



Date: October 19, 2010  
Ref: PGN Proposal: AIS Aids to Navigation (AtoN) Report

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## National Marine Electronics Association Technical Corrigendum Number 2-2010

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1. Supplements the existing AIS parameter group service by adding Aids to Navigation (AtoN) messaging conforming to ITU-R M.1371-4 Message 21. Message 21 was omitted from previous AIS parameter group definitions.

### **Documents Affected**

- Appendix B Version 1.301.

### **Changes to NMEA 2000 Appendix B**

Add the following new parameter group definition accompanying this document:

<b>PGN</b>	<b>Parameter Group Name</b>
129041	AIS Aids to Navigation (AtoN) Report

# AIS Aids to Navigation (AtoN) Report

PGN: 129041

hex: 1F811

This PGN provides information received from an AtoN AIS station conforming to ITU-R M.1371-4 Message 21. The AtoN 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 is typically transmitted autonomously at a rate of once every three (3) min. Other reporting rates are possible when the AtoN device has received an assigned mode command (Message 16) via the VHF data link, or by an external command such as PGN 129804 - AIS Assignment Mode Command.

Application of all data fields is dependant upon the latest version of ITU-R M.1371.

Single Frame: **N** Priority Default: **4** Default Update Rate: **NA** milliseconds Frequency: **NA** cycles per second  
 Destination: **Global** Query Support: **N** ACK Rqmnts: **None**

Field # Field Name Original Reference ID # 203

**1** **Message ID** Byte Field Size: Bit Field Size: **6** **6** Request Parameter **Yes**  
**DD188** AIS Message Identifier Message Identifier (range of 0 to 63).

See the latest version of ITU-R M.1371 for more information.

**DF52** Bit field bit(n) Range: Variable Resolution: 1 Used to construct bit fields

21 = AIS Aids to Navigation (AtoN) Report

**2** **Repeat Indicator** Byte Field Size: Bit Field Size: **2** **2** Request Parameter **No**  
**DD185** AIS Repeater Indicator Used by the repeater to indicate how many times a message has been repeated (range of 0 to 3).

- 0 = Default
- 1 = First retransmission
- 2 = Second retransmission
- 3 = Final retransmission

See the latest version of ITU-R M.1371 for more information.

**DF52** Bit field bit(n) Range: Variable Resolution: 1 Used to construct bit fields

**3** **ID** Byte Field Size: **4** Bit Field Size: Request Parameter **No**  
**DD010** Generic numeric ID, large Number of route, waypoint, event, mark, etc.

**DF55** Integer, 32 bit unsigned uint32 Range: 0 to 4,294,967,292 Resolution: 1 bit Unit-less number

MMSI number of AtoN station reporting position

**4** **Longitude** Byte Field Size: **4** Bit Field Size: Request Parameter **No**  
**DD023** Longitude, WGS-84 Longitude referenced to WGS-84

**DF25** Longitude int32 Range: +/- 180 deg Resolution: 1x10E-7 deg "-" = West, resolution ~1.1 cm

**5** **Latitude** Byte Field Size: **4** Bit Field Size: Request Parameter **No**  
**DD022** Latitude, WGS-84 Latitude referenced to WGS-84

**DF23** Latitude int32 Range: +/- 90 deg Resolution: 1x10E-7 deg "-" = South, resolution ~1.1 cm

**6** **Position Accuracy** Byte Field Size: Bit Field Size: **1** Request Parameter **No**  
**DD184** AIS Position Accuracy 0 = low accuracy > 10m such as nondifferential GNSS (default),  
 1 = high accuracy < 10m such as DGNSS

See the latest version of ITU-R M.1371 for more information.

**DF52** Bit field bit(n) Range: Variable Resolution: 1 Used to construct bit fields

**7 RAIM Flag** *Byte Field Size:* *Bit Field Size:*  *Request Parameter*   
**DD189** AIS RAIM-flag  
 0 = RAIM not in use (default),  
 1 = RAIM in use

See the latest version of ITU-R M.1371 for more information.

