Annex A

9.2.1.1 IEC 61162-1 Sentences used

ACK – General Base Station Configuration

This sentence is used to acknowledge alarm condition reported by the AIS RX PRO
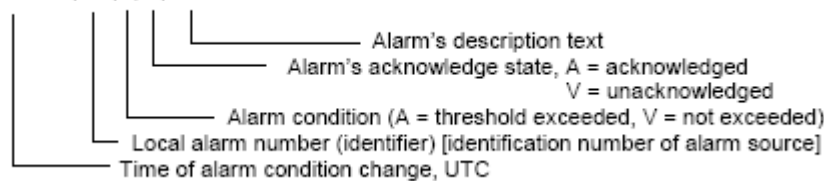
```
$--ACK, xxx*hh<CR><LF>
```

Where xxx is the alarm number as indicated by the alarm message

ALR – Set alarm state

AIS RX PRO alarm condition and status. This sentence is used to report an alarm condition on an AIS RX PRO and its current state of acknowledgement.
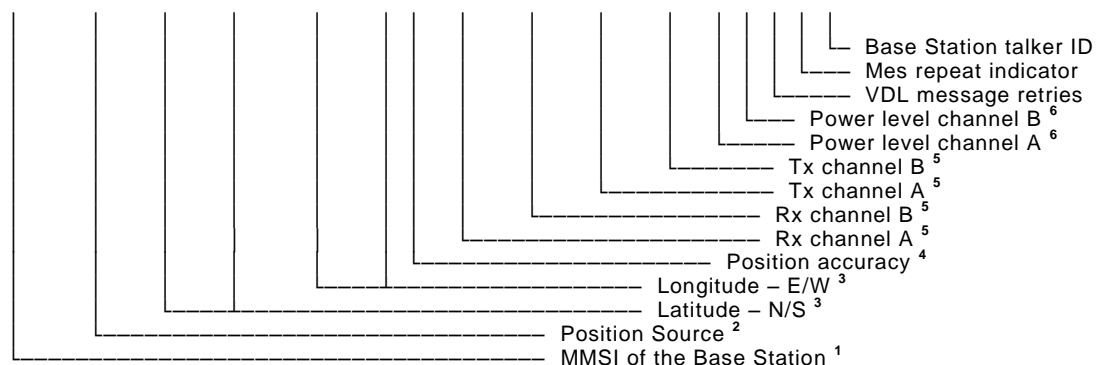


```
$--ALR,hhmmss.ss,xxx,A, A,c--c*hh<CR><LF>
```
- Alarm's description text
- Alarm's acknowledge state, A = acknowledged V = unacknowledged
- Alarm condition (A = threshold exceeded, V = not exceeded)
- Local alarm number (identifier) [identification number of alarm source]
- Time of alarm condition change, UTC

BCF – General Base Station Configuration

This sentence is used to configure the static Base Station parameters when it is initially installed, and later in order to make changes to the way it operate. Dynamic parameters (e.g. UTC and position of a moving Base Station) are input in a different way. This sentence supports system administration of the AIS Base Station operation.


```
$--BCF,xxxxxxxxx,x,llll.ll,a,yyyyy.yy,a,x,xxxx,xxxx,xxxx,xxxx,x,x,x,x,aa*hh<CR><LF>
```
- Base Station talker ID
- Mes repeat indicator
- VDL message retries
- Power level channel B [6]
- Power level channel A [6]
- Tx channel B [5]
- Tx channel A [5]
- Rx channel B [5]
- Rx channel A [5]
- Position accuracy [4]
- Longitude – E/W [3]
- Latitude – N/S [3]
- Position Source [2]
- MMSI of the Base Station [1]

NOTES

1. This Data Field is the MMSI of the Base Station. In early Base Stations, this Data Field set the MMSI of the Base Station. For Base Stations built to comply with IEC 62320-1, this Data Field should not be used. The attached "Comment Block" parameter-code "d:" should be used to test if this sentence is intended for this Base Station. The Base Station should ignore this sentence if the parameter-code "d:" value in the attached Comment Block does not match the internal "Unique Identifier" (Also, see the SID sentence.).

2. Identifies the source of the position:

    0 = surveyed position

    1 = internal EPFD in use

    2 = external EPFD in use

    3 = internal EPFD in use with automatic fall back to surveyed position

    4 = internal EPFD in use with automatic fall back to external EPFD upon failure of internal EPFD

    5 = external EPFD in use with automatic fall back to surveyed position

    6 = external EPFD in use with automatic fall back to internal position source upon failure of external position source

3. Surveyed position of the Base Station. The position is only applicable to fixed Base Stations. Within the Base Station, the "electronic position fixing device" Data Field must be set to a value of 7 indicating a surveyed position. Mobile or non-fixed Base Stations receive their position information by another means.

