National Marine Electronics Association

International Marine Electronics Association

Technical Bulletin

Amendment to NMEA0183 Version 4.10
 # AT 0183 20150115

NMEA 0183 Amendment
An amendment is a technical specification that will be new information to the NMEA 0183 Standard. This Amendment, AT 0183 20150115 is publically available and will be added to the next NMEA 0183 version at a later date.

This amendment is based on legacy sentences and legacy comment block grouping protocol published in the first edition of the IEC 62320-2 Ed.1 AIS AtoN Station Standard**, Appendix A.**

The purpose of this amendment is to assure the publication of these legacy sentences even though these sentences should not be used for new designs.

This NMEA amendment, AT 0183 20150115 has taken the legacy sentences directly from the IEC 62320-2 Ed.1AIS AtoN Station Standard Appendix A. NMEA received permission to publish these IEC sentences, as is, from Mr. Kim Fisher, TC 80 Secretary on October 7, 2014 at the IEC WG15's request made during the September 2014 WG15 meeting in Seattle Washington.

The information in this NMEA amendment, including sentences and comment grouping protocol, is not to be used for new designs. Please note the replacement notes.

All of these functions and capabilities have been replaced with standardized methods, intended for new designs.

Note: All of the legacy sentences and comment group protocol have replacements that are currently only available with the NMEA 0183 Standard Version 4.10.

Annex A IEC 62320-2 AIS AtoN Station Standard
(informative)

Proposed additional IEC 61162 AIS AtoN Station sentences

A.1 Standard IEC 61162 sentences

The standard configuration sentences should be as defined in the IEC 61162 series. The electrical characteristics should be as specified by the manufacturer.

Subclause 5.3.1.1 provides an overview of the sentences that should be used for data exchange and for configuration of AIS AtoN applications. It includes existing sentences from IEC 61162-1 with additional AtoN sentences as provided in this annex.

This annex defines the format of input/output sentences specifically defined for AIS AtoN Stations in accordance with the data structures of IEC 61162.

Note: The AAR sentence is replaced by the CBR sentence in NMEA 0183 Version 4.10. The CBR sentence should be used for new designs. The CBR sentence has been updated with NMEA Technical Corrigendum TC# 0183 20150116 dated January 16, 2015.