**DF52** Bit field **bit(n)** *Range:* Variable *Resolution:* 1 Used to construct bit fields

**8 Time Stamp** *Byte Field Size:* *Bit Field Size:*  *Request Parameter*   
**DD186** AIS Time Stamp  
 0-59 = UTC second when the report was generated,  
 60 = time stamp not available (default),  
 61 = positioning system is in manual input mode,  
 62 = Electronic position fixing system operates in estimated (dead reckoning) mode,  
 63 = positioning system is inoperative

See the latest version of ITU-R M.1371 for more information.

**DF52** Bit field **bit(n)** *Range:* Variable *Resolution:* 1 Used to construct bit fields

**9 AtoN Structure Length/Diameter** *Byte Field Size:*  *Bit Field Size:* *Request Parameter*   
**DD194** Distance, medium  
 Dependent upon PG Field definition.

**DF75** Distance, Medium **uint16** *Range:* 0 to 6553.2 m *Resolution:* 1x10E-1 m

See Message 21 Dimension/reference for position data field and notes for interpretation of these values in the latest version of ITU-R M.1371.

**10 AtoN Structure Beam/Diameter** *Byte Field Size:*  *Bit Field Size:* *Request Parameter*   
**dd194** Distance, medium  
 Dependent upon PG Field definition.

**DF75** Distance, Medium **uint16** *Range:* 0 to 6553.2 m *Resolution:* 1x10E-1 m

See Message 21 Dimension/reference for position data field and notes for interpretation of these values in the latest version of ITU-R M.1371.

**11 Position Reference Point from Starboard Structure Edge/Radius** *Byte Field Size:*  *Bit Field Size:* *Request Parameter*   
**DD194** Distance, medium  
 Dependent upon PG Field definition.

**DF75** Distance, Medium **uint16** *Range:* 0 to 6553.2 m *Resolution:* 1x10E-1 m

See Message 21 Dimension/reference for position data field and notes for interpretation of these values in the latest version of ITU-R M.1371.

**12 Position Reference Point from True North facing Structure Edge/Radius** *Byte Field Size:*  *Bit Field Size:* *Request Parameter*   
**DD194** Distance, medium  
 Dependent upon PG Field definition.

**DF75** Distance, Medium **uint16** *Range:* 0 to 6553.2 m *Resolution:* 1x10E-1 m

See Message 21 Dimension/reference for position data field and notes for interpretation of these values in the latest version of ITU-R M.1371.

**13 Aid to Navigation (AtoN) Type**  
**DD305** AIS Aids to Navigation Type

*Byte Field Size:*

*Bit Field Size:*

*Request Parameter*

0 = Type of AtoN not specified (default)  
 1 = Reference point  
 2 = RACON  
 3 = Fixed structures off-shore, such as oil platforms, wind farms; This code identifies 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  
 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

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.

See Latest version of ITU-R M.1371 for more information.

**DF52** Bit field

**bit(n)** *Range:* Variable *Resolution:* 1 Used to construct bit fields

**14 Off Position Indicator**  
**DD306** Off position indicator

*Byte Field Size:*

*Bit Field Size:*

*Request Parameter*

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.

