National Marine Electronics Association

International Marine Electronics Association

Technical Bulletin

Technical Corrigendum   TC# 0183 20150316

NMEA 0183 Version 4.10
CBR Sentence
COP Sentence
MEB Sentence

Introduction:

This Technical Corrigendum includes several enhancements to three NMEA 0183 sentences (CBR, COP and MEB). These sentences are used to configure AIS AtoN Stations. The changes are directly related to updates IEC 62320-1 Edition 2 AIS AtoN Station Standard.

This Technical Corrigendum includes necessary clarifications and additions to the CBR, COP, and MEB sentences.

Change summary

CBR Sentence
Notes 5, 6 and 7 have been expanded.

COP Sentence
This sentence has been extended with the "Reference date" data field.
Note 7 has been added for this new field.

MEB Sentence
Note 6 has been expanded.

The complete sentences and text are provided for context, with the changes highlighted and in a **bold font**. Text that no long applies is in **bold red font**, highlighted and has a **red strike thru**

CBR – Configure Broadcast Rates for AIS AtoN Station Message Command.

This sentence configures slots and transmission intervals that will be used to broadcast AIS AtoN Station messages (See IEC 62320-2). The sentence supports scheduling of messages with real, virtual, and synthetic MMSI's (See AID Sentence). The messages are assigned to the AIS AtoN Station for each channel.
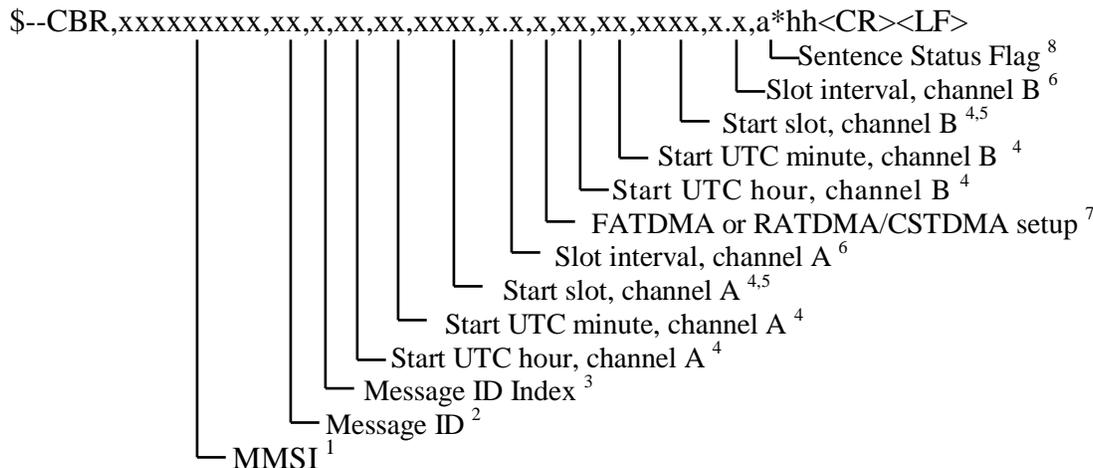
Message 21 is defined by the content of the ACG and ACF sentences and is identified by the MMSI and the message ID 21. Message ID Index = 0 is reserved to define the on-position message 21 transmission schedule. Message ID Index = 1 is reserved to define the off-position message 21 transmission schedule. The off-position schedule is optional (see ACG sentence, Off-position behavior).

Other than message 21, the combination of MMSI, Message ID, and Message ID Index are used to: (1) configure, (2) reference the AIS AtoN stations transmission slots, and (3) link to the MEB sentence.

Each message's transmission schedule is defined by the combination of Start UTC Hour, Start UTC Minute, Start Slot, and Slot Interval.

The AIS AtoN Station should apply this sentence to autonomously and continuously transmit VDL messages until revised by a subsequent CBR sentence. Subsequent CBR assignments override existing CBR assignments.

This sentence can be queried. The query response may contain one or more sentences and will continue until the transfer of all current schedule information is complete.