AAR – Configure broadcast rates for AtoN Station message command **DEPRECATED**

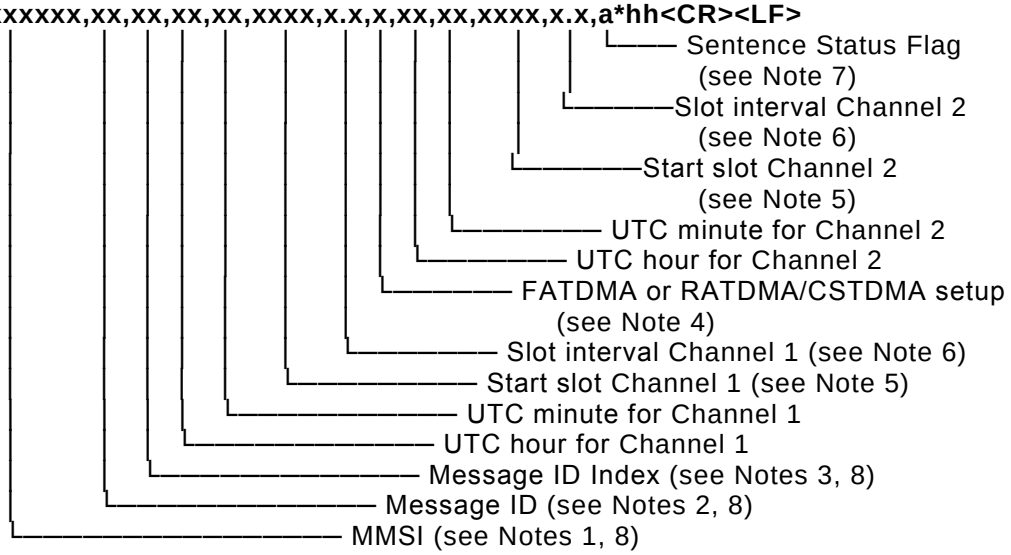
A.1.1 Description

This sentence assigns the schedule of slots that will be used to broadcast Message 21 and other allowed AIS AtoN Station messages. It provides the start slot and interval between the slots used for consecutive transmissions for the message. The AIS AtoN Station should apply the information provided by this sentence to autonomously and continuously transmit the VDL messages until revised by a new AAR sentence.

The AIS AtoN Station, upon receipt of an AAR Query for this information, will generate sentences for configured messages providing the current broadcast schedule. New AAR assignments will override existing AAR assignments.

A.1.2 Configuration via the configuration port using the AAR sentence

$--AAR,xxxxxxxxx,xx,xx,xx,xx,xxxx,x.x,x,xx,xx,xxxx,x.x,a*hh<CR><LF>



NOTE 1 The MMSI is defined in the AID sentence. This field contains the linkage between the MMSI definition (AID), Message 21 configuration (ACF, and ACE) and scheduling (AAR) of Message 21 transmissions.

NOTE 2 Message ID is the message identification of the message being scheduled. When Message ID is 0 this indicates that the slots being defined will be used for chaining messages. These slots are not reserved on the VDL via a Message 20 until the competent authority requires their use and will reserve the slots at that time for the proper duration. These slots can be used for chaining or for MPR single transmission.

NOTE 3 Message ID Index is used when there are multiple versions of a Message ID. This index value should start at 1.

NOTE 4 Used to select whether the AAR is configuring an FATDMA schedule or RATDMA/CSTDMA schedule (0 indicates FATDMA, 1 indicates RATDMA and 2 indicates CSTDMA)

NOTE 5 For all messages which need to be transmitted in FATDMA mode, starting slot ranging from −1 to 2249 should be used. A value of –1 discontinues broadcasts of the message when the AAR sentence is sent to the AtoN Station, and indicates that no message has been broadcast if the AAR sentence is received from the AtoN Station. A null field indicates no change to the current start slot setting when sent to the AtoN Station, and indicates that the start slot has not been set, i.e. is unavailable, when the AAR sentence is received from the AtoN Station. For an RATDMA/CSTDMA transmission schedule, this field will be Null.

NOTE 6 For all messages which need to be transmitted, in FATDMA mode slot Interval ranging from 0 to (24*60*2250;once per day) and in RATDMA/CSTDMA mode, time interval ranges from 0 to (24*60*60) s. A null field indicates no change to the current slot interval setting when sent to the AtoN Station, and indicates that the slot interval has not been set, i.e. is unavailable, when the AAR sentence is received from the AtoN Station.

NOTE 7 This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

"R' = sentence is a query response

"C" = sentence is a configuration command to change settings.

NOTE 8 The MMSI/Message ID/Message ID index are used to reference a table of messages loaded using MPR, ACF/ACE; this sentence defines the broadcast schedule for each message. Each message in this table is referenced by the combination of MMSI, Message ID, and Message ID index.

A.1.3 Query via the configuration port for AAR

To query this sentence, use the standard IEC 61162-1 query structure. The query response will continue until all message IDs/payload identification /and schedules have been transferred.

Note: The ACE sentence is replaced by the ACG sentence in NMEA 0183 Version 4.10. The ACG sentence should be used for new designs.

