Scale | 2 | 0 = metres, in 1 metre steps: 001-511, 0 = default = unspecified  1 = metres, in 10 metre steps: 001-511, 0 = default = unspecified  2 = COG and SOG (used only by mobile AtoN/AMRD). COG in 0-359 true degree steps 360 = not available 361 = SOG < 1 knots, direction is not reported, 362-511-not to be used. SOG in 1 knot steps 0-30 knots), 0 - 28 knots; 29 = 29 knots or higher; 30 = fixed (anchored); 31 = not available = default  3 = Bearing and range. Bearing in 0-359 true degree steps 360 = not available 361 = SOG < 1 knots, direction is not reported, 362-511-not to be used. Range in SOG in metres, in 10 metre steps: 00-30, 31 = not available = default |
| Dimension A | 9 | 000-511 metre / degrees |
| Dimension B | 5 | 00-32 metres / knots |
| Type of Physical AtoN augmented by this AtoN | 4 | 0 = Default = No physical AtoN  1 = Buoy (nun)  2 = Buoy (can)  3 = Buoy (lighted)  4 = Buoy (sound)  5 = Beacon (lighted)  6 = Beacon (sound)  7 = Beacon  8 = [TBD]  9 = RACON  10 = Reserved for regional use  11 = Reserved for regional use  12-15 = Reserved for future use |
| Status | 4 | 0 = Default = Watching Properly  1 = Inoperative  2 = Operating improperly (erratic)  3 = Operating improperly (reduced)  4 = Off=station  5 = Missing (location unknown)  6 = Missing (adrift)  7 = Damaged / occulted / submerged  8 = Removed / Discontinued  9 = Open  10 = Closed  11 = Partially Open  12 = Active  13 = Inactive  14 = TBD  15 = TBD |
| Spare | 5 | Spare. Not used. Should be set to zero. Reserved for future use |
| Number of bits | 168 | Occupies one slot |

Table (bis)

**Nature or Type of AtoN**

|  |  |
| --- | --- |
| 0 | Default, Type Of Aton Not Specified |
| 1 | Augmenting an existing physical AtoN |
| 2 | Reference Point / Area |
| 3 | RACON |
|  |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 | Cardinal Mark: Bifurcation / Junction |
| 11 | Cardinal Mark: Bifurcation / Junction, Pass Left-Hand Side |
| 12 | Cardinal Mark: Bifurcation / Junction, Pass Right-Hand Side |
| 13 | Cardinal Mark: Cardinal Mark E |
| 14 | Cardinal Mark: Cardinal Mark N |
| 15 | Cardinal Mark: Cardinal Mark S |
| 16 | Cardinal Mark: Cardinal Mark W |
| 17 |  |
| 18 |  |
| 19 |  |
| 20 | Cardinal Mark: Channel Near The Left Bank (Green) |
| 21 | Cardinal Mark: Channel Near The Right Bank (Red) |
| 22 | Cardinal Mark: Cross-Over Left Bank |
| 23 | Cardinal Mark: Cross-Over Right Bank |
| 24 | Cardinal Mark: Port / Left Hand Mark |
| 25 | Cardinal Mark: Port Side / Right Descending Bank |
| 26 | Cardinal Mark: Preferred Channel Port Hand |
| 27 | Cardinal Mark: Preferred Channel Starboard Hand |
| 28 | Cardinal Mark: Range Front |
| 29 | Cardinal Mark: Range Rear |
| 30 | Cardinal Mark: Sector Light |
| 31 | Cardinal Mark: Starboard / Right Hand Mark |
| 32 | Cardinal Mark: Starboard Side / Left Descending Bank |
| 33 |  |
| 34 |  |
| 35 |  |
| 36 |  |
| 37 |  |
| 38 |  |
| 39 |  |
| 40 | Isolated Danger (Obstacle): Overhead |
| 41 | Isolated Danger (Obstacle): Overhead Cable |
| 42 | Isolated Danger (Obstacle): Pass Left-Hand Side |
| 43 | Isolated Danger (Obstacle): Pass Right-Hand Side |
| 44 | Isolated Danger (Obstacle): Submerged Cable / Pipe |
| 45 | Isolated Danger (Obstacle): Wreck |
| 46 | Isolated Danger (Obstacle): Derelict Vessel |
| 47 |  |
| 48 |  |
| 49 |  |
| 50 | Isolated Danger (Structure): Bridge Span |
| 51 | Isolated Danger (Structure): Gate |
| 52 | Isolated Danger (Structure): Lock |
| 53 | Isolated Danger (Structure): Offshore Platform |
| 54 | Isolated Danger (Structure): Terminal |
| 55 | Isolated Danger (Structure): Wind Turbine |
| 56 |  |
| 57 |  |
| 58 |  |
| 59 |  |
| 60 | Special Mark (Area): Aquaculture Farm |
| 61 | Special Mark (Area): Guard Zone |
| 62 | Special Mark (Area): Ice Floe Edge |
| 63 | Special Mark (Area): Maritime Event / Regatta |
| 64 | Special Mark (Area): Military Operations Area |
| 65 | Special Mark (Area): Mooring Area |
| 66 | Special Mark (Area): Pollution Response / Recovery Area |
| 67 | Special Mark (Area): Restricted Operations Area |
| 68 | Special Mark (Area): Search And Rescue Area |
| 69 | Special Mark (Area): Substance Fishing Area |
| 70 | Special Mark (Area): Underwater Operations Area |
| 71 |  |
| 72 |  |
| 73 |  |
| 74 |  |
| 75 |  |
| 76 |  |
| 77 |  |
| 78 |  |
| 79 |  |
| 80 | Special Mark (Instruction): Proceed (At Reduced Speed) |
| 81 | Special Mark (Instruction): Proceed (From Here) |
| 82 | Special Mark (Instruction): Proceed (One-Way Traffic Only) |
| 83 | Special Mark (Instruction): Proceed (Outside Channel Only) |
| 84 |  |
| 85 |  |
| 86 |  |
| 87 |  |
| 88 |  |
| 89 |  |
| 90 | Special Mark (Object): End Of Towed Line / Cable / Net / Object / System |
| 91 | Special Mark (Object): Fishing Net Indicator |
| 92 | Special Mark (Object): Iceberg / Ice Floe |
| 93 | Special Mark (Object): Light Vessel |
| 94 | Special Mark (Object): Bridge Main Span Lighting |
| 95 | Special Mark (Object): Marine Mammal Sighting |
| 96 | Special Mark (Object): Mobile Offshore Drilling Unit |
| 97 | Special Mark (Object): Observation / Sampling Station |
| 98 | Special Mark (Object): Persons /Divers / Swimmers On The Water |
| 99 | Special Mark (Object): Remotely Operated Craft / Station / System |
| 100 | Special Mark (Object): Unknown Mobile Craft / Object / System |
| 101 | Special Mark (Object): Vessel In Need Of Assistance (Distress) |
| 102 | Special Mark (Object): Vessel In Need Of Assistance (Non-Distress) |
| 103 |  |
| 104 |  |
| 105 |  |
| 106 |  |
| 107 |  |
| 108 |  |
| 109 |  |
| 110 |  |
| 111 |  |
| 12 |  |
| 113 |  |
| 114 |  |
| 115 |  |
| 116 |  |
| 117 |  |
| 118 |  |
| 119 |  |
| 120 |  |
| 121 |  |
| 122 |  |
| 123 |  |
| 124 |  |
| 125 |  |
| 126 |  |
| 127 | Undefined = Default |