4. 0 = low > 10m.

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

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

6. 0 = high power (Nominal 12.5 Watts)

    1 = low power (Nominal 2 Watts)

    2 to 9 reserved for future use

BRM - Base Station Options Reply of Received Messages

This sentence will give optional information of a received Message of a Base Station. The output sentence of the received Message (VDM) must be just before this sentence.
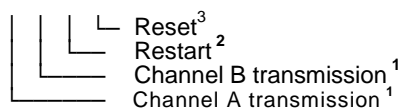
```
$--BRM,,,aaaa,bbbb*<CR><LF>
```

    aaaa: signal strength of previous received message
    bbbb: Slot number

CAB – Control AIS Base Station

This sentence is used to turn on or off the transmission of channel A and B on an AIS Base Station and also to command a restart of the Base Station. This sentence supports system administration of the AIS Base Station operation.

```
$--CAB,x,x,x,x*hh<CR><LF>
               └─ Reset[3]
             └── Restart[2]
           └──── Channel B transmission[1]
         └────── Channel A transmission[1]
```

NOTE 1 Not used since AIS RX PRO is not a transmitting device

NOTE 2 This field commands the AIS RX PRO to restart operations to last known configuration. The value of "1" indicates a restart. If a restart is not being indicated, this field is null.

NOTE 3 Not used

$PTHAJ - AIS data Slot and Jitter message:

The $PTHAJ sentence gives information of when a message is received in terms of; channel the message was received in, slot number and how it is referenced to the start boundary of the slot.

$PTHAJ,a,bbbb,cdddd.d*hh<CR><LF>

a:	AIS Channel (A or B)
bbbb:	Slot number (0-2249)
c:	Time measurement sign (P = positive, N = negative)
dddd.d	Start time in relation to T_{TS} (0 – 13333.3) in micro seconds

Transmissions that are received before expected start time is regarded as negative time (- sign), transmissions hat are received after expected start time is regarded as positive time (+ sign)
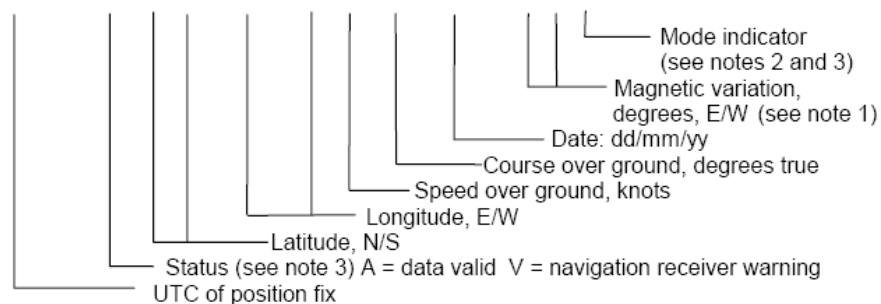
!PTHAR – AIS VHF Data Link message with wrong HDLC Checksum

This sentence is identical to the !--VDM sentence but contains a received message that has been found with wrong HDLC checksum. The !PTHAR sentence indicates that the information received is a AIS message but contains bit error(s) in the data segment. The !AIVDM and !PTHAR sentences have the same structure but have different Talker IDs, Sentence IDs and for the !PTHAR contains a data pay load with wrong CRC.

RMC Recommended minimum specific GNSS data

Time, date, position, course and speed data provided by a GNSS navigation receiver. This sentence is transmitted at intervals not exceeding 2 s and is always accompanied by RMB when a destination waypoint is active. RMC and RMB are the recommended minimum data to be provided by a GNSS receiver. All data fields must be provided, null fields used only when data is temporarily unavailable.

$--RMC, hhmmss.ss, A, llll.ll,a, yyyyy.yy, a, x.x, x.x, xxxxxx, x.x,a, a*hh<CR><LF>

- Mode indicator (see notes 2 and 3)
- Magnetic variation, degrees, E/W (see note 1)
- Date: dd/mm/yy
- Course over ground, degrees true
- Speed over ground, knots
- Longitude, E/W
- Latitude, N/S
- Status (see note 3) A = data valid V = navigation receiver warning
- UTC of position fix

NOTE 1 Easterly variation (E) subtracts from true course. Westerly variation (W) adds to true course.