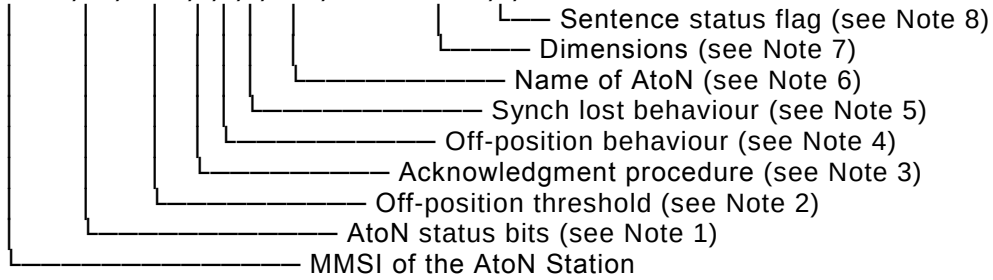
ACE – Extended general AtoN Station configuration command DEPRECATED

A.1.4 Description

This sentence and the ACF sentence are used to configure the AtoN Station parameters when it is initially installed, and later in order to make changes to the way it operates. This sentence supports system administration of the AIS AtoN Station operation.

A.1.5 Configuration via the configuration port using the ACE sentence

$--ACE,xxxxxxxxx,hh,xxxx,x,x,x,c--c,xxxxxxxxxx,a,*hh<CR><LF>



NOTE 1 AtoN status bits, indication of the AtoN status, default "00_{hex}": for a Virtual AtoN, this field should be 00_{hex}. The three most significant bits represent the page ID.

NOTE 2 The off-position indicator is generated when this threshold is exceeded (distance in metres).

NOTE 3 Determines the behaviour of AtoN for message acknowledgement (Message 7 and 13):

0 will provide acknowledgement as defined by manufacturer,

1 will not provide acknowledgement.

NOTE 4 Off-position behaviour:

0 – maintain current transmission schedule,

1 – use new reporting interval configured by AAR using message ID index.

NOTE 5 Synch lost behaviour:

0 – silent,

1 – continue as before.

NOTE 6 Name of the AtoN: maximum 34 characters.

NOTE 7 Reference point of reported position; should be given as dimension (aaabbbccdd) of the buoy.

NOTE 8 This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

"R' = sentence is a query response,

"C" = sentence is a configuration command to change settings.

A.1.6 Query via the configuration port for ACF and ACE

To query these sentences use the standard IEC 61162-1 query structure.

Note: This version of the IEC ACF sentence is incorrect. The Data Field Notes in this IEC sentence description are incomplete and incorrect. This sentence and has been replaced by the NMEA version in NMEA 0183 Version 4.10. The NMEA sentence should be used for new designs.

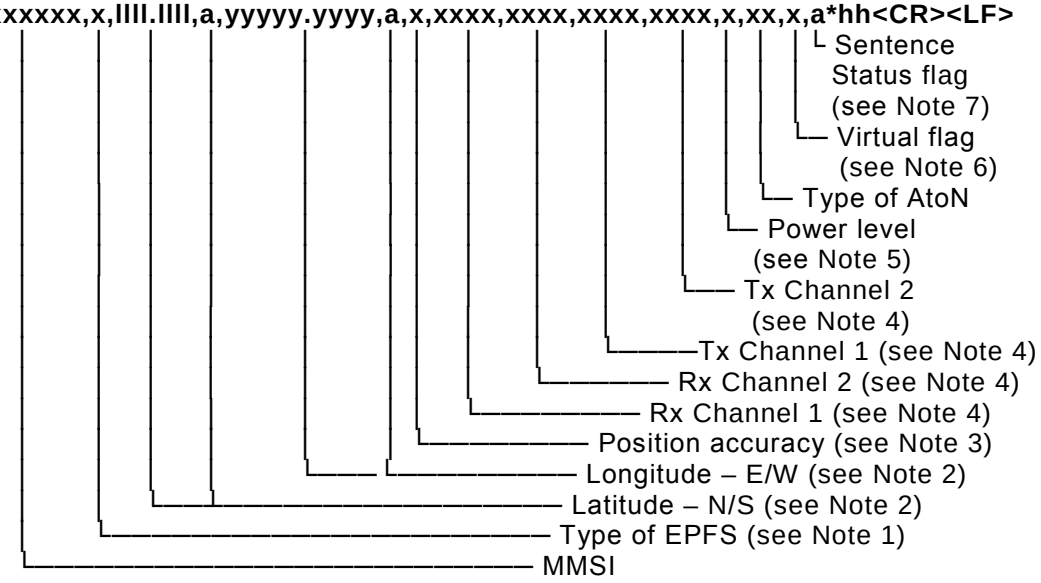
A.2 ACF – General AtoN Station configuration command

A.2.1 Description

This sentence and the ACE sentence are used to configure Message 21 content for the AtoN Station and all of the Synthetic/Virtual AtoN Stations associated with the AtoN Station.

