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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:** 29 August 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. | |
| **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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| 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.

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.

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/112  Subject: Recommendation [ITU-R M.1371-5](https://www.itu.int/rec/R-REC-M.1371-5-201402-I/en) | Annex 4.4 to  Document 5B/315-E |
| 13 May 2025 |
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| 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)*

**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 | Number Identity (in the MMS) of the source of the message (see RR Art. **19** and Rec. 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 = navigating autonomously ,  10 = navigating by remote control ,  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 turn ROTAIS | 8 | 0 to +126 = turning right at up to 708° per min or higher 0 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 min where 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 50  1 = 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 = default 1 = not engaged in special manoeuvre 2 = engaged in special manoeuvre (i.e. regional passing arrangement on Inland Waterway)  3 = reserved for regional use |
| Spare | 2 | Should be set to zero. Reserved for future use |
| Transmit power | 1 | 0 = default = high power  1 = 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)*

**A7-3.26** **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 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. 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 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) |
| Restricted Use Indicator | 2 | Denotes where the AtoN may be operated.  0 = unrestricted use = default 1 = use restricted to territorial waters of the flag state (of MMSI MID) 2 = use restricted 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 flag state competent authority. |
| AIS AtoN Station Type | 3 | Denotes 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 AtoN 3 = a synthetic monitored AIS AtoN 4 = a virtual AIS AtoN 5 = a mobile AIS AtoN 6 = a mobile self-propelled AIS AtoN  7 = reserved for future use |
| 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 = unassigned or unknown = default.  See 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 Use 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 represent the center 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 broadcasted 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/x]; [9/x]-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/x] lines; 0-[8/x]; [9/x]-2 047 reserved for future use.  5 = AtoN Area-Circle. The reported position represents the center 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 righthand 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 that starting point of 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 righthand 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 that 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 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 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 further information, message 28 can broadcast multiple AtoN Dimension Types for the same AtoN 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 shorten to reduce the latency of multiple AtoN Dimension Types, particularly for AtoN Dimension Type 8 (AtoN Area-Polygon) which should broadcast all its pertinent vertices with [x] frames. |
| AtoN Charted Status | 1 | Denotes whether the AtoN is charted or not.  0 = AtoN is uncharted = default 1 = AtoN charted |
| AtoN On-station Status | 4 | Denotes whether the AtoN is on-station or not.  0 = on-station = default  1 = on-station or on course (Mobile AtoN) 2 = on-station, but damaged, occulted, submerged or otherwise not properly visible 3 = on-station, a virtual AtoN reporting the intended position of this AtoN that is reporting itself off-position 4 = off-station location unknown  5 = off-station, but reporting its current position 6 = off-station adrift 7 = off-station, removed or relocated 8 = on-station, as a new or temporary AtoN 9 = unmarked navigation hazard, used by a vessel to inform of an unmarked navigation hazard. 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., 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 reported AtoN; or for vessels to convey an AtoN discrepancy.  0 = no confirmation requested = default;  1 = confirmation requested ( and Source ID = 00MIDxxxx or 99MIDxxxx),  otherwise it is an AtoN discrepancy report  If 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 discrepancy should report the same parameters. |
| Authentication Flag | 1 | 0 = this AtoN is not authenticated = default  1 = 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)*

**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 300 slots, they should be deemed to have originated from the same transmitter.

Figure A8-2

**Burst transmissions in active mode**



Figure A8-3

**Burst transmissions in test/deactivated mode**



**A8-6 Supplemental device ID information**

The source ID should have a unique pattern 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 sequency 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)