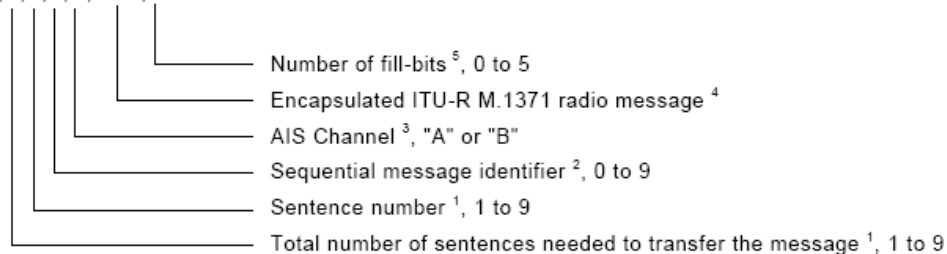NOTE 2 Positioning system Mode indicator:

A = Autonomous mode
D = Differential mode
E = Estimated (dead reckoning) mode
M = Manual input mode
S = Simulator mode
N = Data not valid

NOTE 3 The positioning system Mode indicator field supplements the positioning system Status field (field No. 2) which shall be set to V = invalid for all values of Mode indicator except for A = Autonomous and D = Differential. The positioning system Mode indicator and Status fields shall not be null fields.

! --VDM – AIS VHF data-link message

This sentence is used to transfer the entire contents of a correct received AIS message packet, as defined in ITU-R M.1371-1/2 and as received on the VHF Data Link (VDL), using the "six-bit" field type. The structure provides for the transfer of long binary messages by using multiple sentences.

```
!--VDM,x,x,x,a,s--s,x*hh<CR><LF>
```

Number of fill-bits [5], 0 to 5

Encapsulated ITU-R M.1371 radio message [4]

AIS Channel [3], "A" or "B"

Sequential message identifier [2], 0 to 9

Sentence number [1], 1 to 9

Total number of sentences needed to transfer the message [1], 1 to 9

NOTE 1   The length of an ITU-R M.1371 message may be long and may require the use of multiple sentences. 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. These cannot be null fields.

NOTE 2   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 message 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 message. This allows for the possibility that other sentences might be interleaved with the message sentences that, taken collectively, contain a single message. This field shall be a null field when messages fit into one sentence.

NOTE 3   The AIS message reception channel is indicated as either "A" or "B." This channel indication is relative to the operating conditions of the AIS when the packet is received. This field shall be null when the channel identification is not provided. The VHF channel numbers for channels "A" and "B" are obtained by using an ACA-sentence "query" of the AIS.
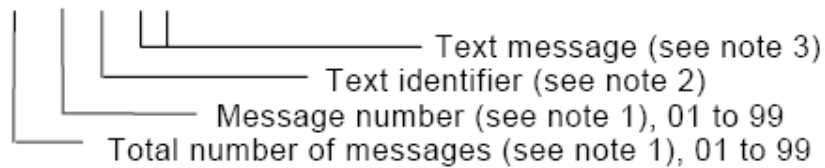
NOTE 4   The maximum string length of encapsulation is limited such that the total number of sentence characters does not exceed 82. This field supports a maximum of 62 valid characters for a message transferred using multiple sentences, and 63 valid characters for a message using a single sentence.

NOTE 5   To encapsulate, the number of binary bits must be a multiple of six. If it is not, one to five "fill bits" are added. This parameter indicates the number of bits that were added to the last 6-bit coded character. This value shall be set to zero when no "fill bits" have been added. This cannot be a null field.

TXT – Text transmission

For the transmission of short text messages. Longer text messages may be transmitted by using multiple sentences.

```
$--TXT,xx,xx,xx,c--c*hh<CR><LF>
```
- Text message (see note 3)
- Text identifier (see note 2)
- Message number (see note 1), 01 to 99
- Total number of messages (see note 1), 01 to 99

NOTE 1   Text messages may consist of the transmission of multiple messages all containing identical field formats. The first field specifies the total number of messages, minimum value = 1. The second field identifies the order of this message (message number), minimum value = 1. For efficiency, it is recommended that null fields be used in the additional sentences; otherwise data is unchanged from the first sentence.

NOTE 2   The text identifier is a number, 01 to 99, used to identify different text messages.

NOTE 3   ASCII characters, and code delimiters if needed, up to the maximum permitted sentence length (i.e. up t61 characters including any code delimiters).