A.2.2 Configuration via the configuration port using the ACF sentence

$--ACF,xxxxxxxxx,x,llll.llll,a,yyyyy.yyyy,a,x,xxxx,xxxx,xxxx,xxxx,x,xx,x,a*hh<CR><LF>



NOTE 1 Identifies the source of the position, see ITU-R M.1371 Message 21 parameter (type of electronic position fixing device).

NOTE 2 Nominal or charted position.

NOTE 3 0 = low > 10 m,

1 = high < 10 m; differential mode of DGNSS.

NOTE 4 VHF channel number, see ITU-R M.1084.

NOTE 5 0 = default manufacturer power level (nominally 12,5 W),

1 to 9 as defined by the manufacturer.

NOTE 6 Virtual AtoN flag

0 = Real AtoN at indicated position (default),

1 = Virtual AtoN,

2 = Synthetic AtoN (flag remains 0 in message 21 but the repeat indicator must be > than 0).

NOTE 7 This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

"R' = sentence is a query response,

"C" = sentence is a configuration command to change settings.

Note: This version of the IEC AFB sentence is incorrect. The Data Field Notes in this IEC sentence description are incomplete and missing in the IEC sentence description. This sentence and has been replaced by the NMEA version in NMEA 0183 Version 4.10. The NMEA sentence should be used for new designs.

A.3 AFB – Forced broadcast command

Description

This sentence is used to force a transmission of the indicated VDL message, this message is already known to the AIS AtoN Station through AAR/MPR or ACE/ACF/AAR configuration commands.

A.3.1 Function via the configuration port for AFB

$--AFB,xxxxxxxxx,xx,xx,xx,xx,xxxx,x,a*hh<CR><LF>

- Sentence status flag (see Note 2)
- Channel 1/2
- Start slot (see Note 1)
- UTC minute for start slot
- UTC hour for start slot
- Message ID index
- Message ID
- MMSI

NOTE 1 If the start slot is null, the AtoN Station will use RATDMA for transmission.

NOTE 2 This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

"R' = sentence is a query response

"C" = sentence is a configuration command to change settings.

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AFC – AtoN function ID capability–

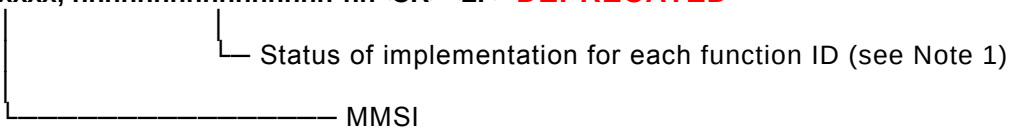
A.3.2 Description

This sentence is used to provide the capability information of implemented function ID by the EUT. This sentence is initiated with a QAFC and the response is the AFC.

Note: The AFC sentence is replaced by the DCR sentence in NMEA 0183 Version 4.10. The DCR sentence should be used for new designs

A.3.3 Query response via the configuration port for AFC

$--AFC,xxxxxxxxx, hhhhhhhhhhhhhhhh*hh<CR><LF> **DEPRECATED**



NOTE 1 Each bit corresponds to the function ID number and the bit value “0” indicates the function ID number is not supported and “1” indicates supported. The most significant bit is function ID “0”.