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

- Sentence Status Flag [8]
- Slot interval, channel B [6]
- Start slot, channel B [4,5]
- Start UTC minute, channel B [4]
- Start UTC hour, channel B [4]
- FATDMA or RATDMA/CSTDMA setup [7]
- Slot interval, channel A [6]
- Start slot, channel A [4,5]
- Start UTC minute, channel A [4]
- Start UTC hour, channel A [4]
- Message ID Index [3]
- Message ID [2]
- MMSI [1]

Notes:

1) This is a MMSI previously defined for the AIS AtoN station (See AID Sentence.).

2) Message ID is the number of the message being scheduled (See ITU-R M.1371). When Message ID is 0 this indicates that the slots being defined will be used for either chaining messages or MEB single transmissions (See IEC 62320-2).

3) Message ID Index is used to distinguish multiple occurrences of the same MMSI and Message ID combination. Valid range is 0 to 7.

4) Nominal start slot for each channel is determined by the combination of Start UTC hour, Start UTC minute, and Start slot.

5) Starting slot valid range is -1 to 2249.
   - A value of –1 clears the schedule and discontinues the broadcasts for the indicated channel(s).
     For FATDMA, a null field indicates no change to the current start slot setting when set to the AtoN Station.
     For RATDMA, start slot defines the first slot of the RATDMA selection interval.
     For RATDMA, a null field indicates that the selection interval randomly selected within the frame.
   - ~~A null field indicates no change to the current start slot setting when sent to the AtoN Station.~~

In response to a query this field cannot be null.
- In response to a query, a value of -1 indicates that the message is not scheduled for broadcast on the indicated channel.

The query response for the start slot selection interval when in RATDMA mode does not distinguish between a previous commanded value or a random chosen value.
- **The current start slot of the selection interval (the value as specified by a previous CBR command sentence).**
- **The current start slot of the selection interval (the value chosen randomly by the AIS device as specified by a previous CBR command sentence).**

6) Message transmission slot interval, valid range is -1 to 3 240 000 slots (24*60*2250 = 3 240 000 is once per day). **When configuring a AtoN Station with an RATDMA/CSTDMA schedule the valid range is: 0 to (24*60*60) slots.** A null field indicates no change to the current slot interval setting when sent to the AtoN Station.   In response to a query this field cannot be null, -1 indicates that the slot interval is not set.

7) Used to select whether the CBR is configuring a FATDMA schedule or RATDMA/CSTDMA schedule (0 indicates FATDMA, 1 indicates RATDMA, and 2 indicates CSTDMA). ~~For RATDMA/CSTDMA mode, scheduled transmissions are between the slot interval and the slot interval plus 150 slots~~. **For RATDMA/CSTDMA modes, the Slot Interval is the time between the start slots of the Selection Intervals.**

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 status report of current settings (use for a reply to a query).
   C = Sentence is a configuration command to change settings. A sentence without "C" is not a command.
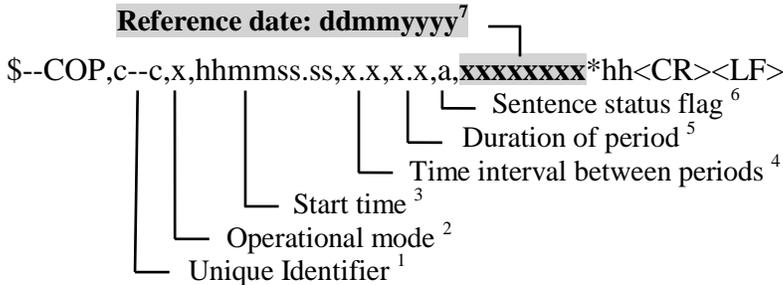
COP – Configure the Operational Period, Command

This sentence configures the operational schedule of a device. This includes directly enabling or disabling device operation, or having the device operation controlled by an internal process.