**DF52** Bit field

**bit(n)** *Range:* Variable *Resolution:* 1 Used to construct bit fields

<b>15</b>	<b>Virtual AtoN Flag</b> <b>DD307</b> Virtual AtoN Flag	<i>Byte Field Size:</i>	<i>Bit Field Size:</i> 1	<i>Request Parameter</i> No
			0 = real AtoN at indicated position (default) 1 = virtual AtoN, does not physically exist	
			See note 2 of MSG 21 in ITU-R M.1371 for more information.	
	<b>DF52</b> Bit field	<b>bit(n)</b> <i>Range:</i> Variable	<i>Resolution:</i> 1	Used to construct bit fields
<b>16</b>	<b>Assigned Mode Flag</b> <b>DD308</b> AIS Assigned Mode Flag	<i>Byte Field Size:</i>	<i>Bit Field Size:</i> 1	<i>Request Parameter</i> No
			0 = Station operating in autonomous and continuous mode (default) 1 = Station operating in assigned mode	
	<b>DF52</b> Bit field	<b>bit(n)</b> <i>Range:</i> Variable	<i>Resolution:</i> 1	Used to construct bit fields
<b>17</b>	<b>Spare</b> <b>DD001</b> Reserved field	<i>Byte Field Size:</i>	<i>Bit Field Size:</i> resv 1	<i>Request Parameter</i> No
			Variable number of reserved bits, all set to logic "1"	
	<b>DF52</b> Bit field	<b>bit(n)</b> <i>Range:</i> Variable	<i>Resolution:</i> 1	Used to construct bit fields
	This field mirrors the "Spare" bit field found within the corresponding AIS message such that future definition within the AIS message can also be accommodated within this field. Normally, spare or reserved bits in NMEA 2000 are encoded with logic 1's, however for AIS PGNs the unused or reserved bits are to be encoded as logic 0's.			
<b>18</b>	<b>Electronic Fixing Position Fixing Device Type</b> <b>DD191</b> AIS Electronic Positioning Device Type	<i>Byte Field Size:</i>	<i>Bit Field Size:</i> 4	<i>Request Parameter</i> No
			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 9-15 = Reserved for future use.	
			See the latest version of ITU-R M.1371 for more information.	
	<b>DF52</b> Bit field	<b>bit(n)</b> <i>Range:</i> Variable	<i>Resolution:</i> 1	Used to construct bit fields
<b>19</b>	<b>NMEA 2000 Reserved</b> <b>DD001</b> Reserved field	<i>Byte Field Size:</i>	<i>Bit Field Size:</i> resv 3	<i>Request Parameter</i> No
			Variable number of reserved bits, all set to logic "1"	
	<b>DF52</b> Bit field	<b>bit(n)</b> <i>Range:</i> Variable	<i>Resolution:</i> 1	Used to construct bit fields
	Used to align subsequent data on byte boundary.			
<b>20</b>	<b>AtoN Status</b> <b>DD309</b> AtoN Status	<i>Byte Field Size:</i>	<i>Bit Field Size:</i> 8	<i>Request Parameter</i> No
			Reserved for indicating AtoN Status; Only defined value is 00000000 (default).	
	<b>DF52</b> Bit field	<b>bit(n)</b> <i>Range:</i> Variable	<i>Resolution:</i> 1	Used to construct bit fields
<b>21</b>	<b>AIS Transceiver Information</b> <b>DD246</b> AIS Transceiver Information	<i>Byte Field Size:</i>	<i>Bit Field Size:</i> 5	<i>Request Parameter</i> No
			0 = Channel A VDL reception, 1 = Channel B VDL reception, 2 = Channel A VDL transmission, 3 = Channel B VDL transmission, 4 = Own information not broadcast, 5-31 = Reserved.	
	<b>DF52</b> Bit field	<b>bit(n)</b> <i>Range:</i> Variable	<i>Resolution:</i> 1	Used to construct bit fields

**22 NMEA 2000 Reserved** *Byte Field Size:* *Bit Field Size:* **resv 3** *Request Parameter* **No**  
**DD001** Reserved field  
 Variable number of reserved bits, all set to logic "1"  
**DF52** Bit field **bit(n)** *Range:* **Variable** *Resolution:* **1** Used to construct bit fields

Used to align subsequent data on byte boundary

**23 Aid to Navigation (AtoN) Name** *Byte Field Size:* **8 or 16 | n** *Bit Field Size:* *Request Parameter* **No**  
**DD004** Generic name string, short  
 Name of place, route, waypoint, destination, vessel, vehicle, etc.  
**DF50** String, variable, short **ch8or16(n)** *Range:* **0 to 250 ASCII or 0 to 125 Unicode Characters** *Resolution:* **1 ASCII or 1 Unicode Character** 2 to 252 bytes. First byte in string (uint8) is the Count byte indicating the number of bytes in the string, including the Count and Control bytes. Second byte in string is the Control byte. The Control byte indicates if the string consists of ASCII characters (Char8) or Unicode characters (Char16). Control byte = 0 => Unicode characters  
 Control byte = 1 => ASCII characters  
 A string with no characters (total length of 2 bytes, i.e. Count = 2) is a null string.

This field is always transmitted using ASCII and combines two fields from ITU-R M.1371 message 21. 'Name of Aids-to-Navigation' is a fixed 20 ASCII character field that is always present, and 'Name of Aid-to-Navigation Extension' is an optional field of up to 14 ASCII characters. The total length of this field is variable and will be from 20 to 34 ASCII characters.

See ITU-R M.1371 for more information.