A.3.4 Query request via the configuration port for AFC

To query this sentence, use the standard IEC 61162-1 query structure

A.4 AID – MMSI configuration for command

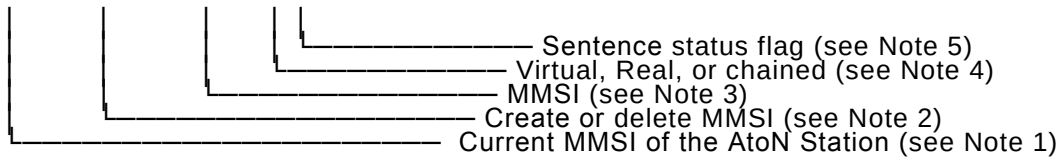
A.4.1 Decription

This sentence is used to load, for an AtoN Station, its Real, Virtual and chained MMSI(s). The MMSI from the factory shall be as defined by the manufacturer. Each AtoN Station will maintain a table of its MMSI(s) and the messages associated with these MMSI(s).

Note: This version of the IEC AID sentence is incorrect. The Data Field Notes in this IEC sentence description are incomplete. The IEC sentence structure is incorrect. This sentence and has been replaced by the NMEA version in NMEA 0183 Version 4.10. The NMEA sentence should be used for new designs.

A.5 Configuration via the configuration port using the AID sentence

A.5.1 $--AID,xxxxxxxxx,x,xxxxxxxxx,a,a*hh<CR><LF>



NOTE 1 The MMSI of the station being addressed. The initial factory setting should be defined by the manufacturer, for example 000000000.

NOTE 2 The indicator to define if the MMSI is being created/changed (1) or deleted (0). If own station MMSI is deleted it should revert to the factory setting. If a Virtual AtoN is deleted, then all associated messages for that Virtual AtoN are also deleted.

NOTE 3 The current MMSI to be created/changed/or deleted.

NOTE 4 Real AtoN, chained, or Virtual AtoN – Real is own station, chained indicates an MMSI that this station is responsible for relaying messages to and from, a Virtual AtoN indicates an MMSI that this station is responsible for generating at least a Message 21.

“R” – Real AtoN;

“V” = Virtual/Synthetic AtoN;

“P” = parent AtoN in the chain;

"C" = child AtoN in the chain.

NOTE 5 This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

"R' = sentence is a query response;

"C" = sentence is a configuration command to change settings.

A.5.2 Query via the configuration port for AID

To query this sentence, use the standard IEC 61162-1 query structure. The query response will continue until all known AtoN MMSIs and types have been transferred.

Note: The AKE sentence is replaced by the CEK sentence in NMEA 0183 Version 4.10. The CEK sentence should be used for new designs.

A.6 AKE – Configure encryption key command - DEPRECATED

A.6.1 Description

This sentence assigns the encryption key that will be used by the AES algorithm to communicate configuration and status information via the VDL. This sentence allows for the entire 128 bit encryption key to be entered, the user must know the current encryption key. The initial encryption key, when shipped from the manufacturer, will be all 0's.

