Message 21: Aids-to-navigation report (AtoN)

This message should be used by an 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, or by an external command. This message should not occupy more than two slots.

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
ID	30	MMSI number, (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 71
Name of Aids-to-Navigation	120	Maximum 20 characters 6-bit ASCII, as defined in Table 44 "@@@@@@@@@@@@@@@@@@@@" = 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 47
Longitude	28	Longitude in 1/10 000 min of position of an AtoN (±180º, East = positive, West = negative 181 = ($6791AC0_h$) = not available = default)
Latitude	27	Latitude in 1/10 000 min of an AtoN (±90º, North = positive, South = negative 91 = (3412140_h) = not available = default)
Dimension/ reference for position	30	Reference point for reported position; also indicates the dimension of an AtoN (m) (see Fig. 42 and § 4.1), if relevant[1]

Parameter	Number of bits	Description
Type of electronic position fixing device	4	0 = Undefined (default) 1 = GPS 2 = GLONASS 3 = Combined GPS/GLONASS 4 = Loran-C 5 = Chayka 6 = Integrated Navigation System 7 = surveyed. For fixed AtoN and virtual AtoN, the charted position should be used. The accurate position enhances its function as a radar reference target 8 = Galileo 9-14 = not used 15 = internal GNSS
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	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	Reserved for the indication of the AtoN status 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 47
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

[1] When using Fig. 41 for AtoN the following should be observed:

– For fixed Aids-to-Navigation, virtual AtoN, and for off-shore structures, the orientation established by the dimension A should point to true north.

– For floating aids larger than 2 m * 2 m the dimensions of the AtoN should always be given approximated to a circle, i.e. the dimensions should always be as follows $A = B = C = D \neq 0$. (This is due to the fact that the orientation of the floating Aid to Navigation is not transmitted. The reference point for reported position is in the centre of the circle.)

– $A = B = C = D = 1$ should indicate objects (fixed or floating) smaller than or equal to 2 m * 2 m. (The reference point for reported position is in the centre of the circle.)

– Floating off shore structures that are not fixed, such as rigs, should be considered as Code 31 type from Table 71 AtoN. These structures should have their "Dimension/reference for position" parameter as determined above in Note [1].

For fixed off shore structures, Code 3 type from Table 71, should have their "Dimension/reference for position" parameter as determined above in Note [1]. Hence, all off shore AtoN and structures have the dimension determined in the same manner and the actual dimensions are contained in Message 21.

[2] When transmitting virtual AtoN information, i.e. the virtual/pseudo AtoN Target Flag is set to one (1), the dimensions should be set to A=B=C=D=0 (default). This should also be the case, when transmitting "reference point" information (see Table 70).

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

Note on AtoN within AIS:

The competent international body for aids-to-navigation, IALA, defines an AtoN as: "a device or system external to vessels designed and operated to enhance safe and efficient navigation of vessels and/or vessel traffic." (IALA Navguide, Edition 1997, Chapter 7).

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.

Notes for nature and type of AtoN table below:

NOTE 1 – The types of aids to navigation listed below 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.

The nature and type of AtoN 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, wind farms. (NOTE 1 – This code should identify an obstruction that is fitted with an AtoN AIS station)
	4	Spare, Reserved for future use
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
	14	Beacon, Starboard hand
	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	Light Vessel/LANBY/Rigs