For example, this is used to coordinate operation of an AtoN chain as specified in IEC 62320-2. (See "Optional chaining of AIS AtoN Stations"). When chaining, the duration of AIS AtoN Station's receiver wake up time must be sufficient to allow correct operation of a chain.

This sentence can be queried.

Name of new field is:

Reference date: ddmmyyyy[7]

$--COP,c--c,x,hhmmss.ss,x.x,x.x,a,**xxxxxxxx***hh<CR><LF>

- Sentence status flag [6]
- Duration of period [5]
- Time interval between periods [4]
- Start time [3]
- Operational mode [2]
- Unique Identifier [1]

Notes:

1) The Unique Identifier is used for system level identification of a station, 15 characters maximum (see the AID sentence formatter). On input, this sentence should be accepted only if this data field matches the AtoN Station's Unique Identifier. On output, this data field is the AtoN Station's Unique Identifier.

2) 0 = operation controlled by internal process using the defined operating schedule.
   1 = enable operation
   2 = disable operation

3) Start time used to calculate the operational schedule. This is also the beginning time of the first operational period.

4) Time Interval between the beginning times of the operational periods in units of seconds.

5) Duration of operational period in units of seconds. (86400 seconds equals 24 hours).

6) 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 status report of current settings (use for a reply to a query).
   C = Sentence is a configuration command to change settings. A sentence without "C" is not a command.

7) **The Reference date specifies the date for Time intervals greater than 24 hours when choosing a start day of schedule that is different than the current day.**
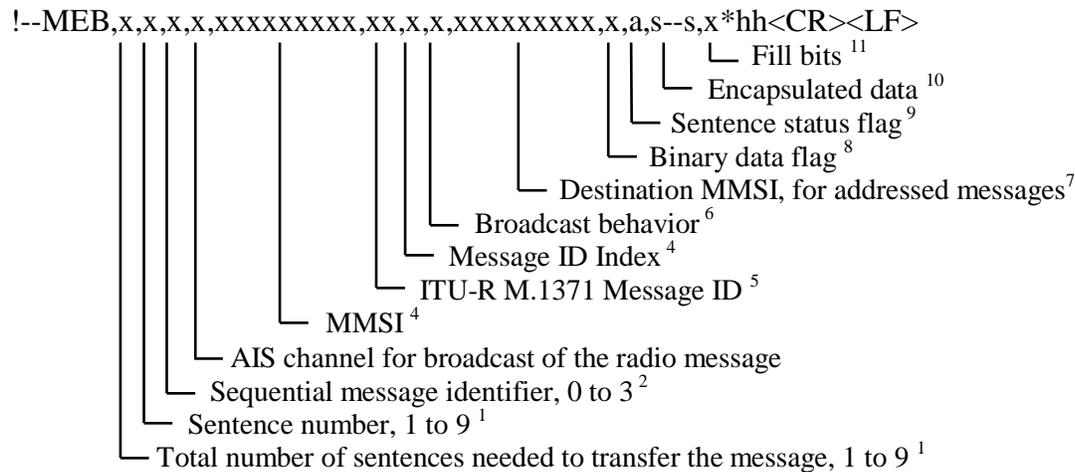
MEB – Message Input for Broadcast, Command

This sentence is used to input a message for storage or immediate broadcast. The sentence associates messages with real, virtual, and synthetic MMSI's (See AID sentence).

The stored message is associated by the MMSI, Message ID, and Message ID Index. The combination of MMSI, Message ID, and Message ID Index are used to reference the stored message and link the message to a transmission schedule as defined by a CBR sentence. The stored message's broadcast begins when both the message content and schedule (See CBR sentence) have been entered.

For immediate message broadcast, the binary data will be broadcast using the slots reserved by the CBR sentence with both Message ID and Message ID Index = 0, or will be broadcast using the next available slot. The channel for the immediate message broadcast is specified by the "AIS channel for broadcast of the radio message" (parameter field 4).