~~A.6.2~~ Configuration via the configuration port for AKE

$--AKE,xxxxxxxxx,c--c, c--c,a*hh<CR><LF>

```
                  │         │      │   └── Sentence status flag (see Note)
                  │         │      └────── New AES encryption key
                  │         └─────────── Current AES encryption key
                  └──────────────────── MMSI of the AtoN Station
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NOTE This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

"R' = sentence is a query response,

"C" = sentence is a configuration command to change settings.

A.6.3 Query via the configuration port for AKE

To query this sentence use the standard IEC 61162-1 query structure.

Note: The ARW sentence is replaced by the COP sentence in NMEA 0183 Version 4.10. The COP sentence should be used for new designs. The COP sentence has been updated with NMEA Technical Corrigendum TC# 0183 20150116 dated January 16, 2015.

A.7 ARW –Configure the receiver turn-on times command – DEPRECATED

A.7.1 Description

This sentence defines the operational period for the receivers. When chaining the duration of receiver wake up time must be sufficient to allow correct operation of a chain.

A.7.2 Configuration via the configuration port for ARW

$--ARW,xxxxxxxxx,x,xx,xx,xxx,xxxx,a*hh<CR><LF>

- Sentence status flag (see Note 4)
- Duration of receiver wake up (see Note 3)
- Receiver wake up interval (see Note 2)
- UTC minute
- UTC hour
- Receiver on or interval (see Note 1)
- MMSI of the AtoN Station

NOTE 1 0 = use interval setting as defined below;

1 = turn receiver on.

NOTE 2 Interval between receiver activation:

1 – 60 min if UTC hour is set to 24;

1 – 256 h if UTC hour is 0- 23;

(Note: 168 h is once per week).

NOTE 3 Maximum awake time (1 440 min is 24 h).

NOTE 4 This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

“R’ = sentence is a query response,

“C” = sentence is a configuration command to change settings.

A.7.3 Query via the configuration port for ARW

To query this sentence use the standard IEC 61162-1 query structure.

Note: The MCR sentence functionality should not be used for new designs. As the publication date of this document the MCR has not been replaced.

A.8 MCR – Configure proprietary AtoN control command – DEPRECATED

A.8.1 Description

The payload of this sentence will be proprietary information used to control the AtoN Station.

A.8.2 Configuration via the configuration port for MCR

$--MCR,xxxxxxxxx,c--c,a*hh<CR><LF>

- Sentence status flag (see Note 1)
- Payload up to the 80 character length
- MMSI

NOTE 1 This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

“R’ = sentence is a query response,

"C" = sentence is a configuration command to change settings.

A.8.3 Query via the configuration port for MCR

To query the message, use the IEC 61161-2 mechanism.

Note: The MPR sentence is replaced by the MEB sentence in NMEA 0183 Version 4.10. The MEB sentence should be used for new designs. The MEB sentence has been updated with NMEA Technical Corrigendum TC# 0183 20150116 dated January 16, 2015.

A.9 MPR – Message configuration of payload re-broadcast command – DEPRECATED

A.9.1 Description

This message will be used to command the AIS AtoN Station to rebroadcast the payload or to define a new message for autonomous, continuous transmission. The AAR configuration with message ID/message ID index for a specific MPR must precede the MPR to identify it as autonomous continuous transmission. If it is a single transmission, this payload will be broadcast using the slots reserved by the AAR with message ID/message ID Index = 0, or it will use the next available slot.