This sentence can be queried. When queried, the query response may contain one or more sentences and will continue until the transfer of all stored information is complete.

```
!--MEB,x,x,x,x,xxxxxxxxx,xx,x,x,xxxxxxxxx,x,a,s--s,x*hh<CR><LF>
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- Fill bits [11]
- Encapsulated data [10]
- Sentence status flag [9]
- Binary data flag [8]
- Destination MMSI, for addressed messages [7]
- Broadcast behavior [6]
- Message ID Index [4]
- ITU-R M.1371 Message ID [5]
- MMSI [4]
- AIS channel for broadcast of the radio message
- Sequential message identifier, 0 to 3 [2]
- Sentence number, 1 to 9 [1]
- Total number of sentences needed to transfer the message, 1 to 9 [1]

Notes:

1) The total number of sentences required to transfer the binary message data to the AIS unit. The first field specifies the total number of sentences used for a message, minimum value 1. The second field identifies the order of this sentence in the message, minimum value 1. All sentences contain the same number of fields. Successive sentences may use null fields for fields that have not changed, such as fields 4, 5, 6, 7, 8, 9, and 10.

2) This sequential message identifier serves two purposes. It meets the requirements as stated in Section 5.3.4 and it is the sequence number utilized by ITU-R M.1371 in message types 6 and 12. The range of this field is restricted by ITU-R M1371 to 0 - 3. The sequential message identifier value may be reused after the AIS unit provides the "ABK" acknowledgement for this number. (See ABK Sentence).

3) The AIS channel that should be used for the broadcast:
   0 = no broadcast channel preference, -
   1 = broadcast on AIS channel A,
   2 = broadcast on AIS channel B,
   3 = broadcast message on both AIS channels A and B,
   For an immediate message broadcast, this cannot be null. For a stored message it should be null.

4) For the message to be broadcast, this MMSI must match a previously entered a real, virtual, or synthetic MMSI (See AID and CBR Sentences).

5) ITU-R M.1371 messages supported by this sentence: 6, 8, 12, 14, 25, and 26. See IEC 62320-2 for the ITU-R M.1371 messages that are supported by an AIS AtoN Station.

6) Broadcast behavior values:

0 = For an AtoN device, the message is stored **in volatile memory** for autonomous continuous transmission as defined by a CBR sentence. The message is identified by the combination of MMSI, Message ID, and Message ID Index.

1 = For an AtoN device, a single transmission (not stored in the "message table") using the next available slot following slot selection priority:

- **If a MEB is received for a given MMSI, Message ID, and Message ID Index and the MMSI, Message ID, and Message ID Index, already has a broadcast schedule then that schedule is used to send the new message**.
- **If a MEB is received for a given MMSI, Message ID, and Message ID Index and the MMSI, Message ID, and Message ID Index, does not have a broadcast schedule, then the message is transmitted using the next available slot using the following priority scheme.**
    - **Use CBR definition, Message ID = 0, Message ID Index = 0 (if available)**
    - **Use RATDMA if supported by the AtoN unit**

2 = for continuous transmission in non-volatile memory

3 = delete the stored message (this includes volatile and non- volatile)

4 – 9 = reserved for future use

7) The "Destination MMSI, for Addressed Messages" should be a null field when the message is not destination specific, and is intended to be destination broadcast on the VHF Data Link.

8) The "Binary data flag" field has a range from 0 to 1 with the following meaning:

0 = unstructured binary data (no Application Identifier bits used)

1 = binary data coded as defined by using the 16-bit Application Identifier (See ITU-R M.1371, messages 25 and 26)

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 status report of current settings (use for a reply to a query).

C = Sentence is a configuration command to change settings. A sentence without "C" is not a command.

10) This is the content of the "binary data" parameter for either ITU-R M.1371 MESSAGE 6, 8, 25, or 26, or the "Safety related Text" parameter for either message 12 or 14. The actual number of "6-bit" symbols in a sentence must be adjusted so that the total number of characters in a sentence does not exceed the "82- character" limit.

11) This field cannot be null.