A.9.2 Configuration or function via the configuration port for MPR

$--MPR,xxxxxxxxx,xx,xx,x,xx,xx,c--c,a*hh<CR><LF>

- Sentence status flag (see Note 3)
- Payload
- Sequence number
- Total number of sentences
- Broadcast behaviour (see Note 2)
- Message ID index
- Message ID (see Note 1)
- MMSI

NOTE 1 The following messages are supported by ITU-R M.1371 Messages 6, 8, 12, 14, 25, 26 and other appropriate messages.

NOTE 2 0 = use AAR definition,

1 = use next available slot.

NOTE 3 This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

"R' = sentence is a query response,

"C" = sentence is a configuration command to change settings.

A.9.3 Query via the configuration port for MPR

To query this sentence, use the standard IEC 61162-1 query structure.

Note: The TSP sentence is replaced by the TPC sentence in the NMEA 0183 Version 4.10. The TPC sentence should be used for new designs.

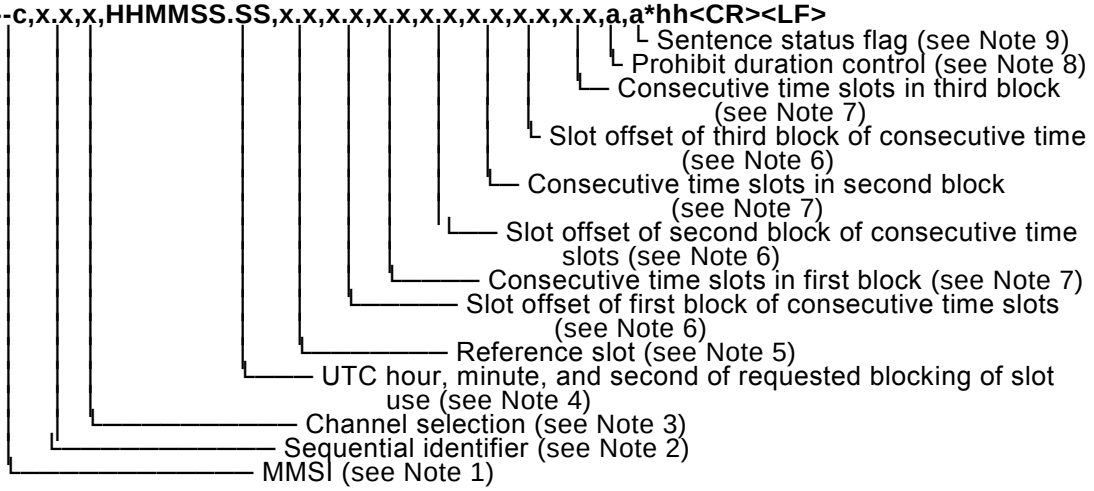
A.10 TSP – Transmit slot prohibit command – DEPRECATED

A.10.1 Description

This sentence is used to prohibit an AIS station from transmitting in the specified slots. The AIS Station receiving this sentence should not use the next occurrence of the indicated slots. This sentence is designed to be used to protect interrogation responses from interference from Base Station transmissions and for use with AtoN Stations. For an AtoN Station the Unique Identifier is the AtoN Station Real MMSI.

A.10.2 Configuration via the configuration port using the TSP sentence

$--TSP,c--c,x.x,x,HHMMSS.SS,x.x,x.x,x.x,x.x,x.x,x.x,x.x,x.x,x.x,a,a*hh<CR><LF>



NOTE 1 The MMSI is defined in the AID sentence and is the MMSI of the Real AtoN.

NOTE 2 The sequential identifier provides an identification number from 0 to 99 that is sequentially assigned and is incremented for each new TSP sentence. The count resets to 0 after 99 is used. This sequential identifier is used to identify the Base Station's response to this TSP-sentence when it replies with a slot prohibit status report (see TSR-sentence).

NOTE 3 1 = Channel 1,

2 = Channel 2.

NOTE 4 This is for record keeping. It contains the hour, minute, and second of this request.

NOTE 5 This is the slot from which the following slot offsets are referenced.

NOTE 6 Slot offset of the first slot in the block of slots to be blocked from use by the Base Station.

0 indicates no prohibited slots.

NOTE 7 Total number of consecutive slots to be blocked from use by the Base Station. The first slot of the block is also part of the count. Therefore, the minimum value is 1.

1-5 = number of prohibited slots.

NOTE 8 This field is used to control the prohibited slots. This field should not be null.

C = immediately restore for use all slots currently prohibited from use,

E = the slot prohibition expires for the slots identified in this sentence after their next occurrence,

P = prohibit the use of slots identified in this sentence. Slots are restored for use using "C" or "R",

R = restore the use of slots identified in this sentence.

NOTE 9 This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

"R" = sentence is a query response,

"C" = sentence is a configuration command to change settings.

A.10.3 Query via the configuration for TSP

To query this sentence, use the standard IEC 61162-1 query structure.

Note: This version of the IEC VER sentence is incorrect. The Data Field Notes in this IEC sentence description are incorrect. The IEC sentence structure is incorrect. This sentence and has been replaced by the NMEA version in NMEA 0183 Version 4.10. The NMEA sentence should be used for new designs.

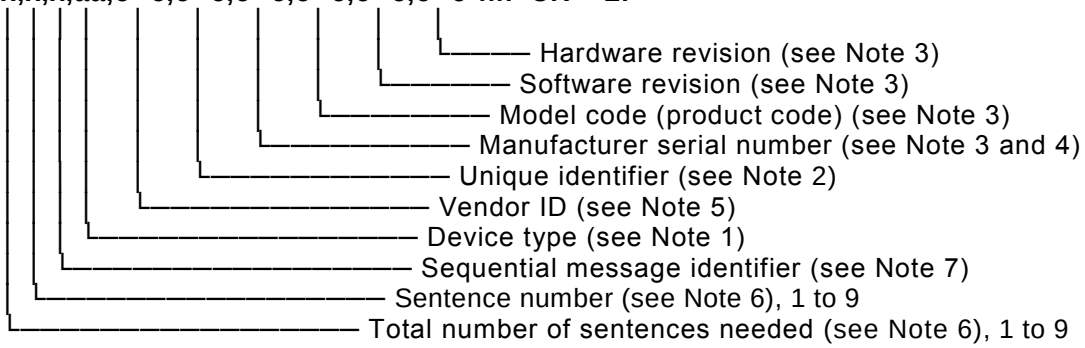
A.11 VER – Version

A.11.1 Description

This sentence is used to provide identification and version information about a talker device. This sentence is produced either as a reply to a query sentence. The contents of the data fields, except for the unique identifier, should be manufactured into the talker device. The unique identifier is the AtoN Station Real MMSI. In order to meet the 79-character requirement, a “multi-sentence message” may be needed to convey all the data fields.

A.11.2 Configuration via the configuration port for

$--VER,x,x,x,aa,c--c,c--c,c--c,c--c,c--c,c--c*hh<CR><LF>



NOTE 1 The device type is used to identify the manufactured purpose of the device. Choice of the device type identifier is based upon the designed purpose of the device. It is set into the equipment based upon the primary design of the device and remains constant even if the user defined talker identifier feature is used (see BCF-sentence). For AIS device types, use one of the following talker identifier mnemonics:

AB: independent AIS Base Station;

AD: dependent AIS Base Station;

AI: mobile class A or B (see IEC 61993-2 and IEC 62287-1) AIS station;

AL: limited AIS Base Station;

AN: AIS aids to navigation station;

AR: AIS receiving station;

AS: AIS physical shore station;

AT: AIS transmitting station;

AX: AIS simplex repeater station;

DU: duplex repeater station;

UP: microprocessor controller;

U#: (0 ≤ # ≤ 9) user configured talker identifier.

NOTE 2 The unique identifier is used for system level identification of a station, 15 alphanumeric character maximum. For an AtoN Station, this is the Real AtoN MMSI number.

NOTE 3 The data field length may be 32 characters maximum. The length of 32 characters is chosen in order to be consistent with similar data field lengths in the IEC 61162 standard. When large character lengths are used and the 80 character sentence limit would be exceeded for a single sentence, a series of successive VER sentences should be used to avoid the problem (using data fields 1 and 2 to ensure the multiple VER sentences are properly associated by the listener). Null fields can be used for data fields contained in other sentences of the series. Every VER sentence shall contain the unique identifier.

NOTE 4 The manufacturer’s serial number for the unit. Note, this “internal” manufacturer’s serial number may or may not match the physical serial number of the device.

NOTE 5 Vendor identification.

NOTE 6 Depending on the number of characters in each data field, it may be necessary to use a “multi-sentence message” to convey a “VER reply.” The first data field specifies the total number of sentences needed, minimum value 1. The second data field identifies the sentence number, minimum value 1.

NOTE 7 The third data field provides the sequential message identifier. The sequential message identifier provides a message identification number from 0 to 9 that is sequentially assigned and is incremented for each new multi-sentence message. The count resets to 0 after 9 is used. For a VER reply requiring multiple sentences, each sentence of the message contains the same sequential message identification number. It is used to identify the sentences containing portions of the same VER reply. This allows for the possibility that other sentences might be interleaved with the VER reply that, taken collectively, contain a single VER reply. This data field may be a null field for VER replies that fit into one sentence.